SHIYAZI HYDRO POWER PROJECT IN GUIZHOU PROVINCE CHINA

Document Prepared By (Guizhou Honor Carbon Asset Management Co., Ltd)

Project Title	Shiyazi Hydro power Project in Guizhou Province China
Version	Version 02
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Project ID	*VCS project database ID, if registered*
Monitoring Period	28/04/2011 to 04/09/2011
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1 PROJECT DETAILS

1.1 Summary Description of Project

Shiyazi 140MW Hydro Power Project (here after referred to as "the proposed project") is a diversion type hydropower station which locates in Meilin canyon lying between Daping town and Baicun town, Wuchuan Country, Zunyi City, Guizhou Province, China. The proposed project total installed capacity is 140MW (2×70MW), the power density of the project is 17.4 W/m2. The estimated annual operation time of the proposed project is 3416h and the average electricity generated is 478,200 MWh and the expected annual feed-in electricity to the grid is 467,300MWh. The electricity generated by the proposed project will meet the electricity demand of industrial and agricultural production and Zunyi City people's life, assume the task to adjust the peak in the local grid, and finally is delivered to China Southern Power Grid (CSPG).

Electricity generated by the proposed project will displace part of the electricity generated by China Southern Power Grid (CSPG) which is dominated by fossil fuel-fired power plants, and thus greenhouse gas (GHG) emission reductions could be achieved. The estimated annual GHG emission reductions are 368,209 tCO2e.

1.2 Sectoral Scope and Project Type

The project falls into: Sectoral Scope 1: energy industries (renewable sources)

Subclass: hydro power

The Project is not a Grouped project.

1.3 Project Proponent

Project Participants	Guizhou Zhongshui Energy Co.Ltd.
Role	Project owner
Contact Information	Ms. Huo Hong Tel: +86-851-6992740 Fax: +86-851-6992741 Address : No.136 Ruijingbei Road,Guiyang City, Guizhou Province, China
Responsibilities	Be responsible for the management of the proposed project.

1.4 Other Entities Involved in the Project

There is no any other Project Participant(s)

1.5 Project Start Date

28/04/2011

1.6 Project Crediting Period

28/04/2011-04/09/2011

Reason to choose this Crediting Period is that the project successfully registered for CDM project on 05/09/2011, meanwhile the Project generated electricity continuously from 28/04/2011.

1.7 Project Location

The proposed project is located at Meilin canyon which lies between Daping town and Baicun town, Wuchuan Country, Zunyi City, Guizhou Province. The geographical coordinates of the dam are 107º58′7″E and 28º39′9″N, and the geographical coordinates of the powerhouse are 107º58′7″E and 28º39′9″N.

1.8 Title and Reference of Methodology

Title of the approved methodology: ACM0002-Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Version 12.1.0)

Tool: "Tool to calculate the emission factor for an electricity system" (Version 02.0)

"Tool for the demonstration and assessment of additionality" (Version 05.2)

"Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 02)

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

The construction of the project started on 15/07/2007. The first set of water turbine and generator unit started commissioning on 28/04/2011, the second on 28/04/2011. Since then project is operation at full capacity. Project activity was operational during the first monitoring period.

There is no exchange of equipment during the monitoring period. There is no event occurred during this monitoring period, which may have impact on the applicability of the methodology as well as emission reduction.

2.2 Project Description Deviations

Not applicable

2.3 Grouped Project

This project is not a grouped project; this section is therefore not applicable.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	EF grid, CM, y
Data unit:	tCO2/MWh
Description:	Emission factor

Source of data:	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value applied:	0.78795
Purpose of the data:	Baseline emission calculation
Any comment:	-

3.2 Data and Parameters Monitored

Data Unit / Parameter:	$EG_{PJ\ to\ Grid,\ y}$
Data unit:	MWh
Description:	Electricity exported to the grid by the proposed project
Source of data:	The ammeter data
Description of measurement methods and procedures to be applied:	The electricity supplied to the grid will be monitored hourly and recorded monthly by the Main Meter. Data will be archived for 2 years following the end of the crediting period by means of electronic and paper backup.
Frequency of monitoring/recording:	Continuous measurement and daily recording
Value monitored:	
Monitoring equipment:	Meter: M1, M2 Accuracy: 0.2s Location: The output of the project at project site belonging to the grid company Calibration: Once every three month
QA/QC procedures to be applied:	The uncertainty level of this data is low. The data will be measured continuously and recorded daily and then aggregated monthly.. Measurements are being continuously recorded, and then the output will be aggregated so that monthly output electricity can be shown. Electricity sales receipts will also be obtained as an additional check. The meters will be calibrated periodically in accordance with the regulation(DL/T448-2000). The accuracy of the meter selected is 0.2s class.
Calculation method:	Not applicable
Any comment:	-

