



**Monitoring report form for CDM project activity
(Version 09.0)**

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

MONITORING REPORT

Title of the project activity	Wind Power Project at Tadas, Karnataka		
UNFCCC reference number of the project activity	9376		
Version number of the PDD applicable to this monitoring report	09		
Version number of this monitoring report	1.0		
Completion date of this monitoring report	12/10/2021		
Monitoring period number	02		
Duration of this monitoring period	01/01/2016-30/12/2019 (both days included)		
Monitoring report number for this monitoring period	Not applicable		
Project participants	ReNew Wind Energy (Karnataka) Private Limited		
Host Party	India		
Applied methodologies and standardized baselines	ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources; Version 13.0.0 Standardized baseline: NA		
Sectoral scopes	Sectoral 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
	-	291,965	-
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	339,340		

SECTION A. Description of project activity

A.1. General description of project activity

ReNew Wind Energy (Karnataka) Private Limited has set up wind power project of 50.4 MW at Tadas in Haveri & Darwada district of Karnataka, India. The project consists of installation of 63 wind turbines (WTGs) of 800 kW each.

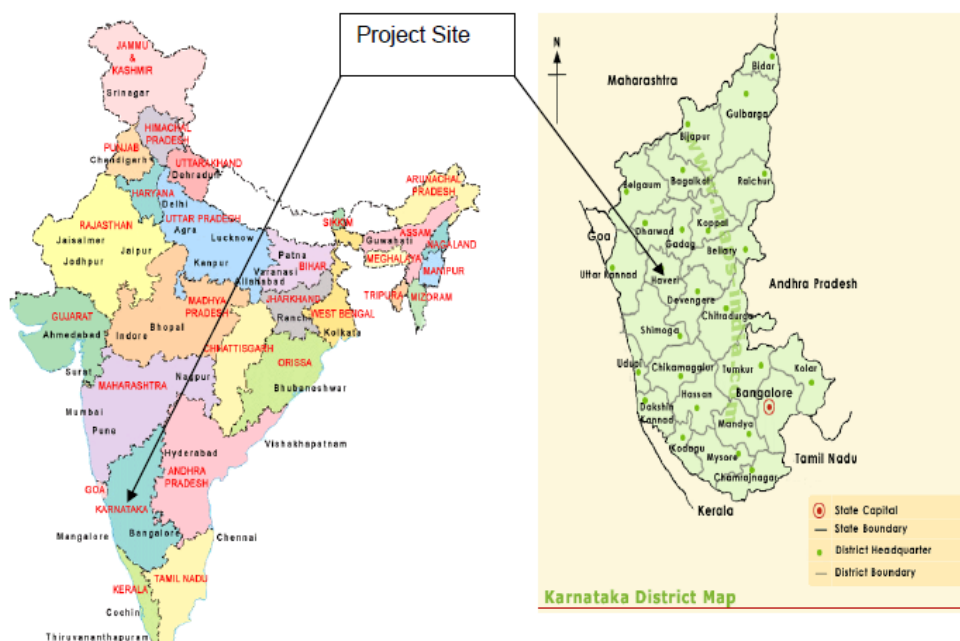
The project activity is a clean source of energy and replaces electricity from the power plants of the connected electricity grid which is emission intensive and therefore effects net GHG emission reductions. During the current monitoring period, the project activity has supplied **325,454.808** MWh of energy to the connected electricity grid, which results to emission reduction of **291,965** tCO₂e.

A.2. Location of project activity

The project is located in the Tadas of Haveri & Darwada districts in the state of Karnataka, India. Wind turbine-wise detailed locations are tabulated below.

