



Monitoring report form
(Version 05.1)

Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form" at the end of this form.

MONITORING REPORT

Title of the project activity	Wind Power Project at Rajkot, Gujarat	
UNFCCC reference number of the project activity	8095	
Version number of the monitoring report	1	
Completion date of the monitoring report	20/07/2015	
Monitoring period number and duration of this monitoring period	Monitoring period: 2 nd , Duration of this monitoring period: 01/12/2013 to 30/06/2015	
Project participant(s)	M/s ReNew Wind Energy (Rajkot) Private Limited	
Host Party	India	
Sectoral scope(s)	Sectoral Scope 1: Energy Industries (renewable - / non-renewable sources)	
Selected methodology(ies)	Methodology : ACM0002 version 12.3.0, - Consolidated methodology for grid connected electricity generation from renewable sources	
Selected standardized baseline(s)	NA	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	76,535 tCO ₂ e	
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	NA	81,289 tCO ₂ e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

ReNew Wind Energy (Rajkot) Private Limited (RNWERPL), the Project Proponent (PP), has set up wind power project of 25.2 MW capacity at Villages: Godladha, Madhavipur, Kalasar, Devpara and Madava of Rajkot district in Gujarat.

The purpose of the project activity is to generate electricity using wind as renewable energy source and helping in reducing usage of fossil fuels which are used for electricity generation. This reduce the dependency on fossil fuels for power generation and reduce the Green House Gas (GHG) emissions.

The baseline scenario for the project activity as per the applied methodology ACM0002 version 12.3.0 is : “Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system.” The same has been described in detail in the registered PDD section B.4.

As the project activity is a Greenfield project, there was no power plant existing at the project site prior to the installation of the project activity (i.e. in the pre-project scenario).

The project consists of installation of 12 Suzlon make wind turbines of 2.1 MW capacity each. As per the Energy Estimate report issued by a third party agency, the project activity is expected to supply 50.733 GWh of energy to the NEWNE Grid of India each year. This translates into a Plant Load Factor (PLF) of 22.98%. Also, this is expected to result in emission reductions of 48,338 tCO₂e per year of operation.

The project was commissioned successfully on 29/03/2012 as evident from commissioning certificate dated 26/04/2012 and 11/06/2012 issued by Gujarat Energy Development Agency (GEDA).

