



Monitoring report form for CDM project activity
(Version 09.0)

| MONITORING REPORT | | | |
|---|---|---|--|
| Title of the project activity | Wind Power Project at Jath, Maharashtra | | |
| UNFCCC reference number of the project activity | 9154 | | |
| Version number of the PDD applicable to this monitoring report | 06 | | |
| Version number of this monitoring report | 01 | | |
| Completion date of this monitoring report | 12/10/2021 | | |
| Monitoring period number | 03 | | |
| Duration of this monitoring period | 01/09/2015-31/12/2019 (both days included) | | |
| Monitoring report number for this monitoring period | Not applicable | | |
| Project participants | ReNew Wind Energy (Jath) Private Limited | | |
| Host Party | India | | |
| Applied methodologies and standardized baselines | ACM0002: Consolidated baseline methodology for Grid-connected electricity generation from renewable sources-Version 13.0.0 Standardized baseline: 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 until 31 December 2020 | Amount achieved from 1 January 2021 |
| | - | 588,927 tCO ₂ e | - |
| Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD | 704,821 tCO ₂ e | | |

SECTION A. Description of project activity

A.1. General description of project activity

The project activity involves setting up of 29 numbers of G58/0.85 MW and 30 numbers of G 97/2.0 MW Wind Turbine Generators (WTGs) by ReNew Wind Energy (Jath) Private Limited (RNWEJPL) at Jath Mandal of Sangli district in Maharashtra, India. The total installed capacity of the project activity is 84.65 MW. The projects has started commissioning on 28/09/2012 and successfully commissioned all the turbines on 06/08/2013.

The net electricity exported to grid during this verification period is **618,036.98** MWh which results to a net emission reduction of **588,927** tCO₂e.

A.2. Location of project activity

Project activity is located in Sangli district in the state of Maharashtra, India. Wind turbine-wise detailed coordinates have been listed below:

Wind turbine-wise detailed locations are tabulated below.

| Sl. no. | Turbine ID | Turbine Location | Coordinates | Sl. No. | Turbine ID | Turbine Location | Coordinates |
|---------|------------|------------------|---------------------|---------|------------|------------------|----------------------|
| 1 | GR1 | GJ30N | E52.1109; N18.77225 | 31 | GJ I-02 | GJI 28 | E52.7210; N18.84014 |
| 2 | GR2 | GJ 31N | E52.4292; N18.77912 | 32 | GJ I-03 | GJI 47 | E52.6911;N18.84480 |
| 3 | GR3 | GJ 25 | E52.5909; N18.74517 | 33 | GJ I-04 | J97/1-124 | E52.6574; N18.85011 |
| 4 | GR4 | GJ 26 | E52.5909; N18.74691 | 34 | GJ I-05 | J97/1-122 | E52.6354; N18.85479 |
| 5 | GR5 | GJ 49 | E52.1739; N18.75966 | 35 | GJ I-06 | GJII 92N | E52.5992; N18.85923 |
| 6 | GR6 | GJ 01-A | E52.5750; N18.75382 | 36 | GJ I-07 | GJI 21N1 | E52.5898; N18.86392 |
| 7 | GR7 | GJ 28N | E52.1092; N18.77052 | 37 | GJ I-08 | GJI 16N | E52.5657; N18.86889 |
| 8 | GR8 | GJ 45N | E52.4906; N18.71092 | 38 | GJ I-09 | GJI 18N | E52.5270; N18.87592 |
| 9 | GR9 | GJ 44N | E52.5890; N18.74863 | 39 | GJ I-10 | GJI 19 | E52.5593; N 8.88566 |
| 10 | GR10 | GJB15 | E52.4056; N18.78863 | 40 | GJ I-11 | GJI 20N | E52.5978; N 18.88198 |
| 11 | GR11 | GJB13 | E52.1662; N18.76122 | 41 | GJ I-12 | GJI 87N | E52.6517; N18.87838 |
| 12 | GR12 | GJB10 | E52.5797; N18.75209 | 42 | GJ I-13 | GJI 88N | E52.8172; N18.85523 |
| 13 | GR13 | GJB16 | E52.5843; N18.75036 | 43 | GJ I-14 | GJI 90 | E52.8325; N18.85068 |
| 14 | GR14 | GJB-11 | E52.5117; N18.77011 | 44 | GJ I-15 | GJI 17N | E52.8535; N18.84539 |
| 15 | GR15 | GJB20 | E52.1057; N18.76705 | 45 | GJ I-16 | GJI 86 | E52.7175; N18.88873 |
| 16 | GR16 | GJB 02A | E52.4410; N18.77783 | 46 | GJ I-17 | GJI 84 | E52.9491; N18.87892 |
| 17 | GR17 | GJB24 | E52.5703; N18.75555 | 47 | GJ I-18 | GJI 70 | E52.9486; N18.85854 |
| 18 | GR18 | GJB27 | E52.4778; N18.71218 | 48 | GJ I-19 | GJII 58 | E53.0453; N18.84815 |
| 19 | GR19 | GJB28 | E52.1074; N18.76879 | 49 | GJ I-20 | GJI 76 | E53.0716; N18.88191 |
| 20 | GR20 | GJB25 | E52.4999; N18.77140 | 50 | GJ I-21 | J97/1-144 | E53.0865; N18.87590 |
| 21 | GR21 | GJB36 | E52.4646; N18.77526 | 51 | GJ I-22 | J97/1-145 | E53.0953; N18.87100 |
| 22 | GR22 | GJB01 | E52.2798; N18.72842 | 52 | GJ I-23 | GJI -15N | E53.1165; N18.86535 |
| 23 | GR23 | GJB02 | E52.1161; N18.77745 | 53 | GJ I-24 | GJII 07 | E53.1502;N18.85389 |
| 24 | GR24 | GJB 09 | E52.4764; N18.77397 | 54 | GJ I-25 | J97/2-112 | E53.2157;N18.86168 |
| 25 | GR25 | J58/2-100 | E52.4882; N18.77269 | 55 | GJ I-26 | GJII 76 | E52.7691;N18.81145 |
| 26 | GR26 | GJB 35N | E52.5656; N18.75728 | 56 | GJ I-27 | GJII 77 | E52.7514;N18.8158 |
| 27 | GR27 | GJB 26N | E52.3938; N18.78298 | 57 | GJI-28 | GJ II97 | E52.9457;N18.8178 |
| 28 | GR28 | 58/2-134 | E52.5235; N18.76882 | 58 | GJ I-29 | GJI 23 | E52.6457;N18.8159 |
| 29 | GR29 | J58/2-71 | E52.2824; N18.73019 | 59 | GJ I-30 | J97/2-113 | E52.6484;N18.80996 |
| 30 | GJ I-01 | GJII 33N | E52.7415; N18.83430 | | | | |