Sl. No.	Turbine ID	Coordinates	Sl. No	Turbine ID	Coordinates
1	96 A	E 52.1705; N 16.67327	33	427	E 52.5999; N 16.76583
2	305	E 52.6028; N 16.65302	34	428	E 52.5980; N 16.76252
3	373	E 52.9340; N 16.68784	35	429	E 52.6651; N 16.76222
4	377	E 52.9135; N 16.70042	36	430	E 52.6541; N 16.75949
5	378	E 52.8794; N 16.70240	37	431	E 52.6477; N 16.75663
6	379	E 52.8811; N 16.70536	38	432	E 52.6904; N 16.75071
7	380	E 52.9042; N 16.70959	39	433	E 52.6874; N 16.74602
8	381	E 52.9193; N 16.71320	40	434	E 52.7355; N 16.74220
9	382	E 52.9548; N 16.71623	41	435	E 52.7779; N 16.74344
10	383	E 53.0023; N 16.71231	42	436	E 52.7927; N 16.73963
11	384 A	E 52.9876; N 16.70452	43	437	E 52.7543; N 16.73770
12	385 B	E 53.0114; N 16.70072	44	438	E 52.8002; N 16.73698
13	386	E 53.0218; N 16.69699	45	439	E 52.8963; N 16.74504
14	389 A	E 53.1343; N 16.71175	46	440	E 52.8837; N 16.74767
15	390 B	E 53.1248; N 16.71635	47	441 A	E 52.9068; N 16.73991
16	391 A	E 53.1065; N 16.72071	48	442	E 52.8935; N 16.73796
17	392 A	E 53.1104; N 16.72416	49	443	E 52.9067; N 16.73493
18	393	E 53.0656; N 16.72762	50	444	E 52.8052; N 16.73125
19	394	E 53.0748; N 16.73067	51	445	E 52.7940; N 16.73398
20	395	E 53.0832; N 16.73380	52	446	E 52.7903; N 16.72854
21	396	E 53.1354; N 16.73499	53	447	E 52.8059; N 16.72503
22	397	E 53.1443; N 16.73221	54	448	E 52.8032; N 16.72215
23	398	E 53.1257; N 16.72921	55	449	E 52.8430; N 16.71984
24	399	E 53.1549; N 16.72611	56	450 A	E 52.9290; N 16.71896
25	400 A	E 53.2366; N 16.72274	57	451	E 52.9531; N 16.72353
26	401	E 53.2017; N 16.73364	58	452	E 52.9679; N 16.72661
27	421	E 52.6975; N 16.77312	59	453 A	E 52.8005; N 16.69007
28	422	E 52.7058; N 16.77664	60	454	E 52.7488; N 16.69260
29	423	E 52.5799; N 16.77633	61	455	E 52.7025; N 16.69552
30	424	E 52.5707; N 16.77359	62	456	E 52.7329; N 16.69962
31	425	E 52.5736; N 16.77071	63	457 A	E 52.6695; N 16.69940

Sl. No.	Turbine ID	Coordinates	Sl. No.	Turbine ID	Coordinates
32	426	E 52.5651; N 16.76809			



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)	ReNew Wind Energy (Karnataka) Private Limited (Private entity)	No

A.4. References to applied methodologies and standardized baselines

ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 13.0.0)¹

Reference: ACM0002 (Version 13.0.0) draws upon the following tools:

- TOOL7: Tool to calculate the emission factor for an electricity system (Version 02.2.1)²
- TOOL1: Tool for demonstration and assessment of additionality (Version 6.1.0)³

Standardized baseline: Not Applicable

A.5. Crediting period type and duration

31/12/2012-30/12/2019 (Renewable)

¹ https://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_71ZC14NVE4V5DHA3TUT3896PFLPVGG

² <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf>

³ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.1.0.pdf>

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

The project activity involves installation of 63 numbers of Enercon make E-53, 800 kW WTGs. The total installed capacity of the project activity is 50.4 MW. The net electricity generated by the project activity is supplied to the connected grid.

The technical specification of WTGs installed in the project activity are shown below-

GENERAL	
Rated power	800 kW
Rotor diameter	52.9 m
Hub height	73 m
Wind class (IEC)	IEC/NVN Class S, ($v_{av} = 7.5$ m/s, $v_{ext} = 57$ m/s)
Turbine concept	Gearless, variable speed, single blade adjustment
ROTOR	
Type	Upwind rotor with active pitch control
Rotational direction	Clockwise
No. of blades	3
Swept area	2,198 m ²
Blade material	GRP (epoxy resin); integrated lightning protection
Rotational speed	Variable, 12 - 28.3 rpm
Pitch control	ENERCON single blade pitch system, one independent pitch system per rotor blade with allocated emergency supply
DRAIN TRAIN AND GENERATOR	
Hub	Rigid
Main bearing	Tapered roller bearing pair
Generator	ENERCON direct-drive annular generator
Grid feeding	ENERCON inverter
Brake systems	3 independent pitch control systems with emergency power supply, rotor brake, rotor lock
Yaw control	Active via adjustment gears, load-dependent damping
Cut-out wind speed	28 - 34 m/s (with ENERCON storm control)
Remote monitoring	ENERCON SCADA

