



Monitoring report form
(Version 05.1)

Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form" at the end of this form.

MONITORING REPORT

Title of the project activity	Sichuan Baishuijiang Duonuo Hydropower Project	
UNFCCC reference number of the project activity	8916	
Version number of the monitoring report	Version 01	
Completion date of the monitoring report	10/05/2016	
Monitoring period number and duration of this monitoring period	1 st Monitoring Period: 01/01/2013-25/03/2016 (first and last days included)	
Project participant(s)	Jiuzhaigou Hydropower Development Co. Ltd.	
Host Party	People's Republic of China	
Sectoral scope(s)	1: energy industries (renewable sources)	
Selected methodology(ies)	ACM0002 Consolidated baseline 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	284,491 tCO ₂ e	
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	664,237

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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Sichuan Baishuijiang Duonuo Hydropower Project (hereinafter referred to as the "project") is a diversion type of hydropower project with an installed capacity of 100 MW (2*50MW). The purpose of the project is to generate electricity from clean and renewable water sources and to displace part of the electricity generated by fossil fuel-fired power plants connected to the Central China Power Grid (CCPG).

The technology employed by the project is the state-of-the francis turbine manufactured by the domestic company. The project is a diversion type of hydropower station with a reservoir, headrace tunnel, power house, booster station, and so on.

The project started construction on 6 July 2009 as the construction contract was signed and was put into operation on 26 April 2013. During the first monitoring period, the project continued operation smoothly without any breakdown or malfunction.

The time span of 01/01/2013-25/03/2016 is the first monitoring period for the project. The amount of net electricity delivered to the CCPG is 916,948.045MWh. Therefore, the total emission reductions achieved are 664,237tCO₂e.

A.2. Location of project activity

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The project is located on Baishui river, an upstream branch of the Bailong river. The geographical coordinates of the dam are 103.7808° E and 33.6131° N and the powerhouse are 103.9206° E and 33.5603° N.

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)
People's Republic of China	Jiuzhaigou Hydropower Development Co. Ltd.	No

A.4. Reference of applied methodology and standardized baseline

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- ACM0002 Consolidated baseline methodology for grid-connected electricity generation from renewable sources (version 12.3.0)
- Tool for the demonstration and assessment of additionality (version 06.1.0)
- Tool to calculate the emission factor for an electricity system (version 02.2.1)

Above methodologies and Tools are available at
<http://cdm.unfccc.int/methodologies/PAmethodologies/approved>

A.5. Crediting period of project activity

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The project applies a renewable 7-year crediting period. The start date of the first 7-year renewable crediting period is 01/01/2013 and the length of this period is from 01/01/2013 to 31/12/2019.

A.6. Contact information of responsible persons/entities

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Shanghai Marukyu Environment Co., Ltd.

Address: No.1628 Jinshajiang Road, Shanghai, P. R. China

Tel: +86-21-32525665

Fax: +86-21-32525665

Email: oyy@shjec.cn

SECTION B. Implementation of project activity**B.1. Description of implemented registered project activity**

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The project started operation on 26 April 2013 when the water turbine-generating units started running.

The technical parameters of main equipment are shown in Table 1 below.

Table 1. Main Technical Parameters

Parameters	Unit	Data
Power density	W/m ²	56.82
Turbine		
Units		2
Model		HL(EF)-LJ-220
Rated head	m	305
Rated flow	m ³ /s	18.43
Rated speed	r/min	500
Generator		
Units		2
Model		SF-J50-12/4450
Rated power	MW	50
Rated voltage	kV	13.8
Operational lifetime	year	30

During the first monitoring period, the project operated smoothly without exchange of equipment occurred. In addition, no events or situations occurred in the monitoring period which impacted the applicability of the methodology.

The main meter (serial number: 211299420) and the backup meter (serial number: 211299482) were calibrated on 17/04/2014 and 16/04/2015, and functioned well in the first monitoring period.

B.2. Post-registration changes**B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline**

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Not applicable.

B.2.2. Corrections

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Not applicable.

B.2.3. Changes to start date of crediting period

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Not applicable.

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

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Not applicable.

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

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Not applicable.

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

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Not applicable.

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

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Not applicable.

SECTION C. Description of monitoring system

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The monitoring system of the project activity is the same as the registered PDD.

Data Collection Procedures

Data generation:

The exports and imports of electricity by the project are continuously monitored by the electricity meters installed at the project site as shown in Figure 1 below.

Data recording:

Recorded as per monitoring plan.

Data aggregation:

The net electricity supplied to the grid is summed over the monitoring period. The data are aggregated monthly. The monthly data are checked and confirmed by both the project owner and the grid company, and then used for the monthly settlement of electricity sales. The operator reports the monthly data to the CDM leaders, based on which the latter calculate the monthly emission reductions of the project activity.

Calculation:

Net electricity supplied to the CCPG (EG_{facility}) by the project activity can be calculated by electricity exported to the grid ($EG_{\text{facility to CCPG}}$) minus electricity imported from the grid ($EG_{\text{CCPG to facility}}$), measured by the main meter. See section E for the calculation of emission reductions.

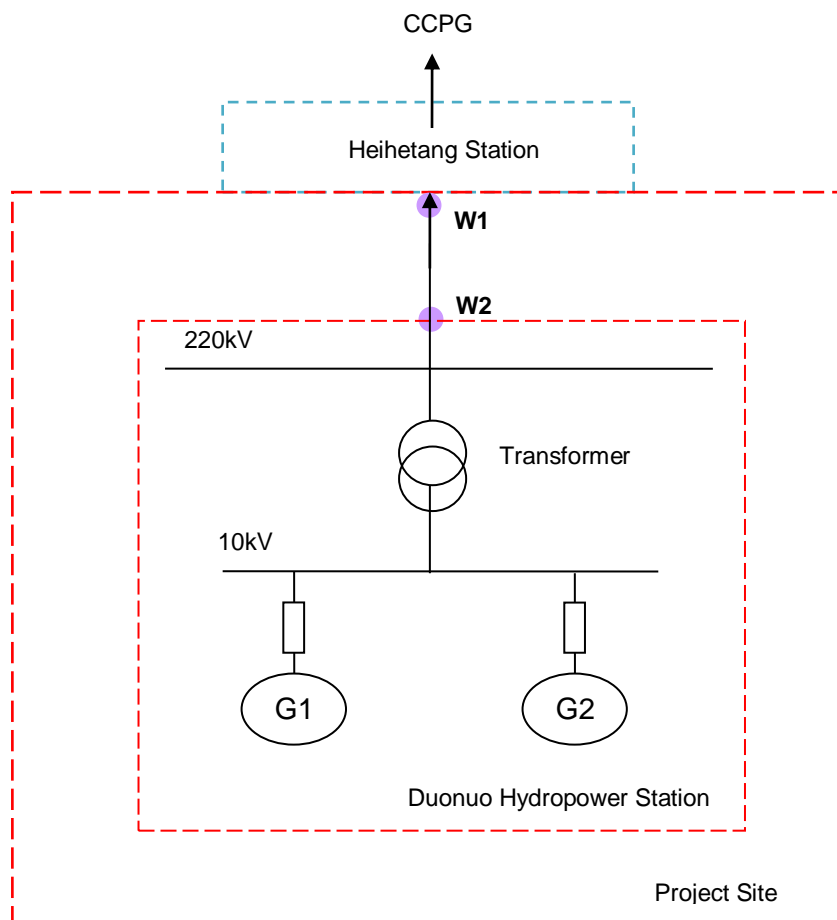


Figure 1. Monitoring Points for the Project

- Main electric meter is installed at Heihetang station (W1) to monitor the imported and exported electricity by the project.
- Backup electric meter is installed at the outlet of Duonuo hydropower station (W2) to monitor the imported and exported electricity by the project. The data from the backup meter will be used for emission reduction calculation in case of any failure or lack of accuracy of the main meter.

All electric meters have the function of bidirectional measurement. All meters with accuracy of 0.2s were calibrated on 17/04/2014 and 16/04/2015. The latest calibration will be valid until 16/04/2016.

Organization Structure

A CDM team has been established by the project owner, including one CDM team leader as the monitoring manager, one deputy team leader and four members. Besides, a CDM QA/QC manager was also appointed by the project owner for supervising the CDM monitoring work. The monitoring organization of the project is shown in Figure 2 below.

