Monitoring report form for CDM project activity
(Version 08.0)

Complete this form in accordance with the instructions attached at the end of this form.

MONITORING REPORT			
Title of the project activity	Hunan Zhugaotan Hydropower Project		
UNFCCC reference number of the project activity	4713		
Version number of the PDD applicable to this monitoring report	05		
Version number of this monitoring report	01		
Completion date of this monitoring report	08/05/2021		
Monitoring period number	1st monitoring period		
Duration of this monitoring period	01/06/2011-31/12/2012		
Monitoring report number for this monitoring period	N/A		
Project participants	Huayuan ChunJiang Power Generation Co., Ltd.		
Host Party	P. R. China		
Applied methodologies and standardized baselines	Methodologies Used: ACM0002-Consolidated baseline methodology for grid-connected electricity generation from renewable sources (version 11)		
Sectoral scopes	Sectoral scopes :1: Energy industries (renewable - / non-renewable sources)		
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013 until 31 December 2020	Amount achieved from 1 January 2021
	91,050	0	0
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	95,802		

SECTION A. Description of project activity

A.1. General description of project activity

>>Zhugaotan Hydropower Project (hereinafter referred to as "the project") is a newly-built hydropower project, located on the downstream of Youshui River in Huayuan County, Hunan Province, P. R. China. The total installed capacity of the project is 33 MW (3×11MW). The purpose of the project is to generate electricity by using water resources to alleviate electricity shortage in Central China. The project will contribute to the reduction of GHG emission by displacing part of the electricity from the fossil fuel fired power plants of the CCPG (Central China Power Grid), which is dominant with fossil fuel fired power plants.

Relevant dates for the project activity is as below:

Event	Date
Project starting date	08/09/2007
Registration date	11/05/2011
Operation of the 1st generator	08/10/2011
Operation of the 2nd generator	13/01/2012
Operation of the 3rd generator	15/03/2012
1st monitoring period	01/06/2011-31/12/2012

Total emission reductions achieved in this monitoring period are 91,050tCO_2e.

A.2. Location of project activity

>>
The project is located on the downstream of Youshui River within Huayuan County, Hunan Province, which is 1.5 km away from the Huayuan County, and its geographical coordinates are east longitude of 109.4644°and north latitude of 28.5944°.

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
The Peoples' Republic of China (Host)	Huayuan ChunJiang Power Generation Co., Ltd.…	No

A.4. References to applied methodologies and standardized baselines

>>
Title of the approved baseline and monitoring methodology: ACM0002-Consolidated baseline methodology for grid-connected electricity generation from renewable sources (version 11)
Please refer to below link for the methodology:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

Title of the methodology to calculate the emission factor: Tool to calculate the emission factor for an electricity system (version 02)
Please refer to below link for the methodology:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

A.5. Crediting period type and duration

>> The fixed crediting period is chosen for the project. The start date of the crediting period is 01/06/2011. The fixed crediting period of the project activity is from 01/06/2011 to 31/05/2021.

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

>>
The implementation and operation of project is in strict accordance with the description in the registered PDD. The implementation of the project is as follows:

Event	Time
Project starting date	08/09/2007
Registration date	04/05/2011
Crediting period	01/06/2011-31/05/2021 (fixed)
Operation of the 1st generator	08/10/2011
Operation of the 2nd generator	13/01/2012
Operation of the 3rd generator	15/03/2012
1st monitoring period	01/06/2011-31/12/2012

There was no special events happened during this monitoring period, which may impact the applicability of the methodology. The project was under normal operation during this monitoring period.

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

>>
The project operation is in accordance with the monitoring plan (MP), and there was no any deviation to the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

B.2.2. Corrections

>>
There was no corrections to the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

B.2.3. Changes to the start date of the crediting period

>>
There is no changes to the start date of the crediting period for the project activity.

B.2.4. Inclusion of monitoring plan

>>
Not applicable.

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

>>

There are no permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents.

B.2.6. Changes to project design

>>
There are no changes to the project design.

B.2.7. Changes specific to afforestation or reforestation project activity

>>
Not applicable.

