Monitoring report form for CDM project activity
(Version 08.0)

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

MONITORING REPORT			
Title of the project activity	15 MW Wind Energy Project in Maharashtra		
UNFCCC reference number of the project activity	1778[1]		
Version number of the PDD applicable to this monitoring report	03		
Version number of this monitoring report	01		
Completion date of this monitoring report	31/08/2021		
Monitoring period number	04		
Duration of this monitoring period	01/07/2012 to 31/03/2016 (Inclusive of both dates)		
Monitoring report number for this monitoring period	Not Applicable		
Project participants	1. M/s D. J. Malpani (India) 2. Eneco Energy Trade B.V. (United Kingdom of Great Britain and Northern Ireland)		
Host Party	India		
Applied methodologies and standardized baselines	Methodology: AMS- I. D:- Grid connected renewable electricity generation, Version 11[2] Standardized Baseline: NA		
Sectoral scopes	01- 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
	9,893 tCO_2e	64,309 tCO_2e	0 tCO_2e
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	97,018 tCO_2e		

[1] https://cdm.unfccc.int/Projects/DB/BVQI1207584460.66/view

[2] https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK

SECTION A. Description of project activity

A.1. General description of project activity

The main purpose of the project activity is the implementation and operation of 15 MW wind farms to generate electricity in high wind speed areas of Maharashtra. M/s D. J. Malpani (DJM) is the promoter of these wind farms. The project activity consists of 12 wind electric generators (WEGs) installed in three phases at various locations within Maharashtra. The generated electricity from WEGs is connected to state electric utility namely Maharashtra State Electricity Distribution Company Limited (MSEDCL) and transmitted through state electric grid.

Phase	WEG Location No.	Installed Capacity (MW)	Technology	Village, District	Substation
Phase - I	K 400	1.25	SUZLON, S70	Mandal, Nandurbar	Jamde Substation
Phase - I	K 401	1.25	SUZLON, S70	Mandal, Nandurbar	Jamde Substation
Phase - I	K 402	1.25	SUZLON, S70	Akhatwade, Nandurbar	Jamde Substation
Phase - I	K 407	1.25	SUZLON, S70	Mandal, Nandurbar	Jamde Substation
Phase - I	K 412	1.25	SUZLON, S70	Mandal, Nandurbar	Jamde Substation
Phase - I	K 413	1.25	SUZLON, S70	Mandal, Nandurbar	Jamde Substation
Phase - II	K 254	1.25	SUZLON, S70	Dhavlivihar, Dhulia	Valve Substation
Phase—II	K 118	1.25	SUZLON, S70	Titane, Dhulia	Jamde Substation
Phase - III	J 114	1.25	SUZLON, S70	Isharde, Dhulia	Jamde Substation
Phase - III	J 115	1.25	SUZLON, S70	Isharde, Dhulia	Jamde Substation
Phase - III	J 127	1.25	SUZLON, S70	Isharde, Dhulia	Jamde Substation
Phase - III	J 128	1.25	SUZLON S70,	Isharde, Dhulia	Jamde Substation
Total		**12 machines**		**15MW**	

During the reported monitoring period 01/07/2012 to 31/03/2016 (First and last date included) the project activity has supplied 82,676 MWh of electricity, and thus contributing to the GHG reductions of 74,202 tCO_{2e}.

A.2. Location of project activity

Host Party: India

State: Maharashtra

City/ Town/ Community: Dhule and Nandurbar

Physical/ Geographical location: GPS coordinates is provided under the below table:-

Phase	Windmill Location	Addresses	Latitude	Longitude
Phase-I	K 400	Gut No. 168/4/P, Village-Mandal, Taluka-Nandurbar, Dist.: Nandurbar	21° 21´57.29˝ N	74° 14’27.60”E
Phase-I	K 401	Gut No. 161/1A/1, Village-Mandal, Taluka-Nandurbar, Dist.: Nandurbar	21° 21´57.29˝ N	74° 14’27.60”E
Phase-I	K 402	Gut No. 46/P, Village-Akhatwade, Taluka-	21° 21´57.29˝ N	74° 14’27.60”E

