



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

Title of the project activity	Inner Mongolia Wulanchabu Hongji Wind Farm Project	
UNFCCC reference number of the project activity	4150	
Version number of the PDD applicable to this monitoring report	2.0	
Version number of this monitoring report	01	
Completion date of this monitoring report	10/03/2020	
Monitoring period number	The 7 th monitoring period	
Duration of this monitoring period	04/03/2018-20/02/2020 (first and last days included)	
Monitoring report number for this monitoring period	N/A	
Project participants	Project Owner: CGNPC (Wulanchabu) Wind Power Co., Ltd.	
Host Party	P.R. China	
Applied methodologies and standardized baselines	Applied methodology: ACM0002 "Grid-connected electricity generation from renewable sources" (Version 19.0) standardized baselines: NA	
Sectoral scopes	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
	0 tCO ₂ e	1,154,368 tCO ₂ e
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	1,202,577 tCO ₂ e	

SECTION A. Description of project activity

A.1. General description of project activity

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Inner Mongolia Wulanchabu Hongji Wind Farm Project (hereinafter referred to as the Project) is located in Wulanchabu City, Inner Mongolia Autonomous Region, P.R.China. It is invested, constructed and operated by CGNPC (Wulanchabu) Wind Power Co., Ltd. (hereinafter referred to as the Project Owner).

The total installed capacity of the Project is 296.5 MW equipped with 290 sets of wind turbines with a unit installed capacity of 850 kW and 25 sets of wind turbines with a unit installed capacity of 2,000 kW. The purpose of the Project is the generation of electricity from wind and the supply of this electricity to North China Power Grid. The Project as a renewable energy source generates emission reductions by avoiding CO₂ emissions from the same amount of electricity generation from North China Power Grid, which is mainly composed of traditional thermal power plants.

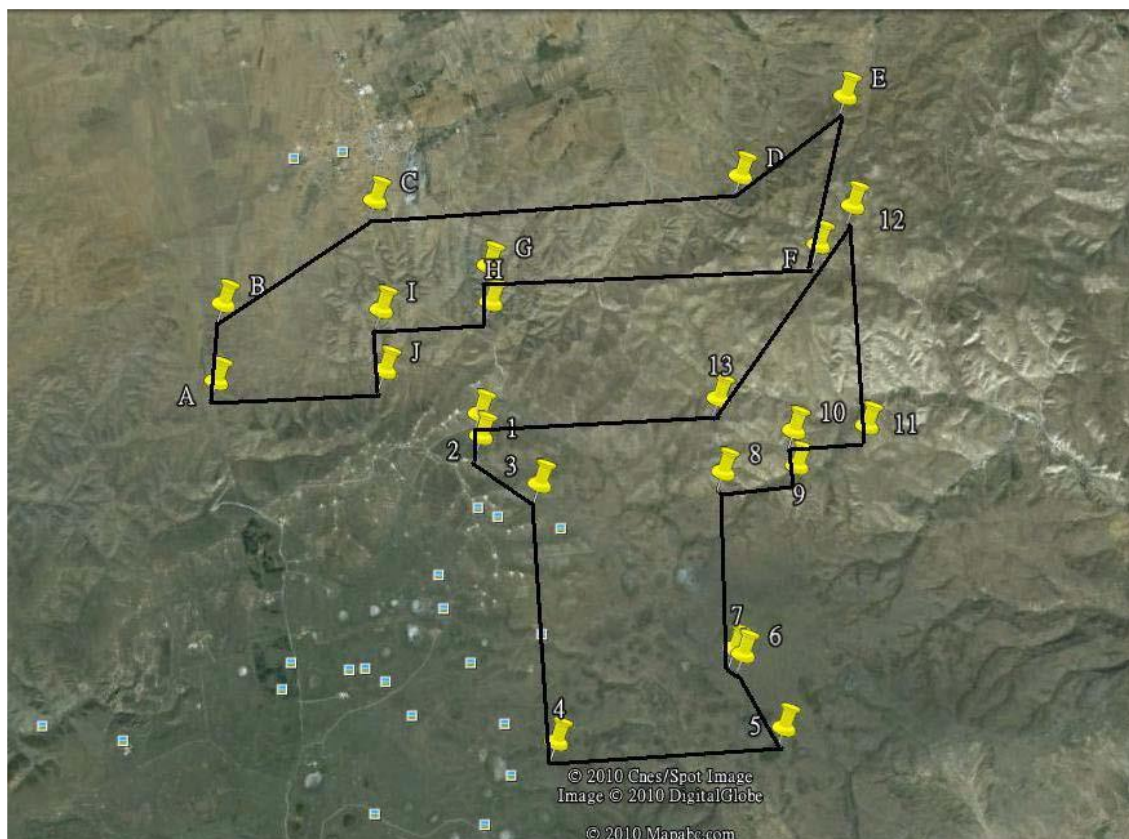
Construction of the Project was started on 25/08/2009. The first turbine was commissioned on 12/03/2010. This monitoring report focuses on the emission reductions generated by the Project from 04/03/2018 to 20/02/2020. Actual emission reductions of the Project are 1,154,368 tCO₂ in this monitoring period.