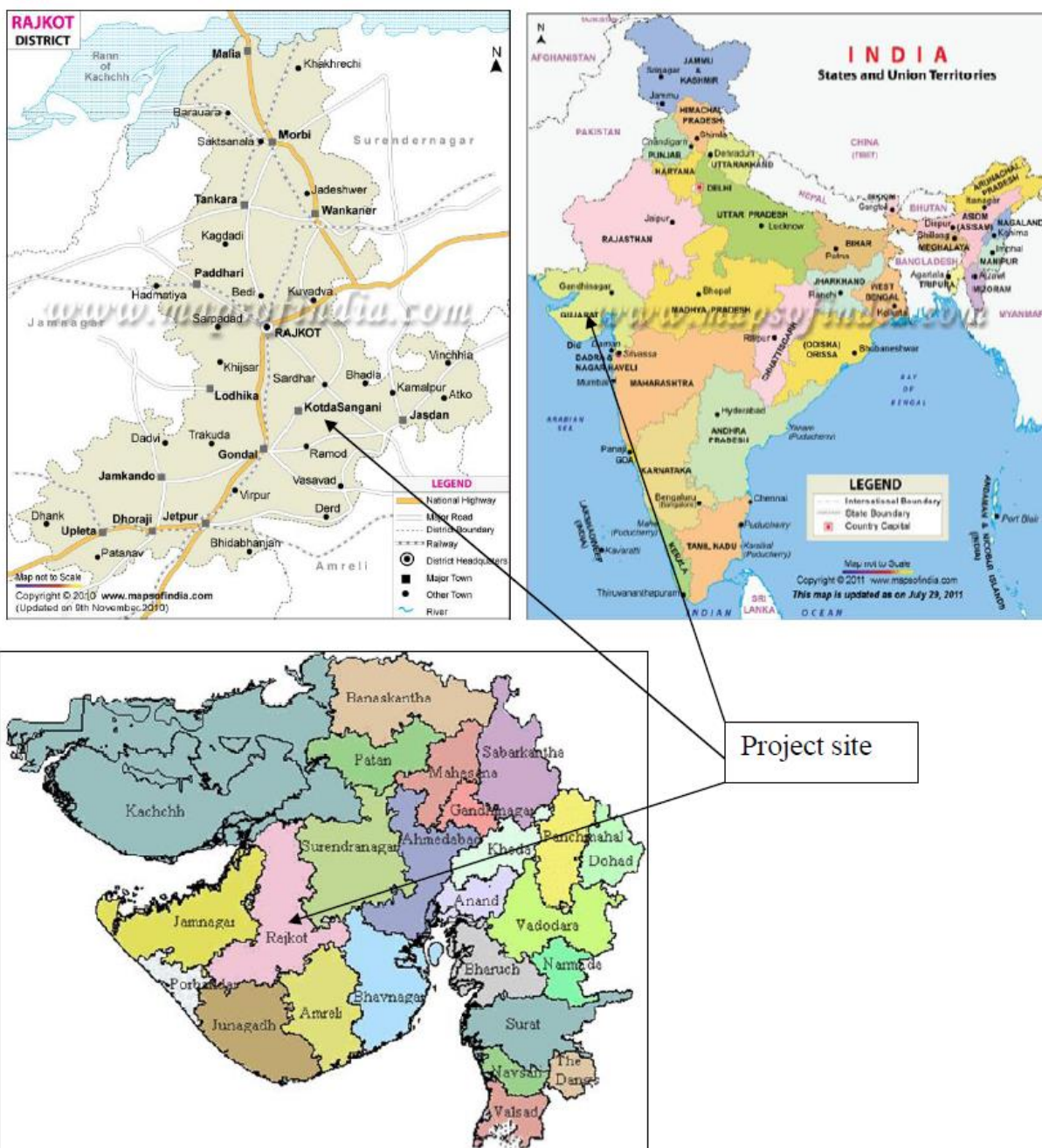
This is the 2nd verification of project activity, the duration of first verification was 15 Nov 2012 to 30 Nov 2013, for which CER's have already been issued.

A.2. Location of project activity

The project is located in the Godladhar, Madhavipur, Kalasar, Devpara and Madav villages of Jasdan Taluka, Rajkot District, Gujarat State of India.

Wind turbine-wise detailed co-ordinates are tabulated below.

Location No.	Village/Taluka/District/State	Coordinates
G 034	Godladhar/Jasdan/Rajkot/Guj.	N22 02 39.2 E71 18 58.5
G 036	Godladhar/Jasdan/Rajkot/Guj.	N22 03 01.8, E71 18 08.2
G 037	Madhavipur/Jasdan/Rajkot/Guj	N22 03 33.6 , E71 18 01.5
G 038	Godladhar/Jasdan/Rajkot/Guj.	N22 02 52.1 E71 18 58.9
G 039	Godladhar/Jasdan/Rajkot/Guj.	N22 03 14.8 E71 18 45.6
G 041	Madhavipur/Jasdan/Rajkot/Guj	N22 03 47.3, E71 17 49.0
G 042	Madhavipur/Jasdan/Rajkot/Guj	N22 03 45.5, E71 18 10.6
G 046	Kalasar /Jasdan/Rajkot/Guj.	N22 05 06.0, E71 16 42.6
G 055	Devpara /Jasdan/Rajkot/Guj.	N22 06 04.6, E71 14 19.7
G 056	Devpara /Jasdan/Rajkot/Guj.	N22 06 18.1, E71 14 15.1
G 068	Madava /Jasdan/Rajkot/Guj.	N22 08 36.6, E71 14 06.0
G 112	Kalasar/Jasdan/Rajkot/Guj.	N22 04 54.0, E71 16 18.0



A.3. Parties and project participant(s)

