



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

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

**MONITORING REPORT**

<b>Title of the project activity</b>	Wind Power Project in Karnataka India	
<b>UNFCCC reference number of the project activity</b>	7434	
<b>Version number of the PDD applicable to this monitoring report</b>	07.1	
<b>Version number of this monitoring report</b>	01	
<b>Completion date of this monitoring report</b>	28/01/2021	
<b>Monitoring period number</b>	01	
<b>Duration of this monitoring period</b>	01/01/2013 to 31/12/2020	
<b>Monitoring report number for this monitoring period</b>	01	
<b>Project participants</b>	M/s Malaxmi Wind Power	
<b>Host Party</b>	India	
<b>Applied methodologies and standardized baselines</b>	Methodology: - AMS-I.D. "Grid connected renewable electricity generation" (EB 61, Version 17) Standardized baselines – Not Applicable	
<b>Sectoral scopes</b>	Sectoral scope 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>	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	0 tCO <sub>2</sub> e	25,223 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>	28,059 tCO <sub>2</sub> e	

## SECTION A. Description of project activity

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

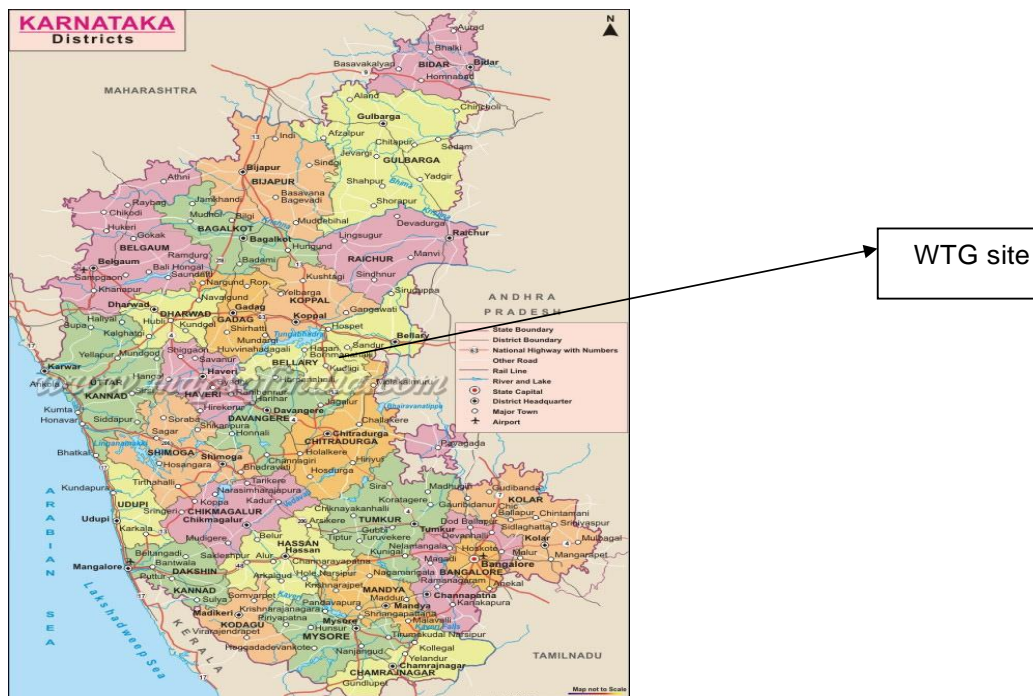
The project activity involves installation of one number of 2100 kW Suzlon make Wind Turbine Generators (WTGs) in the state of Karnataka by M/s Malaxmi Wind Power ( hereafter referred as MWP or Project Proponent (PP)).

The objective of the wind power project activity is to generate renewable electricity using wind power resources. The electricity generated by the project activity is sold to Gulbarga Electricity Supply Company Limited (GESCOM) which is connected to the Southern grid. (Currently Indian grid). The WTG was commissioned on 31/03/2011.