A.2. Location of project activity

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The Project is located in Wulanchabu City, Inner Mongolia Autonomous Region, P.R.China. The Project has geographical coordinates with the range of east longitude from 112°34'00.28" to 112°46'41.26" and north latitude from 41°06'56.80" to 41°16'06.67".

Figure 1. Location and boundary of the project activity



A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (host Party)	CGNPC (Wulanchabu) Wind Power Co., Ltd.	No

A.4. References to applied methodologies and standardized baselines

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The approved large-scale consolidated methodology applied in the project is ACM0002 “Gridconnected electricity generation from renewable sources” (Version 19.0, EB100, 2018). For more information regarding the methodology please refer to:

<http://cdm.unfccc.int/methodologies/DB/VJI9AX539D9MLOPXN2AY9UR1N4IYGD>

The project activity also refers to:

1. “Tool for the demonstration and assessment of additionality (version 07.0.0)”.

<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

2. “Tool to calculate the emission factor for an electricity system” (Version 07.0).

<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

3. Methodological Tool: “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” (Version 03.0.1).

<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf>

More information on the methodology and tools listed above is available at the following website:

<http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

A.5. Crediting period type and duration

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Crediting period	Renewable crediting period (7 years x3)
Starting date of crediting period	04/03/2018
End date of crediting period	03/03/2025

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

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The Project is a greenfield grid-connected wind power project. The total installed capacity of the Project is 296.5 MW equipped with 290 sets of wind turbines with a unit installed capacity of 850 kW and 25 sets of wind turbines with a unit installed capacity of 2,000 kW. Electricity generated by the Project is delivered to North China Power Grid.

Construction of the Project was started on 25/08/2009. The first turbine was commissioned on 12/03/2010. And from then on key equipments of the Project have been operating in line with the registered CDM-PDD approved by CDM EB. During this monitoring period, no overhaul was undertaken for the Project and there was no downtime or exchange of equipment.

No special event or situation, which may impact the applicability of the methodology, occurred in this monitoring period.

The technology process of the Project and key technical parameters of turbines are as below:

Figure 2 Technology process of the project

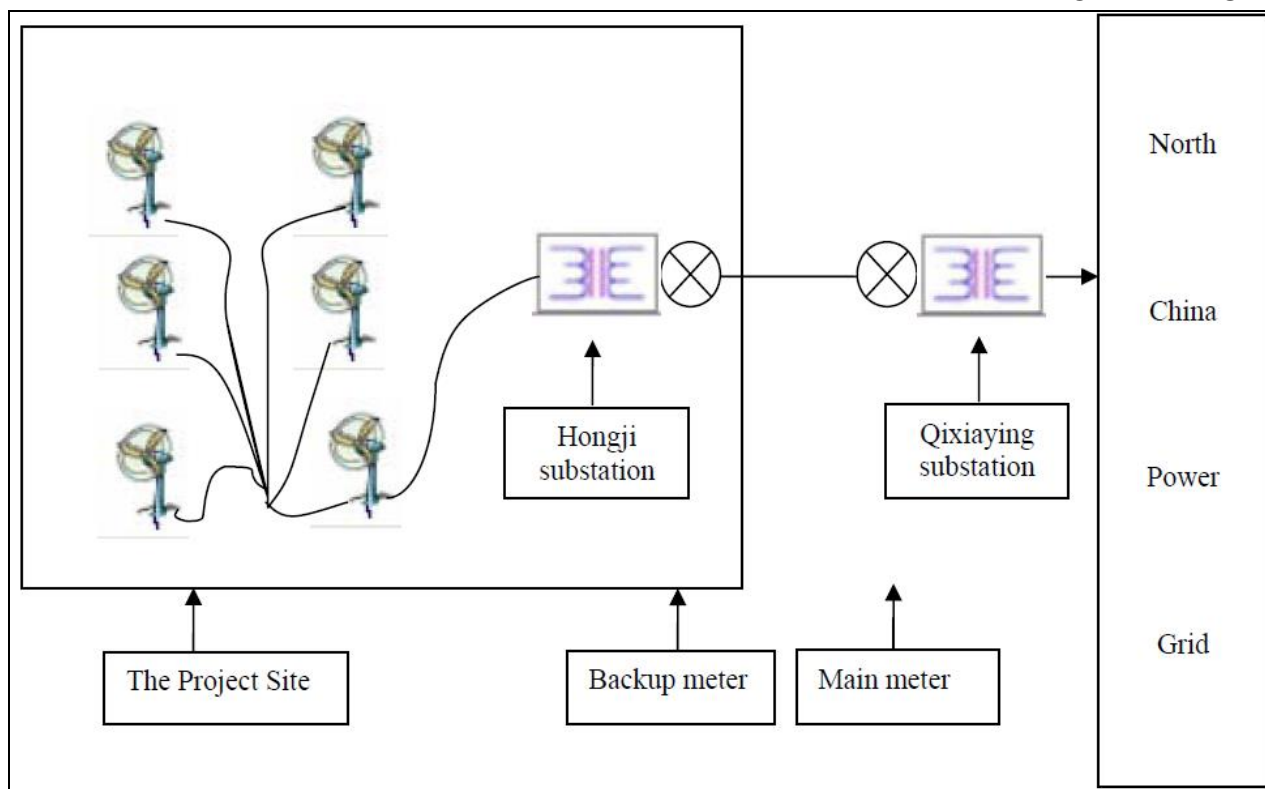


Table 1 Technical Characteristics of the generating equipments

Type	Quantity	Technical parameters
V52-850 kW	290 sets	Rated capacity: 850 kW Height of the hub: 65 m Rotor diameter: 52 m Rated voltage: 690 V Cut-in wind speed: 4 m/s Rated wind speed: 18 m/s Cut-out wind speed: 25 m/s Lifetime: 20 years
V80-2.0 MW	25 sets	Rated capacity: 2,000 kW Height of the hub: 67 m Rotor diameter: 80 m Rated voltage: 690 V Cut-in wind speed: 4 m/s Rated wind speed: 19 m/s Cut-out wind speed: 25 m/s Lifetime: 20 years

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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No any temporary deviation has been applied during this monitoring period.

B.2.2. Corrections

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No any correction to project information or parameters fixed at validation has been approved during this monitoring period.

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

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

B.2.4. Inclusion of monitoring plan

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N/A

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

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There is no permanent change from registered monitoring plan for the current monitoring period.

There is no permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools for the current monitoring period.

B.2.6. Changes to project design

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There is no change to project design of registered project activity.

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

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N/A

SECTION C. Description of monitoring system

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The monitoring system is specified as below:

1. Monitoring system and data collection

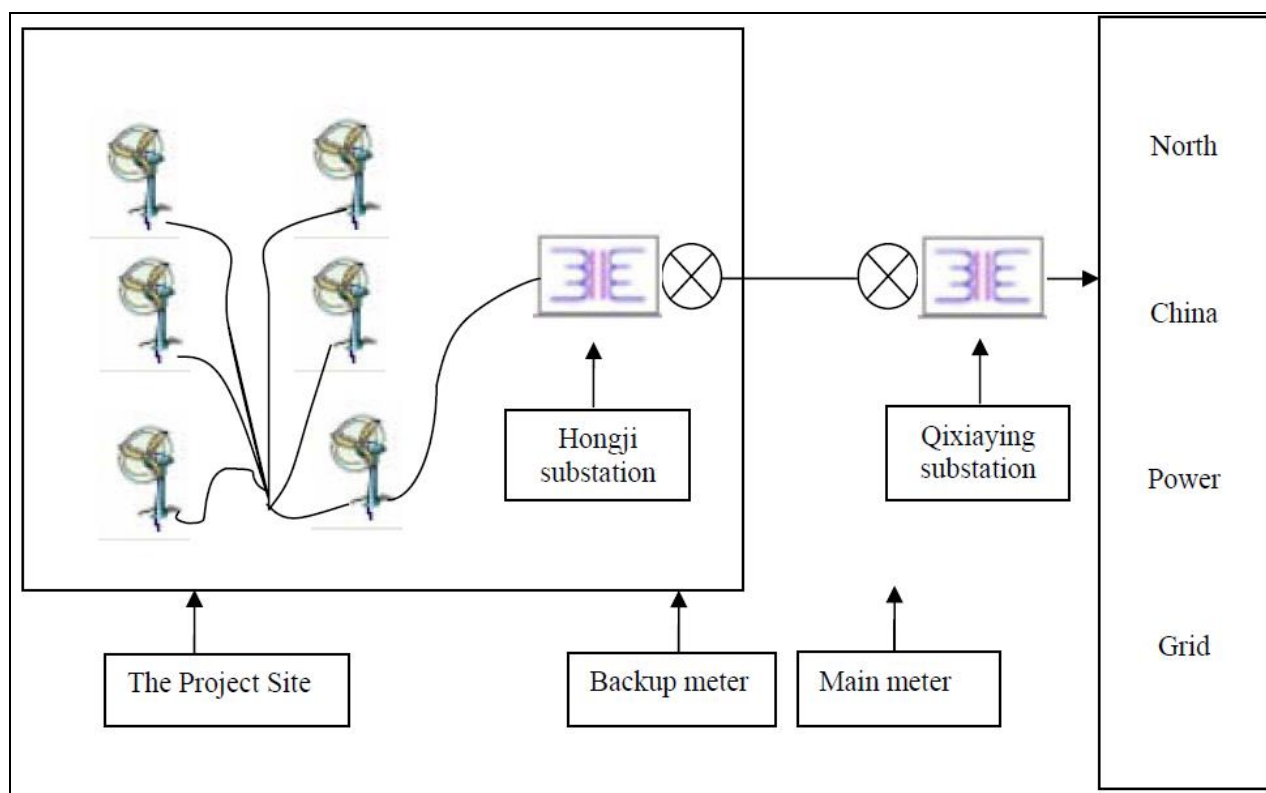
As indicated in Figure 3, the main meter is a bi-directional electricity meter installed at the Qixiaying substation where two monitoring points for parameters “quantity of electricity exported to the grid by the Project” and “quantity of electricity imported from the grid by the Project” are located. A backup meter is installed at the Hongji substation in case of breakdown of the main meter.

Project is continuously measured by the bi-directional main meter installed at the Qixiaying substation. The monthly cut-off time of electricity supplied to and imported from the grid via the main line is 24:00 on the 20th day of every month. Readings of the main meter each month are monthly collected from the Qixiaying substation together with the grid company and recorded on the monthly report by the monitoring staff. After double checked and confirmed by the internal audit staff, the monthly report is formally issued and reported to the CDM manager at the same time. Based on the above data, the quantity of net electricity supplied by the Project to the grid can be calculated out through deduction of imported electricity. A monitoring report is periodically prepared describing the monitoring procedures and the approved and signed off data, corrected errors, and the emission reduction calculations. Calibration records are presented for verification along with the monitoring report.

All data collected as part of the monitoring are archived electronically and kept at least for two years after the end of the last crediting period.

