

 Monitoring report form for CDM project activity (Version 07.0)		
MONITORING REPORT		
Title of the project activity	GHG abatement through Solar Power Generation at Jaisalmer, Rajasthan, India	
UNFCCC reference number of the project activity	7461	
Version number of the PDD applicable to this monitoring report	03	
Version number of this monitoring report	02	
Completion date of this monitoring report	12/03/2020	
Monitoring period number	02	
Duration of this monitoring period	01/09/2017 to 01/02/2020 (Inclusive of both days)	
Monitoring report number for this monitoring period	NA	
Project participants	Precision Technik Private Limited	
Host Party	India	
Applied methodologies and standardized baselines	Methodology: AMS-I.D "Grid connected renewable electricity generation" (EB 61, Version 17) Standardized baselines: Not applicable	
Sectoral scopes	Sectoral Scope: 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
	-	19,695
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	19,107	

SECTION A. Description of project activity

A.1. General description of project activity

M/s Precision Technik Private Limited (PTPL) incorporated on 19th December 1995 under the Companies Act, 1956 is a part of the Sonthalia Group. The Sonthalia Group is a Kolkata based business house with diversified business interests in Polymers, Textiles & Readymade Garments, Jewellery, Steel, Solar Module manufacturing and Infrastructure Development.

PTPL has developed a 5 MW grid connected solar Photo voltaic power project in Nokh Village, Pokhran Tehsil in Jaisalmer District in the State of Rajasthan in Western India. The project activity supplied around 8,322 MWh of net electricity annually to the NEWNE¹ grid thereby reducing 7889 tCO₂ annually. The entire power generated from this project is being sold to NTPC Vidyut Vyapar Nigam (NVVN) by connecting it to state grid through a power purchase agreement with NVVN.

The project activity has been commissioned on 8th February 2012 and is continuing operation since then. During the current monitoring period, 19,695 tCO₂e is been displaced.