The project started commissioned first WTGs on 07/12/2012 and completed commissioning of all WTGs on 03/05/2013. The details of the commissioning of WTGs are provided below:

Date of Commissioning	No of WTG commissioned
07/12/2012	03
24/12/2012	05
04/01/2013	07
28/01/2013	06
08/02/2013	04
13/03/2013	02
30/03/2013	11
30/03/2013	05
16/04/2013	17
03/05/2013	03

Date of Commissioning	No of WTG commissioned
Total	63

B.2. Post-registration changes

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

No temporary deviations have taken place in the current monitoring period.

B.2.2. Corrections

No corrections are applicable in the current monitoring period.

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

No changes to start date of crediting period taken place in the current monitoring period.

B.2.4. Inclusion of monitoring plan

Not applicable in 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

Not applicable in the current monitoring period.

B.2.6. Changes to project design

Not applicable in the current monitoring period.

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

Not applicable in the current monitoring period.

SECTION C. Description of monitoring system

- **Metering:** Electricity supplied to the grid is metered at the metering point connecting 63 machines of the project activity. The meter reading is taken in the presence of representatives of O&M Contractor for the project activity and KPTCL.
- **Metering Equipment:** Metering system for the project activity consists of main and check meter. Both the meters are two-way tri-vector meters capable of recording import and export of electricity
- **Meter Readings:** The electricity supplied to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of Officials from the Utility and O&M contractor, on behalf of project owner. The Joint meter reading contains the value of energy imported and exported. Thus the monitoring parameters for the project activity are the electricity import and electricity export to the grid as mentioned in the JMR. The readings are then adjusted for the transmission loss in the JMR, which can be crosschecked with the value mentioned in the invoices.

- **Inspection of Energy Meters:** All main and check energy meters (export and import), installed at the project are of 0.2% accuracy class (as per the state regulation). Each meter is jointly inspected and sealed on behalf of the parties and is not to be interfered with by either party except in the presence of the other party or its accredited representatives.
- **Meter Test Checking:** There is a separate check and main meter. The Main and Check Meters are close to each other and are tested for accuracy, with a standard meter, by the KPTCL's testing Division in an interval decided by KPTCL. The KPTCL carry out the periodical testing (and calibration if required), sealing and maintenance of meters. The KPTCL provides a copy of the test reports.
- If during the meter test checking, the main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then the meter reading will be as per the main meter as usual. The check meter will, however, be calibrated immediately. If the main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible limit of error, then the meter reading for the month up to the date and time of such test is as per the check meter.
- If both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, both the meters are immediately calibrated and the correction will be applied to the reading registered by the main meter to arrive the correct reading of energy supplied to the grid for the period up to last test.
- If during any of the monthly meter readings, the variation between the main meter and the check meter is more than the permissible limit for meters, all the meters are re-tested and calibrated immediately and the correction applied to the reading registered by the main meter to arrive the correct reading of energy supplied to the grid for the period up to last test.
- In case of the failures such as burning of the meter and the erratic display of the metered parameters and when the error found in testing the meters is beyond the permissible limit of error, the meter are calibrated immediately and the correction applied to the reading registered by the main meter to arrive the correct reading of energy supplied to the grid for the period up to last test.

The daily records for parameters such as power generation, frequency and voltage of the individual machines are noted by the SCADA system. These records are maintained by the O&M contractor and the PP.

Here 16 MW (20 WTG's) are connected in one feeder, 16 MW (20 WTG's) in second feeder and 18.4 MW (23 WTG's) are connected in third feeder. All are connected in KPTCL substation, transmission losses are calculated between substation and feeders (procedure is in form B) and net energy export is calculated by:

$$(EG_{\text{facility},y}) = EG_{\text{export},y} - (EG_{\text{export},y} * \text{Transmission loss \%}) - 115\% EG_{\text{import},y} \text{ Import}$$

Apportioning Procedures in case the dates of monitoring period do not match with billing cycle dates:

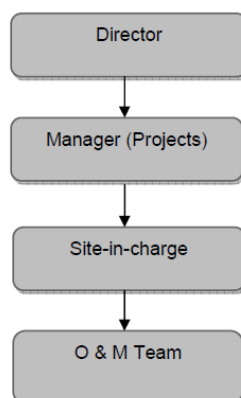
In cases when the dates of the monitoring period for the project activity may not coincide with the dates of the Credit Note issued by distribution licensee. In such a scenario, the net electricity generation data would have to be apportioned. For carrying out the apportioning procedures, WTG controller data (data recorded by the WTG controller software) are utilized. The electricity generation from WTG controllers is recorded on a daily basis in the Power Generation Reports maintained by the O&M contractors. The data from Power Generation Reports are referred for determination of the apportioning ratio. The following steps are applied to carry out the apportioning:

- i. Apportioned Electricity Export = Apportioning Ratio x Electricity Export as per Credit Note

- ii. Apportioned Electricity Import = Apportioning Ratio x Electricity Import as per Credit Note
- iii. Apportioned Net Electricity Supplied to Grid = Apportioned Electricity Export – Apportioned Electricity Import

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 will be as per the Power Purchase Agreement with the state utility.

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



Meter readings are taken jointly at the appointed date by PP's representative, O&M contractors and Discom officials. The same reported to the site-in-charge and the compiled reports are sent to the Manager (Projects) and Director. The Manager monitors overall activity of the project and report to the Director. As per O & M schedule, the operation and maintenance activities are carried out by trained and qualified technical staff of O&M contractor.

Each party maintains 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.

Calibration details of meters are provided in **Annexure 1**.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	$EF_{grid,OM,y}$
Unit	tCO ₂ e/ MWh
Description	Simple operating margin for Southern grid
Source of data	CO ₂ baseline database (Version 7.0)
Value(s) applied	0.9515
Choice of data or measurement methods and procedures	This value is calculated by taking weighted average of 3 years values for Simple Operating Margin of Southern grid viz. 2008/09, 2009/10 and 2010/11.
Purpose of data/parameter	Calculation of combined margin emission factor of Southern grid
Additional comments	The value is ex-ante and will remain same throughout the crediting period of the project activity.

Data/Parameter	$EF_{grid,BM,y}$
Unit	tCO ₂ e/ MWh

Description	Build margin for Southern grid
Source of data	CO ₂ baseline database (Version 7.0) published by CEA in January 2012
Value(s) applied	0.7339
Choice of data or measurement methods and procedures	Default values used as per the "Tool to calculate the emission factor for an electricity system" Version 02.2.1
Purpose of data/parameter	Calculation of combined margin emission factor of Southern grid
Additional comments	The value is ex-ante and will remain same throughout the crediting period of the project activity.

Data/Parameter	EF _{grid,CM,y}
Unit	tCO ₂ e/ MWh
Description	Combined margin emission factor for Southern grid
Source of data	Calculated as per the procedure described in PDD section B.6.1
Value(s) applied	0.8971
Choice of data or measurement methods and procedures	This value is calculated using EF _{grid,OM,y} and EF _{grid,BM,y} values as per Version 02.2.1 of methodological tool to calculate the emission factor for an electricity system
Purpose of data/parameter	Calculation of Baseline emission of the project activity
Additional comments	The value is ex-ante and will remain same throughout the crediting period of the project activity.

Data/Parameter	W _{OM}
Unit	%
Description	Weightage of operating margin emission factor
Source of data	Latest version of the "Tool to calculate the emission factor of an electricity system" (Version 02.2.1)
Value(s) applied	0.75
Choice of data or measurement methods and procedures	Default values used as per the "Tool to calculate the emission factor for an electricity system" Version 02.2.1
Purpose of data/parameter	Calculation of combined margin emission factor of SOUTHERN grid
Additional comments	The value is ex-ante and will remain same throughout the crediting period of the project activity.

Data/Parameter	W _{BM}
Unit	%
Description	Weightage of build margin emission factor
Source of data	Latest version of the "Tool to calculate the emission factor of an electricity system" (Version 02.2.1)
Value(s) applied	0.25
Choice of data or measurement methods and procedures	Default values used as per the "Tool to calculate the emission factor for an electricity system" Version 02.2.1
Purpose of data/parameter	Calculation of combined margin emission factor of SOUTHERN grid
Additional comments	The value is ex-ante and will remain same throughout the crediting period of the project activity.