In the absence of the project activity electricity generated from the WTGs would have been generated by the operation of existing/proposed grid connected fossil fuel based power plants connected to Southern grid. The Project activity thus reduces the anthropogenic emissions of greenhouse gases (GHGs) in to the atmosphere associated with the equivalent amount of electricity generation from the existing/proposed fossil fuel based grid connected to Southern grid.

### A.2. Location of project activity

Location No.	Latitude	Longitude	Village	District	State	Country
SND101	15° 23'54.1" N	76° 53'08.9"E	Konchigere	Bellary	Karnataka	India



**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)	M/s Malaxmi Wind Power Private Entity	No

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

**Methodology:** AMS-I.D Grid Connected Renewable Electricity Generation (Version 17)<sup>1</sup>

**Type I** : Renewable Energy Project (Small Scale)

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

Fixed crediting period of 10 years 00 Months have been opted for the project activity.

This is the first crediting period of the project activity.

Crediting Period: 01/01/2013 to 31/12/2022

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

The objective of the wind power project activity is to generate renewable electricity using wind power resources. The electricity generated by the project activity is sold to Gulbarga Electricity Supply Company Limited (GESCOM) which is connected to the Southern grid. (Currently Indian grid)

The technical life time for the Wind Turbine Generator is 20 years 0 months. Technical details of 2100 kW Wind Turbine Generator of Suzlon makes machine of S88 installed by Malaxmi Wind Power is as under:

Sr. no.	Item	Description
1.	Make	Suzlon
2.	Model no.	S88
3.	Rating in KW	2100
4.	Hub Height	80 m
5.	Rotor Type	3 bladed, Upwind/Horizontal axis
6.	Rotor diameter	88m
7.	Rotor Swept area	6082 m <sup>2</sup>
8.	Cut-in wind speed	4.0 m/s
9.	Rated wind speed	14 m/s
10.	Cut-out wind speed	25 m/s
11.	Regulation	Active Pitch-Regulated
12.	Pitch System Type	Electrical

Installation and operation of the windmills do not pose any environmental hazards. The technology of harnessing wind power through windmills is environmentally safe and sound.

<sup>1</sup> <http://cdm.unfccc.int/methodologies/DB/RSC TZ8SKT4F7N1CFDXCSA7BDQ7FU1X>

The host Government also agrees to this fact and does not ask for Environmental Impact Assessment for this type of projects. As supplier of wind energy converters (wind mills), Suzlon is well known in the market. They have a strong R&D back up. The project activity also reduces the other air pollutants such as SO<sub>x</sub>, NO<sub>x</sub> and particulate matter which would have been emitted by fossil fuel based power plants connected to the grid in the absence of project activity.

## **B.2. Post-registration changes**

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

There are no deviations from the registered monitoring plan or applied methodology.

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

There are no corrections.

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

There is no change to the start date of crediting period.

### **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**

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

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

There are no changes to project design of registered project activity.

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

Not Applicable

## **SECTION C. Description of monitoring system**

The project activity is operated and managed by the project head with the help of site O & M contractor (personnel from the wind turbine manufacturer). For the accurate execution of the Project activity a project team has been constructed. The wind power project abided by all regulatory and statutory requirements as prescribed under the state and central laws and regulations. The project team is delegated with the responsibility of monitor and document the electricity generated and also safe keeping of the recorded data. The project team is also responsible for calculation of actual creditable emission reduction in the most transparent and relevant manner.

### **Monitoring Plan for the WTG's**

The electricity being generated is monitored at the Project site using an electronic Trivector export and import meter of 0.2 s Class accuracy which is installed and owned by

PP. There is also check meter which is an electronic trivector meter of Class 0.2 s which is installed and owned by the Gulbarga Electricity Supply Company Limited (GESCOM). The monthly meter readings (both main and check meters) taken jointly by the GESCOM and the PP and this reading comprised of the electricity generation from 12 midnight of the previous month to 12 midnight of the current month. Both the main and check meters are jointly inspected and sealed on behalf of the parties and not be interfered with by either party except in the presence of the other party or its accredited representatives.