SECTION C. Description of monitoring system

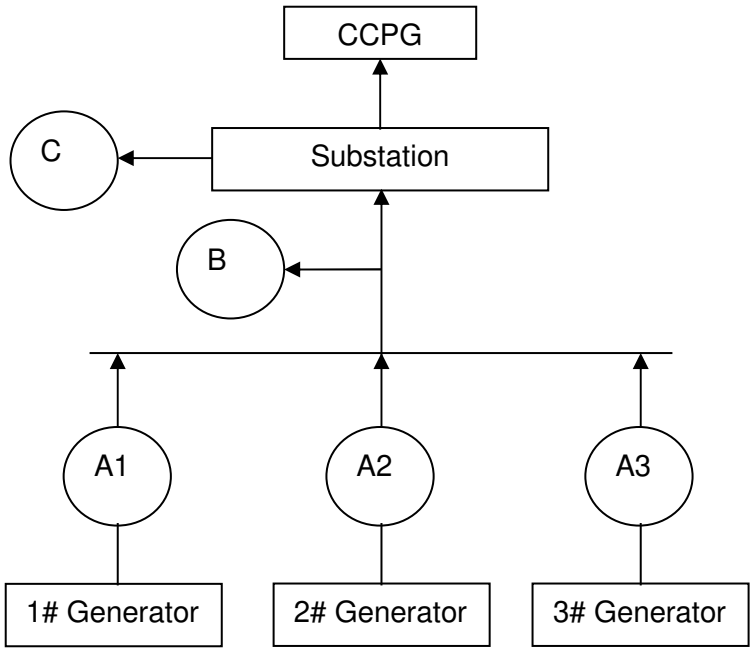
>>

1. Location of meters

The main meter installed is used to monitor the electricity exported to the CCPG and the electricity imported from the CCPG. All data used for CERs calculation are obtained from main meter during this monitoring period.

The main meter and back up meter have been calibrated once per year in accordance with the industry standard and the calibration records show the operation of the meters is in normal situation.

The meters position of the project is shown as follows:



A: monitor meters of electricity generated by generators;
B: main monitor meter of net electricity generation delivered to the grid by the project;
C: back up monitor meter of net electricity generation delivered to the grid by the project.

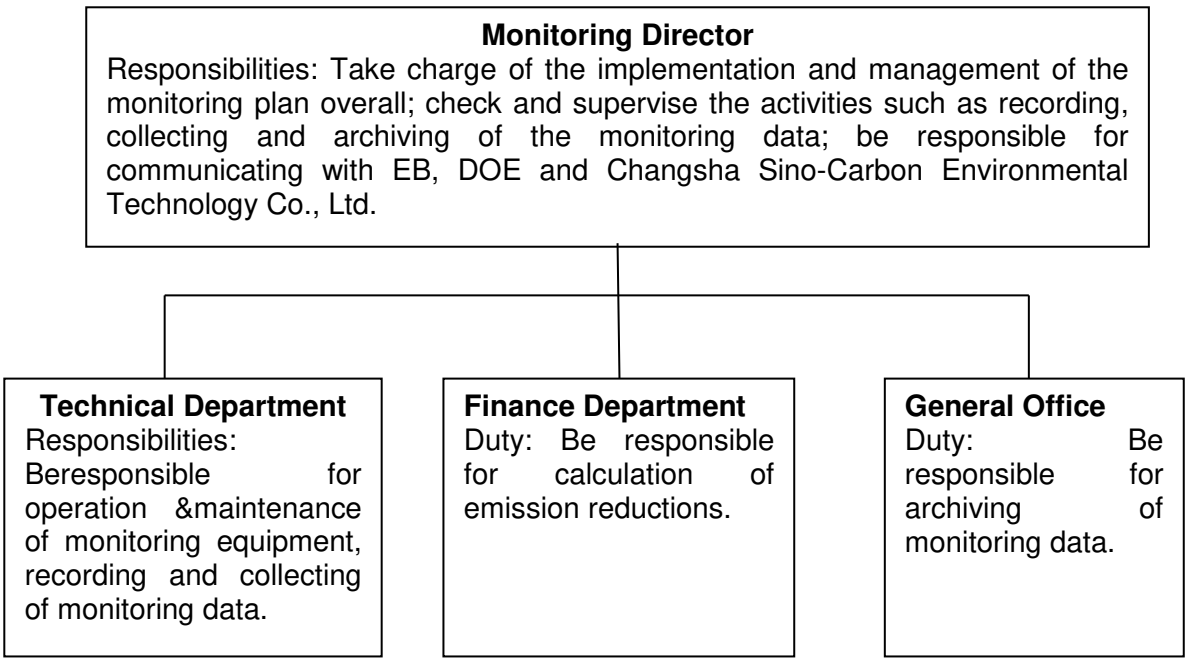
The calibration information of Main Meter is as follows:

Name of the meter	Serial No.	Accuracy	Calibration date	Valid until	Calibration entity
main meter	43414010000187979	0.2S	13/10/2011 13/10/2012	12/10/2012 12/10/2013	Xiangxi metering

back up meter	43414040000187980	0.2S	13/10/2011 13/10/2012	12/10/2012 12/10/2013	center of Hunan Electric Power Co., Ltd
1# generator meter	11030611780208	0.5S	13/10/2011 13/10/2012	12/10/2012 12/10/2013	
2# generator meter	11030611780205	0.5S	13/10/2011 13/10/2012	12/10/2012 12/10/2013	
3# generator meter	11030611780210	0.5S	13/10/2011 13/10/2012	12/10/2012 12/10/2013	

2. Monitoring management structure

In order to obtain reliable monitoring data, the project developer will establish a monitoring management structure prior to the starting of the crediting period. Clear responsibilities will be assigned to all staffs involved in the CDM project. A monitoring director will be appointed who has the overall responsibilities for the monitoring of the project, other staffs will be responsible for the data recording, data collecting, data archiving and emission reductions calculation. The detailed structure is as follows:



3. Data collection procedure

The readings of the main meter are used for calculating the emission reductions when the main meter is in normal operation state. The monitoring processes are as follows:
(1) The designated persons from the grid company and the project company record the readings of the meter for the electricity delivered to CCPG and consumed by the project activity from CCPG;
(2) The power grid company provides the project owner with a settling accounts sheet about the net electricity supplied to CCPG monthly;
(3) The project owner provides the power grid company with a sale receipt after the power grid company has confirmed the settling accounts sheet, and preserves the copy of the sale receipt.

4. Emergency measures/procedures

When the main meter or back-up meter have a breakdown, the electricity generation difference will be treated as follows:
(1) When one of the two meters has a breakdown, the readings of another meter will be adopted;
(2) If both of the main meter and back up meter have breakdowns, the net electricity supplied to

the grid will be calculated with the readings of other meters such as the meter installed at the exit of the generator deducting the loss after the discussion between the owner and the grid company.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

(Copy this table for each data or parameter.)

Data/Parameter	EF_y
Unit	tCO_2e/MWh
Description	Emission factor of CCPG
Source of data	Registered PDD
Value(s) applied	0.9735
Choice of data or measurement methods and procedures	The data is used for baseline emission calculations. The figure is calculated ex-ante and is fixed during the crediting period.
Purpose of data/parameter	EF_{OM} is 1.2783 tCO_2e/MWh, and EF_{BM} is 0.6687 tCO_2e/MWh.
Additional comments	EF_y

D.2. Data and parameters monitored

(Copy this table for each data or parameter.)

Data/Parameter	TEG_y
Unit	MWh
Description	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year *y*
Measured/calculated/ default	Measured
Source of data	Meters installed on the exit of generators
Value(s) of monitored parameter	96,802MWh

