



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 | Jangi 91.8 MW wind farm in Gujarat | | |
| UNFCCC reference number of the project activity | 6702 | | |
| Version number of the PDD applicable to this monitoring report | 3.0 | | |
| Version number of this monitoring report | 01 | | |
| Completion date of this monitoring report | 20/04/2021 | | |
| Monitoring period number | 04 | | |
| Duration of this monitoring period | 01/06/2018 to 31/12/2020 (Inclusive of both dates) | | |
| Monitoring report number for this monitoring period | 01 | | |
| Project participants | GP Wind (Jangi) Private Limited | | |
| Host Party | India | | |
| Applied methodologies and standardized baselines | Methodology: ACM0002 ver. 12.3 – Consolidated baseline methodology for grid-connected electricity generation from renewable sources. Standardized Baseline: NA | | |
| Sectoral scopes | 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 |
| | 0 tCO ₂ | 525,873 tCO ₂ | 0 tCO ₂ |
| Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD | 658,981 tCO ₂ | | |

SECTION A. Description of project activity

A.1. General description of project activity

The purpose of Jangi 91.8 MW wind farm in Gujarat (hereafter referred to as “the project”) is to utilise the wind resources for power generation to alleviate electricity shortage in Northern, Eastern, Western, and North-Eastern (hereafter referred to as “NEWNE”) regions (now is a part of Unified Indian Grid). The generated electricity is delivered to NEWNE grid (now Unified Indian Grid), which is dominant of fuel-fired power plants.

The project is a wind farm project with installed capacity 91.8 MW, consisting of 51 sets 1.8 MW V100 class 3 turbines which are manufactured by Vestas Denmark.

The project implementation was started on 02/12/2010. The 1st turbine was put into operation on 31/08/2011 and the project is fully operational from 23/12/2011.

Purpose of the project activity:

The purpose of this project is to generate environmentally friendly, clean, GHG-emission-free-electricity, which will reduce the overall GHG emissions resulting from conventional electricity generation activities.

Scenario existing prior to the start of the implementation of the project activity:

The project activity forms a part of the NEWNE Grid of India (now part of Unified Indian Grid). The project activity generates power by using the kinetic energy of wind, thus resulting in zero emissions during electricity production. The power produced displaces an equivalent amount of power from the grid, which is generated mainly by fossil fuel fired power plants. Hence, the project activity results in reduction of GHG emissions. Hence, in the absence of this project activity, this power would be otherwise generated by grid connected fossil fuel based power plants.

Project Scenario:

Wind powered electricity generation is considered environmentally friendly. It replaces some of the fossil fuel dominated electricity generation mix of the current grid and contributes to GHG emission reduction.

The project activity generates electricity by using the kinetic energy of flowing wind. There are no GHG emissions during electricity production in this way. The electricity produced displaces an equivalent amount of power from the existing grid, which is currently generated mainly by fossil fuel fired power plants. Hence, it reduces GHG emissions.

A.2. Location of project activity

The project is located in Jangi town, Kutch District, Gujarat, India. The project site is about 20km South East from Samakhiali town. The access to the project site is through village roads of Vandhiya, Modpar, Lakhapar and Jangi, situated along the National Highway No.8A. It is situated between Latitudes 23°15'02.0" and 23°11'22.0" North and between Longitudes 70°30'12.0" and 70°38'26.0" East with the average elevation varying from 8 to 30 meters above mean sea level. The project owns 52 parcels of land (51 turbine locations and 1 SCADA building location).

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) | GP Wind (Jangi) Private Limited | No |

A.4. References to applied methodologies and standardized baselines

ACM0002-Consolidated baseline and monitoring methodology for grid connected electricity generation from renewable sources (Version 12.3.0)¹

Tool for the demonstration and assessment of additionality (Version 06.1.0)

Tool to calculate the emission factor for an electricity system (Version 02.2.1)

A.5. Crediting period type and duration

Crediting Type - Fixed
 Length of Crediting Period - 10 Years
 Duration of Crediting Period - 01/11/2012 – 31/10/2022

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

The project is a wind farm project, the installed capacity of the project is 91.8 MW, consisting of 51 sets 1.8 MW turbines.