A.2. Location of project activity

The project activity is located at

Village : Nokh

Tehsil: Pokhran

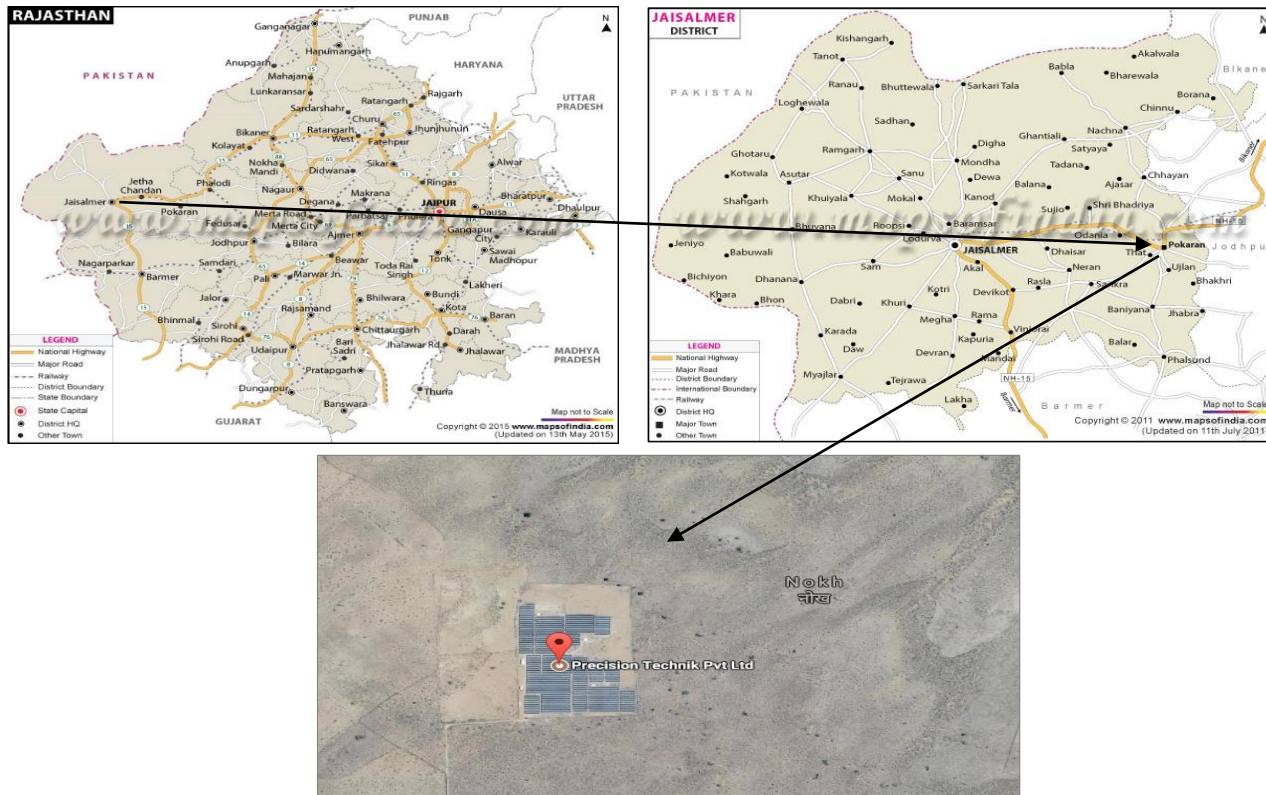
District : Jaisalmer

State: Rajasthan

The latitude and longitude are as follows:

Latitude 26° 54' 56.69" N

Longitude 70° 54' 30.03" E



¹ NEWNE: Northern Eastern Western North-Eastern (Now INDIAN grid)

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host)	Precision Technik Private Limited	No

A.4. References to applied methodologies and standardized baselines

Title: Grid Connected Renewable Electricity Generation

Reference: AMS I.D. (Version 17, EB 61)

A.5. Crediting period type and duration

Type of crediting period	Fixed
Crediting period from	31 Oct 13 - 30 Oct 23
Length of the Crediting Period	10 Years
Monitoring period from	01 Sep 17 to 01 Feb 20
Length of the Monitoring Period	884 Days

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

The technology employed by the Proposed Project Activity includes the usage of poly crystalline-based solar PV modules with an aggregate of 5 MW generation capacity to supply the generated electricity to the NEWNE Grid. The generation and consumption of the Project Activity is monitored continuously through the energy meters at project site & substations. The data is used for the calculation of exports to the grid and imports from the grid.

The above mentioned investors employed the Solar PV Modules of poly crystalline technology for the proposed 5 MW project. The Solar power system has been designed with number of sub main plants, solar PV arrays and inverters of suitable capacity. The electricity exported by the proposed project activity would displace an equivalent amount of electricity generated by the power plants already operational and proposed to be added in the North-East-West-North East (NEWNE) Grid which relies predominantly on fossil fuels. Thus, it contributes towards reduction in the demand-supply gap during periods of electricity shortage and increase in the share of renewable energy in the grid mix.

The solar PV power plant has got solar PV modules, inverters, transformers and other protection system and supporting components as well. The various components of the plant include:

- Solar Photovoltaic modules
- Inverters
- Transformers
- Circuit breakers
- Lightning arrester
- Isolator
- Current transformer
- Switchyard
- LT panel
- Earthing system

The Direct Current (DC) from modules is converted into Alternating Current (AC) by inverters. The inverter outputs are fed into a junction box, which in turn is connected to the LV Panel in the control

room. The output from LV Panel is stepped up by outdoor type transformers located near the control room. The HV side of transformer is connected to HT Panel in the control room. The LV and HT Panels have all necessary metering and protection as per Power evacuation schematic.

- 5 MW divided into 5 nos of 1 MW
- 1 MW divided in to 2 nos of 500 KW inverter
- 500 kw system is connected by 113 strings of solar panel
- Each string consists of 22 solar modules connected in series

Basic System Design:

Parameter	Specifications
Power Generation Units	5 no's each with a proposed capacity of 1MW.
Inverter	Each of the 1 MW units are divided into 2 nos of 500 kW each. Inverter input voltage range 500-820 volt
Modules	230 Wp 30 volts modules have been used. 4348 modules (1 MW) have been used.
Strings	String voltage is 660 volt, 226 strings per MW have been used
Wires	Each inverter has got 5 wires

The project activity has been commissioned on 8th February 2012 and is continuing operation smoothly with schedule planned maintenance. The plant is connected to RVPN's 132 kV GSS (PS-2) District Jodhpur, the metering equipment installed at delivery points having the main meter and check meter serial number 11071570 and 11071571 respectively. The electricity meters are under the custody of the DISCOM and are calibrated by DISCOM as per their procedures. However, the project proponent ensures that the meters are calibrated at least once in three years. The main meter (11071570) was replaced on 11-09-2019 with meter number 16113796 L&T make.

