



**Monitoring report form for CDM project activity**  
(Version 07.0)

**MONITORING REPORT**

<b>Title of the project activity</b>	5.10 MW Wind Power Project by Shyam Metalics & Energy Limited in Maharashtra, India	
<b>UNFCCC reference number of the project activity</b>	9697 <sup>1</sup>	
<b>Version number of the PDD applicable to this monitoring report</b>	04	
<b>Version number of this monitoring report</b>	02	
<b>Completion date of this monitoring report</b>	21/08/2019	
<b>Monitoring period number</b>	02	
<b>Duration of this monitoring period</b>	01/10/2016 to 31/12/2018 (both first and last date included)	
<b>Monitoring report number for this monitoring report</b>	NA	
<b>Project participants</b>	Shyam Metalics & Energy Limited	
<b>Host Party</b>	India	
<b>Applied methodologies and standardized baselines</b>	AMS I.D, "Grid connected renewable electricity generation" (Version 17)	
<b>Sectoral scopes</b>	1 : Energy industries (renewable - / non-renewable sources)	
<b>Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period</b>	<b>Amount achieved before 1 January 2013</b>	<b>Amount achieved from 1 January 2013</b>
	0 tCO <sub>2</sub> e	14,815 tCO <sub>2</sub> e
<b>Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD</b>	19,172 tCO <sub>2</sub> e	

<sup>1</sup> <https://cdm.unfccc.int/Projects/DB/RINA1374589833.08/view>

## SECTION A. Description of project activity

### A.1. General description of project activity

The proposed CDM project activity is a wind power project in the state of Maharashtra, comprising six Wind Turbine Generators (WTGs), with a cumulative capacity of 5.10 MW. The project activity consists of six units of 850 kW wind turbine generators.

The purpose of the project is to generate 8,935 MWh (estimation as per registered PDD) of average electricity per annum, using the kinetic energy of wind, thus resulting in zero emissions during electricity production. The power generated is supplied to the state electricity board and replace the equal amount of power, which would have been generated by fossil fuel-dominated NEWNE grid.

The project activity is combination of freshly installed WTGs with an aggregate capacity of 5.1 MW. The project activity is using technically and commercially proven wind turbines from Gamesa Wind Turbines Pvt Ltd. The applied technology is considered to be one of the most environmentally friendly and safe technologies available as the operation of the wind turbine does not emit any GHGs or any other harmful gases unlike the operation of conventional power plants. The project uses the kinetic energy in wind to drive the wind turbine blades, which generates electricity.

List of the facilities, systems and equipment that are installed by the project activity have been tabulated below

Label	Survey Field No.	Village	Capacity	Make	Model No	Latitude (N)	Longitude (E)	Commissioning Date
GJN 47	19	Malal	0.85 MW	Gamesa	G58	17°00'57.82"	75°13'45.53"	26/09/2012
GJ 09 N1	122	Rampur	0.85 MW	Gamesa	G58	17°00'29.01"	75°10'23.35"	30/09/2012
GJ41	12	Malal	0.85 MW	Gamesa	G58	17°00'55.74"	75°13'17.98"	30/09/2012
GJ 43N	14	Malal	0.85 MW	Gamesa	G58	17°00'55.97"	75°13'17.3"	26/09/2012
GJN 5	151	Rampur	0.85 MW	Gamesa	G58	17°00'43.43"	75°09'29.04"	31/03/2012
GJN 7	150	Rampur	0.85 MW	Gamesa	G58	17°00'35.58"	75°09'36.05"	31/03/2012

All the installations are new. The power is generated at voltage of 690 V, which is stepped up to 33 kV at transformers located in a small yard adjacent to each WTG, before being fed into 110/33/11 kV Jath substation, which is the grid interconnection point. Meter readings for billing purposes are noted at this substation with the help of two energy meters--main meter and check meter-- installed therein.

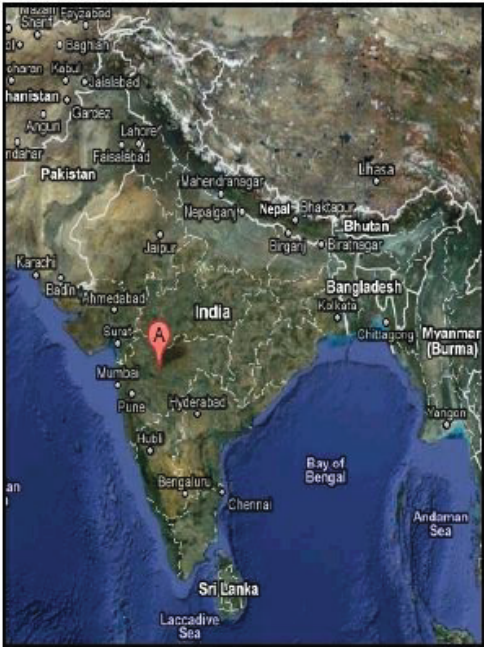
The total emission reductions for the current monitoring period account to 14,815 tCO<sub>2</sub>e.

### A.2. Location of project activity

District : Sangli  
State : Maharashtra  
Country : India

The project activity WTGs latitude and longitude are mentioned in section A.1 of MR.