Both the main and check meters tested for accuracy every calendar year with reference to a portable standard meter with an accuracy class of 0.1s. The meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2s class accuracy. The consumption as recorded by main meter hold well for the purpose of emission reduction calculation as long as the error in the main meter is within the permissible limits.

If during the tests, the meter is found to be beyond the permissible limits of error, the meter shall be immediately calibrated and the error percentage shall be applied for all measured values taken during the period between the date of testing when the meter has not reported errors within the permissible limits and the date of testing where the meter has reported errors beyond the permissible limits.

The registration date is the starting date of the crediting period. There is a timeline on the date on which the project activity registered and the date on which the joint meter reading (JMR) conducted. To avoid confusion for metering of electricity for this initial period (date of registration to date of joint meter reading), the project proponent proposes to calculate the initial period generation on pro rata basis as follows:

1. As per the generation reading at the controller of the individual turbines for this period / (total generation reading at the controller for the entire month) \* Net electricity supplied by the WTG to the grid for the entire month

Verification periods would be taken up to a JMR date to avoid confusion.

For the last verification period, the remaining days between the JMR reading date and the end of verification period would be estimated based on a pro rata basis as follows:

1. As per the generation reading at the controller of the individual turbines for this period / (total generation reading at the controller for the entire month) \* Net electricity supplied by the WTG to the grid for the entire month

The project team is also responsible for calculation of actual creditable emission reduction in the most transparent and relevant manner.

The parameter  $EG_{T-E,y, \text{Karnataka}}$  as described in section D.2 is the power transmission loss as a result of the transmission of electricity from the WTG site to the sub-station in Karnataka. The transmission losses is calculated from the reading taken by the main and check meter at the sub-station which records the electricity received at the substation from various WTGs. The readings recorded at the meters at sub-station are used to apportion for transmission losses by individual WTGs. However, the apportioning is carried out by ESCOM. The calculation for the transmission loss done by ESCOM as per given formula with reference to the article 6 of the PPA executed between the project proponent and GESCOM:

$Z$  = Percentage of line losses

$X$  = Cumulative of all the exported energies from all the metering points connected to the sub-station.

i.e.  $X = X_1 + X_2 + X_3 + \dots + X_n$

$Y$  = Sub-station bulk meter reading

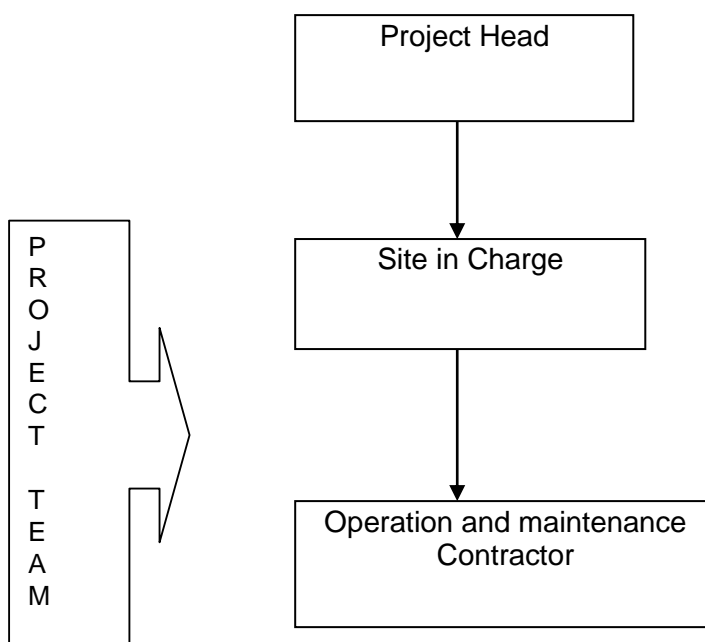
$Z = [(X-Y)/X] \times 100$

$E_{GT-E,y,,Karnataka} = Z \times E_{G_{export,y,Karnataka}}$

The transmission losses is reported in Form B issued to project proponent by ESCOM. The same transmission losses is considered for the project activity.