No events or situations happened during the reported monitoring period that can alter the applicability of the applied methodology.

B.2. Post-registration changes

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

There is no request for deviation applied during this monitoring period.

B.2.2. Corrections

There have not been any corrections to project information or parameters fixed at validation during the current monitoring period.

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

Changes regarding state date of crediting period has been informed to UNFCCC via email by PP and same is approved. Please refer UN web page of same project. The earlier crediting period was from 31/10/2012 to 30/10/2022 and it is changed to 31/10/2013 to 30/10/2023.

B.2.4. Inclusion of monitoring plan

There has not been any change in the monitoring plan during the current monitoring period.

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

Not Applicable.

B.2.6. Changes to project design

There has not been any change in the PDD during the current monitoring period.

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

This project activity is not an afforestation or reforestation project activity.

SECTION C. Description of monitoring system

The project proponent is following the following operational & management structure in order to monitor the emission reduction. The organization structure for the proposed power plant comprises of a General Manager as the in-charge for the entire power plant operations and maintenance. He is positioned at site and directly reports to the Chief executive officer. He is supported by Site Manager and Site supervisor.

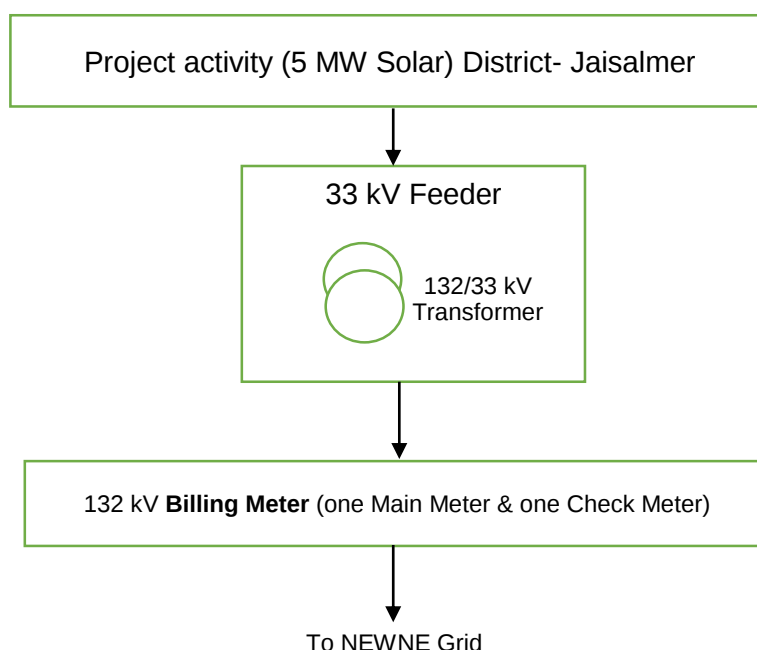
The day-to-day operation like planning the routine maintenance, safety and environmental control are placed under the care of the Site manager. The organizational structure and responsibilities on project operation, monitoring, data recording and ER calculation has been mentioned below:



Designation	Responsibilities
Chief Executive officer (CEO)	• Holds complete control over monitoring aspects • Pertaining to the project • Review of Monitoring report • Training of the staff. • Emission reduction calculation is maintained by the CEO for verification.
General Manager	• Entire power plant operation & maintenance • Periodic checking of recorded & stored data. • Emission reduction calculation & Monitoring • Report preparation.

Site Manager & Site Supervisor	• Day to day Operation • Storage of data • Data Recording
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Layout of metering arrangement for project activity is as follows:



Calibration Details:

The electricity meters are under the custody of the DISCOM and calibrated by DISCOM as per their standard procedures. However, project proponent had ensured that the meters calibrated at least once in three years. The calibration details of meters involved in the project activity is tabulated below:

	Main Meter	Check Meter
Serial Number	11071570	11071571
Accuracy Class	0.2s	0.2s
Make	Larsen & Turbo Limited	Larsen & Turbo Limited
Calibration Date	30-Nov-2014	30-Nov-2014
Calibration Due Date	29-Nov-2017	29-Nov-2017
Calibration Date	8-Mar-2018	8-Mar-2018
Calibration Due Date	7-Mar-2021	7-Mar-2021
Meter Change and Calibration date	11-Sep-2019	
New Serial Number	16113796	
Accuracy Class	0.2s	
Make	Larsen & Turbo Limited	
Calibration Due Date	10-Sep-2022	

The period 29 November 2017 to 08 March 2018 is not covered under the validity of calibrated energy meters. Therefore error factor as per the accuracy class (0.2%) of meters is applied during the duration. As a conservative approach, full month from November 2017 to March 2018 have been considered for the application of error factor. .