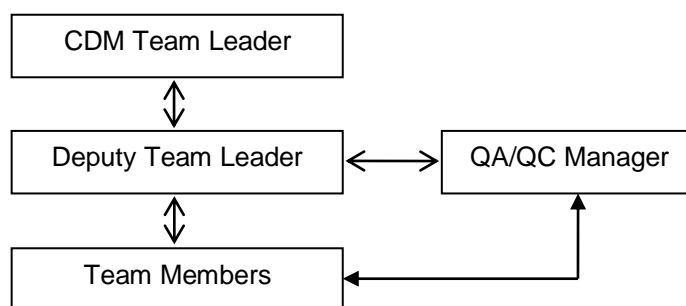


Figure 2. Monitoring Organization

Roles and Responsibilities

The CDM team leader is responsible for supervising and verifying metering and recording data, and is the contact person with DOE, the project consultant and other entities related to CDM. The deputy CDM leader assists the team leader and carries out internal audit periodically. The team members are in charge of meter reading, data checking and recording, aggregation, archiving and reporting to the leader and the deputy leader.

The CDM QA/QC manager is responsible for assessing the operation performance of the QA/QC procedures (for recording, maintaining and archiving data) periodically according to the report from the CDM team leader or deputy leader and based on the observed actual operation performance, and is responsible for training programs regarding CDM monitoring.

Data protection procedures

The electricity data collected from the main meter and the backup meter are stored in the password protected folder in computer. The backup data is stored in the hard disk.

Every month, the operation staffs at both W1 and W2 sites send the monthly data to QA/QC manager and CDM team leader for review.

Emergency procedures

The net electricity delivered to the CCPG by the project is calculated by deducting electricity imported from the CCPG from total electricity delivered by the project. The data are from the main meter readings when the project runs well and from the backup meter readings in case of any failure of the main meter. If both systems data are not within the acceptable limits of accuracy or if both meters perform improperly, the project owner and the grid company shall jointly prepare an estimation of the correct reading.

Training and internal audits

The CDM team carried out internal audits in the first monitoring period. The operation situation, exports and imports of electricity by the project, and other issues were checked.

The CDM team also performed personnel training regarding CDM monitoring. In the training programs, the roles and responsibilities of CDM team, the data metering, recording and reporting processes etc were educated and reviewed.

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

Data/parameter:	$F_{i,j,y}$
Unit	Tonnes or m ³
Description	The amount of fuel i consumed by relevant power sources j in year y (mass or volume, tonnes for solid and liquid fuel, and m ³ for gas fuel)
Source of data	China Energy Statistical Yearbook (2008-2010)
Value(s) applied)	See Annex 3 of the registered PDD
Choice of data or measurement methods and procedures	China Energy Statistical Yearbook is an authoritative publication.
Purpose of data	For calculating baseline emissions
Additional comments	-

Data/parameter:	$FC_{i,y}$
Unit	Tonnes or m ³
Description	The quantity of fuel i (in a mass or volume unit) consumed in the CCPG for power generation in year y
Source of data	China Energy Statistical Yearbook (2008-2010)
Value(s) applied)	See Annex 3 of the registered PDD
Choice of data or measurement methods and procedures	China Energy Statistical Yearbook is an authoritative publication.
Purpose of data	For calculating baseline emissions
Additional comments	-

Data/parameter:	$NCV_{i,y}$
Unit	GJ/t or GJ/m ³
Description	Net calorific value (energy content) of fossil fuel type i in year y
Source of data	China Energy Statistical Yearbook (2008-2010)
Value(s) applied)	See Annex 3 of the registered PDD
Choice of data or measurement methods and procedures	China Energy Statistical Yearbook is an authoritative publication.
Purpose of data	For calculating baseline emissions
Additional comments	-

Data/parameter:	$EF_{CO_2,i,y}$
Unit	tCO ₂ /GJ
Description	CO ₂ emission factor of fossil fuel type i used in power unit m in year y
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 2, page 1.23
Value(s) applied)	See Annex 3 of the registered PDD
Choice of data or measurement methods and procedures	Using values from 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Purpose of data	For calculating baseline emissions
Additional comments	-