**The location map of the Project Activity is given below**



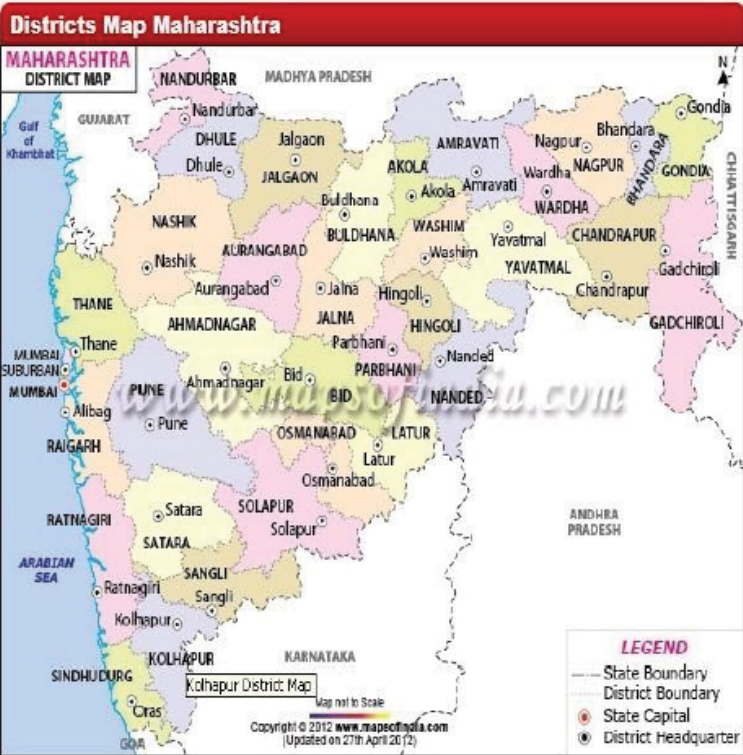
Country: India

State: Maharashtra

District: Sangli

State: Maharashtra

### Districts Map Maharashtra

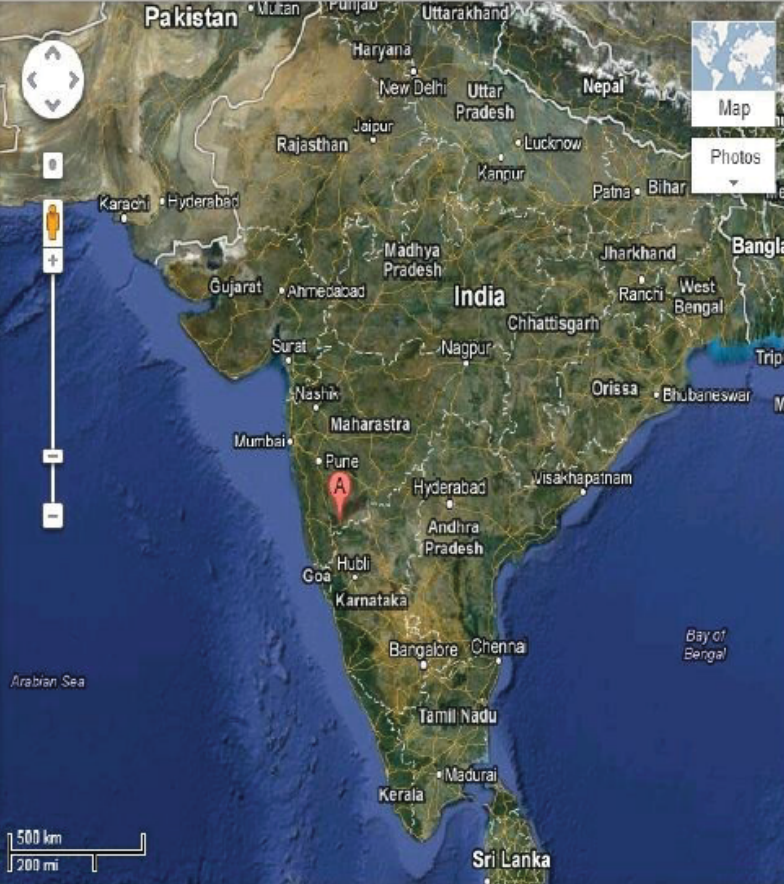


**LEGEND**

- State Boundary
- District Boundary
- State Capital
- District Headquarter

**Satara, Maharashtra**

Survey Field No.	Coordinates (UTM)
365	43Q 518266 1880197
66	43Q 521420 1878696
49	43Q 521296 1878323
122	43Q 518468 1880517
151	43Q 516829 1880967
140/2	43Q 517451 1880547



### 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)	Shyam Metals & Energy Limited	No

**A.4. Reference to applied methodologies and standardized baselines**

The project activity has applied following baseline and monitoring methodology:

- AMS I.D, “Grid connected renewable electricity generation” (Version 17)
- Tool to calculate the emission factor for an electricity system” (Version 02.2.1)

<https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTFQQOFQQH4SBK>

**A.5. Crediting period type and duration**

Type	- Fixed
Monitoring Period	- 02
Start date of crediting period	- 23/07/2013
Length of Crediting period	- 10 Years
Duration of Crediting Period	- 23/07/2013 to 22/07/2023
Current Monitoring Period	- 01/10/2016 to 31/12/2018