Party involved (host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
India (host)	ReNew Wind Energy (Rajkot) Private Limited (RWERPL)	No

A.4. Reference of applied methodology and standardized baseline

Title: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" ACM0002 (Version 12.3.0)

Reference: ACM0002 (Version 12.3.0) draws upon the following tools which have been used in the PDD:

1. Tool to calculate the emission factor for an electricity system (Version 02.2.1)
2. Tool for demonstration and assessment of additionality (Version 6.1.0)

A.5. Crediting period of project activity

15th November 2012 to 14th November 2019 (Renewable)

A.6. Contact information of responsible persons/entities

Rohit Joshi
Deputy Manager
ReNew Wind Energy (Rajkot) Pvt. Ltd.

The entity is also the project participant mentioned in Appendix 1

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

The project consists of installation of 12 Suzlon make wind turbines of 2.1 MW capacity each. The technical specifications of the S-88 model wind turbine are mentioned below:

Description	Specifications
Wind speed at rated output	14 m/s
Cut in speed	4 m/s
Cut out speed	25 m/s
Hub height	79 m
Power regulation	Pitch
Rotor diameter	88 m
Swept area	6082 m ²
Generator type	Asynchronous slip ring type induction generator
Generator rated power output	2100 kW
Voltage	690 V
Life	25 years

These turbines are supplied by Suzlon Energy Ltd and are designed for particular wind conditions. The technology for the same is environmentally safe and sound and there is no technology transfer to the host party involved in the same. Lifetime of the WTGs is expected to be 25 years as per data shared by the technology supplier.

The project was commissioned successfully on 29/03/2012 as evident from commissioning certificate dated 26/04/2012 and 11/06/2012 issued by Gujarat Energy Development Agency (GEDA).

B.2. Post-registration changes**B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline**

No such temporary deviations have taken place.

B.2.2. Corrections

No corrections are applicable.

B.2.3. Changes to start date of crediting period

No such changes to start date of crediting period taken place.

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

Not Applicable

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

Not Applicable

B.2.6. Changes to project design of registered project activity

Not Applicable

B.2.7. Types of changes specific to afforestation or reforestation project activity

Not Applicable

SECTION C. Description of monitoring system

In Monitoring & Verification protocol, the objective is to have clear, credible and accurate monitoring, evaluation and verification procedures. This involves recording, data collection of all wind turbines, metering of electricity generated at substation, on daily basis as well as on monthly basis. The general conditions for metering, recording, meter readings, meter inspections, Test & Checking and communication shall be as per the Power Purchase Agreement with the state utility.

Procedure for apportioning of electricity:

1. In case the start/end dates of monitoring period do not match with the start/end dates of Joint Meter Reading Sheets / Generation reports issued by GETCO/SLDC, following apportioning procedure will be applied for the first and the last monitoring period within a particular crediting period:

Apportioning will be carried out based on ratio of generation data recorded using WTG yard meter installed near each WTG. The emission reductions of that particular period (between the start/end date of

monitoring period and the end/start of the billing period) will be calculated based on percentage generation of that particular period at WTG using yard meter data multiplied with the total units generated in the month as per the Certificate for share of electricity generated by Wind farm provided by GETCO/SLDC. The calculation formula has been furnished below:

Generation from all project WTGs for the period y1 = $EG_{WTGyard,i,y1}$

Generation from all project WTGs for the period y2 = $EG_{WTGyard,i,y2}$

Net energy supplied used for calculation of emission reduction for the monitoring period y1

N

$$\sum_{i=1} ((EG_{facility,i,y2}) * (EG_{WTGyard,i,y1} / EG_{WTGyard,i,y2}))$$

Where:

y1 = No. of days within a billing period up to which generation is considered for emission reduction calculation

y2 = No. of days in the billing period

N = No. of feeders to which project WTGs are connected to.