All the monitoring data is stored / recorded and kept under safe custody of the project head. All the monitoring data is stored / recorded and kept under safe custody of the project head for a period of a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity.

Designation	Responsibilities
Project Head	Performance reviews
Site In charge	<ul style="list-style-type: none"> <li>• Operation, Monitoring and Verification of Data</li> <li>• Data Recording</li> <li>• Storage of data</li> </ul>
Operation and Maintenance Contractor (personnel from third party)	<ul style="list-style-type: none"> <li>• Operation and Maintenance</li> <li>• Storage of data</li> <li>• Data Recording</li> </ul>



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

<b>Data/Parameter</b>	$EF_{grid,OM,y}$
Unit	tCO <sub>2e</sub> /MWh
Description	The Operating Margin emission factor of Southern Grid
Source of data	Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database version 6.0 dated March 2011
Value(s) applied	0.96708
Choice of data or measurement methods and procedures	The value used is calculated ex-ante as average of the last three years of the Operating margin provided by Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database version 6.0 dated March 2011
Purpose of data/parameter	For the calculation of the Baseline Emission
Additional comments	--

<b>Data/Parameter</b>	$EF_{grid,BM,y}$
Unit	tCO <sub>2e</sub> /MWh
Description	The Build Margin emission factor of Southern grid
Source of data	Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database version 6.0 dated March 2011
Value(s) applied	0.76340
Choice of data or measurement methods and procedures	The value used is calculated ex-ante as recent most Build margin provided by Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database version 6.0 dated March 2011
Purpose of data/parameter	For the calculation of the Baseline Emission
Additional comments	--

<b>Data/Parameter</b>	$EF_{CO2,grid,y} = EF_{grid,CM,y}$
Unit	tCO <sub>2e</sub> /MWh
Description	The grid CO <sub>2</sub> emission factor in year y
Source of data	Calculated
Value(s) applied	0.91616
Choice of data or measurement methods and procedures	The value has been calculated as $0.75 * EF_{grid,OM,y} + 0.25 * EF_{grid,BM,y}$
Purpose of data/parameter	For the calculation of the Baseline Emission
Additional comments	--

**D.2. Data and parameters monitored**

<b>Data/Parameter</b>	$EG_{BL,y}$
Unit	MWh
Description	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y
Measured/calculated/default	Measured
Source of data	Form B which is given by ESCOM

Value(s) of monitored parameter	27,580.70
Monitoring equipment	Energy meters ( Main & Check meters)
Measuring/reading/recording frequency	Continuous measurement, monthly recording
Calculation method (if applicable)	The net electricity supplied by the WTG's installed in Karnataka is calculated as the difference between Export and the import readings and the Transmission Losses as follows: <b><math>EG_{BL,y} = (EG_{\text{export},y,\text{Karnataka}} - EG_{\text{import},y,\text{Karnataka}} - EG_{T-E,y,\text{Karnataka}})</math></b>
QA/QC procedures	The readings of the main meter are cross checked with the readings in the check meters. The data is archived electronically for a minimum of two years after the end of the crediting period. The form B and invoice are under the custody of Project Executor and Controller.
Purpose of data/parameter	The Data/Parameter is required to calculate the baseline emission
Additional comments	--

