INNER MONGOLIA JINGNENG SAIHAN WIND FARM PHASE II PROJECT

Document Prepared by Climate Bridge (Shanghai) Ltd.

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Project Title	**Inner Mongolia Jingneng Saihan Wind Farm Phase II Project**
Version	1.1
Report ID	-
Date of Issue	06-04-2021
Project ID	921
Monitoring Period	21-09-2015 to 31-12-2020
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Inner Mongolia Jingneng Saihan Wind Farm Phase II Project (hereinafter referred to as the project) located in Suniteyouqi, Xilinguole League, Inner Mongolia Autonomous Region, P. R. China. The project involves the installation of 24 wind turbines with capacity of 2000 kW each, which amount to a total installed capacity of 48 MW. The estimated annual net electricity supplied to the grid of the project is 118,560 MWh. The construction of the project was started on 20/06/2009, and the first wind turbine has been put into operation on 27/10/2009. All the 24 wind turbines have been put into operation on 26/12/2009.The electricity generated from the project is supplied to the North China Power Grid, by replacing the electricity generated from fossil fuel-fired power plants dominated North China Power Grid (NCPG), the project activity achieves obvious greenhouse gas (GHG) emission reductions by avoiding CO_2 emissions.

During this VCS monitoring period from 21/09/2015 to 31/12/2020[1] (both days included), the total emission reduction achieved is 379,769 tCO_2e.

1.2 Sectoral Scope and Project Type

Sectoral scope: 1. Energy (renewable/non-renewable);

Project type: Wind-power generation project;

The project is not a grouped project.

1.3 Project Proponent

Organization name	**Beijing International New Energy Co., Ltd.**
Contact person	Jiaman Xu
Title	Project Manager
Address	No.1, Nanbinhe Road, Guanganmenwai, Xuanwu District, 1003 Room, Gaoxin Building, Beijing City, China.
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[1] This monitoring period started from 21/09/2015 to 31/12/2020, with totally 1,929 days. Among which, 1,497 days (21/09/2015-26/10/2019) in first crediting period (27/10/2009-26/10/2019), and 432 days (27/10/2019- 31/12/2020) in second crediting period (27/10/2019-26/10/2029).

1.4 Other Entities Involved in the Project

Organization name	Climate Bridge Ltd.
Role in the Project	VCU Buyer
Contact person	Zhiwen Gao
Title	General Manager
Address	Block B, