 <div style="text-align: center;"> Monitoring report form for CDM project activity (Version 09.0) </div>			
MONITORING REPORT			
Title of the project activity	5 MW Wind Power Project at Baramsar and Soda Mada, district Jaisalmer, Rajasthan, India.		
UNFCCC reference number of the project activity	0267 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	18/04/2022		
Monitoring period number	04		
Duration of this monitoring period	01/07/2011 – 15/06/2013 (Inclusive of both the dates)		
Monitoring report number for this monitoring period	NA		
Project participants	Transport Corporation of India Ltd. Asja Ambiente Italia S.p.A.		
Host Party	India		
Applied methodologies and standardized baselines	AMS-I.D Grid connected renewable electricity generation, Version-07 ² Standardized Baseline: Not Applicable		
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
	6,475 tCO ₂ e	1,977 tCO ₂ e	0 tCO ₂ e
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	11,385 tCO ₂ e		

¹ [CDM: 5 MW Wind Power Project at Baramsar and Soda Mada, district Jaisalmer, Rajasthan, India. \(unfccc.int\)](http://unfccc.int)

² [SSC I.D.pdf \(unfccc.int\)](http://unfccc.int)

SECTION A. Description of project activity

A.1. General description of project activity

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The project activity is an initiative by the Transport Corporation of India Limited towards clean energy generation by means of installation of 4 state-of-art Wind Electricity Generators of individual capacities 1.25 MW each, at two locations, village Baramsar (2.5 MW) and Mada (2.5 MW), District Jaisalmer in the State of Rajasthan aggregated to a total installed capacity of 5 MW.

The generated electricity from the aforesaid wind farm is evacuated to the RVPN grid under a power purchase agreement and subsequently all the electricity generated is sold to the state electricity utility. These WEGs have been installed in two phases at two locations namely Baramsar and Soda Mada in Jaisalmer district of Rajasthan. Phase 1 installed 2 X 1.25 MW WEGs in July 2003, while Phase 2 installed another 2 X 1.25 MW WEG in December 2004.

The purpose of the project activity is to meet the electricity demand of the NEWNE grid by generation of power utilizing the renewable wind energy in the region. Since wind energy projects entail zero project emissions, the project activity would result in reduction of greenhouse gas emissions which would have resulted if fossil fuel was used to generate the equivalent quantity of power.

This is the fourth monitoring period associated with the project activity. It covers the period from 01/07/2011 to 15/06/2013 (Both days included). The total emission reductions achieved in this monitoring period are 8,451 ERs.

The first monitoring period for the project activity is from 16/06/2003 to 01/07/2006 (Both days included) and was issued 12,600 CERs.

The second monitoring period for the project activity is from 02/07/2006 to 01/09/2008 (Both days included) and was issued 12,674 CERs.

The third monitoring period for the project activity is from 02/09/2008 to 30/06/2011 (Both days included) and was issued 14,183 CERs.

A.2. Location of project activity

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The wind farm is located at village Baramsar (Turbine location: J 70 and J 71) and Mada (Turbine location: J 227 and J 228) at District Jaisalmer in the state of Rajasthan.

District	: Jaisalmer
State	: Rajasthan
Latitude	: 27°02" N
Longitude	: 70°57" E
Height above MSL	: 150 – 325 m

The location has been chosen based on the available average wind power potential in the area established by the micro-siting studies done by the Suzlon Energy Limited (Supplier of WEGs).