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

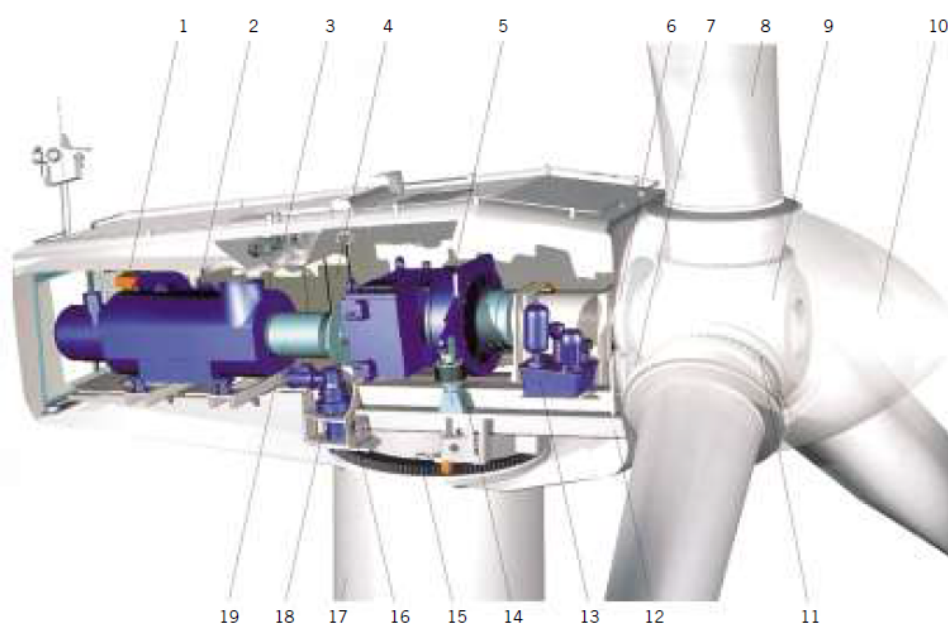
The project activity WTGs are already implemented and running satisfactorily. The CDM project activity is a wind power project in the state of Maharashtra, comprising of six Wind Turbine Generators (WTGs), with a cumulative capacity of 5.10 MW. The project activity involved installation of six units of 850 kW wind turbine generators. The commissioning details of each WTG is mentioned in section A.1 of MR.

The purpose of the project is to generate electricity, using the kinetic energy of wind, thus resulting in zero emissions during electricity production. The power generated is supplied to the state electricity board and replace the equal amount of power, which would have been generated by fossil fuel-dominated NEWNE grid.

The project activity is using technically and commercially proven wind turbines from Gamesa Wind Turbines Pvt Ltd. The applied technology is considered to be one of the most environmentally friendly and safe technologies available as the operation of the wind turbine does not emit any GHGs or any other harmful gases unlike the operation of conventional power plants. The project use the kinetic energy in wind to drive the wind turbine blades, which generates electricity.

The schematic diagram of WTG is mentioned below





1. Service crane
2. Generator
3. Cooling system
4. Top control unit
5. Gearbox

6. Main shaft with two bearing housings
7. Rotor lock system
8. Blade
9. Blade Hub

10. Hub cover
11. Blade bearing
12. Bed frame
13. Hydraulic unit
14. Shock absorbers

15. Yaw ring
16. Brake
17. Tower
18. Yaw gears
19. Transmission. High speed shaft

There are no changes that have happened in project activity which may impact the applicability of the 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**

Not Applicable during the current monitoring period.

### **B.2.2. Corrections**

Not Applicable during the current monitoring period.

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

Not Applicable during the current monitoring period.

### **B.2.4. Inclusion of monitoring plan**

Not Applicable 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 during the current monitoring period.

### **B.2.6. Changes to project design**

Not Applicable during the current monitoring period.

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

Not Applicable.

**SECTION C. Description of monitoring system**

The monitoring plan is in accordance with the modalities and procedures for small-scale CDM project activities, as the project activity is a grid-connected wind power project implemented in the state of Maharashtra. The monitoring plan, which is implemented and taken care by the project proponent, describes the monitoring organization, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving

**Monitoring Organization**

The Project is managed by a Project Manager, who is a full time General Manager, further to be assisted by a Manager (Operations), in-charge of all technical aspects. The Manager (Operations) who is responsible for the operational activity of the wind project is having under him one Asst. Manager.

The monitoring agenda is delegated to a competent person identified for the purpose. The identified person is the in charge of GHG monitoring activities and prepare necessary audit reports for review by the management.

The identified person in charge is assisted by a team of experienced personnel in disciplines such as mechanical and electrical with experience in plant operation, measurements and management. The primary responsibility of the team is to collect, measure, monitor, record and reports the information on various data items to the person in charge and the General Manager, in accordance with the applicable standards. Periodic calibration of various instruments used in the monitoring of the data and record keeping of the same also is the responsibility of the team.

The responsibility of storage and archiving of information in good condition also lies with the designated person in charge. The person in charge undertake periodic verifications and onsite inspections to ensure the quality of the data collected by the team.

**Monitoring plan– Maharashtra**

For the project activity in order to establish creditable emission reduction, it has to record the actual electricity supplied by the project proponent through clean source of Energy i.e. Wind which would displace the equivalent units of electricity produced by Fossil fuel based power plants.