Indicative electric connection diagram of the project is described as follow:

Figure 3 Indicative electric connection diagram of the project activity



2. Organizational structure and responsibility

Table 2. Organizational structure and roles and responsibilities

Organizational structure		Roles and responsibilities
CGNPC (Wulanchabu) Wind Power Co., Ltd.		the Project Owner
CDM Project Office	CDM manager	Overall management of monitoring and reporting activities Crosscheck of meter readings Check of calibration validity
	Monitoring staff	Data collection, reporting and archiving Calibration and maintenance of electricity meters
	Internal audit staff	Identification of potential improvements or required changes Double check of data

3. Quality assurance and quality control

The electricity meters are at least annually calibrated for precision by a qualified entity in accordance with industry standards (e.g. the power sector standard DL/T448 in China). Calibration records are kept by the monitoring staff for verification. The meters will be jointly inspected and sealed on behalf of the parties concerned and not be interfered with by either party except in the presence of the other party or its accredited representatives.

The meters installed will be calibrated by a qualified entity, under any of the following conditions:

- (a) before the end of the validity of the previous calibration certificate;
- (b) after the detection of a difference larger than the allowable error in the readings of the meters;
- or
- (c) after the repair of all or part of a meter caused by the failure of one or more parts to operate in accordance with the specifications.

The CDM manager crosschecks meter readings from the main meter received and receipts for sold/purchased electricity and also compares the data with the meter readings from the backup meter.

The most conservative values between the readings of the main meter and receipts for sold/purchased electricity are adopted. The CDM manager also checks the validity of the calibration certificates of the electricity meters. If the data are correct and the meters are calibrated, the data will be approved, signed off and stored. If any errors are identified, such errors will be described and corrected, prior to approval, signing off and storage of the corrected data.

The internal audit staff will also identify potential improvements or required changes in the monitoring and reporting procedure for the future.

4. Emergency procedures

Should any previous month readings of the main meter be inaccurate by more than the allowable error, or otherwise the main meter failed to function, the quantity of net electricity generation supplied by the Project to the grid will be determined by the following steps:

- (a) by reading the backup meter, unless a test by either party reveals it is inaccurate;
- (b) if the backup meter also fails to function or is not within the allowable error of precision, the Project Owner and the grid company will jointly prepare a reasonable and conservative estimate of the correct readings, and provide sufficient evidence that shows this estimation is reasonable and conservative for verification by the DOE;
- (c) if the grid company and the Project Owner fail to agree then the matter will be referred for arbitration according to agreed procedures.

5. Training

A CDM Monitoring Manual has been compiled and training on personnel from the CDM Project Office has been completed within three months from registration of the Project. Training on new personnel to the CDM Project Office will be completed within three months from starting work.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	$EF_{grid,CM,y}$
Unit	tCO ₂ /MWh
Description	The Baseline Emission Factor
Source of data	The registered PDD
Value(s) applied	0.84045
Choice of data or measurement methods and procedures	Calculated follow the "Tool to calculate the emission factor for an electricity system" (Version 07.0)
Purpose of data/parameter	Baseline emission calculations
Additional comments	N/A

D.2. Data and parameters monitored

Data/parameter:	$EG_{facility,y}$
Unit	MWh
Description	Quantity of net electricity generation supplied by the Project to the grid
Measured/calculated/default	Calculated
Source of data	The Project Site
Value(s) of monitored parameter	1,373,512.27
Monitoring equipment	Details can be showed in Table 4.
Measuring/reading/recording frequency:	Continuously measurement and monthly recording
Calculation method (if applicable):	$EG_{facility,y} = EG_{export,y} - EG_{import,y}$
QA/QC procedures:	<ol style="list-style-type: none"> 1. Receipts for sold/purchased electricity are used for crosscheck. 2. When the main meter fails to work normally, the readings of the backup meter will be adopted. 3. The data will be archived till the end of the crediting period and two years thereafter. 4. The main meter is calibrated by a qualified entity in accordance with industry standards.
Purpose of data:	Baseline emission calculations
Additional comments:	Data will be archived at least for two years after the end of the crediting period, or the last issuance of CERs, whichever is later

Data/parameter:	$EG_{export,y}$
Unit	MWh
Description	Quantity of electricity exported to the grid by the Project