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) | ReNew Wind Energy (Jath) Private Limited (Private entity) | No |

A.4. References to applied methodologies and standardized baselines

ACM0002: Grid-connected electricity generation from renewable sources; Version 13.0.0¹

Reference: ACM0002 Version 13.0.0 draws upon the following tools:

- TOOL 7: Tool to calculate the emission factor for an electricity system (Version 02.2.1)²
- TOOL1: Tool for the demonstration and assessment of additionality (Version 06.1.0)³

Standardized baseline: Not applicable

A.5. Crediting period type and duration

01/01/2013-31/12/2019 (Renewable)

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

The project activity involves installation of Gamesa Wind Turbines Private Limited make 29 number G58/0.85 MW and 30 Number G97/2.0 MW WTGs. The total installed capacity of the project activity is 84.65 MW. The project activity is supplying electricity to NEWNE grid.

The commissioning details of 29 WTGs of G-58 make are given below:

| Date of Commissioning | No. of Turbines commissioned |
|-----------------------|------------------------------|
| 30/09/2012 | 10 |
| 22/05/2013 | 7 |
| 30/05/2013 | 4 |
| 05/06/2013 | 1 |
| 30/06/2013 | 1 |
| 19/07/2013 | 6 |

The commissioning details of 30 WTGs of G-97 make are given below:

| Date of Commissioning | No. of Turbines commissioned |
|-----------------------|------------------------------|
| 28/09/2012 | 4 |
| 30/09/2012 | 3 |

¹ <https://cdm.unfccc.int/UserManagement/FileStorage/DYPFI935XBG274NWH6O8CM1KEZR0VU>

² <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf>

³ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.0.0.pdf>

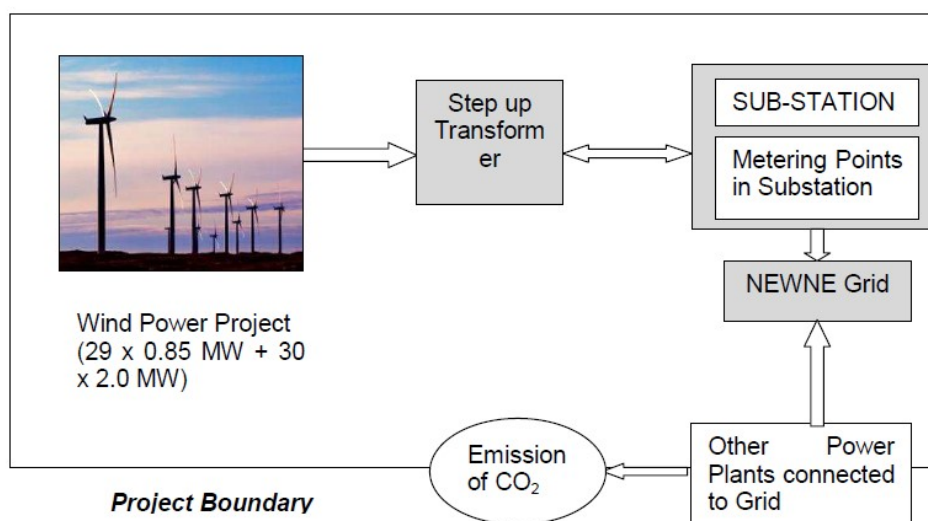
| Date of Commissioning | No. of Turbines commissioned |
|-----------------------|------------------------------|
| 07/02/2013 | 5 |
| 26/02/2013 | 1 |
| 03/04/2013 | 2 |
| 26/06/2013 | 4 |
| 30/06/2013 | 4 |
| 19/07/2013 | 5 |
| 24/07/2013 | 1 |
| 06/08/2013 | 1 |