**Metering**

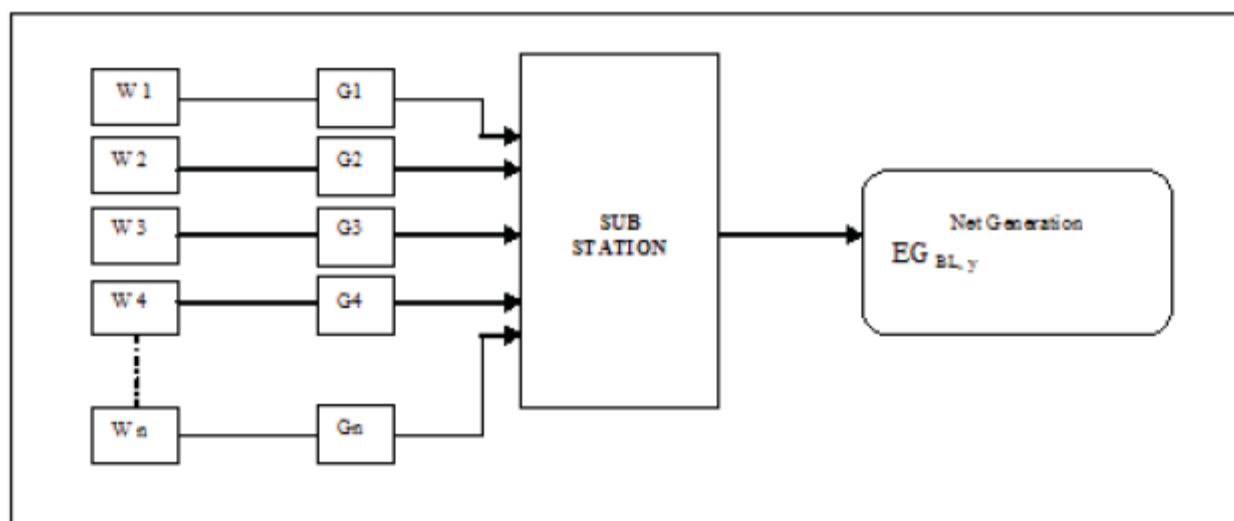
The monitoring of the generated electricity through Wind Turbine Generator is carried out by MSEDCL on monthly basis at the delivery point (Tri-vector meters installed at the substation) and also, Through Supervisory control and data acquisition system (SCADA) installed at Wind turbine generator controller on daily basis.

The value of the net electricity supplied to the grid by the project activity in year  $y$  i.e.  $EG_{BL,y}$  is arrived at after subtracting the electricity imported from the grid by the project activity in year  $y$ ,  $EG_{IMP,PA,y}$ , from electricity exported to the grid by the project activity in year  $y$ ,  $EG_{EXP,PA,y}$ .

The calculation for  $EG_{EXP,PA,y}$  &  $EG_{IMP,PA,y}$  is done in the following manner:

In presence of the O&M representative and DISCOM representative, the monthly JMR is done at the substation at the main/check meter, which displays the combined export/import data for  $n$  number of WTGs, which includes the WTGs of the project activity, connected to that meter.

The OM representative prepares the JMR report to be submitted to DISCOM. In that report, apart from the combined values of export/import of  $n$  WTGs read from the meter, the individual break up of export/import data for each WTG is also provided. The values of  $EG_{EXP,PA,y}$  &  $EG_{IMP,PA,y}$  are apportioned in the break up sheet prepared by the O&M contractor i.e. Gamesa. PP doesn't have any role or control on preparation of electricity break up sheets.



Flow diagram of monitoring arrangement

Note – The above flow diagram is just schematic representation for common metering arrangement and each feeder (e.g G1, G2 etc) involves multiple number of WTGs based on feeder load. For current monitoring period, WTGs GJN 05 & GJN 07 are connected to Feeder no. 1, whereas WTGs GJ 47 N, GJ 09N1, GJ 41 N & GJ 43N are connected to Feeder no. 2. Thus, Feeder 1 and Feeder 2 meter details are provided in Monitoring report.

The proposed project activity requires evacuation facilities for sale to grid, which is maintained by the state power utility (MSEDCL).

- The electricity generation measurements are required by the utility and the investors to assess electricity sales revenue
- The primary recording of the electricity fed to the state utility grid is carried out jointly at the incoming feeder of the state power utility (MSEDCL).
- The joint measurement is carried out once in a month in presence of both parties (the developer's representative and officials of the state power utility). Both parties sign the recorded reading.

The calibration details of meters are provided in the Annex-1 of the report.

#### The Feeder wise WTG location is as follows

Feeder Location	WTGs Connected
Feeder 1	GJN 05 & 07
Feeder 2	GJ 43N & 47 N; GJ 41 N & 09 N1

#### Date Uncertainty

In the event when verification period dates and billing cycle of WTGs in the Project Activity, do not coincide:

Each WTG is equipped with the Integrated Electronic Tri-vector Meter, which are connected to Central Monitoring System (CMS). The system continuously monitors the generation from each

WTG. A daily-consolidated report of the generation data is generated in the form of 'Daily Performance Report' and recorded in Electronic as well as Printed form. In the event when the individual verification period dates and billing cycle dates (or dated of B-Form) of the various WTGs in the project activity do not coincide, the following procedure would be adopted to estimate the Net Power Supplied to the Grid during the specified period/or days where there is a mismatch.

