Monitoring report form for CDM project activity
(Version 09.0)

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

MONITORING REPORT			
Title of the project activity	Hunan Xiaotan Hydropower Project		
UNFCCC reference number of the project activity	2842		
Version number of the PDD applicable to this monitoring report	03		
Version number of this monitoring report	01		
Completion date of this monitoring report	21/09/2021		
Monitoring period number	3rd monitoring period		
Duration of this monitoring period	18/05/2014-29/06/2017		
Monitoring report number for this monitoring period	NA		
Project participants	Chenxi County Qiongtian Hydropower Co., Ltd.		
Host Party	P. R. China		
Applied methodologies and standardized baselines	Methodologies Used: ACM0002-Consolidated methodology for grid-connected electricity generation from renewable sources (version 7)		
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
	0	173,122	0
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	239,206		

SECTION A. Description of project activity

A.1. General description of project activity

>>
Hunan Xiaotan Hydropower Project (hereinafter referred to as "the project") is a new hydropower plant, locates on Chenshui Branch of Yuanjiang River in Xiaotan Town, Chenxi County, Huaihua City, Hunan Province. The total installed capacity of the project is 20 MW. 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	07/08/2006
Registration date	23/06/2010
Operation of the 1st generator	04/11/2011
Operation of the 2nd generator	30/11/2010

Total emission reductions achieved in this monitoring period are 173,122 tCO_2e.

A.2. Location of project activity

>>
The project locates in Xiaotan Town, Chenxi County, Huaihua City, 8 km away from the county. The project activity is a riverbed-hydroelectric station, and the power house is very close to the dam. Therefore, the dam and the power house has the same GPS coordinates, namely 110°08′39″E and 27°56′ 19″N.

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)	Chenxi County Qiongtian Hydropower Co., Ltd.	No

A.4. References to applied methodologies and standardized baselines

>>
Title of the approved baseline and monitoring methodology: ACM0002-Consolidated methodology for grid-connected electricity generation from renewable sources (version 7)
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 01.1)
Please refer to below link for the methodology:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

A.5. Crediting period type and duration

>>
The renewable crediting period is chosen for the project. The start date of the first crediting period is 30/06/2010. The first crediting period of the project activity is from 30/06/2010 to 29/06/2017.

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 and the equipment employed by the project are as follows:

Event	Time
Project starting date	07/08/2006
Registration date	23/06/2010
Crediting period	30/06/2010-29/06/2017 (renewable)
Operation of the 1st generator	04/11/2011
Operation of the 2nd generator	30/11/2010
3rd monitoring period	18/05/2014-29/06/2017

The detailed features of the project are as below:

Parameters		Unit	value
Hydraulic Turbine	Model	—	GZTF07B-WP-450
	Quantity	Unit	2
	Rated Capacity	MW	11
	Rated Rotation	r/min	107.1
	Rated Water Head	M	7.2
	Rated Flow	m^3/s	170.39
	Efficiency	—	91.4%
	Age	year	0
	Lifetime	year	30
Generator	Model	—	SFWG10-56/5130
	Quantity	Unit	2
	Unit Capacity	MW	10
	Rated Voltage	kV	10.5
	Power Factor	—	0.9
	Age	year	0
	Lifetime	year	30
	Efficiency	—	97%

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

>>
Starting date of the first crediting period was changed from 23/06/2010 to 30/06/2010. This change has been approved by EB.

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.

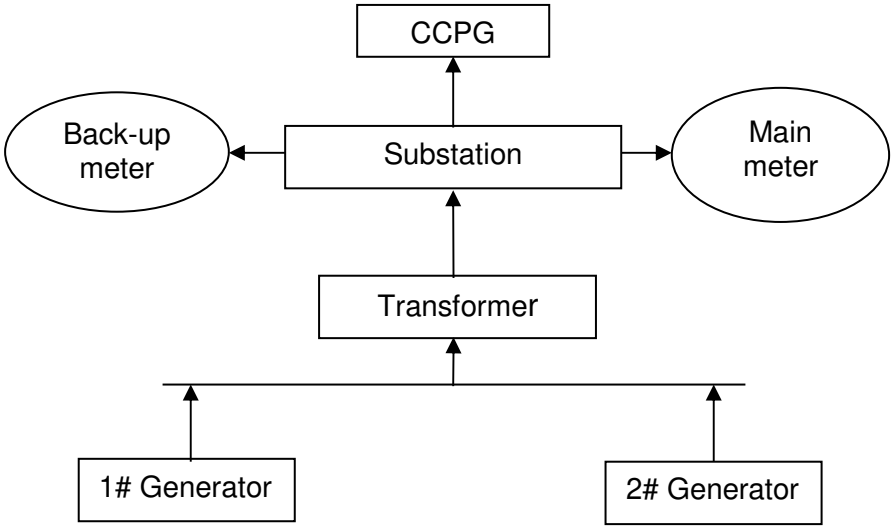
SECTION C. Description of monitoring system

