

SICHUAN HUADIAN XIXI RIVER HYDRO-ELECTRICITY DEVELOPMENT CO., LTD. DILUO HYDROELECTRIC PROJECT

Document Prepared By Beijing Cronus Technology Consultancy Centre

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1 PROJECT DETAILS

1.1 Summary Description of Project

Sichuan Huadian Xixi River Hydro-electricity Development Co., Ltd. Diluo Hydroelectric Project (hereafter referred to as “the Project”) is hydropower project with a run-of-river reservoir. The Project reduces greenhouse gas emissions by generating carbon neutral power that displaces carbon intensive power from Central China Power Grid (hereafter referred to as “the grid”). The total installed capacity of the Project is 100 MW (2×50MW). The Project uses hydro power generation technology for electricity generation and transmission.

1.2 Sectoral Scope and Project Type

The Project falls in the sectoral scope 1: energy industries (renewable-/non-renewable sources). The Project is not a grouped project.

1.3 Project Proponent

Sichuan Huadian Xixi River Hydro-electricity Development Co., Ltd (Project Owner)

Address: Sanchakou West Road, Xichang City, China, 615000

Tel: 86-834-2169408

Fax: 86-834-2169408

1.4 Other Entities Involved in the Project

There is no any other project participant(s).

1.5 Project Start Date

17-12-2009

1.6 Project Crediting Period

17-12-2009 to 14-06-2011, in total 545 days

1.7 Project Location

The Project is located in Zhatai Village, Diluo Town, Butuo County, Sichuan Province, China. The GSP coordinates of the powerhouse and dam are 27°34'52"N, 103°2'41"E and 27°40'12.76"N and 103°2'50.43"E respectively.

1.8 Title and Reference of Methodology

ACM0002 Version 12.1.0 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources

<http://cdm.unfccc.int/UserManagement/FileStorage/LDJ5AX4P2NWF0U19EY3QCISOVM7TKR>

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

<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.pdf>

"Tool to calculate the emission factor for an electricity system" (Version 2)

<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf>

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

The project was registered under CDM on 15-6-2011 and installed two sets of turbine and generator (50MW each) which are the same as described in the project PDD.

The Project consists of one site only and the implementation is not phased. The Project started commissioning on 17-12-2009 and continued operation since 26-12-2009.

The project operated normally during the indicated monitoring period, however the revenue meters were replaced on 23-03-2011.

2.2 Deviations from the Monitoring Plan

N/A

2.3 Grouped Project

N/A

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	EF _y
Data unit:	tCO ₂ /MWh
Description:	Baseline emission factor
Source of data:	Calculated according to the procedure outlined in B.6.1 of the validated PDD
Value applied:	0.85285
Purpose of the data:	Calculation of baseline emissions
Any comment:	N/A

3.2 Data and Parameters Monitored

Data Unit / Parameter:	EG _{pj,y}		
Data unit:	MWh		
Description:	Quantity of electricity exported by the project plant to the grid in year y		
Source of data:	Monthly records of the revenue meters		
Description of measurement methods and procedures to be applied:	Measured by old Revenue Meter I and II from 17-12-2009 to 25-03-2011 and measured by new Revenue Meter I and II from 25-03-2011 to 14-06-2011		
Frequency of monitoring/recording:	Continuous measurement, monthly recording		
Value monitored:	598,414.125		
Monitoring equipment:	Continuous bidirectional electricity meters (the revenue meters). The calibration frequency is yearly. Please see detailed calibration information below.		
	Meter (Old)	Revenue Meter I	Revenue Meter II
	Replace date	23-03-2011	23-03-2011
	Tag No.	20080356020101	20080356020100
	Accuracy	0.5s	0.5s
	Calibration date	28-03-2010	28-03-2010
	Validity	27-03-2011	27-03-2011
	Meter (New)	Revenue Meter I	Revenue Meter II
	Install date	23-03-2011	23-03-2011

	Tag No.	209475035	209475191
	Accuracy	0.2s	0.2s
	Calibration date	10-11-2010	10-11-2010
	Validity	09-11-2011	09-11-2011
QA/QC procedures to be applied:	The revenue meters are calibrated according to the Verification Regulation of Electrical Energy Meters with Electronics (JJG 596-1999). Electricity exported by the project plant to the grid ($EG_{pj,y}$) are cross-checked against records for sold electricity. In case of inconsistency, the smaller value is used for being conservative.		
Calculation method:	Quantity of electricity exported by the project plant to the grid ($EG_{pj,y}$) are determined by the electricity output measured by the revenue meters minus the agreed transmission loss between the Project Developer and the grid company.		
Any comment:	N/A		