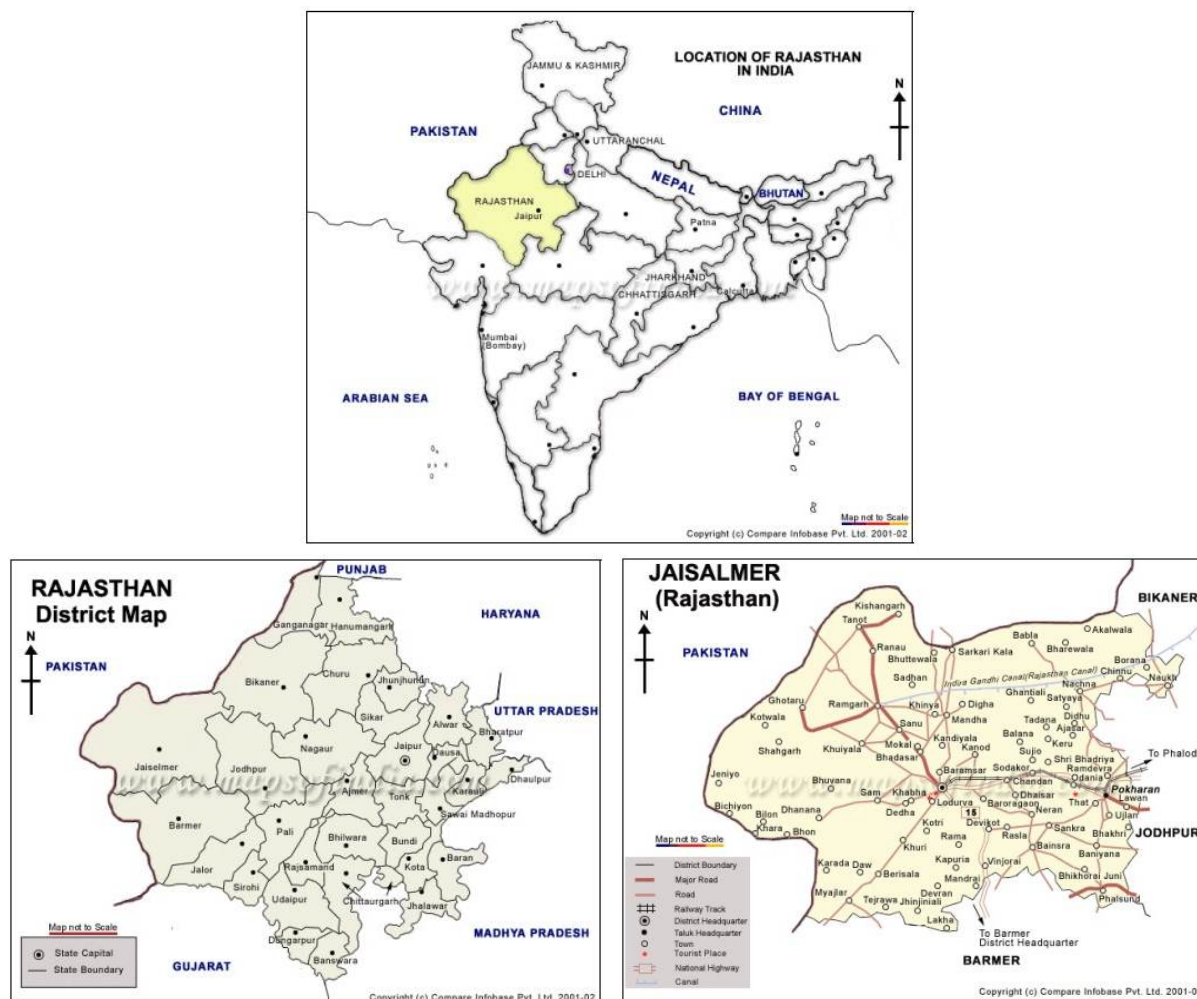


Fig.1: Project Location

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Government of India (Host Country)	Transport Corporation of India Ltd.	No
Italy	Asja Ambiente Italia S.p.A	No

A.4. References to applied methodologies and standardized baselines

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Type: I-Renewable Energy Projects

Category: D-Grid connected renewable electricity generation

Reference: AMS-I.D, version.07³

A.5. Crediting period type and duration

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Crediting period type: Fixed

Crediting period: 16/06/2003 – 15/06/2013

³ [CDM: Grid connected renewable electricity generation --- Version 18.0 \(unfccc.int\)](http://unfccc.int)

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

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The project activity is an initiative by the Transport Corporation of India Limited towards clean energy generation by means of installation of 4 state-of-art Wind Electricity Generators of individual capacities 1.25 MW each. These WEGs have been installed in two phases at two locations namely Baramsar and Soda Mada in Jaisalmer district of Rajasthan. Phase 1 installed 2 X 1.25 MW WEGs in July 2003, while Phase 2 installed another 2 X 1.25 MW WEG in December 2004.