The technical specification of G58 & G 97 WTGs installed in the project activity are described below-

| Technical Parameters | G58 | G97 |
|----------------------|---|---|
| ROTOR | | |
| Diameter | 58 Meter | 97 Meter |
| Swept Area | 2,642 Sq. Meter | 7,390 Sq. Meter |
| Rotational Speed | 19.44 – 30.8 rpm | 9.6 – 17.8 rpm |
| BLADES | | |
| Number of Blades | 3 | 3 |
| Length | 28.3 Meter | 47.5 Meter |
| Airfoils | NACA 63.XXX + FFA-W3 | Gamesha |
| Material | Fiberglass pre-impregnated with epoxy resin | Pre-impregnated with epoxy glass fiber + carbon fiber |
| TOWER | | |
| Type | Modular | Modular |
| Height | 65 Meter | 90 Meter |
| GEAR BOX | | |
| Type | 1 planetary stage / 2 parallel axis | 1 planetary stage / 2 parallel axis |
| Ratio | 1:61.74 (50Hz) | 1:106.8 (50Hz) |
| GENERATOR | | |
| Type | Dual power fed | Dual power fed |
| Rated Power | 850 kW | 2.0 MW |
| Voltage | 690 V AC | 690 V AC |
| Frequency | 50 Hz | 50 Hz |
| Protection Class | IP 54 | IP 54 |
| Power Factor | 0.95 CAP – 0.95 IND at partial loads and 1 at nominal power | 0.95 CAP – 0.95 IND Throughout the power range |

The life of the project equipment, i.e. wind turbines are 20 years. Apart from the WTGs, the project activity also involves the installation of transformers, transmission lines/ cables and other equipment required for the generation and transfer of electricity to the grid.

Diagrammatic representation of project activity is provided below:



B.2. Post-registration changes

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

No temporary deviations have taken place in the current monitoring period.

B.2.2. Corrections

Not applicable in the current monitoring period.

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

No changes to start date of crediting period taken place in the current monitoring period.

B.2.4. Inclusion of monitoring plan

Not applicable in 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 in the current monitoring period.

B.2.6. Changes to project design

In the previous verification it was found that the project installed capacity had been augmented from initial planned 74.65 MW (29 numbers of G58/0.85 MW and 25 numbers of G 97/2.0 MW wind turbines) to 84.65 MW (29 numbers of G58/0.85 MW and 30 numbers of G 97/2.0 MW wind turbines).

The relevant change in capacity and related change in total generation potential had been incorporated in the revised PDD and IRR_ER Sheet. The following are the snapshot of the parameters that got changed in the project design:

| Parameter | Parameter As per registered PDD | As per commissioned project |
|--------------------------|---------------------------------|-----------------------------|
| No. of wind turbines G97 | 25 | 30 |
| Capacity of the project | 74.65 MW | 84.65 MW |
| Net Generation | 150.405 MU | 170.56 MU |

| Parameter | Parameter As per registered PDD | As per commissioned project |
|--|---------------------------------|---------------------------------|
| Project Cost | 4883.00 INR Million | 5558.00 INR Million |
| Debt Contribution | 3418.10 INR Million | 3890.60 INR Million |
| Operation and Maintenance Cost(first year) | 57.33 INR Million | 65.01 INR Million |
| Emission Reductions | 143,315 tCO ₂ e/year | 162,514 tCO ₂ e/year |
| Equity IRR | 12.48% | 12.39% |
| Parameter | As per registered PDD | As per commissioned project |
| No. of wind turbines G97 | 25 | 30 |

The changes were approved on 16/01/ 2015 with PRC reference number PRC-9154-001.

However in the current monitoring period there are no changes in the project design.

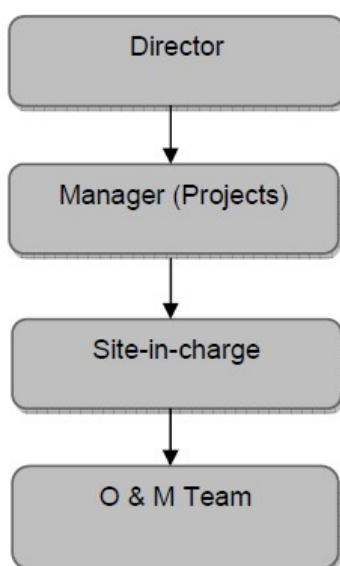
B.2.7. Changes specific to afforestation or reforestation project activity

Not applicable in the current monitoring period.

SECTION C. Description of monitoring system

In Monitoring & Verification protocol, the objective is to have clear, credible and accurate monitoring, evaluation and verification procedures. This involves recording, data collection of all wind turbines, metering of electricity generated at substation, on daily basis as well as on monthly basis. The general conditions for metering, recording, meter readings, meter inspections, Test & Checking and communication are as per the Power Purchase Agreement.

The project proponent proposes following arrangements in order to carry out metering and O&M activities for all wind turbines:



Meter readings are taken jointly at the appointed date by PP's representative and Discom officials. The same is reported to the site-in-charge and the compiled reports are sent to the Manager (Projects) and Director. The Manager monitors overall activity of the project and report to the Director. As per O & M schedule, the operation and maintenance activities are carried out by trained and qualified technical staff.

Each party maintains complete and accurate records and all other data required by each of them for the purposes of proper administration and the operation of the project. For each WTG in the project activity, the distribution licensee report electricity exported and imported from the grid. The net electricity supplied to the grid is reported as the difference between the export and import from

the WTG. The electricity export and import data is monitored via main and check meters connected to feeders at the respective sub-stations. Multiple WTGs are connected to each feeder, some of which are part of the project activity (WTGs under this project activity) and some of which are not part of the project activity (WTGs owned by other entities). Distribution licensee follows an apportioning procedure to account for electricity generation from individual WTGs based on data from individual WTG controllers.

The electricity exported and imported from the grid is recorded on a monthly basis, jointly in the presence of representatives of project proponent (O&M Contractors) and distribution licensee personnel. Following the joint meter readings, the O&M Contractors provide the readings of the WTG controller to Distribution licensee. Based on the monthly export and import data as per main/check meters and the WTG controller readings, distribution licensee provides a break-up of the electricity exported and imported for each WTG.