<b>X</b>	Sum of generation during partial days of the month recorded at panel meter (kWh)
<b>Y</b>	Total generation during the month recorded at panel meter (kWh/month)
<b>Z = X / Y</b>	Generation during partial days (kWh)
<b>B</b>	Energy export as per B-Form during the month (kWh/month)
<b>(B*Z)</b>	Partial days exported as per B-Form considered for emission reduction calculation (kWh)

For current monitoring period, apportioning is not applicable.

### Data Archiving

The metering equipments is maintained in accordance with electricity standards and have the capability of recording daily and monthly readings. Records of joint meter reading are maintained at site and a copy is kept with the PP. Necessary records of calibration are maintained by both MSEDCL and project proponents.

The Generation Data and other related documents will be kept for 2 years after the whole crediting period. All monitored data is stored / archived under safe custody of the project executor and controller for a period of crediting period (10 Years fixed crediting period) + 2 years.

### QA/QC Procedure

- The main & check meters are tested for accuracy, with a portable standard meter, by the MSEDCL'S testing division at the cost of seller. The MSEDCL carry out the calibration, periodical testing, sealing & maintenance of meters annually in the presence of authorized representative(s) of seller sign on the result thereof.
- The frequency of meter testing is annual. All meters are tested only at the metering point. The MSEDCL provides a copy of the test reports to the seller.
- If during testing, both the main & check meters are found within the permissible limits of error i.e. 0.2%, the energy computation will be as per the main meter. If during test, any of the main meter is found to be within permissible limits of error but the corresponding check meter is beyond the permissible limit, energy computation will be as per the main meter. The check meter shall be calibrated immediately.
- If during the tests, the main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within the permissible limits of error, then the energy computation for the month to-date & time of such test check shall be in accordance with check meter. The main meter shall be calibrated immediately & the energy for the period thereafter shall be as per the calibrated main meter.
- If during any of the monthly meter readings, the variation between the main meter & check meter is more than 0.2%; all the meters shall be retested & calibrated immediately by MSEDCL, at the seller's cost.
- The correction required as per result of testing will be applied to generation & consumption of energy for the period from last meter reading to the time of such test checks. Energy from the period there after shall be in accordance with calibrated main meter.
- The net electricity supplied to the grid can be crosschecked with the invoices raised / sales receipts.

## SECTION D. Data and parameters

### D.1. Data and parameters fixed ex ante



Data/Parameter	$EF_{NEWNE, OM, y}$
Unit	tCO <sub>2</sub> /MWh
Description	Operating margin CO <sub>2</sub> emission factor for the project electricity system in year y
Source of data	CEA's "Baseline Carbon Dioxide Emission Database Version 7.0 "
Value(s) applied	0.9842
Choice of data or measurement methods and procedures	Calculated in line with "Tool to calculate the emission factor for an electricity system (Version 02.2.1)" using data from Central Electricity Authority of India's (CEA) "Baseline Carbon Dioxide Emission Database Version 7.0". Justified in section B.6.1 of registered PDD.
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	The value is fixed ex-ante

Data/Parameter	$EF_{NEWNE, BM, y}$
Unit	tCO <sub>2</sub> /MWh
Description	Build margin CO <sub>2</sub> emission factor for the project electricity system in year y
Source of data	CEA's "Baseline Carbon Dioxide Emission Database Version 7.0 "
Value(s) applied	0.8588
Choice of data or measurement methods and procedures	Calculated in line with "Tool to calculate the emission factor for an electricity system (Version 02.2.1)" using data from Central Electricity Authority of India's (CEA) "Baseline Carbon Dioxide Emission Database Version 7.0". Justified in section B.6.1 of registered PDD.
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	The value is fixed ex-ante

Data/Parameter	$EF_{NEWNE, CM, y}$
Unit	tCO <sub>2</sub> /MWh
Description	Combined margin CO <sub>2</sub> emission factor for the project electricity system in year y
Source of data	CEA's "Baseline Carbon Dioxide Emission Database Version 7.0 "
Value(s) applied	0.9528
Choice of data or measurement methods and procedures	Calculated in line with "Tool to calculate the emission factor for an electricity system (Version 02.2.1)" using data from Central Electricity Authority of India's (CEA) "Baseline Carbon Dioxide Emission Database Version 7.0". Justified in section B.6.1 of registered PDD.
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	The value is fixed ex-ante

## D.2. Data and parameters monitored

Data/Parameter	$EG_{BL, y}$
Unit	MWh
Description	Quantity of net electricity supplied to the grid by project activity in year y
Measured/calculated/default	To be calculated
Source of data	Monthly joint meter reading (JMR) at pooling substation.
Value(s) of monitored parameter	15,549.52 MWh