		Nandurbar, Dist.: Nandurbar		
Phase-I	K 407	Gut No. 370/1/P, Village-Mandal, Taluka-Nandurbar, Dist.: Nandurbar	21° 21´57.29˝ N	74° 14'27.60"E
Phase-I	K 412	Gut No. 375/1/P, Village-Mandal, Taluka-Nandurbar, Dist.: Nandurbar	21° 21´57.29˝ N	74° 14'27.60"E
Phase-I	K 413	Gut No. 378/1B/P, Village-Mandal, Taluka-Nandurbar, Dist.: Nandurbar	21° 21´57.29˝ N	74° 14'27.60"E
Phase-II	K 254	Gut No. 74/1A/P, Village-Dhavlivihir, Taluka- Sakri, Dist.: Dhulia	20° 59'25.01"N	74° 18'51.54"E
Phase-II	K 118	Gut No. 43/1, Village-Titane, Taluka-Sakri, Dist.: Dhulia	20° 59'25.01"N	74° 18'51.54"E
Phase-III	J 114	R.S.No.16, Village-Isharde, Taluka- Sakri, Dist.: Dhulia	20° 59'25.01"N	74° 18'51.54"E
Phase-III	J 115	R.S.No.16, Village-Isharde, Taluka- Sakri, Dist.: Dhulia	20° 59'25.01"N	74° 18'51.54"E
Phase-III	J 127	R.S.No.16, Village-Isharde, Taluka- Sakri, Dist.: Dhulia	20° 59'25.01"N	74° 18'51.54"E
Phase-III	J 128	R.S.No.16, Village-Isharde, Taluka- Sakri, Dist.: Dhulia	20° 59'25.01"N	74° 18'51.54"E

Location Map of the Project Activity is been Provided below:-

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 Party)	M/s D.J. Malpani (Private Entity)	No
United Kingdom of Great Britain and Northern Ireland (Other Parties)	Eneco Energy Trade B.V. (Private Entity)	No

A.4. References to applied methodologies and standardized baselines

Title : AMS-I.D. - "Grid connected renewable electricity generation "(Version 11, EB 31)[3]

Reference : Appendix B of the simplified M & P for small-scale CDM project Activities

Tools referenced for this methodology:-

- Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion[4]
- Tool to calculate the emission factor for an electricity system[5]
- Tool to determine the remaining lifetime of equipment[6]

A.5. Crediting period type and duration

Type - Fixed

[3] https://cdm.unfccc.int/filestorage/C/D/M/CDMWF_AM_UYF1PQNDY5FZ4VH4HZ28FYAP13SI9W/AMS_I.D_rev_ver11.pdf?t=blN8cXlwOHU2fDBYeG5m9CtX5SzW4lHQbYup

[4] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v3.pdf

[5] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf

[6] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf

Duration – 24/10/2008 to 23/10/2018

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

All the machines are S70 make and have been developed by Suzlon Energy Ltd. (SUZLON) in association with its collaborators using state of the art technology. The primary driver for the development of the turbines was Suzlon's commitment to make wind energy more accessible - in terms of technology, yield and cost.

In wind energy generation, kinetic energy of wind is converted into mechanical energy and subsequently into electrical energy. Wind has considerable amount of kinetic energy when blowing at high speeds. Thiskinetic energy when passes through the blades of the WEG is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates, thereby producing electricity. The technology is a clean technology since there are no GHG emissions associated with the electricity generation.

The important parts of a windmill are:

I. Main Tower

This is a very tall structure with a door and inside ladder at the bottom. The door is used to enter into thetower for operation and maintenance.

II. Blades

The WEGs are provided with three blades. The blades are self-supporting in nature made up of Fibre Reinforced Polyester. The blades are mounted on the hub.

III. Nacelle

The Nacelle is the one which contains all the major parts of a WEG. The nacelle is made up of thick rugged steel and mounted on a heavy slewing ring. Under normal operating conditions, the nacelle would be facing the upstream wind direction.

IV. Hub

The Hub is an intermediate assembly between the wing and the main shaft of the wind turbine. Inside the hub, a system to actuate the aerodynamic brake is fitted. The hub is covered with nose cone.

V. Main Shaft

The shaft is to connect the gear box and the hub. Solid high carbon steel bars or cylinders are used as main shaft. The shaft is supported by two bearings.

VI. Gear Box. Bearing and Housing

The gearbox is used to increase the speed ratio so that the rotor speed is increased to the rated generator speed. Oil cooling is employed to control the heating of the gearbox. Gearboxes are mounted over dampers to minimize vibration. The main bearings are placed inside housing.