D.2. Data and parameters monitored

Data/Parameter	$EG_{\text{facility},y}$																									
Unit	MWh																									
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y																									
Measured/calculated/default	Calculated																									
Source of data	Joint meter reading OR break up sheet provided by KPTCL (referred as 'Form B')																									
Value(s) of monitored parameter	325,454.808																									
Monitoring equipment	<p>Equipment: Main & Check Meters; Meter details provided in Table below. Details on calibration dates are provided in the Annexure 1.</p> <table border="1"> <thead> <tr> <th>Location number</th><th>Remarks</th><th>Main meter</th><th>Check meter</th></tr> </thead> <tbody> <tr> <td rowspan="2">457</td><td>Old meter</td><td>12092899</td><td>12092896</td></tr> <tr> <td>Replacement meter</td><td>18068282</td><td>18068274</td></tr> <tr> <td rowspan="2">465</td><td>Old meter</td><td>12092918</td><td>12092919</td></tr> <tr> <td>Replacement meter</td><td>18068273</td><td>18068296</td></tr> <tr> <td rowspan="2">431</td><td>Old meter</td><td>12092897</td><td>12093826</td></tr> <tr> <td>Replacement meter</td><td>18049490</td><td>18068277</td></tr> </tbody> </table> <p>Also for all meters:</p> <ul style="list-style-type: none"> • Meter make: L&T (for all meters) • Accuracy class: 0.2 s • Meter calibration frequency: Annual 	Location number	Remarks	Main meter	Check meter	457	Old meter	12092899	12092896	Replacement meter	18068282	18068274	465	Old meter	12092918	12092919	Replacement meter	18068273	18068296	431	Old meter	12092897	12093826	Replacement meter	18049490	18068277
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Measuring/reading/recording frequency	Continuous measurement and at least monthly recording.																									
Calculation method (if applicable)	<p>The JMR is usually taken once in month for the feeder meters. The JMR gives electricity export, import and losses till common substation. By using these data, net export by the WTGs in the Project activity is calculated.</p> <p>The net electricity supplied to grid is a calculated value and determined as the difference between the electricity exported to the grid and the electricity imported from the grid by the project activity and transmission losses mentioned in the Form B. The emission reduction would be computed on the basis of $EG_{\text{facility},y}$.</p> <p>Net export ($EG_{\text{facility},y}$) = $EG_{\text{export},y} - (EG_{\text{export},y} \cdot \text{Transmission loss \%}) - 115\% EG_{\text{import},y}$</p>																									
QA/QC procedures	The meter(s) are 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 annual calibration have been done during the verification period and details are provided in section C above.																									
Purpose of data/parameter	Calculation of baseline emissions																									
Additional comments	The data is 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	$E_{\text{export}, y}$																									
Unit	MWh																									
Description	The quantity of electricity supplied by the project plant/unit to the grid in year y																									
Measured/calculated/default	Measured																									
Source of data	Joint meter reading OR break up sheet provided by KPTCL (referred as 'Form B')																									
Value(s) of monitored parameter	329,663.231																									
Monitoring equipment	<p>Equipment: Main & Check Meters; Meter details provided in Table below. Details on calibration dates are provided in the Annexure 1.</p> <table border="1"> <thead> <tr> <th>Location number</th><th>Remarks</th><th>Main meter</th><th>Check meter</th></tr> </thead> <tbody> <tr> <td rowspan="2">457</td><td>Old meter</td><td>12092899</td><td>12092896</td></tr> <tr> <td>Replacement meter</td><td>18068282</td><td>18068274</td></tr> <tr> <td rowspan="2">465</td><td>Old meter</td><td>12092918</td><td>12092919</td></tr> <tr> <td>Replacement meter</td><td>18068273</td><td>18068296</td></tr> <tr> <td rowspan="2">431</td><td>Old meter</td><td>12092897</td><td>12093826</td></tr> <tr> <td>Replacement meter</td><td>18049490</td><td>18068277</td></tr> </tbody> </table> <p>Also for all meters:</p> <ul style="list-style-type: none"> • Meter make: L&T (for all meters) • Accuracy class: 0.2 s • Meter calibration frequency: Annual 	Location number	Remarks	Main meter	Check meter	457	Old meter	12092899	12092896	Replacement meter	18068282	18068274	465	Old meter	12092918	12092919	Replacement meter	18068273	18068296	431	Old meter	12092897	12093826	Replacement meter	18049490	18068277
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Measuring/reading/recording frequency	Continuous measurement and monthly recording																									
Calculation method (if applicable)	<p>The electricity generated and fed into the grid is continuously monitored using energy meters.</p> <p>For measuring the electricity exported by the project activity, the state electricity board has installed energy meters at the common feeders of the project activity. Monthly readings are taken jointly by the representative of State Electricity Transmission Co. Ltd. and site in charge of Project Proponent and a statement is prepared and signed by the representatives of both parties.</p> <p>The meters have an accuracy class of 0.2S (as per state regulation)</p> <p>Measurement by: electricity meters (feeder meters) Monitoring: Continuous measurement and monthly recording. Recording: Electronic/ Paper Recording Frequency: Continuous monitoring and monthly recording Responsibility: The operators/ O&M team will be responsible for measurement Archiving: Crediting Period + 2 years</p> <p>Calibration Frequency: As determined by state utility, once in five years is the CEA norm of calibration, however annual calibrations have been performed and details are provided in Section C above</p>																									