>>
1. Location of meters

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

The meters position of the project is shown as follows:

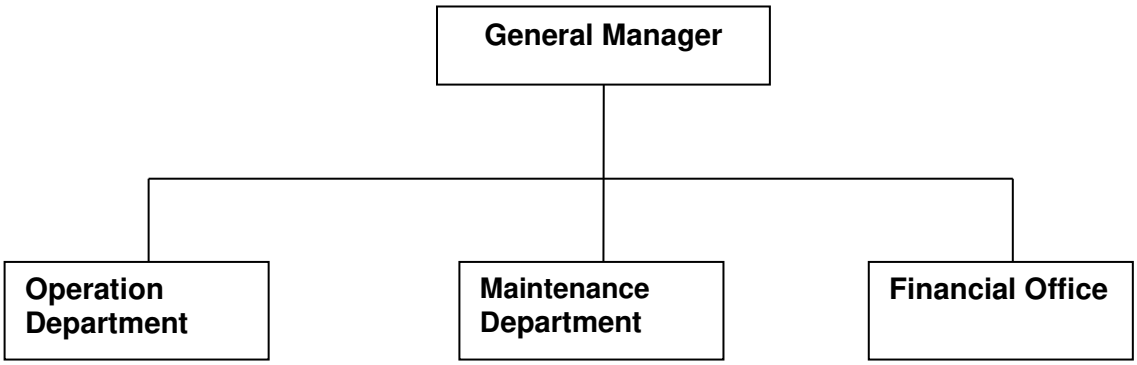


The calibration information of meters is as follows:

Name of the meter	Serial No.	Accuracy	Calibration date	Valid until	Calibration entity
Main meter	90609644	0.5S	29/05/2013	28/05/2014	Measurement institute of Chenxi power grid company
			29/05/2014	28/05/2015	
			29/05/2015	28/05/2016	
			29/05/2016	28/05/2017	
			29/05/2017	28/05/2018	
Back-up meter	90600402	0.5S	29/05/2013	28/05/2014	
			29/05/2014	28/05/2015	
			29/05/2015	28/05/2016	
			29/05/2016	28/05/2017	
			29/05/2017	28/05/2018	

2. Monitoring management structure

In order to obtain reliable monitoring data, the project owner will establish a monitoring management structure prior to the start of the crediting period. Clear responsibilities will be assigned to all staffs involved in the CDM project. A General Manager 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:



The duty of each position summarized as follows:

General Manager is take charge of the implementation and management of the monitoring plan overall; check and supervise the activities such as recording, collecting and archiving of the monitoring data; be responsible for communicating with DOE and Hunan CDM Project Service Centre.

Operation Department is take charge of the operation of turbines and generators, record and keep the electricity monitoring data.

Maintenance Department is responsible for maintenance of the facilities of the hydropower plant.

Financial Office is responsible for archiving of monitoring data.

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:
a. When main meter has a breakdown, the readings of back-up meter will be adopted;
b. If both of the main meter and back-up meter have breakdowns, the project owner should notice the power grid company immediately and solve the problem with a conservative calculation method.

After handling of the emergency, the project owner must prepare a report regarding the emergency to explain to DOE that the handling method is reasonable.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante[1]

Data/Parameter	EF_y
Unit	tCO_2e/MWh

[1] As other parameters for ex anti in the registered PDD are not being used in the calculation of ER, thus are not list in the MR table.