VII. Brake

Brake is employed in the WEGs to stop the wind turbine mainly for maintenance check. Brakes are also applied during over speed conditions of the wind turbine. The brakes are placed on the high speed shaft.

VIII. Generator

The generator uses induction type of generator. The generators are provided with monitoring sensors in each phase winding to prevent damage to the generators.

Technical Details of 1.25 MW (S 70) WTG

S. No.	Particulars	Specifications
1.	Rotor diameter	69.1 m
2.	Hub height	74 m
3.	Installed electrical output	1250 kW
4.	Cut-in wind speed	3 m/s
5.	Rated wind speed	12 m/s
6.	Cut-out wind speed	20 m/s
7.	Rotor swept area	3750 m^2
8.	Rotational speed	13.2/19.8
9.	Rotor material	GRP
10.	Regulation	Pitch
11.	Generator	Asynchronous Generator, 4/6 poles
12.	Rated output	250/1250 kW
13.	Rotational speed	1010/1515 rpm
14.	Operating voltage	690 V
15.	Frequency	50 Hz
16.	Protection	IP 56
17.	Insulation class	H
18.	Cooling system	Air cooled
19.	Gear box	3 stage gear box, 1 planetary and 2 helical
20.	Manufacturer	Winenergy
21.	Gear ratio	77.848
22.	Nominal load	1390 kW
23.	Type of cooling	Oil cooling system
24.	Yaw drive system	4 active electrical yaw motors
25.	Yaw bearing	Polymide slide bearing
26.	Safety system	
26.1	Aerodynamic brake	3 times independent pitch regulation
26.2	Mechanical brake	Spring power disc brake, hydraulically released, fail safe.
27.	Control unit	Microprocessor controlled, indicating actual operating conditions, UPS back up system
28.	Tower	Tubular
29.	Design standards	GL/IEC

Commissioning Details of the Project Activity:-

Capacity	WTG Location No	WTG Supplier	Location	Date of Commissioning
1.25 MW	K 413		Mandal,Nandurbar	26-03-2006

1.25 MW	K 407	Suzlon Energy Pvt.Ltd	Mandal Nandurbar	06-03-2006
1.25 MW	K 402		Akahtwade, Nandurbar	06-02-2006
3.75 MW	K400,K401&K412		Mandal, Nandurbar	31-12-2005
1.25MW	K 254		Dhavivhir, Dhule	31-03-2006
1.25 MW	J 115		Isharde, Dhule	24-08-2006
2.5 MW	J114,& J128		Isharde, Dhule	13-08-2006
1.25 MW	J 127		Isharde, Dhule	16-08-2006
1.25 MW	K 118		Titane, Dhule	29-03-2006

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 for this monitoring period

B.2.2. Corrections

Not Applicable for this monitoring period

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

Not Applicable for this monitoring period

B.2.4. Inclusion of monitoring plan

Not Applicable for this 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

Yes, revision of the monitoring plan has been approved on date 02/08/2010[7].

B.2.6. Changes to project design

Not Applicable for this monitoring period.

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

Not Applicable for the project activity.

SECTION C. Description of monitoring system

The project activity essentially involves generation of electricity from wind, the employed WEG can only convert wind energy into electrical energy and cannot use any other input fuel for electricity generation. Thus no special ways and means are required to monitor leakage from the project activity.

- The proposed project activity requires evacuation facilities for sale to grid and the evacuation facility is essentially maintained by the state power utility (MSEDCL).
- The electricity generation measurements are required by the utility and the investors to assess electricity sales revenue and / or wheeling charges.
- The project activity has therefore envisaged two independent measurements of generated electricity from the wind turbines.

[7] https://cdm.unfccc.int/filestorage/2/D/4/2D4E9H7SQ58PXIO0B61AGWJZTNKLCF/Malpani%20Revised%20MP.pdf?t=RHh8cXlwOXR5fDAqXEWbOGON7tCzbVENC3nE

- 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). Machines for sale to utility are connected to the feeder.

- 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 signsthe recorded reading.
- The secondary monitoring, which provides a backup (fail-safe measure) in case the primary monitoring is not carried out, would be done at the individual WEGs. Each WEG is equipped with an integrated electronic meter. These meters are connected to the Central Monitoring Station (CMS) of the entire wind farm through a wireless Radio Frequency (RF) network (PLC). The generation data of individual machine can be monitored as a real-time entity at CMS. The snapshot of generation on the last day of every calendar month are kept as a record both in electronic as well as printed (paper) form.

