



Monitoring report form
(Version 05.1)

MONITORING REPORT

Title of the project activity	Yunnan Puxiqiao Hydropower Project	
UNFCCC reference number of the project activity	6532	
Version number of the monitoring report	01	
Completion date of the monitoring report	18/03/2016	
Monitoring period number and duration of this monitoring period	1 st Monitoring period:01/01/2014-31/03/2016 (first and last days included)	
Project participant(s)	Guodian Yunnan Zhongpu Hydropower Co., Ltd.)	
Host Party	P.R. China	
Sectoral scope(s)	Sectoral scope: 1.Energy industries (renewable/non-renewable sources)	
Selected methodology(ies)	ACM0002- Consolidated methodology for grid-connected electricity generation from renewable sources (Version 12.3.0)	
Selected standardized baseline(s)	-	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	1,190,508	
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	0	272,882

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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Yunnan Puxiqiao Hydropower Project (hereafter referred to as the Project) developed by Guodian Yunnan Zhongpu Hydropower Co., Ltd. is located at the Puxi village, Yayi Town, Mojiang County, Pu'er City, Yunnan Province. The project is under construction at present.

The Project is a newly-built hydropower project with the total installed capacity of 190 MW consisting of two 95 MW generators. The annual total electricity generation is 855,860MWh. Considering the 98% effective coefficient and the 0.2% auxiliary power consumption, the net electricity supplied to the grid is about 837,065 MWh. The reservoir surface area at full reservoir level is 13.06km², and the power density is 14.55W/m². The project is consisted of a dam, a river diversion tunnel, a powerhouse and a step-up substation. The purpose of the Project is to utilize the water resources of Amojiang River to generate electricity, which will be delivered to CSPG through Yunnan Power Grid without CO₂ emissions. The Project will achieve greenhouse gas (GHG) emission reductions by displacing equivalent electricity supplied by CSPG, which is predominated by fossil fuel-fired power plants. The estimated annual emission reductions are 529,276 tCO₂e.

During the 1st monitoring period (01/01/2014-31/03/2016), the project has achieved 272,882 tonnes of CO₂e emission reductions.

A.2. Location of project activity

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The Project is sited at Puxi village, Yayi Town, Mojiang County, Pu'er City, Yunnan Province, P.R.China. The Project has geographical coordinates with east longitude of 101.61 and north latitude of 23.15. Figure 1 shows the location of Pu'er City. Figure 2 shows the location of the Project. The detailed location of the project is shown in figure 1.



Figure 1: Location of Pu'er City of China



Figure 2. Location of the Project

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 whether the Party involved wishes to be considered as project participant (yes/no)
P.R. China (host)	Guodian Yunnan Zhongpu Hydropower Co., Ltd	No

A.4. Reference of applied methodology and standardized baseline

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Approved consolidated baseline and monitoring methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"- ACM0002 Version 12.3.0 The methodology also refers to the approved versions of the following tools:

Tool for the demonstration and assessment of additionality (version 05.2)

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

For more information about the tool please refer to:

<http://cdm.unfccc.int/methodologies/PAmethodologies/approved>

A.5. Crediting period of project activity

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The project activity employs the renewable crediting period (7 years×3), and the starting date of the crediting period is 01/01/2014. The first crediting period is 01/01/2014-31/12/2020.

A.6. Contact information of responsible persons/entities

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Company: Hanergy Carbon Asset Management (Beijing) Inc.