The net electricity generation from each WTG is determined by distribution licensee as follows:

$$\text{Export from WTG} = \frac{\text{Controller Generation at WTG} \times \text{Export from distribution licensee main/check meter}}{\text{Total generation at all WTG controllers for the feeder}}$$

$$\text{Import from WTG} = \frac{\text{Controller Generation at WTG} \times \text{Import from distribution licensee main/check meter}}{\text{Total generation at all WTG controllers for the feeder}}$$

Net electricity export from WTG = Export from WTG - Import from WTG

The above calculations are carried out solely by distribution licensee and only the final apportioned electricity export, import, and net export for each WTG are reported by distribution licensee in the Credit Notes.

Monitoring Frequency:

A monthly joint meter reading of the energy meters are carried out by distribution licensee officials and O&M contractors (representatives of the project promoter).

Apportioning Procedures in case the dates of monitoring period do not match with billing cycle dates:

If the dates of the monitoring period for the project activity do not coincide with the dates of the Credit Note issued by distribution licensee. In such a scenario, the net electricity generation data have to be apportioned. For carrying out the apportioning procedures, WTG controller data (data recorded by the WTG controller software) is used. The electricity generation from WTG controllers is recorded on a daily basis in the Power Generation Reports maintained by the O&M contractors. The data from Power Generation Reports is referred for determination of the apportioning ratio.

The following steps will be applied to carry out the apportioning:

$$(i) \text{ Apportioning Ratio} = \frac{\text{Generation at WTG controller for apportioning}}{\text{Generation at WTG controller for period covered under Credit Note period}}$$

(ii) Apportioned Electricity Export = Apportioning Ratio x Electricity Export as per Credit Note

(iii) Apportioned Electricity Import = Apportioning Ratio x Electricity Import as per Credit Note

(iv) Apportioned Net Electricity Supplied to Grid = Apportioned Electricity Export – Apportioned Electricity Import

The meters installed for the monitoring purpose are provided in the table below. The project activity is connected with three substations, connectivity of project activity in different feeders are provided in the table below:

Connectivity of WTGs during current verification period is provided below:

| SI | Substation | Main Meter Serial No | Connected WTGs |
|----|--------------------|--|----------------|
| 1 | 170 MW Jath SS F-1 | 15687855 replaced with 02814124 19/11/2019 | 8 |
| 2 | 170 MW Jath SS F-2 | 15687858 | 4 |
| 3 | 170 MW Jath SS F-3 | 15687862 | 2 |
| 4 | 170 MW Jath SS F-4 | 13813553 | 5 |
| 5 | 170 MW Jath SS F-6 | 16636465 | 6 |
| 6 | 170 MW Jath SS F-7 | 15456640 | 1 |
| 7 | 170 MW Jath SS F-8 | 16636473 | 2 |
| 8 | 170 MW Jath SS F-9 | 16351021 | 2 |

The calibration details of feeder meters are provided in the Annexure.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

| | |
|--|---|
| Data/Parameter | W_{BM} |
| Unit | % |
| Description | Weightage of build margin emission factor |
| Source of data | Tool to calculate the emission factor of an electricity system (Version 02.2.1) ⁴ |
| Value(s) applied | 0.25 |
| Choice of data or measurement methods and procedures | Default values used as per the "Tool to calculate the emission factor for an electricity system" Version 02.2.1 |
| Purpose of data/parameter | Calculation of combined margin emission factor of NEWNE grid |
| Additional comments | The value is ex-ante and will remain same throughout the crediting period of the project activity. |

| | |
|--|---|
| Data/Parameter | W_{OM} |
| Unit | % |
| Description | Weightage of operating margin emission factor |
| Source of data | Tool to calculate the emission factor of an electricity system (Version 02.2.1) ⁵ |
| Value(s) applied | 0.75 |
| Choice of data or measurement methods and procedures | Default values used as per the "Tool to calculate the emission factor for an electricity system" Version 02.2.1 |
| Purpose of data/parameter | Calculation of combined margin emission factor of NEWNE grid |
| Additional comments | The value is ex-ante and will remain same throughout the crediting period of the project activity. |

⁴ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v2.2.1.pdf>

⁵ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v2.2.1.pdf>

| | |
|--|---|
| Data/Parameter | $EF_{grid,BM,y}$ |
| Unit | tCO ₂ e/ MWh |
| Description | Build Margin emission factor of NEWNE grid |
| Source of data | CO ₂ baseline database (Version 7.0) published by CEA in January 2012 |
| Value(s) applied | 0.8588 |
| Choice of data or measurement methods and procedures | Default values used as per the "Tool to calculate the emission factor for an electricity system" Version 02.2.1 |
| Purpose of data/parameter | Calculation of combined margin emission factor of NEWNE grid |
| Additional comments | Fixed ex-ante for entire crediting period |

| | |
|--|--|
| Data/Parameter | $EF_{grid,OM,y}$ |
| Unit | tCO ₂ e/ MWh |
| Description | Simple operating margin for NEWNE grid |
| Source of data | CO ₂ baseline database (Version 7.0) published by CEA in January 2012 ⁶ |
| Value(s) applied | 0.9842 |
| Choice of data or measurement methods and procedures | This value is calculated by taking weighted average of 3 years values for Simple Operating Margin of NEWNE grid viz. 2008/09, 2009/10 and 2010/11. |
| Purpose of data/parameter | Calculation of combined margin emission factor of NEWNE grid |
| Additional comments | Fixed ex-ante for entire crediting period |

| | |
|--|---|
| Data/Parameter | $EF_{grid,CM,y}$ |
| Unit | tCO ₂ e/ MWh |
| Description | Combined margin emission factor for NEWNE grid |
| Source of data | Calculated as per the procedure described in PDD section B.6.1 |
| Value(s) applied | 0.9529 |
| Choice of data or measurement methods and procedures | This value is calculated using $EF_{grid,OM,y}$ and $EF_{grid,BM,y}$ values as per Version 02.2.1 of methodological tool to calculate the emission factor for an electricity system |
| Purpose of data/parameter | Calculation of baseline emissions |
| Additional comments | Fixed ex-ante for entire crediting period |