Data Unit / Parameter:	$EG_{Grid\ to\ PJ,\ y}$
Data unit:	MWh

<table>
<tr><td>Description:</td><td>Electricity imported by the proposed project bought from the power grid</td></tr>
<tr><td>Source of data:</td><td>The ammeter data</td></tr>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>The electricity supplied to the grid will be monitored hourly and recorded monthly by the Main Meter. Data will be archived for 2 years following the end of the crediting period by means of electronic and paper backup.</td></tr>
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<tr><td>Value monitored:</td><td></td></tr>
<tr><td>Monitoring equipment:</td><td>
<table>
<tr><td>Meter</td><td>M1</td><td>M2</td></tr>
<tr><td>Accuracy</td><td colspan="2">0.2s</td></tr>
<tr><td>Location</td><td colspan="2">The output of the project at project site belonging to the grid company</td></tr>
<tr><td>Calibration</td><td colspan="2">Once every three month</td></tr>
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<tr><td>Calculation method:</td><td>Not applicable</td></tr>
<tr><td>Any comment:</td><td>-</td></tr>
</table>

Data Unit / Parameter:	CAP_{pj}
Data unit:	MW
Description:	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data:	Project site
Description of measurement methods and procedures to be applied:	The data based on the equipments purchasing contract、nameplates
Frequency of monitoring/recording:	Yearly

Value monitored:	140
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	Not applicable
Any comment:	-

Data Unit / Parameter:	A P_J
Data unit:	m^2
Description:	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.
Source of data:	Project site
Description of measurement methods and procedures to be applied:	-
Frequency of monitoring/recording:	Yearly
Value monitored:	8,060,000
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	Not applicable
Any comment:	-

3.3 Description of the Monitoring Plan

The project owner is the user of this monitoring plan and will be responsible for this monitoring plan. The project owner must maintain credible, transparent, and adequate data estimation, measurement, collection, and tracking systems to maintain the information required for an audit of an emission reduction project. These records and monitoring systems are needed to allow the selected DOE to verify project performance as part of the verification and certification process.

This process also reinforces that CO2 reductions are real and credible to the buyers of the Certified Emissions Reductions (CERs).

Emission reductions will be achieved through avoided power generation of fossil fuel electricity due to the power generated by the proposed project. The grid-connected output is therefore defined as the key data to monitor.

Operational and Management Structure For Monitoring

The monitoring of the emissions reductions will be carried out according to figure 1 below. The General Manager will hold the overall responsibility for the monitoring process, but as indicated below parts of the process are delegated. The first step is the measurement of the electrical energy supplied to the grid and reporting of daily operations, which will be carried out by the plant manager.

The project owner will appoint a monitoring officer who will be responsible for verification of the measurement, collection of sales receipts, collection of billing receipts of the power supplied by the grid to the project and the calculation of the emissions reductions. The monitoring officer will prepare operational reports of the project activity, record the daily operation of the project including operating periods, power generation, power delivered to the grid, and equipment defects, etc. Finally, the monitoring reports will be reviewed by the General Manager.

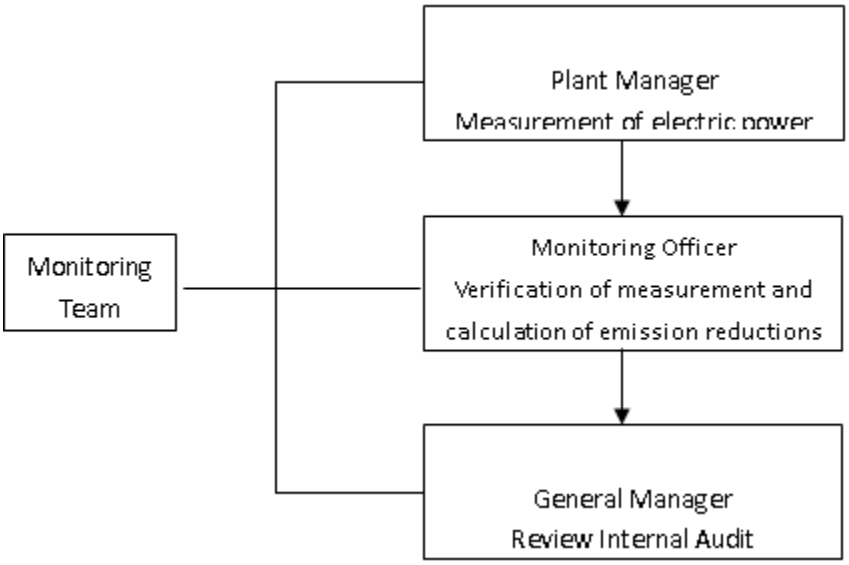

Figure 1 Operation and management structure

Monitoring Plan

The approved monitoring methodology ACM0002(Version 12.1.0) is used for developing the monitoring plan.