Since, the capacity of the proposed project is only 5 MW, which is less than the maximum qualifying capacity of 15 MW, the project activity has been considered as a small scale CDM project activity and UNFCCC indicative simplified modalities and procedures are applied. The main purpose of the project activity is to generate electrical energy through sustainable means using wind power resources, to sell the generated output to the Northern Region Grid and to contribute to climate change mitigation efforts.

Apart from generation of renewable electricity, the project has also been conceived for the following:

- To enhance the propagation of commercialisation of MW class wind turbines in the region
- To contribute to the sustainable development of the region, socially, environmentally and economically

Technical description of the project

Individual state-of-art WEGs of capacity 1.25 MW has been installed. The salient features and technical details of the Suzlon 1.25 MW WEGs are as under:

The salient features of 1.25 MW WEGs is as follows:

1. Higher Efficiency - Designed to achieve increased efficiency and co-efficient of power (C_p)
2. Minimum Stress and Load - Well-balanced weight distribution ensures lower static & dynamic loads
3. Shock Load-free Operation - Advanced hydrodynamic fluid coupling absorbs peak loads and vibrations
4. Intelligent Control - Next gen technologies applied by extensive operational experience maximizes yield
5. Maximum Power Factor - High-speed asynchronous generator with a multi-stage intelligent switching compensation system delivers power factor up to 0.99
6. Climatic Shield - Hermetically sheltered, advanced over-voltage and lightning protection system
7. Unique Micro-Pitching Control - Unmatched fine pitching with 0.1° resolution to extract every possible unit of power
8. Grid-friendly - Grid friendly design generates harmonics-free pure sinusoidal power

A direct grid-connected high-speed generator, in combination with the multiple-stage combined spur/planetary gearbox of the Suzlon Megawatt Series, offers greater robustness and reliability than a low-speed generator connected to the electrical grid via AC-DC-AC-inverter systems. High-speed asynchronous generator with a multi-stage intelligent switching compensation system delivers power factor up to 0.99. The generated power is free from harmonics and is grid friendly.

Operating Data:

1. Rotor Height: 64 m
2. Hub Height: 65 m
3. Cut in Speed: 3 m/s
4. Rated Speed: 12 m/s
5. Cut out speed: 25 m/s
6. Survival Speed: 67 m/s

Rotor:

1. Blade: 3 Blade Horizontal Axis
2. Swept Area: 3217 m²
3. Rotational Speed: 13.9 to 20.8 rpm
4. Regulation: Pitch Regulated

Generator:

1. Type: Asynchronous 4 / 6 Poles
2. Rated Output: 250 / 1250 kW
3. Rotational Speed: 1006 / 1506 rpm
4. Frequency: 50 Hz

Gear Box:

1. Type: Integrated (1 Planetary & 2 Helical)
2. Ratio: 74.971:1

Yaw System:

1. Drive: 4 electrically driven planetary gearbox
2. Bearings: Polyamide slide bearings

Braking System:

1. Aerodynamic Brake: 3 independent systems with blade pitching
2. Mechanical Brake: Hydraulic fail safe disc braking system

Control Unit:

1. Type: Programmable microprocessor based; high speed data communication, active multilevel security, sophisticated operating software, advance data collection remote monitoring & control option, UPS backup, Real time operating indication.

B.2. Post-registration changes**B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents**

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The monitoring plan in the PDD was changed permanently after project registration. The registered PDD of the project includes some not required parameters in the monitoring plan. So, they are changed without impacting on the methodology, baseline and project boundary. The revised monitoring plan for the project activity was duly approved by the CDM Executive Board on 06/08/2010.

The revised monitoring plan was taken for the project activity in order to remove the inconsistent approach stating that the parameter "Electricity supplied to the regional electricity grid by the project" is measured continuously.

To improve the transparency and completeness of monitoring procedure and consistency of the applied Monitoring Methodology AMS-I.D version.07, the following parameters are included in the section D.3 of the registered PDD.

1. Net electricity supplied to the grid by the project (EG_y)
2. Gross electricity supplied to the grid by the project (EG_{export})
3. Electricity consumed from the grid by the project (EG_{import})
4. Controller generation by the project WEGs (EG_{controller generation})

Theoretically, there is no impact on the calculation of the emission reduction achieved by this project activity because the revision is aimed to make the parameter "net electricity export to the grid" transparent and clear because the parameter is calculated based on measured data but not directly measured by the energy meter installed at substation.