Data/parameter:	Electricity Generation
Unit	MWh
Description	Electricity generated by power plant/unit connected to the CCPG in year y
Source of data	China Electric Power Yearbook (2008-2010)
Value(s) applied)	See Annex 3 of the registered PDD
Choice of data or measurement methods and procedures	China Electric Power Yearbook is an authoritative publication. The parameters of Electricity Generation and Auxiliary Power Ratio are used to calculate EG_y .
Purpose of data	For calculating baseline emissions
Additional comments	-

Data/parameter:	Auxiliary Power Ratio
Unit	%
Description	Average on-site electricity usage by all power plants connected to the provincial grids covered by the CCPG
Source of data	China Electric Power Yearbook (2008-2010)
Value(s) applied)	See Annex 3 of the registered PDD
Choice of data or measurement methods and procedures	China Electric Power Yearbook is an authoritative publication. The parameters of Electricity Generation and Auxiliary Power Ratio are used to calculate EG_y .
Purpose of data	For calculating baseline emissions
Additional comments	-

Data/parameter:	$EF_{Coal,Adv,y}$, $EF_{Oil,Adv,y}$, $EF_{Gas,Adv,y}$
Unit	tCO ₂ /MWh
Description	The CO ₂ emission factor of the most advanced technology commercially used in coal-, oil- and gas-fired plants in China, respectively.
Source of data	2011 Baseline Emission Factors for Regional Power Grids in China http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2720.pdf
Value(s) applied)	Coal: 0.7967; Oil: 0.3776; Gas: 0.5250 (See Annex 3 of the registered PDD)
Choice of data or measurement methods and procedures	Official data from Chinese DNA
Purpose of data	For calculating baseline emissions
Additional comments	-

Data/parameter:	$CAP_{Total,y}$
Unit	MW
Description	Total newly capacity addition exceeds 20% on different power sources connected to the CCPG
Source of data	2011 Baseline Emission Factors for Regional Power Grids in China http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2720.pdf
Value(s) applied)	See Annex 3 of the registered PDD
Choice of data or measurement methods and procedures	Official data from Chinese DNA
Purpose of data	For calculating baseline emissions
Additional comments	-

Data/parameter:	CAP_{Thermal,y}
Unit	MW
Description	Newly capacity addition on thermal power sources connected to the CCPG
Source of data	2011 Baseline Emission Factors for Regional Power Grids in China http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2720.pdf
Value(s) applied)	See Annex 3 of the registered PDD
Choice of data or measurement methods and procedures	Official data from Chinese DNA
Purpose of data	For calculating baseline emissions
Additional comments	-

Data/parameter:	EF_{Res}
Unit	kgCO ₂ e/MWh
Description	Default emission factor for emissions from reservoirs of hydropower plants
Source of data	Decision by EB23
Value(s) applied)	90
Choice of data or measurement methods and procedures	Official publication of CDM EB
Purpose of data	For calculating project emissions
Additional comments	-

Data/parameter:	Cap_{BL}
Unit	W
Description	Installed capacity of the hydropower plant before the implementation of the project activity. For new hydropower plants, this value is zero.
Source of data	Project site
Value(s) applied)	0
Choice of data or measurement methods and procedures	Since the project is a new hydropower plant, the value of zero is determined as per ACM0002 (version 12.3.0).
Purpose of data	For calculating project emissions
Additional comments	-

Data/parameter:	A_{BL}
Unit	W
Description	Area of the single or multiple reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m ²). For new reservoir, this value is zero.
Source of data	Project site
Value(s) applied)	0
Choice of data or measurement methods and procedures	Measured from topographical surveys, maps, satellite pictures, etc.
Purpose of data	For calculating project emissions
Additional comments	-