Measured/calculated/default	Measured
Source of data	The Project Site
Value(s) of monitored parameter	1,375,083.79
Monitoring equipment	Details can be showed in Table 4.
Measuring/reading/recording frequency:	Continuously measurement and monthly recording
Calculation method (if applicable):	NA
QA/QC procedures:	<ol style="list-style-type: none"> 1. Receipts for sold/purchased electricity are used for crosscheck. 2. When the main meter fails to work normally, the readings of the backup meter will be adopted. 3. The data will be archived till the end of the crediting period and two years thereafter. 4. The main meter is calibrated by a qualified entity in accordance with industry standards.
Purpose of data:	Baseline emission calculations
Additional comments:	Data will be archived at least for two years after the end of the crediting period, or the last issuance of CERs, whichever is later

Data/parameter:	<i>EG_{import,y}</i>
Unit	MWh
Description	Quantity of electricity imported from the grid by the Project
Measured/calculated/default	Measured
Source of data	The Project Site
Value(s) of monitored parameter	1,571.52
Monitoring equipment	Details can be showed in Table 4.
Measuring/reading/recording frequency:	Continuously measurement and monthly recording
Calculation method (if applicable):	NA
QA/QC procedures:	<ol style="list-style-type: none"> 1. Receipts for sold/purchased electricity are used for crosscheck. 2. When the main meter fails to work normally, the readings of the backup meter will be adopted. 3. The data will be archived till the end of the crediting period and two years thereafter. 4. The main meter is calibrated by a qualified entity in accordance with industry standards.
Purpose of data:	Baseline emission calculations
Additional comments:	Data will be archived at least for two years after the end of the crediting period, or the last issuance of CERs, whichever is later

Table 4: Details of the metering instruments

Meters	Type	Accuracy Class	Serial number	Calibration frequency
Main meter	ZMQ202C.4r4af6	0.2s	95807684	Annually
Backup meter	ZMQ202C.4r4af6	0.2s	95336153	Annually

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D.3. Implementation of sampling plan

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The parameters monitored described in section D.2 above do not involve the sampling approach.

SECTION E. Calculation of emission reductions or net anthropogenic removals

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

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The baseline emission BE_y (tCO₂) during the monitoring period results from:

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

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

BE_y = Baseline emissions (tCO₂)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the Project (MWh).

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the Project to the grid (MWh)

$EF_{grid,CM,y}$ = Emission factor of the grid (tCO₂/MWh)

As per the registered CDM-PDD, the electricity supplied to the grid should be net of auxiliary use, so: $EG_{facility,y} = EG_{export,y} - EG_{import,y}$

Where:

$EG_{export,y}$ = Quantity of electricity exported to the grid by the Project (MWh)

$EG_{import,y}$ = Quantity of electricity imported from the grid by the Project (MWh)

The net electricity exported by the project is calculated as below:

Table 4 The electricity exported to the grid ($EG_{export,y}$)

Monitoring Period		Electricity exported to the grid by calculation meter readings (MWh)	Electricity exported to the grid by sales receipts (MWh)	Conservative value after crosscheck (MWh)
Start	End	A	B	C=MIN(A,B)
2018/3/4	2018/3/20	33005.22	33005.22	33,005.22
2018/3/21	2018/4/20	79158.97	79158.97	79,158.97
2018/4/21	2018/5/20	58671.78	58671.78	58,671.78
2018/5/21	2018/6/20	63491.59	63491.59	63,491.59
2018/6/21	2018/7/20	41532.91	41532.91	41,532.91
2018/7/21	2018/8/20	32008.64	32008.64	32,008.64
2018/8/21	2018/9/20	43023.41	43023.41	43,023.41
2018/9/21	2018/10/20	50613.43	50613.43	50,613.43
2018/10/21	2018/11/20	81602.98	81602.98	81,602.98
2018/11/21	2018/12/20	91729.54	91729.54	91,729.54
2018/12/21	2019/1/20	68460.58	68460.58	68,460.58
2019/1/21	2019/2/20	52677.34	52677.34	52,677.34
2019/2/21	2019/3/20	46627.16	46627.16	46,627.16
2019/3/21	2019/4/20	66174.13	66174.13	66,174.13
2019/4/21	2019/5/20	70757.38	70757.38	70,757.38
2019/5/21	2019/6/20	56766.31	56766.31	56,766.31