Monitoring equipment	<p>The net electricity supplied to the grid by the project activity is continuously monitored both in individual WTG control panel (in built) and at the energy meter (main and check meter) installed at the sub-station. The project activity WTGs involves two feeders to export electricity to grid. Section C of MR mentioned the meter details for each feeder.</p> <p>The meters remain under the custody of state utility. Since, the energy meter is connected to number of WTGs along with the project WTGs the net electricity exported to grid by the project WTGs are calculated based on the gross electricity exported and imported to/from the grid at substation where all WTGs (WTGs of project activity and WTGs of other than project activity) are connected.</p> $EG_{BL,y} = EG_{EXP,PA,y} - EG_{IMP,PA,y}$ <p>Joint Meter Reading is recorded at the end of every month, by the representative of the state electricity board and representative of O&amp;M Contractor. The Joint Meter Reading taken at the substation is apportioned by O &amp; M provider along with state utility for individual project participants. PP doesn't have any role or control on preparation of Joint meter readings for individuals. PP also receives a copy of export (<math>EG_{EXP,PA,y}</math>) and import (<math>EG_{IMP,PA,y}</math>) data for his WTGs from which the net export of electricity to grid is calculated on monthly basis (<math>EG_{BL,y} = EG_{EXP,PA,y} - EG_{IMP,PA,y}</math>). This value is directly used for emission reduction calculation and on the same monthly net generation data, PP raises the invoice to MSEDCL.</p>
Measuring/ reading/ recording frequency	Continuous monitoring, Hourly measurement and Monthly recording
Calculation method (if applicable)	$EG_{BL,y} = EG_{EXP,PA,y} - EG_{IMP,PA,y}$
QA/QC procedures	<p><b>Accuracy class of metering equipment:</b> 0.2 s</p> <p><b>Calibration frequency:</b> Annual</p> <p><b>Responsible person for measurement</b> – DISCOM shall be responsible for the calibration of the meters.</p> <p><b>Data Archiving:</b> All data collected as part of monitoring would be archived electronically and kept for at least two years after the end of the last crediting period.</p> <p>The net electricity supplied to the grid can be crosschecked with the invoices raised / sales receipts.</p> <p>Calibration details of the Meters have been provided in Annex-1 of the report.</p>
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

<b>Data/Parameter</b>	<b><math>EG_{EXP,PA,y}</math></b>
Unit	MWh
Description	Quantity of electricity exported to the grid by project activity in year y
Measured/calculated/ default	Measured
Source of data	JMR report and Break up sheet provided by Gamesa to MSEDCL
Value(s) of monitored parameter	15,607.72 MWh

Monitoring equipment	<p>The value of <math>EG_{EXP,PA,y}</math> is apportioned by the O&amp;M contractor (Gamesa) and provided to the DISCOM in the break up sheet along with the JMR report as explained in section B.7.3 registered PDD.</p> <p>For measuring the energy exported and imported by the project activity at the interconnection point, two set of main meter (part of interconnection facility) and check meter will be provided (Each feeder involves one set of main and check meters). The meters are owned by the state electricity board. The project activity WTGs involves two feeders to export electricity to grid. Section C of MR mentioned the meter details for each feeder.</p> <p>Apart from hourly meter reading, monthly joint meter readings at the interconnection point will be noted by the designated officials of the company and DISCOM. The joint meter readings will be recorded and signed by the authorized representative of both the parties.</p> <p>Calibration procedure – National Test House or equivalent – Third party testing Accuracy of the measurement - <math>\pm 0.2\%</math> Responsible person for measurement – DISCOM shall be responsible for the calibration of the meters</p>
Measuring/r eading/ recording frequency	Continuous monitoring, Hourly measurement and Monthly recording
Calculation method (if applicable)	Not applicable
QA/QC procedures	<p><b>Accuracy class of metering equipment:</b> 0.2 s <b>Calibration frequency:</b> Annual <b>Data Archiving:</b> All data collected as part of monitoring would be archived electronically and kept for at least two years after the end of the last crediting period. Calibration details of the Meters have been provided in Annex-1 of the report.</p>
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

<b>Data/Parameter</b>	<b><math>EG_{IMP,PA,y}</math></b>
Unit	MWh
Description	Quantity of electricity imported from the grid by project activity in year y
Measured/calculated/ default	Measured
Source of data	JMR report and Break up sheet provided by Gamesa to MSEDCL
Value(s) of monitored parameter	58.21 MWh

Monitoring equipment	<p>The value of <math>EG_{IMP,PA,y}</math> is apportioned by the O&amp;M contractor (Gamesa) and provided to the DISCOM in the break up sheet along with the JMR report as explained in section B.7.3 of registered PDD.</p> <p>For measuring the energy exported and imported by the project activity at the interconnection point, two set of main meter (part of interconnection facility) and check meter will be provided (Each feeder involves one set of main and check meters). The meters are owned by the state electricity board. The project activity WTGs involves two feeders to export electricity to grid. Section C of MR mentioned the meter details for each feeder.</p> <p>Apart from hourly meter reading, monthly joint meter readings at the interconnection point will be noted by the designated officials of the company and DISCOM. The joint meter readings will be recorded and signed by the authorized representative of both the parties.</p> <p>Calibration procedure – National Test House or equivalent – Third party testing Accuracy of the measurement - <math>\pm 0.2\%</math> Responsible person for measurement – DISCOM shall be responsible for the calibration of the meters</p>
Measuring/ reading/ recording frequency	Continuous monitoring, Hourly measurement and Monthly recording
Calculation method (if applicable)	Not applicable
QA/QC procedures	<p><b>Accuracy class of metering equipment:</b> 0.2s <b>Calibration frequency:</b> Annual Data Archiving: All data collected as part of monitoring would be archived electronically and kept for at least two years after the end of the last crediting period. Calibration details of the Meters have been provided in Annex-1 of the report.</p>
Purpose of data/parameter	Calculation of baseline emissions
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

The project activity reduces carbon dioxide through displacement of grid electricity generation with fossil fuel based power plants by renewable- wind energy. The emission reduction  $ER_y$  due to project activity during a given year  $y$  is calculated as the difference between baseline emissions ( $BE_y$ ) and project emissions ( $PE_y$ ) and leakage emissions ( $LE_y$ ). However, as per registered PDD, there are no any project and leakage emissions.