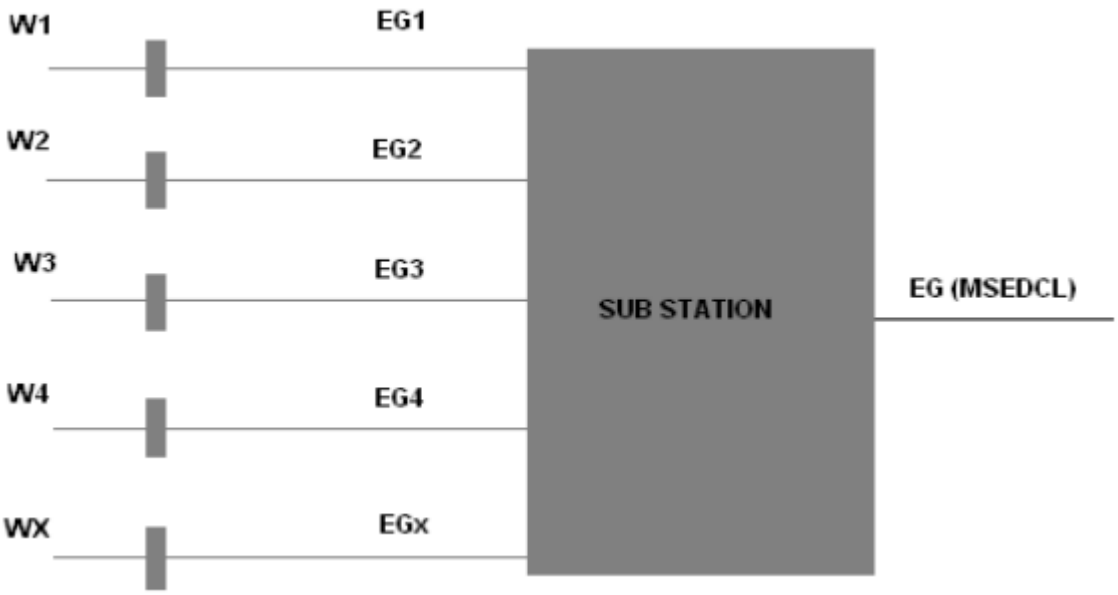
Trivector Meter - is a device that measures the amount of electrical energy supplied to the utility. It is called as tri-vector meter because it measures energy consumption of the three phase lines R, Y, B which are 120 phase difference from each other. It measures the consumption in terms of the active energy, reactive energy, apparent energy, power factor.

Description of calibration of WEG Controller

SCS Controller is a micro-processor based intelligent controller which has been specially designed for control of wind turbines. It uses a Woodward Multi function Relay that has three current inputs from CT and three direct voltage inputs (690 Volts). The analog values of current/voltage are converted into digital signal internally using A/D Converters at very high sampling rate. A software program reads these values and displays instantaneous parameters such as voltage, current, power factor, kVAh, kVArh and kWh. These instantaneous values are then time integrated and displayed/stored. Woodward relay does not have a display and needs special protocol to view energy readings as this relay communicates digital signal through special communication protocol hence, it is not possible to calibrate. Moreover, turbine can not run without this relay hence it can not be removed for calibration during operation.

Description of billing calculation from net meter to individual meters

Each substation is connected to approximately 50 wind turbines. The generation reading is collectively displayed by the substation meter. The net generation of each of the wind turbines is then calculated in the following manner:



The generated electricity is measured through inbuilt control panel meter of the WTGs. The monitoring of electricity generation from all these wind turbines is done at common monitoring station as a part of central monitoring system. The system consists of a state- of- the- art controlling and monitoring and well trained staff personnel of O&M contractor, Suzlon Energy Limited, are always present on site to monitor various parameters of power generation and deal with any problems related to generation, transmission or maintenance. The Electricity Generated from the wind turbine/s (either individual or group) of the project proponent in MWh is presented as

$$\sum_{0}^{n} EG_{n,y}$$

And the summation of total Electricity Generated from all the wind turbines at the given site and connected to common bulk meter in MWh as measured at inbuilt control panel meters of the WTGs is presented as:

$$\sum_{0}^{m} EG_{m,y}$$

A ratio based on these two set of measured values is used for apportioning the net electricity supplied to the western regional grid (Now integrated in to NEWNE Grid) by the project activity. The second metering is carried out at grid interconnection point (sub station) wherein the Joint Meter Reading (JMR) is carried out, usually in the first week of every month, in presence of the representatives of the project proponent & the state electricity utility (MSEDCL). This JMR is used for calculation of the amount of electricity supplied to the grid against which the utility makes the payment to the project proponent. The JMR gives both the “export” ($EG_{JMR,export}$) and “import” ($EG_{JMR,import)}$ of the electricity to/ from the western grid (Now integrated in to NEWNE Grid).. There are common bulk meter which monitors both the export and import of electricity to the grid.