The project implementation was started on 02/12/2010. The 1st turbine was commissioned and put into operation on 31/08/2011 and the project was fully put into operation on 23/12/2011. The project was under normal and continued operation status until now.

| Sr. No. | WTG Location no. | Commissioning date | Sr. No. | WTG Location no. | Commissioning date |
|---------|------------------|--------------------|---------|------------------|--------------------|
| 1 | VW08 | 31/08/2011 | 26 | JW39 | 20/10/2011 |
| 2 | VW44 | 31/08/2011 | 27 | JW40 | 29/09/2011 |
| 3 | VW57 | 01/10/2011 | 28 | JW41 | 20/10/2011 |
| 4 | JW03 | 31/08/2011 | 29 | JW42 | 20/12/2011 |
| 5 | JW06 | 31/08/2011 | 30 | JW43 | 30/09/2011 |
| 6 | JW07 | 31/08/2011 | 31 | JW44 | 30/11/2011 |
| 7 | JW21 | 18/11/2011 | 32 | JW45 | 23/11/2011 |
| 8 | JW17 | 19/11/2011 | 33 | JW46 | 24/10/2011 |
| 9 | JW18 | 19/11/2011 | 34 | JW47 | 24/10/2011 |
| 10 | JW19 | 19/11/2011 | 35 | JW48 | 30/11/2011 |
| 11 | JW20 | 19/11/2011 | 36 | JW49 | 24/10/2011 |
| 12 | JW22 | 18/11/2011 | 37 | JW50 | 13/12/2011 |
| 13 | JW26 | 31/08/2011 | 38 | JW51 | 13/12/2011 |
| 14 | JW28 | 31/08/2011 | 39 | JW52 | 23/12/2011 |
| 15 | JW32 | 23/12/2011 | 40 | JW53 | 21/12/2011 |
| 16 | VW59 | 23/12/2011 | 41 | JW54 | 13/12/2011 |
| 17 | VW61 | 31/08/2011 | 42 | JW55 | 20/12/2011 |

¹ <https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG>

| | | | | | |
|----|------|------------|----|------|------------|
| 18 | VW70 | 23/12/2011 | 43 | JW56 | 17/12/2011 |
| 19 | JW24 | 30/09/2011 | 44 | JW57 | 20/12/2011 |
| 20 | JW31 | 31/08/2011 | 45 | JW58 | 20/12/2011 |
| 21 | JW33 | 03/09/2011 | 46 | JW59 | 17/12/2011 |
| 22 | JW34 | 03/09/2011 | 47 | JW60 | 20/12/2011 |
| 23 | JW35 | 01/10/2011 | 48 | JW61 | 20/12/2011 |
| 24 | JW36 | 29/09/2011 | 49 | JW62 | 20/12/2011 |
| 25 | JW37 | 23/11/2011 | 50 | JW63 | 12/11/2011 |
| | | | 51 | JW64 | 23/11/2011 |

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

B.2.2. Corrections

Not Applicable

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

The start date of crediting period was changed from 01/06/2013 to 01/11/2012. The same is approved by UNFCCC. Please refer UN web page for same.
<https://cdm.unfccc.int/Projects/DB/RWTUV1342443620.03/view>