#### Baseline Emissions Factor and Baseline Emissions during the current monitoring period

Particulars	Value
Baseline Emissions Factor ( $EF_{NEWNE, CM, y}$ in $tCO_2/MWh$ )	0.9528
Net Electricity Supplied to the Grid by the Project ( $EG_{BL,y}$ in MWh)	15,549.32
<b>Baseline Emissions (<math>BE_y</math> in <math>tCO_2e</math>)</b>	<b>14,815</b>

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

As per methodology and registered PDD, it is zero.

**E.3. Calculation of leakage emissions**

As per methodology and registered PDD, it is zero.

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

	Baseline GHG emissions or baseline net GHG removals (t CO <sub>2</sub> e)	Project GHG emissions or actual net GHG removals (t CO <sub>2</sub> e)	Leakage GHG emissions (t CO <sub>2</sub> e)	GHG emission reductions or net anthropogenic GHG removals (t CO <sub>2</sub> e)		
				Before 01/01/2013	From 01/01/2013	Total amount
<b>Total</b>	14,815	0	0	0	14,815	14,815

**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 <sub>2</sub> e)	Amount estimated ex ante for this monitoring period in the PDD (t CO <sub>2</sub> e)
14,815 tCO <sub>2</sub> e	19,172 tCO <sub>2</sub> e

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

As per the CDM registered PDD, the amount of CERs generated annually is 8,513 tCO<sub>2</sub>e.

Therefore, the amount of estimated ex ante for this monitoring period is identified as explained below.

The total number of days in this monitoring period is 822 days.

Hence, the amount of estimated ex ante for this monitoring period = 8,513\* (822/365)  
= 19,172 tCO<sub>2</sub>e

**E.6. Remarks on increase in achieved emission reductions**

CER's generated are low as compared due to registered PDD because, in actual case the PLF is on lower side, due to which there is a decrease in the electricity generation. The actual ER is 22.72% lower than estimated values.

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

The capacity of the project remained 5.1 MW during this monitoring period which falls under the scale of small scale project activity **Annex-1: Meter Details & Calibration Details**

The details of the meter calibrations are provided below

Feeder Details	Meter Details	SL. No. of Meter	Make of Meter	Accuracy Class	Date of Calibration	Due Date of Calibration
Feeder-1	Main Meter <sup>2</sup>	13099021	Elster	0.2 s	07-08-15	06-08-16
					19-09-17	18-09-18

<sup>2</sup> Due to delay in calibration, error factor has been applied to the generation values of Feeder-1 WTGs from Oct-2016 to Sep-2017.



					27-06-18	26-06-19
	Check Meter <sup>3</sup>	13132615	Elster	0.2 s	07-08-15	06-08-16
					19-09-17	18-09-18
					27-06-18	26-06-19
Feeder-2	Main Meter <sup>4</sup>	13132626	Elster	0.2 s	07-08-15	06-08-16
					13-10-17	12-10-18
					27-06-18	26-06-19
	Check Meter <sup>5</sup>	13132613	Elster	0.2 s	07-08-15	06-08-16
					13-10-17	12-10-18
					27-06-18	26-06-19

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<sup>3</sup> Due to delay in calibration, error factor has been applied to the generation values of Feeder-1 WTGs from Oct-2016 to Sep-2017.

<sup>4</sup> Due to delay in calibration, error factor has been applied to the generation values of Feeder-2 WTGs from Oct-2016 to Oct-2017.

<sup>5</sup> Due to delay in calibration, error factor has been applied to the generation values of Feeder-2 WTGs from Oct-2016 to Oct-2017.

**Annex-2: Breakdown Details**

The breakdown details for Feeder-1 WTGs (GN 05 & 07) are provided below

Date	Customer Name	State	Site	WTG ID	MW	Breakdown Remark	Breakdown Hrs.
09-Jan-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Grid Down from EB	2.60
15-Jan-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Monthly Lubrication	1.00
06-Feb-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Elec Voltage Asymmetry	0.10
07-Feb-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Elec Yaw Sensor Err Stop	0.40
01-Mar-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Grid Down from EB	0.50
05-Mar-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	FSS Fault	0.40
11-Jun-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Elec Yaw Sensor Err Stop	0.30
12-Jun-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Elec Voltage Asymmetry	0.10
23-Jul-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Grid Down from EB	0.20
24-Jul-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Grid Down from EB	0.20
15-Aug-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Grid Down from EB	0.20
16-Aug-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Grid Down from EB	0.20
07-Sep-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Grid Down from EB	0.20
08-Sep-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Elec Voltage Asymmetry	0.10
27-Dec-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Monthly Lubrication	0.80
19-Jan-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Grid Down from EB	2.60
20-Jan-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Monthly Lubrication	1.00
06-Feb-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Elec Voltage Asymmetry	0.10
07-Feb-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Elec Yaw Sensor Err Stop	0.40
24-Feb-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Monthly Lubrication	1.00
25-Feb-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Grid Down from EB	0.20
05-Mar-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Elec Voltage Asymmetry	0.10
11-Apr-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Monthly Lubrication	0.80
12-Apr-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Grid Down from EB	2.60
23-May-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Monthly Lubrication	1.00
24-May-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Elec Yaw Sensor Err Stop	0.40
15-Jul-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Grid Down from EB	0.20
16-Jul-18	Shyam Metalics &	Maharashtra	Sangli	GN 07	0.85	Elec Voltage	0.10