B.2.2. Corrections

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During this monitoring period, there is no any correction to the project information or parameters fixed at validation has been identified.

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

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There is no change in the start date of the crediting period, considering the monitoring plan has been implemented.

B.2.4. Inclusion of monitoring plan

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

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

>>

There are no any changes from registered monitoring plan or applied methodology.

B.2.6. Changes to project design

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

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

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The project activity is not an afforestation or reforestation activity.

SECTION C. Description of monitoring system

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The project activity's project boundary encompasses the physical, geographical site of the renewable generation source." The project boundary is composed of the Wind Energy Generators and the metering equipment for each generator and substation, and the grid (Northern grid) which is used to transmit the generated electricity.

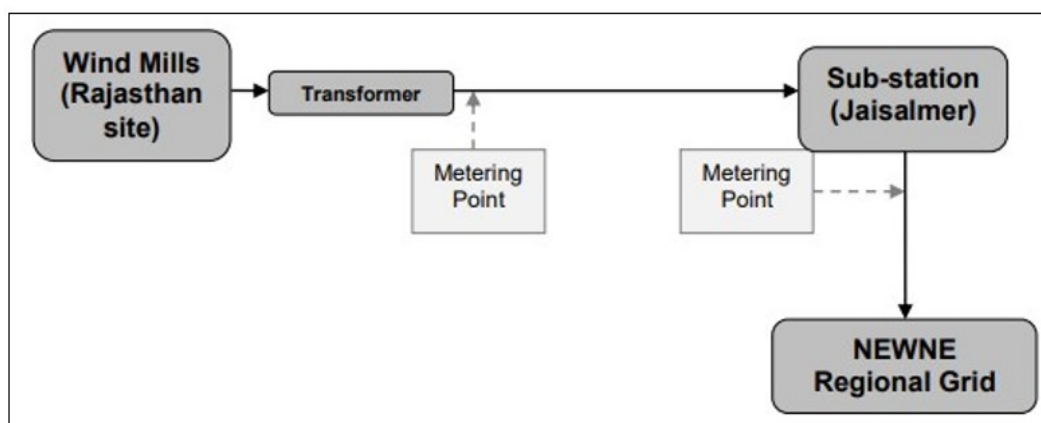


Fig.2: Single Line Diagram

In order to ensure the highest levels of accuracy in the monitoring of the parameters the project proponent have undertaken an Operation and Maintenance (O&M) agreement with the supplier of the WEGs i.e. SEL for a period of 20 years. The performance of the mills, safety in operation and scheduled / breakdown maintenances are organized and monitored by the contractor. SEL has appointed a Deputy General Manager at the main office who is the in-charge of the entire O&M team. The maintenance team is headed by the Deputy Manager and under him is the Assistant Manager. Two Senior Engineers have been appointed on the wind mill site to look after the WEGs and they report to the Assistant Manager about the various activities undertaken on a daily basis. The operations team consists of Senior Engineers, Engineers and Technicians who take the readings and prepare a daily generation report of all the WEGs. The organizational structure is described as follows:

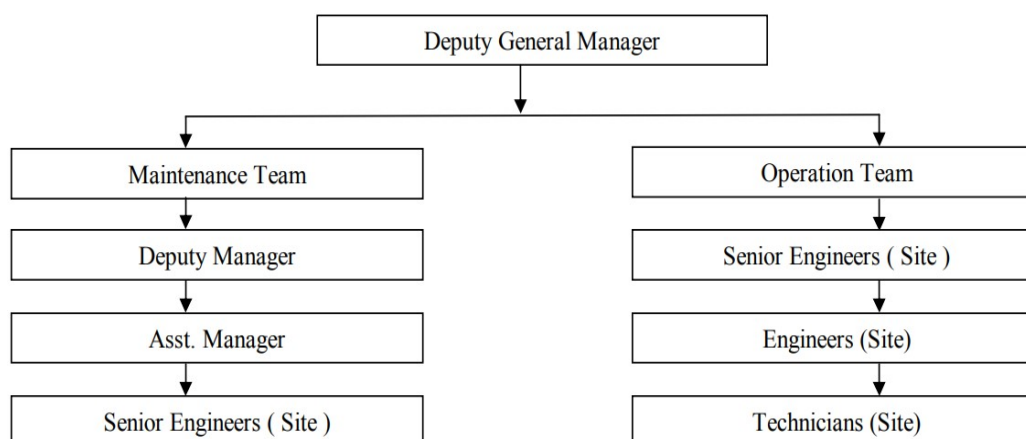


Fig.3: Organizational Structure

Data collection and archiving:

The following records are maintained in connection to the project:

- a. Monthly generation records, daily generation data of CoM, calibration and meter change records.

- b. Invoices, sale receipts and monthly electricity bills are available at the project proponent's head office.
- c. Any unusual condition such as discrepancies found during operation, meter failures, WEG breakdown, etc.

The data is archived for least a period of 2 years after the end of the crediting period, both in electronic as well as in paper form.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	EF _y
Unit	tCO ₂ /MWh
Description	CO ₂ baseline emission factor for the electricity displaced due to the project activity
Source of data	The baseline emission factor for the project activity has been calculated in the registered PDD using the power generation mix and recent capacity additions of Northern Regional electricity grid.
Value(s) applied	0.7678 tCO ₂ /MWh
Choice of data or measurement methods and procedures	The baseline emission factor EF _y is calculated as the weighted average of the Operating Margin emission factor (EF _{OM,y}) and the Build Margin emission factor (EF _{BM,y})
Purpose of data/parameter	Baseline emission calculations
Additional comments	This parameter has been fixed ex-ante for the entire crediting period in the registered PDD.

D.2. Data and parameters monitored

Data/Parameter	EG _y
Unit	MWh
Description	Net electricity supplied by the WTGs in the project activity to the grid
Measured/calculated/default	Calculated
Source of data	Joint meter reading sheets prepared by the state electricity board representatives and O&M Service provider// break-up sheet prepared by O&M Service provider.
Value(s) of monitored parameter	11,008 MWh
Monitoring equipment	Not Applicable
Measuring/reading/recording frequency	Monthly
Calculation method (if applicable)	<p>The amount of electricity exported by all the WTGs connected to energy meter to the grid and the amount of electricity imported from the grid is continuously measured with the help of the electronic meters both by the operator and grid representative together.</p> <p>Net electricity supplied by the project activity to the grid is calculated based on the measured values of export and import on the meter at the delivery point, where the Joint meter readings are taken by the O&M service provider and the representative of the state electricity board.</p> <p>EG_y = EG_{export} - EG_{import}</p>
QA/QC procedures	The quantity of net electricity supplied will be cross-verified from the invoices raised to the state electricity board. Data will be archived in joint meter reading sheets.
Purpose of data/parameter	Baseline emission calculations
Additional comments	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Data/Parameter	EG _{export}
Unit	MWh
Description	Gross electricity supplied to the grid by the project
Measured/calculated/default	Measured
Source of data	Joint meter reading sheets prepared by the state electricity board representatives and O&M Service provider// break-up sheet prepared by O&M Service provider.
Value(s) of monitored parameter	11,091 MWh
Monitoring equipment	Not Applicable
Measuring/reading/recording frequency	Monthly
Calculation method (if applicable)	Not Applicable
QA/QC procedures	<p>The electricity is measured with the help of the electronic meters both by the operator and grid representative together.</p> <p>Further the total exported value is apportioned on the basis of controller generation of each project's WEG. The whole process of apportioning is being carried out by the EPC contractor, Suzlon Energy Ltd., only, on the behalf of clients. Only monthly break up sheet for individual clients is provided to the respective clients.</p> <p>The meters installed on substation (grid interconnection point) are used to measure the mentioned parameter on a continuous basis. Every month these meter readings are recorded by plant personnel, these records will be archived for cross checking yearly figures.</p>
Purpose of data/parameter	Baseline emission calculations
Additional comments	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Data/Parameter	EG _{import}
Unit	MWh
Description	Electricity consumed from the grid by the project
Measured/calculated/default	Measured
Source of data	Joint meter reading sheets prepared by the state electricity board representatives and O&M Service provider and break-up sheet prepared by O&M Service provider.
Value(s) of monitored parameter	83 MWh
Monitoring equipment	Not Applicable
Measuring/reading/recording frequency	Monthly
Calculation method (if applicable)	Not Applicable