2. In case if there are project and non-project WTGs connected to a particular feeder i, the quantity of net electricity supplied by project WTGs to the grid connected to that particular feeder will be calculated based on the formula specified below:

Total generation from all project WTG(s) connected to the feeder i in period y = $EG_{WTGyard,i,y}$

Total generation from all project and non-project WTGs connected to the feeder i in period y = $EG_{Allyard,i,y}$

Quantity of net electricity supplied by all (project and non-project) WTGs connected to feeder i to the grid in period y = $EG_{facility,i,y}$

Net electricity supplied by the project WTGs connected to feeder i to the grid in period y =

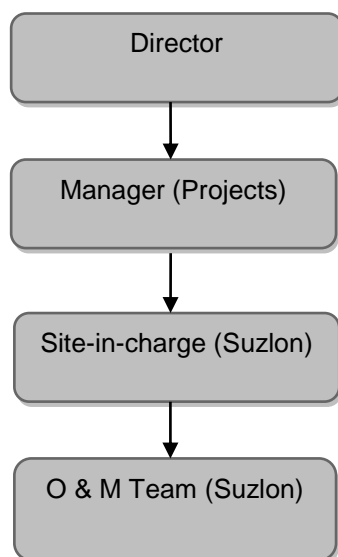
N

$$\sum_{i=1} ((EG_{facility,i,y}) * (EG_{WTGyard,i,y} / EG_{Allyard,i,y}))$$

Where: N = No. of feeders to which project WTGs are connected to.

3. In cases where both scenarios mentioned above exist at the same time (i.e. both project and non-project WTGs connected to the same feeder(s) and the start/end date of the monitoring periods do not match with those of the JMR readings), firstly the apportioning as per point # 2 above will be applied for the billing period y2 to estimate the Net electricity supplied by the project WTGs connected to feeder Z to the grid in period y2. Then this value would replace $(EG_{facility,y2})$ in the formula specified under point # 1 above to arrive at the Net energy export used for calculation of emission reduction for the monitoring period y1.

The project proponent proposes following arrangements in order to carry out metering and O & M activities for all wind turbines:



At 33 kV/66 kV Parveda substation (Currently managed by Suzlon), there are two feeders; Feeder 1 and Feeder 2. Main meter, check meter and ABT meters are located at this substation.

The detailed monitoring, recording and apportioning procedure has been described in appendix 5 of the PDD. The meter readings will be reported to the site-in-charge and the compiled reports will be sent to the Manager (Projects) and Director. The Manager will monitor overall activity of the project and report to the Director. As per O & M schedule, the operation and maintenance activities will be carried out by trained and qualified technical staff of Suzlon.

Each party shall maintain complete and accurate records and all other data required by each of them for the purposes of proper administration and the operation of the project.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/parameter:	$EF_{grid,OM,y}$
Unit	tCO₂/MWh
Description	Simple operating margin for NEWNE grid
Source of data	CO ₂ baseline database (Version 7.0) published by CEA in January 2012
Value(s) applied)	0.9842
Choice of data or measurement methods and procedures	CEA database for CO ₂ baseline data
Purpose of data	Calculation of baseline emissions
Additional comments	Fixed ex-ante for entire crediting period

Data/parameter:	EF_{grid,BM,y}
Unit	tCO₂/MWh
Description	Build margin for NEWNE grid
Source of data	CO ₂ baseline database (Version 7.0) published by CEA in January 2012
Value(s) applied)	0.8587
Choice of data or measurement methods and procedures	CEA database for CO ₂ baseline data
Purpose of data	Calculation of baseline emissions
Additional comments	Fixed ex-ante for entire crediting period

Data/parameter:	EF_{grid,CM,y}
Unit	tCO₂/MWh
Description	Combined margin emission factor for NEWNE grid
Source of data	Calculated as per the procedure described in PDD section B.6.1
Value(s) applied)	0.9528
Choice of data or measurement methods and procedures	CEA database for CO ₂ baseline data
Purpose of data	Calculation of baseline emissions
Additional comments	Fixed ex-ante for entire crediting period

D.2. Data and parameters monitored

Data/parameter:	EG_{facility,i,y}
Unit	MWh
Description	Quantity of net electricity generation supplied by the project WTGs connected to feeder i to the grid in period 01/12/2013 to 30/06/2015
Measured/calculated/default	Calculated