B.2.4. Inclusion of monitoring plan

Not Applicable

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

Not Applicable

B.2.6. Changes to project design

Not Applicable

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

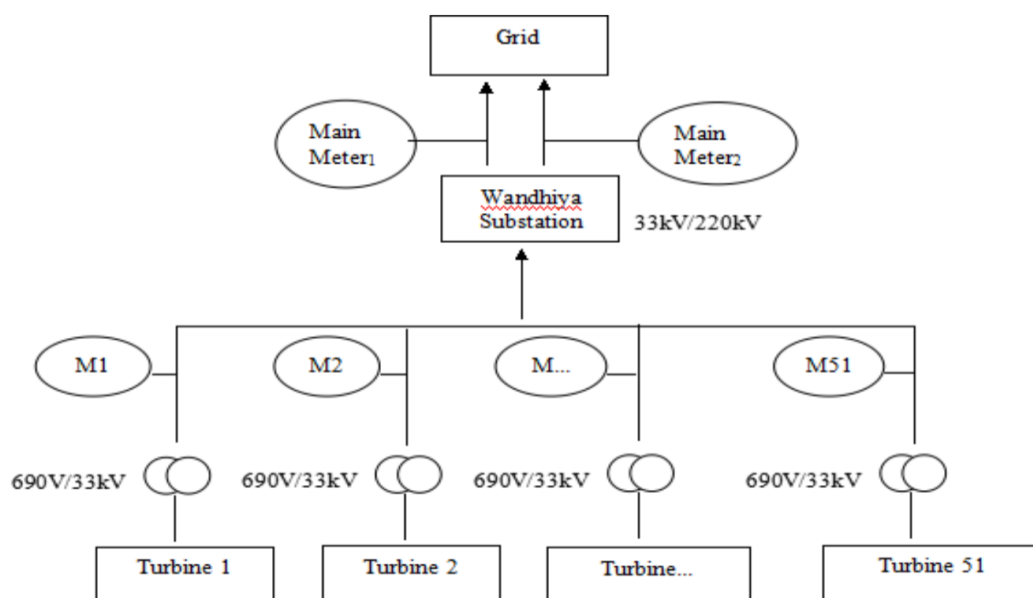
Not Applicable

SECTION C. Description of monitoring system

The generated electricity from the project is transmitted to the substation and then delivered to the grid through line 1 and line 2 respectively.

There are two bidirectional electronic meters (Main Meter 1 and Main Meter 2) installed at substation for line 1 and line 2 to monitor the power exported to power grid and power imported from power grid. Furthermore, there are also two backup meters with same accuracy and function for main meters to ensure the monitoring purpose if the main meter is found malfunction.

Besides the main meters and backup meters, there are 51 meters and their backup meters installed for each turbine to monitor the power generation of the project. The power electric connection diagram is as follow:



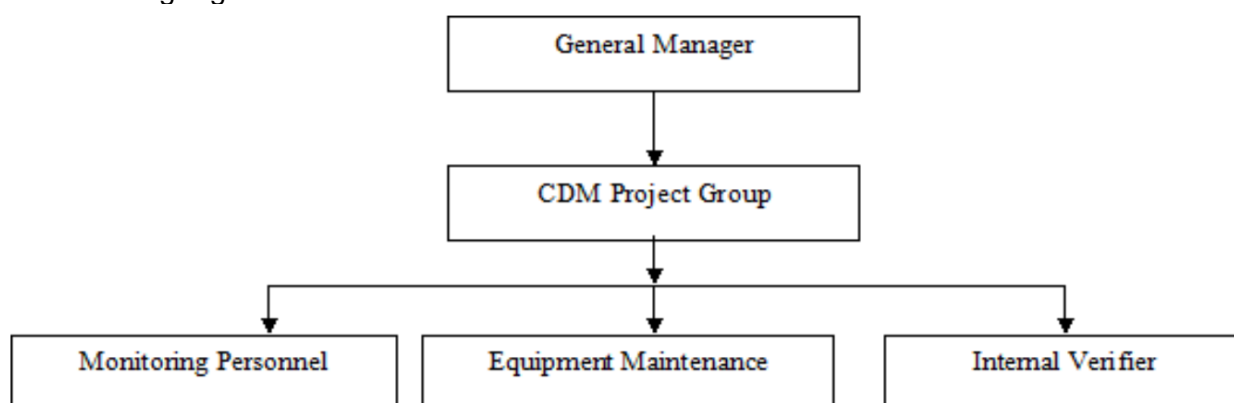
Data collection procedures:

The net electricity supplied to power grid data are measured continuously by 51 turbine meters and are recorded jointly by Grid Company & the Monitoring Personnel from project entity monthly. For monitoring data, based on the readings of meters and after accounting for line losses and grid imports, the power grid company provides the meter readings of 51 meters to project owner and the power grid company provides the net electricity supply data in the second/ third week of early of each month ('Share Certificate'). The Monitoring Personnel from project entity checks and confirms the net electricity supply data mentioned in the Share Certificate. The Internal Verifier from finance department of project entity issues the electricity sales receipts ('Invoices') after approval of general manager.

All the electronic (scanned documents of meter calibration records, scanned documents of sales receipts and electricity transaction notes) and paper monitoring documents are archived during the crediting period and two years after and also two years after last issuance of CERs.

Organizational structure:

The monitoring organizational structure is as follow:



Roles and responsibilities of personnel:

General Manager: General Manager is responsible for the overall management of the monitoring plan and for the internal verification of the monitored data.