D.2. Data and parameters monitored

Data/parameter:	EG _{facility to CCPG,y}		
Unit	MWh		
Description	Quantity of electricity exported to the grid in year y		
Measured/calculated/default	Measured		
Source of data	Metering system readings		
Value(s) of monitored parameter	917,446.741		
Monitoring equipment	Monitored by electric meters		
		Main	Backup
	Type	MK6E	MK6E
	Accuracy	0.2s	0.2s
	Serial number	211299420	211299482
	Calibration frequency	yearly	yearly
	Date of calibrations valid in this monitoring period	17/04/2014 16/04/2015	17/04/2014 16/04/2015
	Validity	till 16/04/2016	till 16/04/2016
Measuring/reading/recording frequency:	Continuously measured, daily recorded and monthly aggregated.		
Calculation method (if applicable):	-		
QA/QC procedures:	Sales records to the grid. Furthermore, the receipt of electricity sales by the project from the grid company are used to double check this parameter.		
Purpose of data:	For calculating baseline emissions		
Additional comments:	-		

Data/parameter:	EG _{CCPG to facility,y}		
Unit	MWh		
Description	Quantity of electricity imported from the grid in year y		
Measured/calculated/default	Measured		
Source of data	Metering system readings		
Value(s) of monitored parameter	498.696		
Monitoring equipment	Monitored by electric meters		
		Main	Backup
	Type	MK6E	MK6E
	Accuracy	0.2s	0.2s
	Serial number	211299420	211299482
	Calibration frequency	yearly	yearly
	Date of calibrations valid in this monitoring period	17/04/2014 16/04/2015	17/04/2014 16/04/2015
	Validity	till 16/04/2016	till 16/04/2016
Measuring/reading/recording frequency:	Continuously measured, daily recorded and monthly aggregated.		
Calculation method (if applicable):	-		
QA/QC procedures:	Power purchase records		
Purpose of data:	For calculating project emissions		
Additional comments:	-		

Data/parameter:	Cap_{PJ}
Unit	W
Description	Installed capacity of the hydropower plant after the implementation of the project activity
Measured/calculated/default	Measured
Source of data	Project site
Value(s) of monitored parameter	100,000,000
Monitoring equipment	Turbine and generator nameplates
Measuring/reading/recording frequency:	Yearly
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	For calculating project emissions
Additional comments:	-

Data/parameter:	A_{PJ}
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.
Measured/calculated/default	Measured and calculated
Source of data	Project site
Value(s) of monitored parameter	1,760,000
Monitoring equipment	Water level indicator
Measuring/reading/recording frequency:	Continuously measured and recorded yearly.
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	For calculating project emissions
Additional comments:	-

D.3. Implementation of sampling plan

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Not applicable since this project data and parameters monitored are not determined by a sampling approach.

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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The baseline emissions are calculated in accordance with both the methodology ACM0002 (version 12.3.0) and the registered PDD according to the following formula:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y} \quad (1)$$

Where:

BE_y Baseline emissions in year y (tCO_2e)

$EG_{PJ,y}$ Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{grid,CM,y}$ Combined margin CO_2 emission factor for grid connected power generation in year y (tCO_2/MWh)

The net electricity supplied by the project to the grid is calculated according to the following formula:

$$EG_{PJ,y} = EG_{facility,y} = EG_{facility\ to\ CCPG} - EG_{CCPG\ to\ facility} \quad (2)$$

Where:

$EG_{facility,y}$ Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

$EG_{facility\ to\ CCPG}$ Total electricity supplied by the project to the CCPG in year y (MWh)

$EG_{CCPG\ to\ facility}$ Electricity imported to the project from the CCPG in year y (MWh)

The emission factor has been calculated on an ex-ante basis and is not updated during the first crediting period in accordance with the registered PDD. The calculated ex-ante baseline emission factor is $0.7244tCO_2/MWh$. During the first monitoring period, no other reference value or IPCC default values were required in the calculation of emission reductions of this project.

The detailed calculation for the baseline emissions is shown below.