Address: 10/F Tower B, North Star Century Center, No.8 Beichenxi Rd., Chaoyang District, Beijing China 100101

Tel: +86-10-83914567

Fax: +86-10-83914555

Email: cdm@hanergy.com

Hanergy Carbon Asset Management (Beijing) Inc. is not a project participant.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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The Project will utilize the water resources of Amojiang River to generate electricity, which will be delivered to CSPG without CO₂ emissions. The Project will achieve greenhouse gas (GHG) emission reductions by displacing equivalent electricity supplied by CSPG, which is predominated by fossil fuel-fired power plants, whose by-products are GHGs (main emissions:CO₂). This project is a diversion type power plant with the capacity of 190MW (2×95MW). The net electricity supplied to the grid is 837,065 MWh. Annual operation hours of the Project is 4505h and the Plant Load Factor (PLF) is 0.514. The reservoir surface area at full reservoir level is 13.06km², and the power density⁴ is 14.55W/m² larger than 10W/m², so there is no emission source from the project activity. The estimated annual emission reductions are 529,276 tCO₂e.

The technical specifications of the main equipments are as follows:

The technical specifications of the main equipments

Hydro Turbine		Generator	
Turbine Type	HL189.4-LJ-330	Generator Type	SF95-28/7600
Rated capability	97.44MW	Rated Capacity	95MW
Rated head	109m	Rated voltage	13.8KV
Rated speed	214.3r/min	Rated power factor	0.875
Efficiency	≥92.16%	Efficiency	≥98.17%
Life time	≥30years	Life time	≥30years

With all technologies and facilities provided domestically, the Project involves no technology transfer from abroad. The monitoring equipment is the bidirectional electric energy meter(s) and the accuracy of the meter(s) should be at least 0.5S in accordance with Technical Management Rules for Electric Power Measuring Installations (DL/T448-2000). The monitoring equipments will be installed at the project site of the proposed project.

The hydropower technology used in the project is common in China. The staffs working in the project will receive training on operation regulation, maintenance procedures and other required knowledge regarding operation of hydropower plant before the operation starting date.

The Project will connect with CSPG, so the baseline scenario of the Project is the same as the scenario existing prior to the start of implementation of the Project activity.

B.2. Post-registration changes

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

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There are no temporary deviations from registered monitoring plan or applied methodology.

B.2.2. Corrections

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There are no corrections.

B.2.3. Changes to start date of crediting period

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There are no changes to the start date.

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

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The project participant did not choose a delayed submission monitoring plan at the time of the registration of the project.

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

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There are no permanent changes from registered monitoring plan or applied methodology.

B.2.6. Changes to project design of registered project activity

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There are no changes to project design of registered project activity.

B.2.7. Types of changes specific to afforestation or reforestation project activity

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There are no types of changes specific to afforestation or reforestation project activity.

SECTION C. Description of monitoring system

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For the purpose of the integrated, continuous, transparent and accurate monitoring of the Project and the precise calculation of emission reductions during the crediting period, based on the monitoring methodology and the actual conditions of the Project, the monitoring plan is designed as follow:

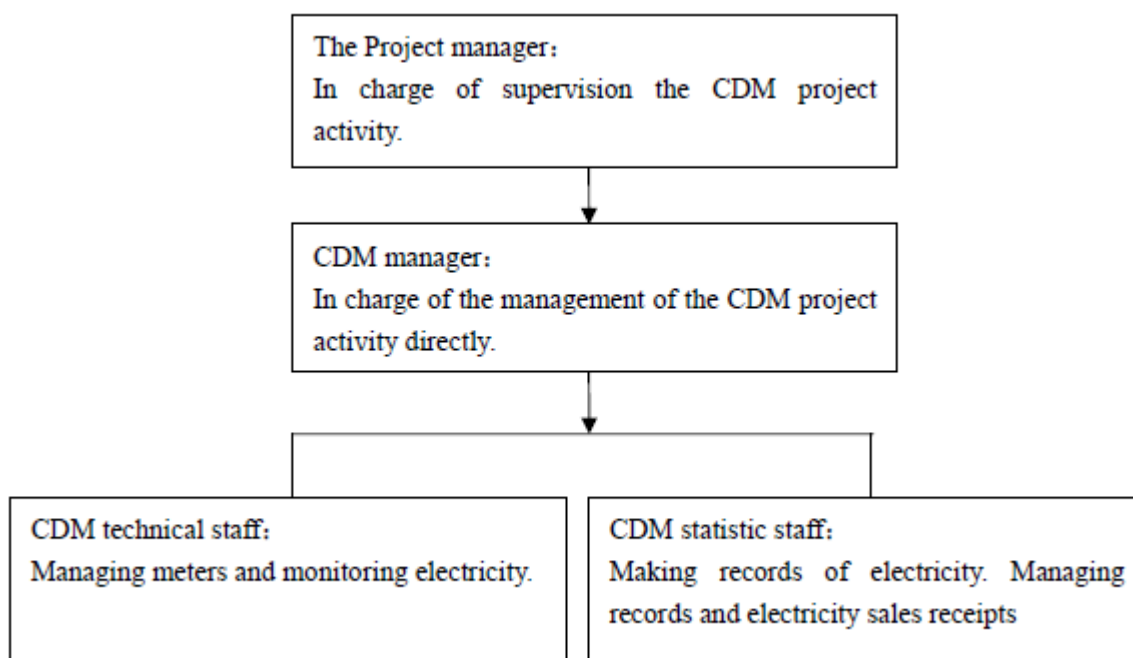
1. Data monitored

In this PDD, emission factor of the Project is determined ex-ante. Therefore the net electricity supplied to the grid by the Project is defined as the key data is monitored.

Moreover, according to the requirements of monitoring methodology, the installed capacity, and area of reservoir measured in the surface of the water after the implementation of the Project is also monitored.

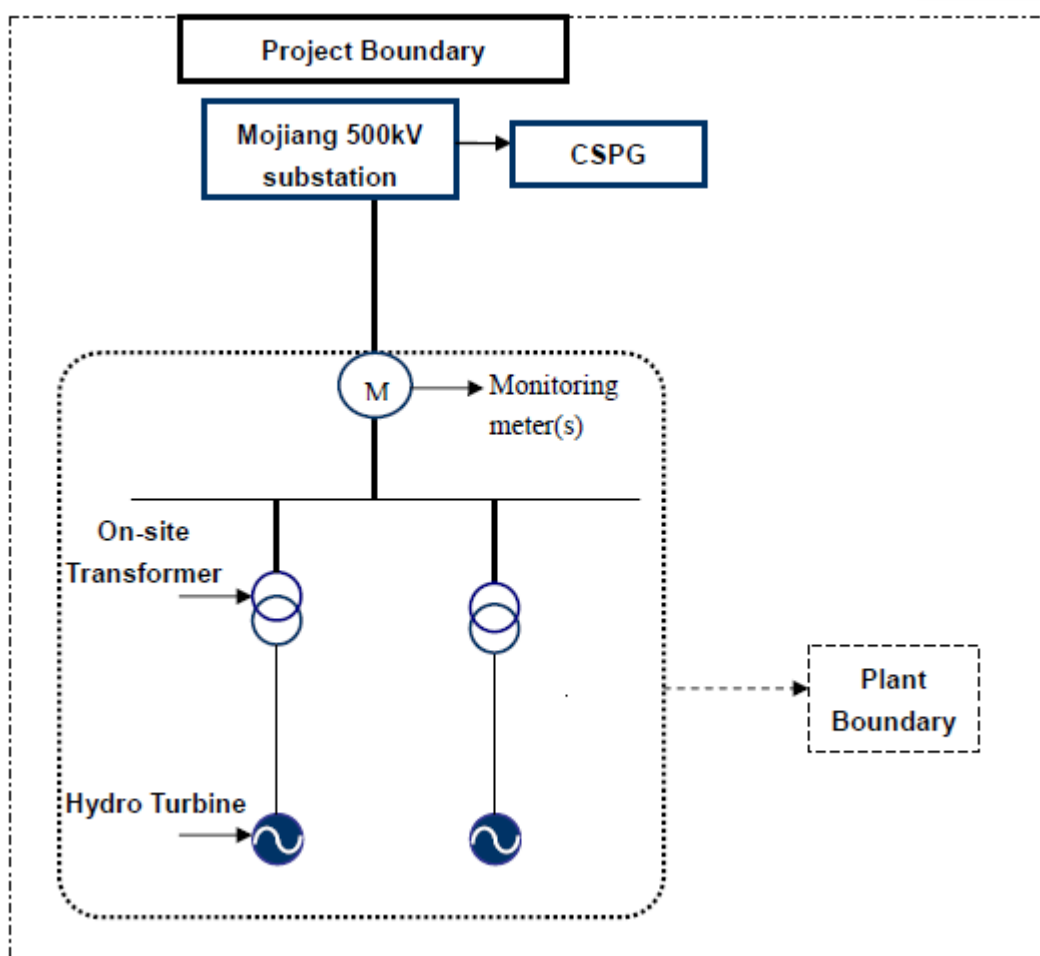
2. Implementation of the monitoring plan