CDM Project Group: It is consisted of Monitoring Personnel, Equipment Maintenance and Internal Verifier.

Monitoring Personnel: To conduct the monitoring task strictly based on the monitoring manual and registered PDD. The staffs are responsible for recording required monitored parameters, for reporting the monitoring results and for reporting the abnormal situation of the project. Each shift is responsible for the works.

Equipment Maintenance: To conduct the regular check and maintenance of equipment's.

Internal Verifier: Internal Verifier is appointed from financial department. The verifier is responsible for calculating the emission reductions regularly and for preparing the sales receipts of electricity transaction.

Training:

The project staffs have been trained respectively regarding operational regulations, quality control, data monitoring & archive and CDM knowledge.

Emergency procedures:

The backup meters will be used for monitoring when main meters are in malfunction status. The emergency report will be prepared by Monitoring Personnel and Equipment Maintenance together for reference.

During the given monitoring period, the meters were in well functions and no emergency situation happened.

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

| Data/Parameter | $EF_{grid\ CM,y}$ |
|--|--|
| Unit | tCO ₂ /MWh |
| Description | Combined margin CO ₂ emission factor for grid connected power generation |
| Source of data | "CO ₂ Baseline Database for the Indian Power Sector" version 6 ² published by the Central Electricity Authority, Ministry of Power, Government of India. |
| Value(s) applied | 0.9491 |
| Choice of data or measurement methods and procedures | Data used is from Indian authorities(CEA) |
| Purpose of data/parameter | Used for emission reductions calculation |
| Additional comments | N/A. |

D.2. Data and parameters monitored

| Data/Parameter | $EG_{facility,y}$ |
|----------------|-------------------|
| Unit | MWh |

² https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver6.pdf

| | |
|---------------------------------------|--|
| Description | Quantity of net electricity generation supplied by the project plant/unit to the grid in year y. |
| Measured/calculated/default | Measured |
| Source of data | Electricity meters |
| Value(s) of monitored parameter | 554,075.709 |
| Monitoring equipment | Bidirectional electronic meters. |
| Measuring/reading/recording frequency | Continuous measurement, monthly recording |
| Calculation method (if applicable) | None |
| QA/QC procedures | Meter records are cross-checked by invoices. All meters have back-up meters installed. Calibration procedures are in line with the wheeling agreement between the project owner and the grid company. Calibration expected every year, minimum every 3 years |
| Purpose of data/parameter | Used for calculation of baseline emission reductions |
| Additional comments | N/A. |

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

Baseline Emissions are calculated as:-

$$BE_y = EG_{\text{facility},y} * EF_{\text{grid,CM},y}$$

Where:

BE_y = Baseline emission in year y (tCO₂/yr)

$EG_{\text{facility},y}$ = 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).

$EF_{\text{grid,CM},y}$ = Combined margin CO₂ 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" (tCO₂/MWh).

Baseline emission factor (Combined Margin) ($EF_{\text{grid,CM},y}$) = 0.9491 tCO₂e/MWh

$$\begin{aligned} \text{Baseline Emission} &= EG_{\text{facility},y} * EF_{\text{grid,CM},y} = 554,075.709 \text{ MWh} \times 0.9491 \text{ tCO}_2\text{e/MWh} \\ &= 525,873 \text{ tCO}_2 \text{ (Rounded Down Value)} \end{aligned}$$

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

According to ACM0002, Version 12.3.0 the project emissions are zero.

Thus, $PE_y = 0$

E.3. Calculation of leakage emissions

According to ACM0002, Version 12.3.0 there are no leakage emissions. So $LE_y = 0$.

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 | 525,873 | 0 | 0 | 0 | 525,873 | 0 | 525,873 |

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) |
|---|--|
| 525,873 | 658,981 |

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 254,527 tCO₂e per year, the number of days covered during the current monitoring period comes out to be 945 days, based upon which the estimated emission reductions attributed to this monitoring period comes out to be 658,981 tCO₂e. 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 658,981 tCO₂e, whereas actual emission reductions achieved are 525,873 tCO₂e, which is approximately 20.2% lower than the estimated emission reductions. The generation of electricity depends upon many other climatic conditions, and not within the control of the project participant. The lower generation during the current verification period is hence due to certain natural conditions and low PLF.

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

Not Applicable as project activity is not a small-Scale project activity.

Document information

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

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