2019/6/21	2019/7/20	36506.26	36506.26	36,506.26
2019/7/21	2019/8/20	44595.72	44595.72	44,595.72
2019/8/21	2019/9/20	31887.24	31887.24	31,887.24
2019/9/21	2019/10/20	40874.12	40874.12	40,874.12
2019/10/21	2019/11/20	78514.83	78514.83	78,514.83
2019/11/21	2019/12/20	81690.83	81690.83	81,690.83
2019/12/21	2020/1/20	73430.68	73430.68	73,430.68
2020/1/21	2020/2/20	51282.74	51282.74	51,282.74
Total		-	-	1,375,083.79

Table 5 The electricity imported from the grid ($EG_{import,y}$)

Monitoring Period		Electricity imported from the grid by calculation meter readings (MWh)	Electricity imported from the grid by sales receipts (MWh)	Conservative value after crosscheck (MWh)
Start	End	D	E	F=MAX(D,E)
2018/3/4	2018/3/20	24.53	24.53	24.53
2018/3/21	2018/4/20	31.87	31.87	31.87
2018/4/21	2018/5/20	26.92	26.92	26.92
2018/5/21	2018/6/20	59.36	59.36	59.36
2018/6/21	2018/7/20	71.51	71.51	71.51
2018/7/21	2018/8/20	91.56	91.56	91.56
2018/8/21	2018/9/20	64.48	64.48	64.48
2018/9/21	2018/10/20	78.62	78.62	78.62
2018/10/21	2018/11/20	36.54	36.54	36.54
2018/11/21	2018/12/20	38.41	38.41	38.41
2018/12/21	2019/1/20	58.39	58.39	58.39
2019/1/21	2019/2/20	181.62	181.62	181.62
2019/2/21	2019/3/20	34.96	34.96	34.96
2019/3/21	2019/4/20	33.83	33.83	33.83
2019/4/21	2019/5/20	29.87	29.87	29.87
2019/5/21	2019/6/20	68.53	68.53	68.53
2019/6/21	2019/7/20	115.59	115.59	115.59
2019/7/21	2019/8/20	86.22	86.22	86.22
2019/8/21	2019/9/20	167.91	167.91	167.91
2019/9/21	2019/10/20	124.28	124.28	124.28
2019/10/21	2019/11/20	48.1	48.1	48.10
2019/11/21	2019/12/20	58.42	58.42	58.42
2019/12/21	2020/1/20	16.27	16.27	16.27
2020/1/21	2020/2/20	23.73	23.73	23.73
Total		-	-	1,571.52

Net Electricity supplied to the NCPG by the project

Monitoring Period	$EG_{facility,y}$
	G=C-F
04/03/2018-20/12/2019	1,373,512.27 MWh

$$BE_y = EG_{facility,y} \times EF_{grid,CM,y} = 1,373,512.27 \text{ MWh} \times 0.84045 \text{ tCO}_2\text{e/MWh} = 1,154,368 \text{ tCO}_2\text{e}.$$

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

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According to the applied methodology, for the project is a renewable energy project activity, hence, $PE_y = 0 \text{ tCO}_2\text{e}$.

E.3. Calculation of leakage emissions

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According to the applied methodology, no leakage is considered for the project.

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	Total amount
Total	1,154,368	0	-	0	1,154,368	1,154,368

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)
1,154,368	1,202,577

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

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According to the registered PDD, the emission reductions of the project are estimated to be 610,488 tCO₂e per annum. This monitoring period from 04/03/2018 to 20/02/2020 has 719 days. As a result, the estimated emission reductions during the monitoring period are calculated as: $610,488 \text{ tCO}_2\text{e} / 365 \text{ days} * 719 \text{ days} = 1,202,577 \text{ tCO}_2\text{e}$.

E.6. Remarks on increase in achieved emission reductions

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The actual value of emission reductions in this period is lower than that estimated in the PDD.

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

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N/A

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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"> • Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
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		