<b>Data/Parameter</b>	<b><math>EG_{\text{export},y,\text{Karnataka}}</math></b>
Unit	kWh
Description	The Electricity exported by the Project activity
Measured/calculated/default	Measured
Source of data	Form B which is given by ESCOM
Value(s) of monitored parameter	28,429,050.00
Monitoring equipment	Energy meters (Main & Check meters)
Measuring/reading/recording frequency	Continuous measurement, monthly recording
Calculation method (if applicable)	<p>The electricity exported is measured using energy meter at grid interconnection point which is under the control of ESCOM. For billing purpose, the meter readings (Joint meter readings or JMR's) are taken every month by ESCOM officials in the presence of Suzlon representatives and the readings are jointly certified. The JMR's have the readings of both the main meter as well as the check meter. The readings along with the export units for the month are issued to project proponent as Form B by ESCOM. The sum of the export units as reported in the Form B of all the above meters represent the total electricity exported to the grid by the project activity.</p> <p>Measurement equipment : Energy meters  Calibration frequency : Once in a Year  Accuracy of the meters : 0.2s  Measurement interval : Continuous measurement, monthly recording</p>
QA/QC procedures	<p>The readings of the main meter are cross checked with the readings in the check meters. In case of failure/error in the readings of the main meter, the readings in the check meter considered and the main meter retested/recalibrated/replaced immediately. The data is archived electronically for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity.</p> <p>The data on electricity exported to the grid by the project activity is cross- checked with the invoices raised by the PP.</p> <p>The form B and invoice is under the custody of Project Executor and Controller.</p>
Purpose of data/parameter	The Data/Parameter is required to calculate the baseline emission.



Additional comments	--
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<b>Data/Parameter</b>	<b>EG<sub>import,y,,Karnataka</sub></b>
Unit	kWh
Description	The Electricity imported by the Project Activity
Measured/calculated/default	Measured
Source of data	Form B/Monthly billing records which is given by ESCOM.
Value(s) of monitored parameter	228,450.00
Monitoring equipment	Energy meters (Main & Check meters)
Measuring/reading/recording frequency	Continuous measurement, monthly recording
Calculation method (if applicable)	<p>The electricity electricity imported is measured using energy meter at grid interconnection point which is under the control of ESCOM. For billing purpose, the meter readings (Joint meter readings or JMR's) are taken every month by ESCOM officials in the presence of Suzlon representatives and the readings are jointly certified. The JMR's have the readings of both the main meter as well as the check meter. The readings along with the import units for the month are issued to project proponent as Form B by ESCOM. The sum of the import units as reported in the Form B of all the above meters represent the total electricity imported from the grid by the project activity.</p> <p>Measurement equipment : Energy meters  Calibration frequency : Once in a Year  Accuracy of the meters : 0.2s  Measurement interval : Continuous measurement, monthly recording</p>
QA/QC procedures	<p>The readings of the main meter are cross checked with the readings in the check meters. In case of failure/error in the readings of the main meter, the readings in the check meter is considered and the main meter is retested/recalibrated/replaced immediately. The data archived electronically for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. The data on electricity imported from the grid by the project activity cross- checked with the invoices raised by the PP</p> <p>The form B and invoice is under the custody of Project Executor and Controller.</p>
Purpose of data/parameter	The Data/Parameter is required to calculate the baseline emission
Additional comments	--

<b>Data/Parameter</b>	<b>EG<sub>T-E,y,,Karnataka</sub></b>
Unit	kWh
Description	The total transmission losses for the Project Activity.
Measured/calculated/default	Measured
Source of data	Form B which is given by ESCOM.
Value(s) of monitored parameter	619,904.66
Monitoring equipment	Energy meters (Main & Check meters)
Measuring/reading/recording frequency	Continuous measurement, monthly recording

Calculation method (if applicable)	The transmission losses is reported in Form B issued to project proponent by ESCOM. The same transmission losses is considered for the project activity.
QA/QC procedures	<p>The data is archived electronically for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. The data on transmission losses by the project activity cross-checked with the invoices raised by the PP</p> <p>The form B and invoice is under the custody of Project Executor and controller.</p>
Purpose of data/parameter	The Data/Parameter is required to calculate the baseline emission.
Additional comments	--

### D.3. Implementation of sampling plan

Sampling is not required for the given project activity.