Monitoring tasks must be implemented according to the monitoring plan in order to ensure that the real, measurable and long-term greenhouse gas (GHG) emission reduction for the proposed project is monitored and reported.

1. Responsibility

Overall responsibility for daily monitoring and reporting lies with the project owner. A CDM group will be established by the project owner to carry out the monitoring work.

2. Reporting

Table 1 Information of the meters

Meter	Accuracy	Location	Function	Calibration
M1	0.2s	The output of the project at project site belonging to the grid company	To monitor electricity exported to the power grid and consumed from power grid of the project (main meter)	Once every three month
M2	0.2s	The output of the project at project site belonging to the grid company	To monitor electricity exported to the power grid and imported from power grid of the project (backup meter)	Once every three month

The specific steps for data collection and reporting are listed below:

(1) The readings of M1 will be measured hourly and recorded monthly. The data of electricity exported to power grid and electricity imported from power grid are recorded monthly and monitored hourly. The difference of exported and imported data is the net power generation of the project;

(2) Both of the Power Grid Company and Project Owner record the net electricity generation data according to the reading of M1;

(3) The power grid company provides project owner the electricity trade note. The project owner crosschecks the net electricity generation data and provides the Power Grid Company with sales receipts and preserves the copies of the sales receipts.

(4) If one's readings are not consistent with the other, the readings will be crosschecked with readings of backup meter M2. Then a right reading would be used to calculate.

(5) The project owner provides DOE with readings record of Main Meters and copies of sales receipts.

The principle of the processes is to guarantee the DOE could obtain the actual and precise data of net generated electricity.

If any errors of the meters are detected, the party owning the meters shall repair, recalibrate or replace them, and give the other party sufficient notice to allow a representative to attend during any corrective activity. If the readings of M1 is beyond allowable error, the data should be determined firstly by M2 ,if it is also beyond allowable error the electricity during the meters malfunction period will be abandoned in order to be conservative.

3. Calibration

The meters will be calibrated periodically in accordance with the regulation(DL/T448-2000). The main meters will be calibrated once every three month.

4. Data management system

Physical document such as paper-based maps, diagrams and environmental assessments will be collected in a central place, together with this monitoring plan. In order to facilitate auditors' reference of relevant literature relating to the project, the project material and monitoring results will be indexed. All paper-based information will be stored by the technology department of the project owner and all the material will have a copy for backup. And all data including calibration records are kept until 2 years after the end of the total credit time of the CDM project.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

According the ACM0002, the baseline emissions(BEy) is calculated as follows:

$BE_y = EG_{facility,y} \times EF_{grid,CM,y} = (EG_{PJ\ to\ Grid,y} - EG_{Grid\ to\ PJ,y}) \times EF_{grid,CM,y}$

$EG_{facility,y} = EG_{PJ\ to\ Grid,y} - EG_{Grid\ to\ PJ,y}$

Where

BE_y – Baseline emission in year y (tCO2/yr)

$EG_{facility,y}$ –Net electricity supplied to the grid (MWh)

$EF_{grid,CM,y}$ – The emission factor in year y, calculated according to the registered PDD

The emission factor in registered PDD has been determined as 0.78795tCO2e/MWh.

$EG_{PJ\ to\ Grid,y}$ –Electricity exported to the grid by the proposed project (MWh)

$EG_{Grid\ to\ PJ,y}$ –Electricity imported by the proposed project bought from the power grid (MWh)

The detailed calculation procedure is described below:

According to the detail data of the two tables below, the BEy could be calculated as follows:

$BE_y = EG_{facility,y} \times EF_{grid,CM,y} = (EG_{PJ\ to\ Grid,y} - EG_{Grid\ to\ PJ,y}) \times EF_{grid,CM,y}$ = (148,713.160 – 502.920)MWh × 0.78795 tCO2e/MWh = 116,782 tCO2e