D.2. Data and parameters monitored

| | |
|---------------------------------|---|
| 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 | Calculated |
| Source of data | Distribution Licensee report on energy delivered to grid (Credit Note/JMR) |
| Value(s) of monitored parameter | 618,036.98 MWh |

⁶ <https://cea.nic.in/cdm-co2-baseline-database/?lang=en#tesr>

| Monitoring equipment | <p>Equipment: Main & Check Meters; Meter details provided in Table below. Details on calibration dates are provided in the Annexure 1.</p> <table border="1" data-bbox="646 233 1321 747"> <thead> <tr> <th>Feeder number</th><th>Main meter:</th><th>Check meter:</th></tr> </thead> <tbody> <tr> <td>Feeder 1</td><td>15687855 (old) 02814124 (new) replaced on 19/11/2019</td><td>15687856</td></tr> <tr> <td>Feeder 2</td><td>15687858</td><td>15687860</td></tr> <tr> <td>Feeder 3</td><td>15687862</td><td>12853657</td></tr> <tr> <td>Feeder 4</td><td>13813553</td><td>16351040</td></tr> <tr> <td>Feeder 6</td><td>16636465</td><td>16636468</td></tr> <tr> <td>Feeder 7</td><td>15456640</td><td>16351020</td></tr> <tr> <td>Feeder 8</td><td>16636473</td><td>02814125</td></tr> <tr> <td>Feeder 9</td><td>16351021</td><td>16351022</td></tr> </tbody> </table> <p>Also for all meters:</p> <ul style="list-style-type: none"> • Meter make: Elster A1800 (for all meters) • Accuracy class: 0.2 s • Meter calibration frequency: once in 5 (five) years | Feeder number | Main meter: | Check meter: | Feeder 1 | 15687855 (old) 02814124 (new) replaced on 19/11/2019 | 15687856 | Feeder 2 | 15687858 | 15687860 | Feeder 3 | 15687862 | 12853657 | Feeder 4 | 13813553 | 16351040 | Feeder 6 | 16636465 | 16636468 | Feeder 7 | 15456640 | 16351020 | Feeder 8 | 16636473 | 02814125 | Feeder 9 | 16351021 | 16351022 |
|---------------------------------------|--|---------------|-------------|--------------|----------|---|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Feeder number | Main meter: | Check meter: | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 1 | 15687855 (old) 02814124 (new) replaced on 19/11/2019 | 15687856 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 2 | 15687858 | 15687860 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 3 | 15687862 | 12853657 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 4 | 13813553 | 16351040 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 6 | 16636465 | 16636468 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 7 | 15456640 | 16351020 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 8 | 16636473 | 02814125 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 9 | 16351021 | 16351022 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Measuring/reading/recording frequency | <ul style="list-style-type: none"> • Monitoring: Continuous measurement and monthly recording • Recording: Electronic/ Paper • Recording Frequency: Continuous monitoring and monthly recording • Responsibility: The plant management is responsible for the regular recording of data. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calculation method (if applicable) | <p>The electricity generated and fed into the grid is continuously monitored using energy meters. For measuring the net electricity supplied by the project activity, the state electricity board has installed a set of energy meters (main and check) at the substation of the project activity.</p> <p>Monthly readings are taken jointly by the representative of Maharashtra State Electricity Transmission Co. Ltd. and site in charge of Project Proponent and a statement is prepared and signed by the representatives of both parties for total electricity exported to grid, total electricity imported from the grid and the net electricity supplied. The net electricity supplied is calculated as the difference of the total electricity exported to grid and total electricity imported from the grid by the project activity.</p> <p>The meters have an accuracy class of 0.2S</p> <p>The net electricity supplied to grid is a calculated value and is determined as the difference between the electricity exported to the grid and the electricity imported from the grid by the project activity. The emission reduction is computed on the basis of $EG_{facility,y}$.</p> $EG_{facility,y} = E_{export,y} - E_{import,y}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| QA/QC procedures | <p>The meter readings can be cross checked with the invoices for sale of power to ensure correctness.</p> <p>The meter(s) are calibrated and maintained by the state utility as per their own schedule, and this frequency of meter calibration is not within the control of the Project Proponent.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Purpose of data/parameter | Calculation of baseline emissions | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Additional comments | The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Data/Parameter | EG _{export,y} | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---------------|-------------|--------------|----------|--|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Unit | MWh | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Description | Quantity of electricity exported by the project WTGs connected to the feeder i from the grid in the period y | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Measured/calculated/default | Measured | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Source of data | Distribution Licensee report on energy delivered to grid (Credit note / JMR) / | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Value(s) of monitored parameter | 620,906.64 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Monitoring equipment | <p>Equipment: Main & Check Meters; Meter details provided in Table below. Details on calibration dates are provided in the Annexure 1.</p> <table border="1"> <thead> <tr> <th>Feeder number</th><th>Main meter:</th><th>Check meter:</th></tr> </thead> <tbody> <tr> <td>Feeder 1</td><td>15687855 (old) 02814124 (new) replaced on 19/11/2019</td><td>15687856</td></tr> <tr> <td>Feeder 2</td><td>15687858</td><td>15687860</td></tr> <tr> <td>Feeder 3</td><td>15687862</td><td>12853657</td></tr> <tr> <td>Feeder 4</td><td>13813553</td><td>16351040</td></tr> <tr> <td>Feeder 6</td><td>16636465</td><td>16636468</td></tr> <tr> <td>Feeder 7</td><td>15456640</td><td>16351020</td></tr> <tr> <td>Feeder 8</td><td>16636473</td><td>02814125</td></tr> <tr> <td>Feeder 9</td><td>16351021</td><td>16351022</td></tr> </tbody> </table> <p>Also for all meters:</p> <ul style="list-style-type: none"> • Meter make: Elster A1800 (for all meters) • Accuracy class:0.2 s • Meter calibration frequency: once in 5 (five) years | Feeder number | Main meter: | Check meter: | Feeder 1 | 15687855 (old) 02814124 (new) replaced on 19/11/2019 | 15687856 | Feeder 2 | 15687858 | 15687860 | Feeder 3 | 15687862 | 12853657 | Feeder 4 | 13813553 | 16351040 | Feeder 6 | 16636465 | 16636468 | Feeder 7 | 15456640 | 16351020 | Feeder 8 | 16636473 | 02814125 | Feeder 9 | 16351021 | 16351022 |
| Feeder number | Main meter: | Check meter: | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 1 | 15687855 (old) 02814124 (new) replaced on 19/11/2019 | 15687856 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 2 | 15687858 | 15687860 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 3 | 15687862 | 12853657 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 4 | 13813553 | 16351040 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 6 | 16636465 | 16636468 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 7 | 15456640 | 16351020 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 8 | 16636473 | 02814125 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feeder 9 | 16351021 | 16351022 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Measuring/reading/recording frequency | <ul style="list-style-type: none"> • Monitoring: Continuous measurement and monthly recording. • Recording: Electronic/ Paper • Recording Frequency: Continuous monitoring and monthly recording • Responsibility: The plant management is responsible for the regular recording of data. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calculation method (if applicable) | <p>The electricity generated and fed into the grid is continuously monitored using energy meters.</p> <p>For measuring the electricity exported by the project activity, the state electricity board has installed a set of energy meters (main and check) at the substation of the project activity. Monthly readings are taken jointly by the representative of State Electricity Transmission Co. Ltd. and site in charge of Project Proponent and a statement is prepared and signed by the representatives of both parties.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| QA/QC procedures | <p>The meter readings can be cross checked with the invoices for sale of power to ensure correctness.</p> <p>The meter(s) are calibrated and maintained by the state utility as per their own schedule, and this frequency of meter calibration is not within the control of the Project Proponent</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Purpose of data/parameter | Calculation of baseline emissions | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | |
|---------------------|---|
| Additional comments | The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. |
|---------------------|---|