QA/QC procedures	The meter(s) are 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 annual calibration have been done during the verification period and details are provided in section C above.
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	The data is 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, y}			
Unit	MWh			
Description	The quantity of electricity imported by the project plant/unit from the grid in year y			
Measured/calculated/default	Measured			
Source of data	Joint meter reading OR break up sheet provided by KPTCL (referred as 'Form B')			
Value(s) of monitored parameter	262.032			
Monitoring equipment	Equipment: Main & Check Meters; Meter details provided in Table below. Details on calibration dates are provided in the Annexure 1.			
	Location number	Remarks	Main meter	Check meter
	457	Old meter	12092899	12092896
		Replacement meter	18068282	18068274
	465	Old meter	12092918	12092919
		Replacement meter	18068273	18068296
	431	Old meter	12092897	12093826
		Replacement meter	18049490	18068277
	Also for all meters:			
	<ul style="list-style-type: none">• Meter make: L&T (for all meters)• Accuracy class: 0.2 s• Meter calibration frequency: Annual			
Measuring/reading/recording frequency	Continuous measurement and daily recording			

Calculation method (if applicable)	<p>The electricity imported is continuously monitored using energy meters. For measuring the electricity imported by the project activity, the state electricity board has installed energy meters at the common feeders of the project activity. Monthly readings are taken jointly by the representative of State Electricity Transmission Co. Ltd. and site in charge of Project Proponent and a statement is prepared and signed by the representatives of both parties.</p> <p>The meters have an accuracy class of 0.2S (as per state regulation)</p> <p>Measurement by: electricity meters (feeder meters) Recording: Electronic/ Paper Recording Frequency: Continuous monitoring and monthly recording Responsibility: The operators/ O&M team will be responsible for measurement</p> <p>Calibration Frequency: As determined by state utility, once in five years is the CEA norm of calibration, however annual calibrations have been performed and details are provided in Section C above</p>
QA/QC procedures	The meter(s) are 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 annual calibration have been done during the verification period and details are provided in section C above
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	The data is 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}
Unit	MWh
Description	Daily electricity generation at the WTG controller
Measured/calculated/default	Measured
Source of data	Power Generation Reports from O&M Contractor
Value(s) of monitored parameter	NA
Monitoring equipment	WTG controller meters
Measuring/reading/recording frequency	Continuous measurement
Calculation method (if applicable)	<p>The data is monitored via project activity WTG Controllers and is recorded daily in Power Generation Reports by the O&M Contractors. This data is used only for determination of apportioning ratio, and is applied only in cases where the monitoring period does not coincide with the initial/final meter reading dates in the Credit Notes.</p> <p>Monitoring: Continuous measurement. Recording: Electronic/ Paper Recording Frequency: Continuous monitoring and monthly recording Responsibility: The plant management will be responsible for the regular recording of data. Archiving: Crediting Period + 2 years</p>

QA/QC procedures	<p>In case of any fault with the WTG Controller, the same is immediately identified through an interlocking mechanism. In such a scenario the WTG Controller is automatically shut down. The WTG Controller is then replaced.</p> <p>Controller meters do not require calibration as the energy readings of electricity generated at the controller meter is cross verified by the energy calculated by inverting system installed in the WTGs. In case there is any mismatch in the energy values recorded by the controller meter and the energy values calculated by the inverting system the machine will stop working and generate the error report.</p>
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	The data is 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

Not applicable in the current monitoring period.