The Project owner took the responsibility for the monitoring plan implementation. A CDM working team is established which consists of project manager, CDM manager, technical staff, and statistic staff. Organizing structure of the CDM team is shown as follows:



3. Monitoring meters

The electricity exported to CSPG and the electricity imported from CSPG is continuously monitored through bidirectional electric energy meter(s) installed at high voltage side of the substation at the project site, the net electricity generation is the subtraction between electricity output and input. The accuracy of the meter(s) should be at least 0.5S in accordance with Technical Administrative Code of Electric Energy Metering (DL/T448-2000).



4. Procedures of monitoring

On-duty staff will watch the operation status of metering equipments everyday on site. Furthermore, designated staff will collect the measured electricity data and complete the corresponding records on a monthly basis. Before being archived, these records will be checked by other staffs to ensure the correctness. The data from these records will be digested and analyzed and the results will be reported to company administrator or supervisor.

All the relevant data records will be kept by the Project owner during the crediting period and two years after for DOE's verification.

5. Quality assurance and quality control

The quality assurance and quality control procedures involves of data monitoring, recording, maintaining and archiving, and monitoring equipment calibration.

6. Procedures of exception handling and reporting

The CDM technical staffs will take real-time monitoring on the operation status of metering meters to ensure that any abnormality could be detected and the corresponding measures of processing, reporting and recording will be taken in time. The abnormal meters will be repaired immediately and must be calibrated by a qualified third-party before being put into use again. Problem occurred in monitoring and measurement process will be recorded and reported to company administrator or supervisor. Consequently, the corrective resolution will be adopted to deal with that problem and to avoid it occur again in future. All the relevant records of exception handling will be kept by the Project owner during the crediting period and two years after for DOE's verification.

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

Data/parameter:	EF _{grid,CM,y}
Unit	tCO ₂ e/MWh
Description	Combined margin CO ₂ emission factor for the project electricity system in year y
Source of data	Registered PDD
Value(s) applied)	0.6323
Choice of data or measurement methods and procedures	Official statistical data
Purpose of data	Calculation of baseline emissions
Additional comments	The parameter has been fixed in the first credit period

Data/parameter:	Cap _{BL}
Unit	W
Description	Installed capacity of the hydro power plant before the implementation of the project activity. For the proposed project, this value is zero.
Source of data	Project site
Value(s) applied)	0
Choice of data or measurement methods and procedures	Registered PDD
Purpose of data	Calculation of project emissions
Additional comments	-

Data/parameter:	A _{BL}
Unit	m ²

Description	Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full. For the proposed project, this value is zero.
Source of data	Project site
Value(s) applied	0
Choice of data or measurement methods and procedures	Registered PDD
Purpose of data	Calculation of project emissions
Additional comments	-