| | | | |
|---------------------------------------|---|--|--------------|
| Data/Parameter | EG _{import,y} | | |
| Unit | MWh | | |
| Description | The quantity of electricity imported by the project plant/unit from the grid in year y | | |
| Measured/calculated/default | Measured | | |
| Source of data | Distribution Licensee report on energy delivered to grid (Credit Note/JMR) | | |
| Value(s) of monitored parameter | 2,870.37 | | |
| Monitoring equipment | Equipment: Main & Check Meters; Meter details provided in Table below. Details on calibration dates are provided in the Annexure 1. | | |
| | Feeder number | Main meter: | Check meter: |
| | Feeder 1 | 15687855 (old) 02814124 (new) replaced on 19/11/2019 | 15687856 |
| | Feeder 2 | 15687858 | 15687860 |
| | Feeder 3 | 15687862 | 12853657 |
| | Feeder 4 | 13813553 | 16351040 |
| | Feeder 6 | 16636465 | 16636468 |
| | Feeder 7 | 15456640 | 16351020 |
| | Feeder 8 | 16636473 | 02814125 |
| | Feeder 9 | 16351021 | 16351022 |
| | Also for all meters: | | |
| | <ul style="list-style-type: none">• Meter make: Elster A1800 (for all meters)• Accuracy class: 0.2 s• Meter calibration frequency: once in 5 (five) years | | |
| Measuring/reading/recording frequency | <ul style="list-style-type: none">• Monitoring: Continuous measurement and monthly recording.• Recording: Electronic/ Paper• Recording Frequency: Continuous monitoring and monthly recording Responsibility: The plant management is responsible for the regular recording of data. | | |
| Calculation method (if applicable) | For measuring the electricity imported by the project activity, the state electricity board has installed a set of energy meters (main and check) at the substation of the project activity. Monthly readings are taken jointly by the representative of State Electricity Transmission Co. Ltd. and site in charge of Project Proponent and a statement is prepared and signed by the representatives of both parties. | | |
| QA/QC procedures | The meter readings can be cross checked with the invoices for sale of power to ensure correctness. The meter(s) shall be calibrated and maintained by the state utility as per their own schedule, and this frequency of meter calibration is not within the control of the Project Proponent | | |
| Purpose of data/parameter | The data will be used for calculation of emission reductions. | | |

| | |
|---------------------|---|
| Additional comments | The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. |
|---------------------|---|