$$EGy = \left[\frac{\sum_{0}^{n} EG_{n,y}}{\sum_{0}^{m} EG_{m,y}} \right] X \; EG_{MSEDCL}$$

Where,

EG_y	Net Electricity exported to the grid by the Project Activity.
$\sum_{0}^{n} EG_{n,y}$	Electricity generation by WTG/s owned by DJM (either individual or group)
EG_{MSEDCL}	Total net electricity supplied to the grid measured at the substation by common bulk meters (main and chech meter).
$\sum_{0}^{m} EG_{m,y}$	Total electricity generation by the WTGs connected to the common bulk meters

For this project the feeder connections are as follows:

WTG Location No.	WTG Connected on 220 kV/ 33 kV Feeder
K 400	Jamde 15
K 401	Jamde 08
K 402	Jamde 15
K 407	Jamde 08
K 412	Jamde 15
K 413	Jamde 15
K 254	Valve I
K 118	Jamde 04
J 114	Jamde 03
J 115	Jamde 03
J 127	Jamde 03
J 128	Jamde 03

Recording of generation at the joint meter (JMR) is usually from 1st of one month to 1st or 2nd of next month.

Routine Maintenance Services:

The project proponents have signed an “Operation and Maintenance” agreement with the supplier of the wind turbines for the operation of the wind farm. The O & M management structure is as follows:

Routine Maintenance Labour Work involves making available suitable manpower for operation and maintenance of the equipment and covers periodic preventive maintenance, cleaning and upkeep of the equipment including –

a) Tower Torquing
b) Blade Cleaning c)
c) Nacelle Torquing and Cleaning
d) Transformer Oil Filtration

e) Control Panel & LT Panel Maintenance
f) Site and Transformer Yard Maintenance

Security Services: This service includes watch & ward and security of the wind farm and the equipment.

Management services:

a) Data logging in for power generation, grid availability, machine availability.
b) Preparation and submission of monthly performance report in agreed format.

c) Taking monthly meter reading jointly with utility of power generated at wind farm and supplied to grid from the meter/s maintained by utility for the purpose and co-ordinate to obtain necessary power credit report/ certificate.

Technical Services:

a) Visual inspection of the WEG and all parts thereof.
b) Technical assistance including checking of various technical, safety and operational parameters of the equipment, trouble shooting and relevant technical services.
c) Annual and monthly training schedules are organized by the manufacturers and suppliers of the wind turbines.

The responsibilities of CDM project team is presented below

Designation	Responsibilities
Project Head	• Overall performance monitoring • Project Execution
Project Executer and Controller	• Operation • Verification of data • Site visit to check authenticity of data and take corrective action, wherever necessary • Storage of data
Site Main Controller	• Operation, Monitoring and Verification of data • Data recording • Storage of data

Training

Training of staff operating and maintaining the WTGs is carried out by the WTG manufacturer and supplier (Suzlon). Special emphasis is given to the training of the employees to enable them to develop their skills to meet changing WTG technology and to provide efficient and effective O&M services. There is an initial learning programme as well as continuous learning programmes for all employees. All newly-hired employees are required to attend an intensive two- to four-week, full-time training programme to familiarize them with business and operations.

Besides the usual training programs for their staff Suzlon conducts specific familiarization capsules for customers, such that they are fully aware of the capabilities of the highly sophisticated WECs of Suzlon.