Source of data	<p>Sum of net electricity generation values as per all the certificates for share of electricity generated by Wind farm provided by GETCO/SLDC for the period and for all the feeders to which WTGs of the project activity are connected.</p> <p>In cases where there are other (non-project) WTGs connected to the same feeder, appropriate apportioning mechanism specified in section C of this Monitoring Report shall be applied. Here no apportioning is required and values of net electricity generation is directly sourced from the share certificate provided by GETCO/SLDC</p> <p>Also for cases when the start/end dates of monitoring period do not match with the start/end dates of certificates for share of electricity generated by Wind farm provided by GETCO/SLDC, appropriate apportioning mechanism specified section C of this Monitoring Report shall be applied. Here start end dates of monitoring period match with the start end dates of certificates of net electricity generation hence no need of apportioning</p>
Value(s) of monitored parameter	85,316.11 MWh
Monitoring equipment	<p>WTG yard meters (tri-vector meters) as well as the ABT meters installed at the 33/66 kV Parveda substation.</p> <p>For ABT meter: Accuracy Class: 0.2S (Active) and 0.5S (Reactive)</p> <p>For Tri-vector meter (installed at the yard near each WTG): Accuracy Class: 0.2S</p>
Measuring/reading/recording frequency:	Continuous measurement and at least monthly recording.
Calculation method (if applicable):	The above values are calculated by specific apportioning mechanism. The same has been provided in appendix 5 of the registered PDD as well as section C of this Monitoring Report for reference.
QA/QC procedures:	<p>The Quantity of net electricity generation from the certificate for share of electricity can be cross-checked with the invoices for the sale of power by the project proponent.</p> <p>The meter(s) shall be calibrated and maintained by the state utility as per their own schedule and this frequency of meter calibration is not within the control of the Project Proponent. However, PP would ensure that calibration is carried out at least once in 3 years.</p> <p>Meter No.: GJU 62666 Last calibration done: 20.06.2014 Validity: 19.06.2017</p> <p>Meter No.: GJU 62667 Last calibration done: 20.06.2014 Validity: 19.06.2017</p> <p>Meter No.: GJU 62668 Last calibration done: 20.06.2014 Validity: 19.06.2017</p> <p>Meter No.: GJU 62669 Last calibration done: 20.06.2014 Validity: 19.06.2017</p>
Purpose of data:	Calculation of baseline emissions
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 WTG_yard,i,y		
Unit	MWh		
Description	Sum of electricity generation measured at individual yard meters of all project WTGs that are connected to feeder i		
Measured/calculated/default	Measured		
Source of data	Yard meter readings of project activity WTGs		
Value(s) of monitored parameter	NA (as no apportioning is required)		
Monitoring equipment	WTG yard meters (tri-vector meters); Accuracy Class: 0.2S		
Measuring/reading/recording frequency:	Continuous measurement and daily recording		
Calculation method (if applicable):	Not applicable		
QA/QC procedures:	The yard meters installed near individual WTGs will be tested at least once in a year and calibrated (if required).		
	Meter No	Calibration 2013	Calibration 2014
	GJU64014	23.01.2013	08.01.2014
	GJU64011	23.01.2013	08.01.2014
	GJU63931	23.01.2013	08.01.2014
	GJU64012	23.01.2013	08.01.2014
	GJU64013	23.01.2013	08.01.2014
	GJU64020	23.01.2013	08.01.2014
	GJU63930	23.01.2013	08.01.2014
	GJU63935	23.01.2013	08.01.2014
	GJU63928	23.01.2013	07.01.2014
	GJU63929	23.01.2013	07.01.2014
	GJU64019	22.01.2013	07.01.2014
GJU63934	23.01.2013	07.01.2014	
Purpose of data:	Calculation of baseline emissions; This value has been used to derive the apportioned value of the project WTGs for the specified period if monitoring period in verification do not match with the period of generation reports issued by GETCO/SLDC.		
	Here start end dates of monitoring period match with the start end dates of certificates of net electricity generation hence no need of apportioning		
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_{Allyard,i}
Unit	MWh
Description	Sum of electricity generation measured at individual yard meters of all project and non-project WTGs that are connected to feeder i.
Measured/calculated/default	Measured
Source of data	Yard meter readings of project & non-project activity WTGs
Value(s) of monitored parameter	NA (as no apportioning is required)