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

Data/Parameter	Cap_{BL}
Unit	W
Description	Installed capacity of the hydro power plant before the implementation of the project activity. The proposed project is a new hydro power plant, this value is zero.
Source of data	Project site
Value(s) applied	0
Choice of data or measurement methods and procedures	Determine the installed capacity based on recognized standards.
Purpose of data/parameter	Used for project emission calculation.
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 (m^2) For the project, the reservoir is new, 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 and maps.
Purpose of data/parameter	Used for project emission calculation.
Additional comments	/

D.2. Data and parameters monitored

Data/Parameter	EG_y
Unit	MWh
Description	Net electricity supplied to CCPG in year y.
Measured/calculated/ default	Measured
Source of data	Main meter
Value(s) of monitored parameter	177835.02 MWh

<table>
<tr><td>Monitoring equipment</td><td>The data was measured by the Main Meter.
Main meter:
Type: DTSD62-2a
Accuracy class: 0.5S
S/N number: 90609644
Calibration frequency: annually
Calibration information:
<table><tr><th>Calibration date</th><th>Valid until</th></tr><tr><td>29/05/2013</td><td>28/05/2014</td></tr><tr><td>29/05/2014</td><td>28/05/2015</td></tr><tr><td>29/05/2015</td><td>28/05/2016</td></tr><tr><td>29/05/2016</td><td>28/05/2017</td></tr><tr><td>29/05/2017</td><td>28/05/2018</td></tr><tr><td colspan="2">Calibration entity: Measurement institute of Chenxi power grid company</td></tr></table>
Back-up meter:
type: DTSD62-2a
Accuracy class: 0.5S
S/N number: 90600402
Calibration frequency: annually
Calibration information:
<table><tr><th>Calibration date</th><th>Valid until</th></tr><tr><td>29/05/2013</td><td>28/05/2014</td></tr><tr><td>29/05/2014</td><td>28/05/2015</td></tr><tr><td>29/05/2015</td><td>28/05/2016</td></tr><tr><td>29/05/2016</td><td>28/05/2017</td></tr><tr><td>29/05/2017</td><td>28/05/2018</td></tr><tr><td colspan="2">Calibration entity: Measurement institute of Chenxi power grid company</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 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>The main meter will be calibrated once a year and net electricity supplied by the project activity to CCPG would be double checked by receipt of sales.</td></tr>
<tr><td>Purpose of data/parameter</td><td>The data is used for the calculation of baseline 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	20,000,000
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 project emission.
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	650,000
Monitoring equipment	/
Measuring/reading/recording 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 project emission.
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	Data from reading records	Data from ETN(for crosscheck)

	Electricity export (MWh)	Electricity import (MWh)	Net electricity generation (MWh)	Electricity export (MWh)	Electricity import (MWh)	Net electricity generation (MWh)
	A	B	C = A - B	D	E	F=D-E
18/05/2014-13/06/2014	**8691.540**	**0.000**	**8691.540**	**8691.540**	**0.000**	**8691.540**
14/06/2014-13/07/2014	**9500.040**	**0.000**	**9500.040**	**9500.040**	**0.000**	**9500.040**
14/07/2014-13/08/2014	**8273.760**	**0.000**	**8273.760**	**8273.760**	**0.000**	**8273.760**
14/08/2014-13/09/2014	**8671.080**	**0.000**	**8671.080**	**8671.080**	**0.000**	**8671.080**
14/09/2014-13/10/2014	**5068.140**	**0.000**	**5068.140**	**5068.140**	**0.000**	**5068.140**
14/10/2014-13/11/2014	**6827.040**	**0.000**	**6827.040**	**6827.040**	**0.000**	**6827.040**
14/11/2014-13/12/2014	**8340.420**	**7.260**	**8333.160**	**8340.420**	**7.260**	**8333.160**
14/12/2014-25/01/2015	**2399.100**	**1.320**	**2397.780**	**2399.100**	**1.320**	**2397.780**
26/01/2015-25/02/2015	**1783.320**	**0.000**	**1783.320**	**1783.320**	**0.000**	**1783.320**
26/02/2015-25/03/2015	**420.420**	**0.000**	**420.420**	**420.420**	**0.000**	**420.420**
26/03/2015-25/04/2015	**6405.960**	**0.000**	**6405.960**	**6405.960**	**0.000**	**6405.960**
26/04/2015-25/05/2015	**6631.020**	**0.000**	**6631.020**	**6631.020**	**0.000**	**6631.020**
26/05/2015-25/06/2015	**8525.880**	**0.000**	**8525.880**	**8525.880**	**0.000**	**8525.880**
26/06/2015-25/07/2015	**8531.820**	**0.000**	**8531.820**	**8531.820**	**0.000**	**8531.820**
26/07/2015-25/08/2015	**7205.220**	**0.000**	**7205.220**	**7205.220**	**0.000**	**7205.220**
26/08/2015-25/09/2015	**7405.200**	**0.000**	**7405.200**	**7405.200**	**0.000**	**7405.200**
26/09/2015-25/10/2015	**5732.760**	**0.000**	**5732.760**	**5732.760**	**0.000**	**5732.760**
26/10/2015-25/11/2015	**588.060**	**0.000**	**588.060**	**588.060**	**0.000**	**588.060**
26/11/2015-25/12/2015	**607.200**	**0.000**	**607.200**	**607.200**	**0.000**	**607.200**
26/12/2015-27/06/2016*	**6048.900**	**0.000**	**6048.900**	**6048.900**	**0.000**	**6048.900**
28/06/2016-27/07/2016	**8716.620**	**0.000**	**8716.620**	**8716.620**	**0.000**	**8716.620**
28/07/2016-27/08/2016	**8459.880**	**0.000**	**8459.880**	**8459.880**	**0.000**	**8459.880**
28/08/2016-27/09/2016	**2377.320**	**0.000**	**2377.320**	**2377.320**	**0.000**	**2377.320**
28/09/2016-	**2364.120**	**0.000**	**2364.120**	**2364.120**	**0.000**	**2364.120**