The training programme focuses mainly on the management, monitoring and maintenance, and safety and reliability aspects of wind power. The objectives include:

1. Understanding the various stages and aspects in the management of Wind Power systems

2. Understanding the importance of monitoring and maintenance of Wind Power systems and hence the various tasks involved in this.
3. Understanding the importance of safety and reliability aspects involved with Wind Power and the measures taken.
4. Managing generation and other data for future reference.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	EF_{grid}
Unit	tCO_2/MWh
Description	tons of CO_2 per MWh of electricity produced by the project activity
Source of data	CO_2 Baseline Database for the Indian Power Sector, User Guide, Version 3.0 CEA
Value(s) applied	0.8975
Choice of data or measurement methods and procedures	The value has been provided by Central Electricity Authority for the year 2006-2007
Purpose of data/parameter	The data is used for the Baseline emission calculation
Additional comments	This is fixed ex-ante parameter for the crediting period

D.2. Data and parameters monitored

Data/Parameter	EG_y
Unit	MWh
Description	Net Electricity exported to the grid by the Project Activity.
Measured/calculated/ default	Calculated based on the measured parameters
Source of data	Joint meter reading issued by MSEDCL for promoter with the help of O & M contractor by applying logic of apportioning described in section B.7.2 of PDD.
Value(s) of monitored parameter	82,676
Monitoring equipment	Monitored through meters and through the electricity bill by the distribution company
Measuring/reading/recording frequency	Monthly recording
Calculation method (if applicable)	Taken from Joint meter reading issued by MSEDCL for promoter, however the calculation method is given below Net Electricity exported to the grid by the Project Activity is calculated based on the monitoring parameter- $\sum_0^n EG_{n,y}$, EGMSEDCL and $\sum_0^m EG_{m,y}$ $$EGy = \left[\frac{\sum_0^n EG_{n,y}}{\sum_0^m EG_{m,y}}\right] \times EG_{MSEDCL}$$ The Data (i.e. $\sum_0^n EG_{n,y}$ and $\sum_0^m EG_{m,y}$) measured at inbuilt control panel meter of the WTGs of the project activity and recorded by SUZLON at CMS was provided to the MSEDCL for apportioning and for calculating the net electricity exported by WTG's in Joint Meter Reading Report issued by MSEDCL.

QA/QC procedures	The project revenue is based on the net units displaced as calculated by applying apportioning logic on the values that are monitored with the help of metering system involving common bulk meter and inbuilt control panel meter of the WTGs. The common bulk meters constitute main meter and check meter. The accuracy of the main meter and check meter has been verified by comparing with each other. The calibration of the common bulk meters (main & check meter) has been done by state utility on annul basis or as per the schedule of MSEDCL.
Purpose of data/parameter	Used for Baseline Emission calculation
Additional comments	--

Data/Parameter	$\sum_{0}^{n} EG_{n,y}$
Unit	MWh
Description	Electricity generation by WTG/s owned by DJM (either individual or group)
Measured/calculated/ default	Calculated based on the measured parameters
Source of data	Source: Joint meter Reading report Monitored through inbuilt control panel meters of the WTGs. The O & M contractor further aggregates (calculates) the monitored readings to arrive at "Total electricity generation by WTGs owned by DJM"
Value(s) of monitored parameter	82,676
Monitoring equipment	Monitored through inbuilt WTG Controller meter. The inbuilt control panel meters are of accuracy class 0.2 The inbuilt control panel meter is not possible to calibrate (as per detailed description under "Description of calibration of WTG Controller" in section B.7.2 of the revised monitoring plan).
Measuring/reading/recording frequency	The electricity generated by the WTGs of DJM is monitored with the help of inbuilt control panel meters installed on all the WTGs. The data is continuously measured at each WTG by inbuilt control panel meter and recorded at CMS maintained by O & M contractor.
Calculation method (if applicable)	Not Applicable
QA/QC procedures	The inbuilt controller meter is of accuracy class 0.2.
Purpose of data/parameter	Used for Baseline Emission calculation
Additional comments	--

Data/Parameter	$\sum_{0}^{m} EG_{m,y}$
Unit	MWh
Description	Total Electricity generation by all the WTGs connected to the common bulk meters.
Measured/calculated/ default	Measured
Source of data	Source: Joint meter Reading report Monitored through inbuilt control panel meters of the WTGs. The O & M contractor further aggregates (calculates) the monitored readings to arrive at "Total electricity generation by all the WTGs connected to the common bulk meter".