D.2. Data and parameters monitored

Data / Parameter:	EG _{facility,y}
Unit:	MWh
Description:	Electricity supplied by the project activity to the grid during the year y
Measured/ Calculated / Default:	measured
Source of data:	Meter Readings
Value(s) of monitored parameter:	431,571.7
Monitoring equipment:	The monitoring meter is the key Meter.
Measuring/ Reading/ Recording frequency:	Continuous measurement and monthly recording using calibrated meters
Calculation method (if applicable):	It is the difference between the monitored electricity exported to the Grid and monitored electricity imported from the Grid
QA/QC procedures:	The key meter and check meter have calibrated as per industry standards of host country (DL/T448-2000). Cross check by receipt of sales
Purpose of data:	Calculation of baseline emissions
Additional comment:	-

Data / Parameter:	Cap _{PJ}
Unit:	W
Description:	Installed capacity of the hydro power plant after the project activity
Measured/ Calculated / Default:	Measured
Source of data:	Project site
Value(s) of monitored parameter:	190,000,000
Monitoring equipment:	Nameplate of the generating units
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	The installed capacity is designed in the FSR, and supplied by the manufacturer. The Nameplates on the Mechanical and Electrical equipments are used to measure this parameter.
QA/QC procedures:	-
Purpose of data:	Calculation of project emission

Additional comment:	-
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Data / Parameter:	A _{pi}
Unit:	km 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
Measured/ Calculated / Default:	Measured by the third party: HYDROCHINA KUNMING ENGINEERING CORPORATION
Source of data:	Project site
Value(s) of monitored parameter:	13.06
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	-
QA/QC procedures:	The data is checked by the estimated value in the FSR, and the conservative data should be used in the monitoring process.
Purpose of data:	Calculation of project emission
Additional comment:	

D.3. Implementation of sampling plan

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Sampling plan is not applicable.

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

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

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Baseline emission (BE_y) are the product of the baseline emission factor (EF_{grid,CM,y}) multiplied by the electricity supplied by the project activity to the grid (EG_{facility,y}):

$$BE_y = EG_{facility,y} \times EF_{grid,CM,y} = 431,571.7 \text{ MWh} \times 0.6323 \text{ tCO}_2\text{e/MWh} = 272,882 \text{ tCO}_2\text{e}$$

EG _{facility,y}							
Period	Electricity exported to the grid monitored by Key meter	Sales Receipt of electricity exported to the Grid	Conservative Chosen of Electricity exported to the Grid	Electricity Imported from the grid monitored by Key meter	Sales Receipt of electricity imported from the Grid	Conservative Chosen of electricity imported from the Grid	EG _{facility,y}
From-to	MWh	MWh	MWh	MWh	MWh	MWh	MWh
	A	B	C=Min(A,B)	D	E	F=Max(D,E)	G=C-F
01/01/2014-31/01/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01/02/2014-28/02/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01/03/2014-31/03/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01/04/2014-30/04/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01/05/2014-31/05/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01/06/2014-30/06/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01/07/2014-31/07/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01/08/2014-31/08/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01/09/2014-30/09/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01/10/2014-31/10/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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01/11/2014-30/11/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01/12/2014-31/12/2014	5,892.7	5,892.7	5,892.7	0.0	0.0	0.0	5,892.7
01/01/2015-31/01/2015	6,686.2	6,686.2	6,686.2	0.0	0.0	0.0	6,686.2
01/02/2015-28/02/2015	10,681.6	10,681.6	10,681.6	0.0	0.0	0.0	10,681.6
01/03/2015-31/03/2015	1,364.1	1,364.1	1,364.1	0.0	0.0	0.0	1,364.1
01/04/2015-30/04/2015	45,773.6	45,773.6	45,773.6	0.0	0.0	0.0	45,773.6
01/05/2015-31/05/2015	6,987.6	6,987.6	6,987.6	0.0	0.0	0.0	6,987.6
01/06/2015-30/06/2015	9,079.9	9,079.9	9,079.9	0.0	0.0	0.0	9,079.9
01/07/2015-31/07/2015	32,708.5	32,708.5	32,708.5	0.0	0.0	0.0	32,708.5
01/08/2015-31/08/2015	71,277.2	71,277.2	71,277.2	0.0	0.0	0.0	71,277.2
01/09/2015-30/09/2015	89,751.4	89,751.4	89,751.4	0.0	0.0	0.0	89,751.4
01/10/2015-31/10/2015	73,831.2	73,831.2	73,831.2	0.0	0.0	0.0	73,831.2
01/11/2015-30/11/2015	27,380.8	27,380.8	27,380.8	0.0	0.0	0.0	27,380.8
01/12/2015-31/12/2015	17,959.4	17,959.4	17,959.4	0.0	0.0	0.0	17,959.4
01/01/2016-31/01/2016	14,505.9	14,505.9	14,505.9	0.0	0.0	0.0	14,505.9
01/02/2016-29/02/2016	7,691.6	7,691.6	7,691.6	0.0	0.0	0.0	7,691.6
01/03/2016-31/03/2016	10,000.0	10,000.0	10,000.0	0.0	0.0	0.0	10,000.0
Total	431,571.7	431,571.7	431,571.7	0.0	0.0	0.0	431,571.7