Data Unit / Parameter:	EC_y	
Data unit:	MWh	
Description:	Quantity of electricity imported by the project plant from the grid in year y	
Source of data:	Monthly records of the revenue meters	
Description of measurement methods and procedures to be applied:	Measured by old Revenue Meter I and II from 17-12-2009 to 25-03-2011 and measured by new Revenue Meter I and II from 25-03-2011 to 14-06-2011	
Frequency of monitoring/recording:	Continuous measurement, monthly recording	
Value monitored:	811.729	
Monitoring equipment:	Continuous bidirectional electricity meters (the revenue meters). The calibration frequency is yearly. Please see detailed calibration information below.	
	Meter (Old)	Revenue Meter I
	Replace date	23-03-2011
	Tag No.	20080356020101
	Accuracy	0.5s
	Calibration date	28-03-2010
	Validity	27-03-2011
	Meter	Revenue Meter II

	(New)		
	Install date	23-03-2011	23-03-2011
	Tag No.	209475035	209475191
	Accuracy	0.2s	0.2s
	Calibration date	10-11-2010	10-11-2010
	Validity	09-11-2011	09-11-2011
QA/QC procedures to be applied:	The revenue meters are calibrated according to the Verification Regulation of Electrical Energy Meters with Electronics (JJG 596-1999). Electricity imported by the project plant to the grid (EC_y) is cross-checked against records for purchase electricity. In case of inconsistency, the bigger value is used for being conservative.		
Calculation method:	Quantity of electricity imported by the project plant to the grid (EC_y) is determined by the electricity input measured by the revenue meters plus the agreed transmission loss between the Project Developer and the grid company.		
Any comment:	N/A		

Data Unit / Parameter:	Cap_{PJ}
Data unit:	W
Description:	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data:	Nameplate of generators
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Yearly
Value monitored:	100,000,000
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Calculation method:	N/A
Any comment:	N/A

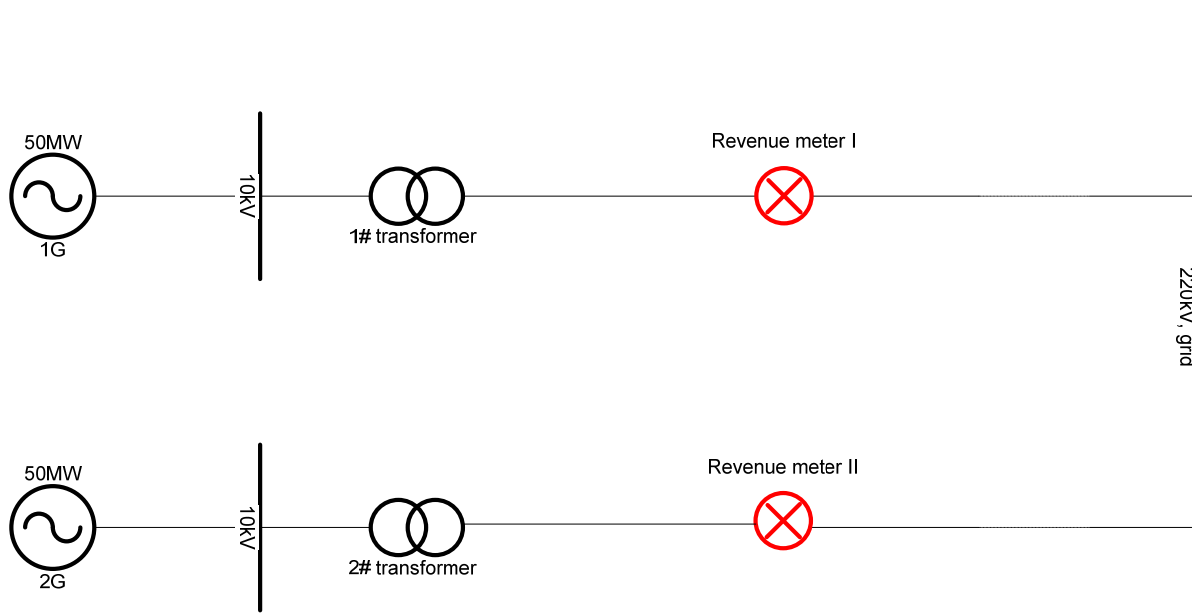
Data Unit / Parameter:	A_{PJ}
Data unit:	m^2
Description:	Area of the reservoir measured in the surface of

	the water, when the reservoir is full
Source of data:	Project activity site
Description of measurement methods and procedures to be applied:	The area of the reservoir has been determined on the basis of the measurement of the crest level of the dam and topography of the area. The Project routinely measures water levels. An average level below design level as stated in the Preliminary Design Report means that the flooded area is less than the area estimated in the Preliminary Design Report.
Frequency of monitoring/recording:	Yearly
Value monitored:	292,000
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Calculation method:	N/A
Any comment:	N/A

3.3 Description of the Monitoring Plan

- Line diagram

Diluo Line Diagram



Monitoring points: The electricity exported and imported is measured by the revenue meters installed at the output of the plant.