| | |
|---------------------------------------|---|
| Data/Parameter | EG_{WTG} |
| Unit | MWh |
| Description | Daily electricity generation at the WTG controller |
| Measured/calculated/default | Measured |
| Source of data | Power Generation Reports from O&M Contractor |
| Value(s) of monitored parameter | NA |
| Monitoring equipment | Not applicable |
| Measuring/reading/recording frequency | <ul style="list-style-type: none"> Monitoring: Continuous measurement. Recording: Electronic/ Paper Recording Frequency: Continuous monitoring and monthly recording Responsibility: The plant management shall be responsible for the regular recording of data. |
| Calculation method (if applicable) | <p>The data will be monitored via project activity WTG Controllers and will be recorded daily in Power Generation Reports by the O&M Contractors.</p> <p>This data will be used only for determination of apportioning ratio, and will be applied only in cases where the monitoring period does not coincide with the initial/final meter reading dates in the Credit Notes.</p> |
| QA/QC procedures | In case of any fault with the WTG Controller, the same would be immediately identified through an interlocking mechanism. In such a scenario the WTG Controller would be automatically shut down. The WTG Controller would then be replaced. |
| Purpose of data/parameter | The data will be used for calculation of emission reductions. |
| Additional comments | The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. |

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

The baseline emissions are calculated as follows:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y}$$

Combined margin CO₂ emission factor for grid connected power generation ($EF_{grid,CM,y}$) is calculated as follows:

$$\begin{aligned}
 EF_{grid,CM,y} &= W_{OM} * EF_{grid,OM,y} + w_{BM} * EF_{grid,BM,y} \\
 &= 0.75 * 0.9842 + 0.25 * 0.8588 = 0.9529 \text{ tCO}_2\text{e/MWh}
 \end{aligned}$$

Thus for ex-ante emission reduction calculations, the baseline emission factor for the grid = 0.9529 tCO₂e/MWh

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

$$EG_{PJ,y} = EG_{facility,y} = 618,036.98 \text{ MWh}$$

Hence, substituting values in equation 1, we get:

$$\begin{aligned} BE_y &= 618,036.98 * 0.9529 \text{ tCO}_2\text{e} \\ &= 588,927.44 \text{ tCO}_2\text{e} \\ &= 588,927 \text{ tCO}_2\text{e} \text{ (Conservative round-down)} \end{aligned}$$

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

The Project activity does not envisage any fossil fuel consumption.

Therefore, the parameter $PE_{FF,y} = 0 \text{ tCO}_2\text{e/ annum}$.

Also, as the proposed CDM Project activity is not a geothermal project activity or a hydro project activity, hence, the Project emissions as per parameters $PE_{GP,y}$ and $PE_{HP,y}$ are also zero.

Therefore, $PE_y = 0 \text{ tCO}_2\text{e/annum}$

E.3. Calculation of leakage emissions

Not applicable as per ACM 0002 version 13.0.0.

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 until 31/12/ 2020 | From 01/01/ 2021 | Total amount |
| Total | 588,927 | 0 | 0 | 0 | 588,927 | 0 | 588,927 |

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) |
|---|--|
| 588,927 | 704,821 |

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

>>

The ex-ante estimation of GHG emission reduction in the registered PDD is 162,514 for 365 days in a year. The number of days in the current monitoring period is 1583 and hence ex-ante estimate of emission reduction for the monitoring period is 704,821.

E.6. Remarks on increase in achieved emission reductions

>>

Actual emission reduction is 16.4% less than the one estimated in registered PDD.

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

>>

The project activity is a large scale project of 84.7 MW and is not a small scale project.

Annexure 1: Meter calibration details

Table 1A: Calibration details for meters on Feeder 1, Feeder 2, Feeder 3 and Feeder 4

| Feeder number | Feeder 1 | | | Feeder 2 | | Feeder 3 | | Feeder 4 | |
|----------------------------------|--------------|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Meter type | Main meter | Main meter | Check meter | Main meter | Check meter | Main meter | Check meter | Main meter | Check meter |
| Meter Serial No | 15687855 | 02814124 | 15687856 | 15687858 | 15687860 | 15687862 | 12853657 | 13813553 | 16351040 |
| Meter make | Elster A1800 | Elster A1800 | Elster A1800 | Elster A1800 | Elster A1800 | Elster A1800 | Elster A1800 | Elster A1800 | Elster A1800 |
| Accuracy class | 0.2s | 0.2s | 0.2s | 0.2s | 0.2s | 0.2s | 0.2s | 0.2s | 0.2s |
| Date of previous calibration I | 24/07/2014 | | 24/07/2014 | 24/07/2014 | 24/07/2014 | 24/07/2014 | 24/07/2014 | 24/07/2014 | 24/07/2014 |
| Validity | 23/07/2019 | | 23/07/2019 | 23/07/2019 | 23/07/2019 | 23/07/2019 | 23/07/2019 | 23/07/2019 | 23/07/2019 |
| Date of previous calibration II | 30/12/2015 | | | 30/12/2015 | 30/12/2015 | 30/12/2015 | 30/12/2015 | 30/12/2015 | 30/12/2015 |
| Validity | 29/12/2020 | | | 29/12/2020 | 29/12/2020 | 29/12/2020 | 29/12/2020 | 29/12/2020 | 29/12/2020 |
| Date of previous calibration III | 22/07/2016 | | 22/07/2016 | 22/07/2016 | 22/07/2016 | 22/07/2016 | 22/07/2016 | 22/07/2016 | 22/07/2016 |
| Validity | 21/07/2021 | | 21/07/2021 | 21/07/2021 | 21/07/2021 | 21/07/2021 | 21/07/2021 | 21/07/2021 | 21/07/2021 |
| Date of previous calibration IV | 18/09/2017 | | 18/09/2017 | 18/09/2017 | 18/09/2017 | 18/09/2017 | 18/09/2017 | 18/09/2017 | 18/09/2017 |
| Validity | 17/09/2022 | | 17/09/2022 | 17/09/2022 | 17/09/2022 | 17/09/2022 | 17/09/2022 | 17/09/2022 | 17/09/2022 |
| Date of previous calibration V | 27/06/2018 | Replacement meter installed on 19/11/2019 | 27/06/2018 | 27/06/2018 | 27/06/2018 | 27/06/2018 | 27/06/2018 | 27/06/2018 | 27/06/2018 |
| Validity | 26/06/2023 | 18/11/2024 | 26/06/2023 | 26/06/2023 | 26/06/2023 | 26/06/2023 | 26/06/2023 | 26/06/2023 | 26/06/2023 |
| Current calibration | | 20/08/2020 | 20/08/2020 | 20/08/2020 | 20/08/2020 | 20/08/2020 | 20/08/2020 | 20/08/2020 | 20/08/2020 |
| Validity | | 19/08/2025 | 19/08/2025 | 19/08/2025 | 19/08/2025 | 19/08/2025 | 19/08/2025 | 19/08/2025 | 19/08/2025 |
| | | Meter no. 15687855 replaced with Meter no. 02814124 on 19/ 11/ 2019 | | | | | | | |