<table>
<tr><td>Monitoring equipment</td><td>The data was measured by the generator meters.
1# generator meter:
Type: DTSD341
Accuracy class: 0.5S
S/N number: 11030611780208
Calibration frequency: annually
Calibration information:
<table><tr><td>Calibration date</td><td>Valid until</td></tr><tr><td>13/10/2011
13/10/2012</td><td>12/10/2012
12/10/2013</td></tr><tr><td colspan="2">Calibration entity: Xiangxi metering center of Hunan Electric Power Co., Ltd.</td></tr></table>2# generator meter:
Type: DTSD341
Accuracy class: 0.5S
S/N number: 11030611780205
Calibration frequency: annually
Calibration information:
<table><tr><td>Calibration date</td><td>Valid until</td></tr><tr><td>13/10/2011
13/10/2012</td><td>12/10/2012
12/10/2013</td></tr><tr><td colspan="2">Calibration entity: Xiangxi metering center of Hunan Electric Power Co., Ltd.</td></tr></table>3# generator meter:
Type: DTSD341
Accuracy class: 0.5S
S/N number: 11030611780210
Calibration frequency: annually
Calibration information:
<table><tr><td>Calibration date</td><td>Valid until</td></tr><tr><td>13/10/2011
13/10/2012</td><td>12/10/2012
12/10/2013</td></tr><tr><td colspan="2">Calibration entity: Xiangxi metering center of Hunan Electric Power Co., Ltd.</td></tr></table></td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>Continuous measurement by meters installed on the exit of generators daily reading and monthly recording.</td></tr>
<tr><td>Calculation method (if applicable)</td><td>The meters will be calibrated once a year.</td></tr>
<tr><td>QA/QC procedures</td><td>/</td></tr>
<tr><td>Purpose of data/parameter</td><td>To calculate the project emission.</td></tr>
<tr><td>Additional comments</td><td>/</td></tr>
</table>

Data/Parameter	$EG_{facility,y}$
Unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Measured/calculated/ default	Measured
Source of data	Main meter

<table>
<tr><td>Value(s) of monitored parameter</td><td>93529MWh</td></tr>
<tr><td>Monitoring equipment</td><td>The data was measured by the main meter:
Type: DTSD341
Accuracy class: 0.2S
S/N number: 43414010000187979
Calibration frequency: annually
Calibration information:
<table><tr><th>Calibration date</th><th>Valid until</th></tr><tr><td>13/10/2011
13/10/2012</td><td>12/10/2012
12/10/2013</td></tr><tr><td colspan="2">Calibration entity: Xiangxi metering center of Hunan Electric Power Co., Ltd.</td></tr></table></td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>Continuous measurement by meter installed at the connection point to the grid, daily reading and monthly recording.</td></tr>
<tr><td>Calculation method (if applicable)</td><td>The meter will be calibrated once a year.</td></tr>
<tr><td>QA/QC procedures</td><td>When the main meter or back-up meter have a breakdown, the electricity generation difference will be treated as follows:
(1) When one of the two meters has a breakdown, the readings of another meter will be adopted;
(2) If both of the main meter and back up meter have breakdowns, the net electricity supplied to the grid will be calculated with the readings of other meters such as the meter installed at the exit of the generator deducting the loss after the discussion between the owner and the grid company.</td></tr>
<tr><td>Purpose of data/parameter</td><td>To calculate the project emission.</td></tr>
<tr><td>Additional comments</td><td>/</td></tr>
</table>

Data/Parameter	Cap_{PJ}
Unit	W
Description	Installed capacity of the hydro power plant after the implementation of the project activity.
Measured/calculated/ default	Measured
Source of data	Project site
Value(s) of monitored parameter	33,000,000
Monitoring equipment	/
Measuring/reading/recording frequency	Yearly monitored based on recognized standards.
Calculation method (if applicable)	/
QA/QC procedures	/
Purpose of data/parameter	The data are used for the calculation of power density.
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
Source of data	Project site
Value(s) of monitored parameter	3,000,000
Monitoring equipment	/
Measuring/reading/recordi ng frequency	Yearly monitored from topographical surveys, maps, satellite pictures, etc
Calculation method (if applicable)	/
QA/QC procedures	/
Purpose of data/parameter	The data are used for the calculation of power density.
Additional comments	/

D.3. Implementation of sampling plan

>>
Not applicable.

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

>>
According to ACM0002, the baseline emissions during this monitoring period is calculated as follows:

$BE_y = EG_y * EF_y$

Where:
EG_y is net electricity supplied by the project activity to the grid in year y, in MWh;
EF_y is baseline emission factor in year y, in tCO_2e/MWh. According to the registered PDD, the EF_y is $0.9735tCO_2e/MWh$, and is fixed during the crediting period.