Period	EG _{facility,y}	EF _{grid,CM,y}	BE _y
	MWh	tCO ₂ e/MWh	tCO ₂ e
	H	I	J=INT(I*H)
01/01/2014-31/03/2016	431,571.7	0.6323	272,882

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

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According to the monitoring data in the section D, the installed capacity is 99MW.

The max APJ during the period 01/01/2014-31/03/2016 is 13.06km². The A_{PJ} during the 1st monitoring period, 01/01/2014-31/03/2016 is smaller than the estimated A_{PJ} 13.06 km² when the reservoir is full. PP chose the value of 13.06km² to calculate the power density conservatively.

According to the registered PDD, PD=14.55 W/m²>10W/m²

So, PE_y=0

E.3. Calculation of leakage

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According to the registered PDD, this is no leakage emission are considered.

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

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	GHG emission reductions or net GHG removals by sinks (t CO ₂ e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	272,882	0	0	0	272,882	272,882

E.5. Comparison of actual emission reductions or net 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 (t CO ₂ e)	1,190,508	272,882

The estimated annual emission reduction in the PDD is 529,276 tCO₂e in the year 2014 , 2015, and 2016. Since the 1st monitoring period is 01/01/2014-31/03/2016(821 days), the estimated emission reduction is calculated as: $529,276 \text{tCO}_2\text{e} \times 821 \text{days} / 365 \text{days} = 1,190,508 \text{ tCO}_2\text{e}$

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

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The actual emission reductions during this monitoring period are less than the estimated emission reductions as per registered PDD.

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Responsible person/ entity for completing the CDM-MR-FORM
Organization name	Guodian Yunnan Zhongpu Hydropower Co., Ltd
Street/P.O. Box	NO. 2, Xinjian Road, Mojiang County
Building	
City	Pu'er City
State/Region	Yunnan province
Postcode	654800
Country	P.R. China
Telephone	+86-0879-4335931
Fax	+86-0879-4335931
E-mail	jinliancai@163.com
Website	-
Contact person	Jin Liancai
Title	Vice General Manager
Salutation	Mr
Last name	Jin
Middle name	-
First name	Liancai
Department	-
Mobile	
Direct fax	+86-0879-4335931
Direct tel.	+86-0879-4335931
Personal e-mail	jinliancai@163.com

Project participant and/or responsible person/ entity	<input type="checkbox"/> Project participant <input checked="" type="checkbox"/> Responsible person/ entity for completing the CDM-MR-FORM
Organization name	Hanergy Carbon Asset Management (Beijing) Inc.
Street/P.O. Box	No.8 Beichenxi Rd.
Building	6/F Tower B, North Star Century Center
City	Beijing
State/Region	Chaoyang District
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Contact person	Li Yang
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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		