## SECTION E. Calculation of emission reductions or net anthropogenic removals

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

As per AMS I D version 17 paragraph 11:

The baseline emissions are the product of electrical energy baseline  $EG_{BL,y}$  expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor.

Parameter	Description	Value	Source
$BE_y = EG_{BL,y} * EF_{CO_2,grid,y}$			
$BE_y$	Baseline Emissions in year y; t CO <sub>2</sub>		Calculated
$EG_{BL,y}$	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)	27,580.70	Quantity of net electricity supplied to the grid during Jun. 13 to Dec.20
$EF_{CO_2,grid,y} = EF_{grid,CM,y}$	CO <sub>2</sub> Emission Factor of grid in year y; tCO <sub>2</sub> e/MWh	0.91616	Calculated

Parameter	Description	Value	Source
$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$			“Tool to calculate the emission factor for an electricity system” version 02.2.1, equation 14
$EF_{grid,CM,y} = EF_{CO_2,grid,y}$	Combined margin CO <sub>2</sub> emission factor in year y. This equals to $EF_{CO_2,grid,y}$ (t CO <sub>2</sub> e/MWh)	0.91616	Calculated
$EF_{grid,OM,y}$	Simple operating margin CO <sub>2</sub> emission factor in year y.	0.96708	Calculated
$EF_{grid,BM,y}$	Build margin CO <sub>2</sub> emission factor in year y	0.76340	Calculated
$W_{OM}$	Weighting of operating margin emission factor	0.75	“Tool to calculate the emission factor for an electricity system” version 02.2.1

$w_{BM}$	Weighting of build margin emission factor	0.25	“Tool to calculate the emission factor for an electricity system” version 02.2.1
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$$BE_y = 27,580.70(\text{MWh}) * 0.91616 (\text{tCO}_2/\text{MWh}) = 25,223 \text{ tCO}_2\text{e (the value is rounded down)}$$

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

In accordance with methodology AMS I.D, leakage is to be considered only if the energy generating equipment is transferred from another activity.

This is not applicable here so  $L_y = 0$

## E.3. Calculation of leakage emissions

As per AMS ID, Version 17, “For most renewable energy project activities,  $PE_y = 0$ . However, for the following categories of project activities, project emissions have to be considered following the procedure described in the most recent version of ACM0002.

- Emissions related to the operation of geothermal power plants (e.g. non-condensable gases, electricity/fossil fuel consumption)
- Emissions from water reservoirs of hydro power plants”

As the project activity is wind power project, hence  $PE_y = 0$

Emissions Reductions = Baseline Emissions ( $BE_y$ ) – Project Emissions ( $PE_y$ ) – Leakage ( $L_y$ )

Hence,

$$ER_y = BE_y$$

$$ER_y = 25,223 \text{ tCO}_2\text{e (the value is rounded down)}$$

## 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>	25,223	0	0	0	25,223	25,223

## 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)
25,223	28,059

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

As per CDM registered PDD, 3,505 tCO<sub>2</sub>e is the amount of CERs generated annually. Therefore, following unitary method, the amount of estimated ex ante for this monitoring period is identified. The total number of days in this monitoring period is 2922.

$$= (3,505/365) * 2922$$

$$= 28,059 \text{ tCO}_2\text{e}$$

The actual emission reductions are less by 10.11% the values applied in ex-ante calculation of the registered CDM – PDD due to less PLF achieved in the wind farm during the monitoring period. The decrease in PLF is only due to the seasonal and cyclic variation in the wind pattern, which is beyond the control of the project proponent.

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

The actual emission reductions are less by 10.11% the values applied in ex-ante calculation of the registered CDM – PDD.

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

The project activity remain as a small scale project activity for the entire period.

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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		