SECTION E. Calculation of emission reductions or net anthropogenic removals

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

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

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y} \quad (1)$$

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

$$\begin{aligned}
 EF_{grid,CM,y} &= W_{OM} * EF_{grid,OM,y} + W_{BM} * EF_{grid,BM,y} \\
 &= 0.75 * 0.9515 + 0.25 * 0.7339 \\
 &= 0.8971 \text{ tCO}_2\text{e/MWh}
 \end{aligned}$$

Thus for ex-ante emission reduction calculations, the baseline emission factor for the grid = 0.8971 tCO₂e/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 ($EG_{PJ,y}$)

$$EG_{PJ,y} = EG_{facility,y} = 325,454.808 \text{ MWh}$$

Hence, substituting values in equation 1, we get:

$$\begin{aligned}
 BE_y &= 325,454.808 * 0.8971 \\
 &= 291,965 \text{ tCO}_2\text{e}
 \end{aligned}$$

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

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.3. Calculation of leakage emissions

Leakage (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	291,965	0	0	0	291,965	-	291,965

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)
291,965	339,340

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

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The ex-ante estimation of GHG emission reduction in the registered PDD is 84,835 for 365 days in a year. The number of days in the current monitoring period is 1460 and hence ex-ante estimate of emission reduction for the monitoring period is 339,340.

E.6. Remarks on increase in achieved emission reductions

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Actual emission reduction is less by 14% than the one estimated in registered PDD.

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

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The project activity is a large scale project of 50.4MW and is not a small scale project.

Annexure1: Calibration details of meters

Location No.	457				465				431			
Meter Type (main/check)	Main	Check	Main	Check	Main	Check	Main	Check	Main	Check	Main	Check
Meter Serial No	12092899	12092896	18068282	18068274	12092918	12092919	18068273	18068296	12092897	12093826	18049490	18068277
Meter make	L&T	L&T	L&T	L&T	L&T	L&T	L&T	L&T	L&T	L&T	L&T	L&T
Accuracy class	0.2 s	0.2 s	0.2 s	0.2 s	0.2 s	0.2 s	0.2 s	0.2 s	0.2 s	0.2 s	0.2 s	0.2 s
Previous calibration I	23/07/2015	23/07/2015	NA	NA	23/07/2015	23/07/2015	NA	NA	23/07/2015	23/07/2015	NA	NA
Validity	22/07/2016	22/07/2016	NA	NA	22/07/2016	22/07/2016	NA	NA	22/07/2016	22/07/2016	NA	NA
Previous calibration II	31/10/2017	31/10/2017	NA	NA	31/10/2017	31/10/2017	NA	NA	31/10/2017	31/10/2017	NA	NA
Validity	30/10/2018	30/10/2018	NA	NA	30/10/2018	30/10/2018	NA	NA	30/10/2018	30/10/2018	NA	NA
Previous calibration III	10/04/2018	10/04/2018	NA	NA	10/04/2018	10/04/2018	NA	NA	10/04/2018	10/04/2018	NA	NA
Validity	09/04/2019	09/04/2019	NA	NA	09/04/2019	09/04/2019	NA	NA	09/04/2019	09/04/2019	NA	NA
Previous calibration IV	NA	NA	26/09/2019	26/09/2019	NA	NA	26/09/2019	26/09/2019	NA	NA	26/09/2019	26/09/2019
Validity	NA	NA	25/09/2020	25/09/2020	NA	NA	25/09/2020	25/09/2020	NA	NA	25/09/2020	25/09/2020
Current calibration	NA	NA	30/01/2019	30/01/2019	NA	NA	30/01/2019	30/01/2019	NA	NA	30/01/2019	30/01/2019
Validity	NA	NA	29/01/2020	29/01/2020	NA	NA	29/01/2020	29/01/2020	NA	NA	29/01/2020	29/01/2020

*Calibration is delayed from July 2016 to Oct 2017. However meters were found to be working within the permissible limit of error hence adjustment equal to the permissible limit of 0.2% is taken in from July 2016 to Oct 2017.

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.
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