QA/QC procedures	<p>The electricity is measured with the help of the electronic meters both by the operator and grid representative together.</p> <p>Further the total imported value is apportioned on the basis of controller generation of each project's WEG. The whole process of apportioning is being carried out by the EPC contractor, Suzlon Energy Ltd., only, on the behalf of clients. Only monthly break up sheet for individual clients is provided to the respective clients.</p> <p>The meters installed on substation (grid interconnection point) are used to measure the mentioned parameter on a continuous basis. Every month these meter readings are recorded by plant personnel, these records will be archived for cross checking yearly figures.</p>
Purpose of data/parameter	Baseline emission calculations
Additional comments	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Data/Parameter	EG_{controller generation}
Unit	MWh
Description	Controller generation by the project WEGs
Measured/calculated/default	Measured
Source of data	Plant log books/measurement records
Value(s) of monitored parameter	11,530 MWh
Monitoring equipment	Not Applicable
Measuring/reading/recording frequency	Daily
Calculation method (if applicable)	Not Applicable
QA/QC procedures	<p>The electricity is measured with the help of controller meters at the control panel of each WEG.</p> <p>The meters installed on substation (grid interconnection point) are used to measure the mentioned parameter on a continuous basis. Every month these meter readings are recorded by plant personnel, these records will be archived for cross checking yearly figures.</p>
Purpose of data/parameter	Baseline emission calculations
Additional comments	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

D.3. Implementation of sampling plan

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No sampling approach has been used.

SECTION E. Calculation of emission reductions or net anthropogenic removals

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

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As per the registered PDD, the baseline emissions are the product of net electricity exported to the grid EG_y and grid emission factor EF_y . and is formulated as,

$$BE_y = EF_y \times EG_y$$

Where,

BE_y = Baseline emissions due to displacement of electricity during the year y (tCO₂)

EG_y = Net quantity of electricity generated by the project activity during the year.
= 11,008 MWh

EF_y = Emission factor of the grid.
= 0.7678 tCO₂/MWh

Therefore,

$$BE_y = 11,008 \times 0.7678 \\ = 8,451 \text{ tCO}_2$$

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

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The project uses wind energy only for power generation which leads to zero net GHG on-site emissions. Hence there is no net emission within the project boundary.

Therefore, $PE_y = 0$

E.3. Calculation of leakage emissions

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The project proponents have identified no anthropogenic greenhouse gases by sources outside the project boundary that are significant, measurable and attributable to the project activity. Hence, no leakage is considered from the project activity.

Therefore, $LE_y = 0$

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	8,451	0	0	6,475	1,977	0	8,451

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)
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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)
8,451	11,385

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

>>

No of days during the current monitoring period = 716 days

Annual estimation as per PDD = 5,804 tCO₂

The estimated emission reductions for 716 days of current monitoring period will be:

= 5,804 x (716/365)

= 11,385 tCO₂

E.6. Remarks on increase in achieved emission reductions

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The estimated annual emission reductions as per the registered CDM PDD corresponding to the current monitoring period are 11,385 tCO₂. The actual emission reductions achieved during the current monitoring period is 8,451 tCO₂. There is decrease in the emission reductions by 26% during the current monitoring period relative to the estimation in the registered CDM-PDD. 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 hence acceptable.

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

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The project activity is a small scale, project type I. The project activity utilises wind power for electricity generation, which is into the category of renewable energy.

The project activity is a Small-Scale activity and there is no change in the installed capacity of the project.

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
09.0	8 October 2021	Revision to: <ul style="list-style-type: none"> Ensure consistency with version 03.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN).
08.0	6 April 2021	Revision to: <ul style="list-style-type: none"> Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: <ul style="list-style-type: none"> Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; Make editorial improvements.
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> Include provisions related to delayed submission of a monitoring plan; Provisions related to the Host Party; Remove reference to programme of activities; Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); Include provisions related to standardized baselines; Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		