27/10/2016						
28/10/2016-27/11/2016	**5920.200**	**0.000**	**5920.200**	**5920.200**	**0.000**	**5920.200**
28/11/2016-27/12/2016	**3609.540**	**0.000**	**3609.540**	**3609.540**	**0.000**	**3609.540**
28/12/2016-18/01/2017	**4491.300**	**0.000**	**4491.300**	**4491.300**	**0.000**	**4491.300**
19/01/2017-27/02/2017	**3719.760**	**0.000**	**3719.760**	**3719.760**	**0.000**	**3719.760**
28/02/2017-27/03/2017	**6213.240**	**0.000**	**6213.240**	**6213.240**	**0.000**	**6213.240**
28/03/2017-27/04/2017	**6179.580**	**0.000**	**6179.580**	**6179.580**	**0.000**	**6179.580**
28/04/2017-27/05/2017	**7459.320**	**0.000**	**7459.320**	**7459.320**	**0.000**	**7459.320**
28/05/2017-27/06/2017	**418.440**	**0.000**	**418.440**	**418.440**	**0.000**	**418.440**
28/06/2017-29/06/2017	**257.400**	**0.000**	**257.400**	**257.400**	**0.000**	**257.400**
sum	**177843.600**	**8.580**	**177835.020**	**177843.600**	**8.580**	**177835.020**
*** As the period starts from 28/12/2015 to 27/05/2016, for the reason that construction of flood bank in the upstream of the power station, which required no water storage during that time, thus, no water could bu used for power generation, the power station restarted generation in June,2016.**						

Note: The data sources are from the main meter readings and can be cross checked by electricity transaction notes. 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 177835.02MWh. 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:

$BE_y = EG_y * EF_y$ =177835.02MWh*0.9735tCO_2/MWh =173,122 tCO_2

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

>>
According to the baseline methodology ACM0002 (Version 7), the power density(PD) of the project is calculated as: PD=(20,000000W-0W)/(650,000m^2-0m^2) =30.77W/m^2 which is greater than 10W/m^2, Therefore PE_y = 0.

E.3. Calculation of leakage emissions

>>
According to baseline methodology ACM0002, leakage is not to be considered.

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

	Baseline GHG emissions	**Project GHG emissions**	**Leakage GHG emissions**	**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	173,122	0	0	0	173,122	0	173,122

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)
173,122	239,206* * As the generator operation duration is 1137 days from 18/05/2014 to 29/06/2017 thus the total estimated emission reduction can be calculated as: 76,790/365*1137=239,206 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*
09.0	8 October 2021	Revision to: • Ensure consistency with version 03.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN).
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.

Version	*Date*	*Description*
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).
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.

Decision Class: Regulatory
Document Type: Form
Business Function: Issuance
Keywords: monitoring report