Table 1B: Calibration details for meters on Feeder 6, Feeder 7, Feeder 8 and Feeder 9

| Feeder number | Feeder 6 | | Feeder 7 | | Feeder 8 | | Feeder 9 | |
|-----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Meter type | Main meter | Check meter | Main meter | Check meter | Main meter | Check meter | Main meter | Check meter |
| Meter Serial No | 16636465 | 16636468 | 15456640 | 16351020 | 16636473 | 02814125 | 16351021 | 16351022 |
| Meter make | Elster A1800 | Elster A1800 | Elster A1800 | Elster A1800 | Elster A1800 | Elster A1800 | Elster A1800 | Elster A1800 |
| 0.2s | 0.2s | 0.2s | 0.2s | 0.2s | 0.2s | 0.2s | 0.2s | 0.2s |

CDM-MR-FORM

| Feeder number | Feeder 6 | | Feeder 7 | | Feeder 8 | | Feeder 9 | |
|----------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Date of previous calibration I | 01/09/2014 | 01/09/2014 | 01/09/2014 | 01/09/2014 | NA | NA | 01/09/2014 | 01/09/2014 |
| Validity | 31/08/2019 | 31/08/2019 | 31/08/2019 | 31/08/2019 | - | - | 31/08/2019 | 31/08/2019 |
| Date of previous calibration II | 30/12/2015 | 30/12/2015 | 30/12/2015 | 30/12/2015 | 30/12/2015 | 30/12/2015 | 30/12/2015 | 30/12/2015 |
| Validity | 29/12/2020 | 29/12/2020 | 29/12/2020 | 29/12/2020 | 29/12/2020 | 29/12/2020 | 29/12/2020 | 29/12/2020 |
| Date of previous calibration III | 22/07/2016 | 22/07/2016 | 22/07/2016 | 22/07/2016 | 22/07/2016 | 22/07/2016 | 22/07/2016 | 22/07/2016 |
| Validity | 21/07/2021 | 21/07/2021 | 21/07/2021 | 21/07/2021 | 21/07/2021 | 21/07/2021 | 21/07/2021 | 21/07/2021 |
| Date of previous calibration IV | 18/09/2017 | 18/09/2017 | 18/09/2017 | 18/09/2017 | 19/09/2017 | 19/09/2017 | 19/09/2017 | 19/09/2017 |
| Validity | 17/09/2022 | 17/09/2022 | 17/09/2022 | 17/09/2022 | 18/09/2022 | 18/09/2022 | 18/09/2022 | 18/09/2022 |
| Date of previous calibration V | 27/06/2018 | 27/06/2018 | 27/06/2018 | 27/06/2018 | 27/06/2018 | 27/06/2018 | 27/06/2018 | 27/06/2018 |
| Validity | 26/06/2023 | 26/06/2023 | 26/06/2023 | 26/06/2023 | 26/06/2023 | 26/06/2023 | 26/06/2023 | 26/06/2023 |
| Current calibration | 20/08/2020 | 20/08/2020 | 20/08/2020 | 20/08/2020 | 20/08/2020 | 20/08/2020 | 20/08/2020 | 20/08/2020 |
| Validity | 19/08/2025 | 19/08/2025 | 19/08/2025 | 19/08/2025 | 19/08/2025 | 19/08/2025 | 19/08/2025 | 19/08/2025 |

Document information

| <i>Version</i> | <i>Date</i> | <i>Description</i> |
|----------------|-----------------|---|
| 09.0 | 8 October 2021 | Revision to: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR). |
| 07.0 | 31 May 2019 | Revision to: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> Include provisions related to delayed submission of a monitoring plan; Provisions related to the Host Party; Remove reference to programme of activities; Overall editorial improvement. |
| 04.0 | 25 June 2014 | Revisions to: <ul style="list-style-type: none"> Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); Include provisions related to standardized baselines; Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; Editorial improvement. |
| 03.2 | 5 November 2013 | Editorial revision to correct table in page 1. |
| 03.1 | 2 January 2013 | Editorial revision to correct table in section E.5. |

| <i>Version</i> | <i>Date</i> | <i>Description</i> |
|---|-----------------|---|
| 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 | | |