Table 2. Electricity delivered and imported

Period	Electricity supplied to the CCPG ($EG_{facility\ to\ CCPG}$) (MWh)	Electricity imported from the CCPG ($EG_{CCPG\ to\ facility}$) (MWh)	Net electricity supplied to the CCPG (EG_{PJ}) (MWh)
	A	B	C=A-B
01/01/2013-25/04/2013	0.000	0.000	0.000
26/04/2013-25/05/2013	19,597.380	24.684	19,572.696
26/05/2013-25/06/2013	40,863.372	0.000	40,863.372
26/06/2013-25/07/2013	51,945.960	0.000	51,945.960
26/07/2013-25/08/2013	44,428.956	3.432	44,425.524
26/08/2013-25/09/2013	0.000	86.064	-86.064
26/09/2013-25/10/2013	3,219.876	61.644	3,158.232
26/10/2013-25/11/2013	19,723.572	4.620	19,718.952
26/11/2013-25/12/2013	10,097.340	4.092	10,093.248
26/12/2013-25/01/2014	8,555.448	0.000	8,555.448
26/01/2014-25/02/2014	7,971.744	0.132	7,971.612
26/02/2014-25/03/2014	7,216.308	4.488	7,211.820
26/03/2014-25/04/2014	17,685.888	0.264	17,685.624
26/04/2014-25/05/2014	28,282.452	0.264	28,282.188
26/05/2014-25/06/2014	56,470.260	0.000	56,470.260
26/06/2014-25/07/2014	41,241.684	0.000	41,241.684
26/07/2014-25/08/2014	32,908.260	4.224	32,904.036
26/08/2014-25/09/2014	50,759.544	7.656	50,751.888
26/09/2014-25/10/2014	38,364.876	12.672	38,352.204
26/10/2014-25/11/2014	21,976.944	19.668	21,957.276
26/11/2014-25/12/2014	6,873.240	76.560	6,796.680
26/12/2014-25/01/2015	17,069.000	0.660	17,068.340
26/01/2015-25/02/2015	15,844.937	0.660	15,844.277
26/02/2015-25/03/2015	22,683.633	0.000	22,683.633
26/03/2015-25/04/2015	28,017.409	0.000	28,017.409
26/04/2015-25/05/2015	21,521.438	19.800	21,501.638
26/05/2015-25/06/2015	56,122.308	0.792	56,121.516

26/06/2015-25/07/2015	65,567.198	0.792	65,566.406
26/07/2015-25/08/2015	36,407.382	0.000	36,407.382
26/08/2015-25/09/2015	14,657.185	53.856	14,603.329
26/09/2015-25/10/2015	37,107.736	1.716	37,106.020
26/10/2015-25/11/2015	26,607.399	12.408	26,594.991
26/11/2015-25/12/2015	7,439.572	41.316	7,398.256
26/12/2015-25/01/2016	26,836.049	0.000	26,836.049
26/01/2016-25/02/2016	12,589.289	56.232	12,533.057
26/02/2016-25/03/2016	20,793.102	0.000	20,793.102
Total	917,446.741	498.696	916,948.045

Table 3. Baseline Emissions

Period	Net electricity supplied to the CCPG (EG _{PJ}) (MWh)	Emission Factor (EF _{grid,CM,y}) (tCO ₂ /MWh)	Baseline Emissions (BE _y) (tCO ₂ e)
01/01/2013-25/03/2016	916,948.045	0.7244	664,237

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

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The monitored power density of the project is 56.82W/m², which is greater than 10W/m². Therefore, the project emission (PE_y) is zero.

E.3. Calculation of leakage

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According to the methodology ACM0002 (version 12.3.0), no leakage emissions (L_y) are considered for the hydropower project.

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	664,237	0	0	0	664,237	664,237

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)	919,724	664,237

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

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The net electricity of 916,948.045MWh was supplied to the CCPG by the project during the first monitoring period 01/01/2013-25/03/2016 (total 1180 days). The actual emission reductions are

664,237tCO₂e, which is less than the estimated emission reductions of 919,724 tCO₂e (=284,491 tCO₂e/365 days *1180 days) in the registered PDD.

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

Project participant and/or responsible person/ entity	<input type="checkbox"/> Project participant <input checked="" type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	Shanghai Marukyu Environment Co., Ltd.
Street/P.O. Box	1628 Jinshajiang Road
Building	#5
City	Shanghai
State/region	
Postcode	200333
Country	People's Republic of China
Telephone	
Fax	
E-mail	
Website	
Contact person	
Title	Manager
Salutation	Ms.
Last name	Ou
Middle name	
First name	Yuanyang
Department	
Mobile	
Direct fax	+86-21-32525670
Direct tel.	+86-21-32525665
Personal e-mail	oyy@shjec.cn