The monitoring results based on main meter are as follows:

Period	Electricity export (MWh)	Electricity import (MWh)	Net electricity generation (MWh)
	A	B	C = A - B
08/10/2011-12/10/2011	**560.560**	**0.000**	**560.560**
13/10/2011-12/11/2011	**4446.640**	**3.520**	**4443.120**
13/11/2011-12/12/2011	**5808.000**	**21.120**	**5786.880**
13/12/2011-12/01/2012	**398.640**	**0.880**	**397.760**
13/01/2012-12/02/2012	**1980.000**	**12.320**	**1967.680**
13/02/2012-12/03/2012	**2342.560**	**17.600**	**2324.960**
13/03/2012-12/04/2012	**4654.320**	**6.160**	**4648.160**

13/04/2012-12/05/2012	**8507.840**	**5.280**	**8502.560**
13/05/2012-12/06/2012	**21879.440**	**0.000**	**21879.440**
13/06/2012-12/07/2012	**14508.560**	**0.000**	**14508.560**
13/07/2012-12/08/2012	**8551.840**	**0.000**	**8551.840**
13/08/2012-12/09/2012	**4013.680**	**17.600**	**3996.080**
13/09/2012-12/10/2012	**5026.560**	**0.000**	**5026.560**
13/10/2012-12/11/2012	**7246.800**	**13.200**	**7233.600**
13/11/2012-12/12/2012	**3493.600**	**0.000**	**3493.600**
13/11/2012-31/12/2012	**267.520**	**59.840**	**207.680**
sum	**93686.56**	**157.52**	**93529.04**

Note: The data sources are from the main meter readings and can be cross checked by electricity sales receipts. There is no malfunction happened to main meter during this monitoring period.

According to above calculation methods, the net electricity generation used for emission reductions calculation is 93529.04MWh. The baseline emission factor (EF_y) is 0.9735tCO_2/MWh, which is fixed during the first crediting period. Then the baseline emissions (BE_y) are calculated as follows:

$BE_y = EG_y * EF_y$ =93529.04MWh*0.9735tCO_2/MWh =91,050 tCO_2

E.2. Calculation of project emissions or actual net removals

>>
According to the registered PDD, the project is a newly built hydropower station, the power density of project is 11 W/m^2, greater than 10W/m^2. According to baseline methodology, it is not needed to consider project emissions.

Therefore $PE_y = 0$.

E.3. Calculation of leakage emissions

>>
According to baseline methodology ACM0002, leakage is not to be considered.
$L_y = 0$

E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)			
				Before 01/01/ 2013	From 01/01/ 2013 until 31/12/ 2020	From 01/01/ 2021	Total amount
Total	91,050	0	0	91,050	0	0	91,050

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO_2e)	Amount estimated ex ante for this monitoring period in the PDD (t CO_2e)

Amount achieved during this monitoring period (t CO_2e)	Amount estimated ex ante for this monitoring period in the PDD (t CO_2e)
91,050	95,802* * As the 1# generator starts operation on 08/10/2011, thus the total operation days is 449 days to 31/12/2012, 2# generator starts operation on 13/01/2012, thus the total operation days is 354 days to 31/12/2012, and 3# generator starts operation on 15/03/2012, thus the total operation days is 292 days to 31/12/2012, thus the total estimated emission reduction can be calculated as: 95802/365/3*(449+354+292)=95,802 tCO_2e.

E.5.1. Explanation of calculation of "amount estimated ex ante for this monitoring period in the PDD"

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

E.6. Remarks on increase in achieved emission reductions

>>
The achieved emission reduction is lower than the estimated in the PDD.

E.7. Remarks on scale of small-scale project activity

>>

Not applicable.

Document information

Version	*Date*	*Description*
08.0	6 April 2021	Revision to: • Reflect the "Clarification: Regulatory requirements under temporary measures for post-2020 cases" (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • 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: • 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 *F-CDM-MR* to *CDM-MR-FORM*; • 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 (EB 70, Annex 11).

Version	*Date*	*Description*
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.

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