Electricity supplied to the grid

Period	M1 EG PJ to Grid, y(MWh)	EG PJ to Grid, (MWh) Sales receipts	EG PJ to Grid, y （MWh）
	A	B	C=min(A,B)
00:00:00 28/04/2011- 24:00:00 30/04/2011	1,396.560	1,400.000	1,396.560
00:00:00 01/05/2011- 24:00:00 31/05/2011	9,199.080	9,200.000	9,199.080
00:00:00 01/06/2011- 24:00:00 30/06/2011	39,977.520	39,980.000	39,977.520
00:00:00 01/07/2011- 24:00:00 31/07/2011	49,114.560	49,110.000	49,110.000
00:00:00 01/08/2011-	42,601.680	42,600.000	42,600.000

24:00:00 31/08/2011			
00:00:00 01/09/2011-24:00:00 04/09/2011	6,432.360	6,430.000	6,430.000
Total	148,721.760	148,720.000	148,713.160

Electricity import from the grid

Period	M1 EG Grid to PJ, y (MWh)	EG Grid to PJ(MWh) Sales receipts	EG Grid to PJ, y （MWh）
	D	E	F=max(D,E)
00:00:00 28/04/2011-24:00:00 30/04/2011	6.600	6.600	6.600
00:00:00 01/05/2011-24:00:00 31/05/2011	137.280	137.280	137.280
00:00:00 01/06/2011-24:00:00 30/06/2011	126.720	126.720	126.720
00:00:00 01/07/2011-24:00:00 31/07/2011	109.560	109.560	109.560
00:00:00 01/08/2011-24:00:00 31/08/2011	117.480	117.480	117.480
00:00:00 01/09/2011-24:00:00 04/09/2011	5.280	5.280	5.280
Total	502.920	502.920	502.920

4.2 Project Emissions

The project is a new hydropower plant resulting in new reservoir, the installed capacity of the proposed project is 140MW, the area of the reservoir is 8.06km^2 based on the report of water surface area at the full reservoir level after operation . According to ACM0002 (Version 12.1.0), the power density of the project activity is calculated as follows:

$$PD=(Cap_{PJ}-Cap_{BL})/(A_{PJ}-A_{BL})$$

Where:

PD＝Power density of the project activity, in W/m^2.

Cap_{PJ} = Installed capacity of the hydropower plant after the implementation of the project activity (W).

Cap_{BL} = Installed capacity of the hydropower plant before the implementation of the project activity (W). For new hydropower plants, this value is zero.

A_{PJ} = Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2).

A_{BL} = Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero.

Then the power density equals to:

$PD = Cap_{PJ} / A_{PJ} = 140\ MW/8.061\ km^2 = 17.4\ W/m^2$

The power density of project is 17.4 W/m^2, which is greater than 10 W/m^2, the project emissions by the project activity are zero.

PEy=0(tCO2e)

4.3 Leakage

According to ACM0002, there is no need for the proposed project to consider leakage. Besides there is no fossil fuel engine/generator which is in place for emergency purpose during the monitoring period. The leakage from the project is zero.

$L_y=0$

4.4 Summary of GHG Emission Reductions and Removals

ER y = BE y – PE y – L y
BE y = Baseline Emissions=116,782 (tCO_2e)
PE y = Project emissions = 0(tCO_2e)
L y = Leakages = 0(tCO_2e)
ER y = BE y=116,782 (tCO_2e)

The total Emission Reductions (ER_y) is calculated as follow:
ERy = BEy – PEy – Ly=116,782-0-0=116,782(tCO_2e)

Emission reductions generated in this monitoring period (28/04/2011-04/09/2011):116,782(tCO_2e).

5 ADDITIONAL INFORMATION

Item	Values of ex-ante calculation	Actual values reached during the monitoring period
Emission reductions (tCO2e)	368,209 (per year); 131,143 (130 days)	116,782 (130 days);

the annually expected emission reduction of the project is 368,209 tCO2e. This monitoring period covers 28/04/2011-04/09/2011 which is 130 days in total. Then the estimated emission reduction for this monitoring period should be: 131,143 tCO2e

The actual GHG emission reduction of this monitoring period (116,782tCO2e) is 11% less than the estimation (131,143 tCO2e). It is because the drought in this monitoring period

Emission reductions	CO_2e (tCO_2e)	CH_4 (tCH_4)	N_2O (t N_2O)	HFCs （t HFC）	PFCs （t PFC）	SF6 (tSF6)	Sum (tCO_2e)
28/04/2011-04/09/2011	116,782						116,782