Value(s) of monitored parameter	82,676
Monitoring equipment	Monitored through inbuilt WTG Controller meter. The inbuilt control panel meters are of accuracy class 0.2 The inbuilt control panel meter is not possible to calibrate (as per detailed description under "Description of calibration of WTG Controller" in section B.7.2 of the revised monitoring plan).
Measuring/reading/recording frequency	The electricity generated by all the WTGs (including WTGs of DJM) is monitored with the help of inbuilt control panel meters installed on all WTGs (which are connected to common bulk meters i.e. main meter & check meter). The data is continuously measured at each WTG by inbuilt control panel meter and recorded at CMS. However access to this reading for WTGs other than that of DJM is not available and the reading are directly reflected in the JMR which is issued by MSEDCL on monthly basis.
Calculation method (if applicable)	Not Applicable
QA/QC procedures	The inbuilt controller meter is of accuracy class 0.2.
Purpose of data/parameter	Used for Baseline Emission calculation
Additional comments	--

Data/Parameter	**EG_{MSEDCL}**
Unit	MWh
Description	Total net electricity supplied to the grid measured at the substation by common bulk meters (main and check meter).
Measured/calculated/ default	Calculated
Source of data	Source: Joint meter Reading report This parameter is calculated by subtracting imported electricity from the exported electricity to grid and monitored with the help of bulk meters.
Value(s) of monitored parameter	82,676
Monitoring equipment	Energy Meters
Measuring/reading/recording frequency	The electricity generated by the WTGs of DJM is monitored with the help of inbuilt control panel meters installed on all the WTGs. The data is continuously measured at each WTG by inbuilt control panel meter and recorded at CMS maintained by O & M contractor.
Calculation method (if applicable)	Net export from all the WTGs is calculated by subtracting import from the export. Export and import of electricity is continuously measured at the common bulk meters (i.e. main meter & check meter). The readings at the common bulk meter are taken on a monthly basis, in presence of the representative of MSEDCL & O & M contractor (PP's representative).
QA/QC procedures	The common bulk meters constitute main meter and check meter. The meters are of accuracy class 0.2. The accuracy of the main meter and check meter has been verified by comparing with each other. The calibration of the common bulk meters (main & check meter) has been done by state utility on annual basis or as per the schedule of MSEDCL.
Purpose of data/parameter	Used for Baseline Emission calculation
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 baseline emissions (BE_y) are the product of the baseline emissions factor ($EF_{grid,CM,y}$), times the net electricity supplied by the project activity to the national grid (EG_{PJ}), as per the formulae given below:

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

Where:

BE_y = Baseline emissions in year y (tCO_2/yr)
$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)
$EF_{grid,CM,y}$ = Combined margin CO emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_2/MWh)

The baseline emission factor is ($EF_{grid,CM,y}$) is fixed ex ante in the project's first crediting period at 0.8975 tCO_2/MWh.

Total Baseline Emission for the Monitoring Period of 01/04/2016 to 23/10/2018 (First and last date included) as follows:

BEy = 82,676 MWh x 0.8975 tCO_2e/MWh

BEy =74,202 tCO_2e (Rounded Value)

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

Being a wind energy project, the project activity does not lead to any form of emission; hence project emission has not been considered in this case.
Hence, PE_y= 0

E.3. Calculation of leakage emissions

The leakage emission for the project activity is considered as Zero.
Hence, LE_y=0

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

	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)			
				Before 01/01/ 2013	From 01/01/ 2013 until 31/12/ 2020	From 01/01/ 2021	Total amount
Total	74,202	0	0	9,893	64,309	0	74,202

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

Amount achieved during this monitoring period (t CO_2e)	Amount estimated ex ante for this monitoring period in the PDD (t CO_2e)
74,202	97,018

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

Considering the annual average emission reductions as per the registered PDD which is 25,848 tCO_2e per year, the number of days covered during the current monitoring period comes out to be 1,370 days, based upon which the estimated emission reductions attributed to this monitoring period comes out to be 97,018 tCO_2e. The detailed calculation can be referred from the emission reduction sheet.

E.6. Remarks on increase in achieved emission reductions

It is to be noted here that as per the estimated emission reduction to be achieved from the project activity for the current monitoring period is 97,018 tCO_2e, whereas actual emission reductions achieved are 74,202 tCO_2e, which is approximately 23.51 % lower than the estimated emission reductions.

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

The project activity remains as a small -scale project activity for the entire monitoring period.

Document Information

Version	*Date*	*Description*
08.0	6 April 2021	Revision to: • Reflect the "Clarification: Regulatory requirements under temporary measures for post-2020 cases" (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.

Version	*Date*	*Description*
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