Monitoring equipment	WTG yard meters (tri-vector meters); Accuracy Class: 0.2S
Measuring/reading/recording frequency:	Continuous measurement and daily recording
Calculation method (if applicable):	Not applicable
QA/QC procedures:	<p>The yard meters installed near individual WTGs will be tested at least once in a year and calibrated (if required).</p> <p>Note: The project proponent does not have any control over the yard meter readings of other project developers and therefore the values certified by the O&M contractor/GETCO/SLDC will be directly used for the purpose of calculation.</p>
Purpose of data:	<p>Calculation of baseline emissions; This value has been used to derive the apportioned value of the project WTGs for the specified period if monitoring period in verification do not match with the period of generation reports issued by GETCO/SLDC.</p> <p>Here start end dates of monitoring period match with the start end dates of certificates of net electricity generation hence no need of apportioning</p>
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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Not Applicable

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1.

E.2. Calculation of baseline emissions or baseline net GHG removals by sinks

According to equation (1) of PDD section B.6.1, the baseline emissions are to be calculated as follows:

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

Combined margin CO₂ emission factor for grid connected power generation ($EF_{grid,CM,y}$) is calculated as follows:

$$\begin{aligned}
 EF_{grid,CM,y} &= W_{OM} * EF_{grid,OM,y} + W_{BM} * EF_{grid,BM,y} \\
 &= 0.75 * 0.9842 + 0.25 * 0.8588 \\
 &= 0.9528 \text{ tCO}_2\text{e/MWh}
 \end{aligned}$$

Thus for ex-ante emission reduction calculations, the baseline emission factor for the grid
 $= 0.9528 \text{ tCO}_2\text{e/MWh}$

Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity ($EG_{PJ,y}$)

$$EG_{PJ,y} = EG_{facility,y} = 85,316.11 \text{ MWh}$$

Hence, substituting values in equation 1, we get:

$$\begin{aligned}
 BE_y &= 85,316.11 * 0.9528 \\
 &= 81,289 \text{ tCO}_2\text{e} \\
 &= 81,289 \text{ tCO}_2\text{e}
 \end{aligned}$$

E.3. Calculation of project emissions or actual net GHG removals by sinks

The Project activity does not envisage any fossil fuel consumption. Therefore, the parameter $PE_{FF,y} = 0 \text{ tCO}_2\text{e/ annum}$. Also, as the proposed CDM Project activity is not a geothermal project activity or a hydro project activity, hence, the Project emissions as per parameters $PE_{GP,y}$ and $PE_{HP,y}$ are also zero.

Therefore, $PE_y = 0 \text{ tCO}_2\text{e/annum}$

E.4. Calculation of leakage

Leakage (LE_y) = 0

E.5. Summary of calculation of emission reductions or net GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	GHG emission reductions or net GHG removals by sinks (t CO ₂ e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	81,289	0	0	0	81,289	81,289

E.6. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO ₂ e)	76,535	81,289

E.7. Remarks on difference from estimated value in registered PDD

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The difference of emission reduction as achieved during the crediting period from estimated value, occurs due to variation of wind flow availability in the project area, which is beyond the control on the PP and purely a natural phenomenon. This is also within the limit of sensitivity test of +10%

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	ReNew Wind Energy (Rajkot) Pvt. Ltd.
Street/P.O. Box	MG Road
Building	601-604 6 th Floor DLF Corporate Park
City	Gurgaon
State/region	Haryana
Postcode	122001
Country	India
Telephone	+91-124- 4896670
Fax	+91-124-4896672
E-mail	parag@renewpower.in
Website	www.renewpower.in
Contact person	Parag Sharma
Title	Chief Operating Officer
Salutation	Mr.
Last name	Sharma
Middle name	
First name	Parag
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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
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 (EB70, 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	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		