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	Energy Ltd					Asymmetry	
07-Sep-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Monthly Lubrication	1.00
08-Sep-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Elec Yaw Sensor Err Stop	0.30
07-Nov-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GN 05	0.85	Monthly Lubrication	1.00
16-Dec-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GN 07	0.85	Grid Down from EB	2.60

The breakdown details for Feeder-2 WTGs (GJ 43N & 47N) are provided below

Date	Customer Name	State	Site	WTG ID	MW	Breakdown Remark	Breakdown Hrs.
20-Jan-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Grid Down from EB	2.60
25-Jan-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Monthly Lubrication	1.00
10-Feb-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Elec Voltage Asymmetry	0.10
15-Feb-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Elec Yaw Sensor Err Stop	0.40
09-Mar-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Grid Down from EB	0.50
15-Mar-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	FSS Fault	0.40
21-Jun-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Elec YawSensor ErrStop	0.30
26-Jun-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Elec Voltage Asymmetry	0.10
13-Jul-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Grid Down from EB	0.20
24-Jul-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Grid Down from EB	0.20
05-Aug-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Grid Down from EB	0.20
26-Aug-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Grid Down from EB	0.20
17-Sep-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Grid Down from EB	0.20
28-Sep-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Elec Voltage Asymmetry	0.10
17-Dec-17	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Monthly Lubrication	0.80
29-Jan-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Grid Down from EB	2.60
30-Jan-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Monthly Lubrication	1.00
05-Mar-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Elec Voltage Asymmetry	0.10
11-Apr-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Monthly Lubrication	0.80
22-Apr-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Grid Down from EB	2.60
18-May-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Monthly Lubrication	1.00
20-May-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Elec Yaw Sensor Err Stop	0.40
05-Jul-18	Shyam Metals & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Grid Down from EB	0.20

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26-Jul-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Elec Voltage Asymmetry	0.10
05-Sep-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Monthly Lubrication	1.00
10-Sep-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Elec Yaw Sensor Err Stop	0.30
17-Nov-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 43N	0.85	Monthly Lubrication	1.00
06-Dec-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 47N	0.85	Grid Down from EB	2.60

The breakdown details for Feeder-2 WTGs (GJ 41N & 09N1) are provided below

Date	Customer Name	State	Site	WTG ID	MW	Breakdown Remark	Breakdown Hrs.
10-Jan-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Grid Down from EB	2.60
15-Jan-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Monthly Lubrication	1.00
09-Feb-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Elec Voltage Asymmetry	0.10
13-Feb-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Elec Yaw Sensor Err Stop	0.40
16-Mar-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Grid Down from EB	0.50
18-Mar-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	FSS Fault	0.40
01-Jun-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Elec Yaw Sensor Err Stop	0.30
05-Jun-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Elec Voltage Asymmetry	0.10
10-Jul-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Grid Down from EB	0.20
18-Jul-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Grid Down from EB	0.20
22-Aug-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Grid Down from EB	0.20
28-Aug-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Grid Down from EB	0.20
20-Sep-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Grid Down from EB	0.20
26-Sep-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Elec Voltage Asymmetry	0.10
27-Oct-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Monthly Lubrication	0.80
19-Nov-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Grid Down from EB	2.60
20-Dec-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Monthly Lubrication	1.00
26-Dec-17	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Elec Voltage Asymmetry	0.10
30-Jan-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Elec Yaw Sensor Err Stop	0.40
05-Feb-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Monthly Lubrication	1.00
06-Mar-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Grid Down from EB	2.60
12-Mar-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Elec Voltage Asymmetry	0.10
21-Apr-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Monthly Lubrication	0.80

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28-Apr-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Grid Down from EB	2.60
03-May-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Monthly Lubrication	1.00
08-May-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Elec Yaw Sensor Err Stop	0.40
15-Jul-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Grid Down from EB	0.20
16-Jul-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Elec Voltage Asymmetry	0.10
13-Sep-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Monthly Lubrication	1.00
19-Sep-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Elec Yaw Sensor Err Stop	0.30
14-Nov-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 41N	0.85	Monthly Lubrication	1.00
16-Dec-18	Shyam Metalics & Energy Ltd	Maharashtra	Sangli	GJ 09N1	0.85	Grid Down from EB	2.60



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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
07.0	31 May 2019	Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN);</li> <li>• Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period;</li> <li>• Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes;</li> <li>• Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods;</li> <li>• Make editorial improvements.</li> </ul>
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN);</li> <li>• Make editorial improvements.</li> </ul>
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> <li>• Include provisions related to delayed submission of a monitoring plan;</li> <li>• Provisions related to the Host Party;</li> <li>• Remove reference to programme of activities;</li> <li>• Overall editorial improvement.</li> </ul>
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> <li>• Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0));</li> <li>• Include provisions related to standardized baselines;</li> <li>• Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1;</li> <li>• Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>;</li> <li>• Editorial improvement.</li> </ul>
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.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		