SECTION D. Data and parameters**D.1. Data and parameters fixed ex ante**

Data/Parameter	EF _{grid, CM, y} / EF _{grid, CO₂, y}
Unit	tCO ₂ / MWh
Description	Combined Margin Emission Factor (or CO ₂ Emission Factor) of the NEWNE Grid
Source of data	"CO ₂ Baseline Database for Indian Power Sector" version 06.0 published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO ₂ Baseline Database for Indian Power Sector" is available at www.cea.nic.in
Value(s) applied	0.948
Choice of data or measurement methods and procedures	Combined Margin Emission Factor has been calculated by the Central Electricity Authority, Govt. of India in accordance the "Tool to Calculate the emission Factor for an Electricity System" (Version 02.2.0, Annex 12, EB 61).
Purpose of data/parameter	Calculation of baseline emission
Additional comments	Computation with data published by authorized Government agency and statistics available in the public domain will ensure the reliability of the parameter. The value of the parameter will be kept fixed during the entire crediting period.

Data/Parameter	EF _{grid, BM, y}
Unit	tCO ₂ / MWh
Description	Build Margin Emission Factor (or CO ₂ Emission Factor) of the NEWNE Grid
Source of data	"CO ₂ Baseline Database for Indian Power Sector" version 06.0 published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO ₂ Baseline Database for Indian Power Sector" is available at
Value(s) applied	www.cea.nic.in
Choice of data or measurement methods and procedures	0.812
Purpose of data/parameter	Build Margin Emission Factor has been calculated by the Central Electricity Authority, Govt. of India in accordance the "Tool to Calculate the emission Factor for an Electricity System" (Version 02.2.0, Annex 12, EB 61).
Additional comments	Calculation of baseline emission

Data/parameter:	EF _{grid, OM, y}
Unit	tCO ₂ / MWh
Description	Operating Margin Emission Factor (or CO ₂ Emission Factor) of the NEWNE Grid
Source of data	"CO ₂ Baseline Database for Indian Power Sector" version 06.0 published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO ₂ Baseline Database for Indian Power Sector" is available at www.cea.nic.in
Value(s) applied)	0.994

Choice of data or measurement methods and procedures	Operating Margin Emission Factor has been calculated by the Central Electricity Authority, Govt. of India in accordance the “Tool to Calculate the emission Factor for an Electricity System” (Version 02.2.0, Annex 12, EB 61).
Purpose of data	Calculation of baseline emission
Additional comments	Computation with data published by authorized Government agency and statistics available in the public domain will ensure the reliability of the parameter. The value of the parameter will be kept fixed during the entire crediting period.

D.2. Data and parameters monitored

Data/Parameter	EG _{BL,y}
Unit	MWh
Description	Quantity of net electricity supplied to the grid in year y
Measured/calculated/default	Measured
Source of data	The data for the net energy supplied to the grid is calculated from the electricity exported from the project to the grid and the electricity imported from the grid. Electricity export and import value are directly considered from the Joint Meter Readings (JMR) signed by NVVN (NTPC Vidyut Vyapar Nigam) and M/s Precision Technik Private Limited.
Value(s) of monitored parameter	20775.388 MWh
Monitoring equipment	Main meter and Check meter with 0.2 accuracy class having facilities to measure export & import of energy is installed. The meters are sealed, maintained and calibrated by the DISCOM
Measuring/reading/recording frequency	Monthly
Calculation method (if applicable)	Net electricity supplied to the grid is calculated based on export & import data (Net electricity supplied to grid = Export electricity – Import electricity). The export and import energy is measured continuously using above mentioned Main & Check meters. Export & Import readings of Main & Check meters are taken on monthly basis by authorized officer of NVVN in the presence of PP or representative of PP. The Reading of main & Check meter (both Export & Import readings) are recorded in log book on monthly basis. Check meter reading are considered when Main meter is found to be defective or stopped. The emission reduction from the project activity is computed based on JMRs and same would be crosschecked by the invoices prepared by M/s Precision Technik Private Limited to NVVN.
QA/QC procedures	The electricity meters are under the custody of the DISCOM and are calibrated by DISCOM as per their procedures. However, the project proponent ensures that the meters are calibrated at least once in three years. Calibration certificates is maintained at the plant and the net energy export figures would be cross-verified against the monthly invoices. This approach is considered reliable and credible.
Purpose of data/parameter	Calculation of baseline emissions.