- Quality assurance and quality control system

The accuracy of the monitoring results are in conformity with calibration requirements, recording frequency and quality assurance and quality control procedures stated in the monitoring plan. Please refer to Section 3.2.

- Data collection procedures

Data generation: electricity exported and imported is measured by the meters mentioned by Section D.2.

Data recording: the project developer record manually the meter readings on 25th of each month and the grid company will confirm the readings to transact the electricity supplied to the grid and issued the receipts.

Data aggregation: the calculated net electricity supplied to the grid per month is summed over the monitoring period.

Calculation: see section 3.2. and section 4. Electricity exported is determined by the electricity output measured by the revenue meters minus the agreed transmission loss between the Project Developer and the grid company. Electricity imported is determined by the electricity input measured by the revenue meters plus the agreed transmission loss between the Project Developer and the grid company. Export and import per month is the difference between the cumulative values on the electricity meters. Net electricity supplied to the grid is electricity export minus electricity import. Net electricity supplied to the grid multiplied by emission factor is emission reductions.

Reporting: The calculated values are included in the Spreadsheet and reported in the CDM-MR.

- Organizational structure, roles and responsibilities

The CDM monitoring team is comprised of a CDM manager, operating manager, operating staff and technicians. The CDM manager has been appointed and trained and is responsible for the CDM monitoring system. Relevant roles and responsibility have been defined to fully implement data collection, archiving and data quality assurance and quality control etc.

- Emergency procedures for the monitoring system

The operating manager will notify the grid company in case there is doubt about the correct functioning of the revenue meters mentioned in the monitoring plan. In that case, the grid company and the operator will check and where necessary replace the meters. If the problem can be solved quickly, no CERs are claimed for the period during which the meter was not functioning correctly. If the problem cannot be solved quickly the grid company and the operator estimate the net electricity supplied to the grid using the data from the backup meters installed along with the revenue meters. No emergencies occurred during this monitoring period.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Calculation of baseline emissions	Symbol	Amount	Unit	Formula	Remarks
Net electricity supplied to grid	EGy	597,602.396	MWh		1
Emission factor	EFy	0.8529	tCO ₂ /MWh		2
Total baseline emissions	BEy	509,664	tCO ₂	BEy=EGy*EFy	

Remarks

- EGy = Net electricity supplied to the grid = electricity export to the grid - electricity import from the grid
 In 2009: 7,442.662 MWh
 In 2010: 473,578.031 MWh
 In 2011: 116,581.703 MWh
- EFy fixed for the first crediting period.

4.2 Project Emissions

Calculation of project emissions	Symbol	Amount	Unit	Formula	Remarks
Total project emissions	PEy	0	tCO ₂ e	N/A	1

Remarks

- As per methodology and PDD.

4.3 Leakage

Calculation of leakage emissions	Symbol	Amount	Unit	Formula	Remarks
Total leakage emissions	Ly	0	tCO ₂ e	N/A	1

Remarks

- As per methodology and PDD.

4.4 Summary of GHG Emission Reductions and Removals

Calculation of emission reductions	Symbol	Amount	Unit	Formula	Remarks
Total baseline emissions	BEy	509,664	tCO ₂ e	BEy=EGy*EFy	1
Total project emissions	PEy	0	tCO ₂ e		2
Total leakage emissions	Ly	0	tCO ₂ e		3
Total emission reductions	ERy	509,664	tCO ₂ e	ERy=BEy-PEy-Ly	4

Remarks

- Monitoring period = 545 days.
 In 2009: 6,347 tCO₂e
 In 2010: 403,891 tCO₂e
 In 2011: 99,426 tCO₂e
- As per methodology and PDD.
- As per methodology and PDD.
- With PEy and Ly = 0; ERy = BEy.

5 ADDITIONAL INFORMATION

The following table shows the comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD. This table shows that the actual value is only 1% more than the estimated emission reduction of the registered CDM-PDD during this monitoring period. Since the ex-ante calculation in the registered PDD was based on a 44 years historical hydrological data, an increase of 1% should be reasonable.

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (tCO ₂ e)	504,046 ¹	509,664

¹ 337,572 tCO₂e(annual GHG emission reductions estimated in registered PDD) / 365 days*545 days (the days length of this monitoring period)