Additional comments	The recorded data is checked periodically by the General Manager and discussed thoroughly with the Site Manager. The report is prepared by General Manager and is reviewed and maintained by the CEO for Verification. The data will be achieved for the period of two years beyond the crediting period.
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D.3. Implementation of sampling plan

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Sampling is not required for the given project activity.

SECTION E. Calculation of emission reductions or net anthropogenic removals

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

This is a renewable power generation project, supplying the entire power generated from the solar farm to the NEWNE grid. This form of energy generation has no associated GHG emissions. So, the emission reduction is dependent on the quantity of electricity being supplied to the grid system.

Baseline emission (BE_y):

The baseline emissions is the product of electrical energy baseline $EG_{BL,y}$, expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor. Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors.

$$BE_y = EG_{BL,y} \times EF_{CO_2,grid,y}$$

Where,

BE_y is the baseline emissions in year y, tCO₂

$EG_{BL,y}$ is the quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{CO_2,grid,y}$ is the CO₂ emission factor of the grid in year y, tCO₂/MWh

Therefore,

$$BE_y = 20775.388 \times 0.9480$$

$$BE_y = 19,695 \text{ tCO}_2$$

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

As per registered PDD, there is no project activity emissions associated with the project activity.

E.3. Calculation of leakage emissions

As per registered PDD, there is no leakage associated with the project activity.

Emission reduction (ER_y):

The emission reduction achieved by the project activity will be the difference between the baseline emission and the sum of the project emission and leakage.

$$ER_y = BE_y - PE_y - LE_y$$

$$= 19,695 - 0 - 0$$

$$= 19,695 \text{ tCO}_2\text{e}$$

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

	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions (t CO ₂ e)	GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e)		
				Before 01/01/2013	From 01/01/2013	Total amount
Total	19,695	0	0	-	19,695	19,695

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 ₂ e)	Amount estimated ex ante for this monitoring period in the PDD (t CO ₂ e)
19,695	19,107

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

Estimated ex ante emission reduction= Plant Capacity x number of days in the current monitoring period x 24 x Plant load Factor x Grid emission factor
= 5.00 MW x 884 x 24 x 19.00% x 0.9480
=19,107 tCO₂e

E.6. Remarks on increase in achieved emission reductions

From E.5 above, we can observe that actual emission reduction for the monitoring is increased by 3.08%. The increase in actual emission reductions is due to more number of sunny days in the monitoring period, which is not in control of the project owner.

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

This project activity is a small scale activity and the project capacity would remain under the limit of small scale throughout during the crediting period.

Breakdown Details

Date	Time Duration	Breakdown	Description
3-Sep-2017	7:00	8:00	Ground Fault
8-Sep-2017	11:20	11:20	TL work
10-Sep-2017	2:50	2:50	TL work
11-Sep-2017	10:50	10:50	Ground Fault(2 inverter)
12-Sep-2017	8:00	8:00	Ground Fault(2 inverter)
13-Sep-2017	3:10	3:10	Ground Fault(2 inverter)
15-Dec-2017	8:00	8:00	Inv-1 is in standby mode due to internal fault
5-Jan-2018	8:00	2:50	Inv-1 is in standby mode due to internal fault
6-Jan-2018	8:00	8:00	Ground Fault
10-Feb-2018	8:00	8:00	Ground Fault
13-Mar-2018	7:00	7:00	Ground Fault
16-Apr-2018	11:20	11:20	Ground Fault
22-Jun-2018	2:50	2:50	Ground Fault
1-Nov-2018	10:50	10:50	Inv-1 is in standby mode due to internal fault
12-Dec-2018	8:00	8:00	Inv-1 is in standby mode due to internal fault
12-Mar-2019	9:45	9:45	Inverter 10 fault
15-May-2019	8:00	8:00	Inverter 10 fault
3-Jun-2019	7:00	7:00	Ground Fault(2 inverter)
17-Jul-2019	11:20	11:20	Ground Fault
18-Aug-2019	2:50	2:50	Ground Fault
12-Oct-2019	10:50	10:50	Ground Fault
6-Jan-2020	8:00	2:50	Ground Fault

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
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 <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 (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).

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.
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Document Type: Form		
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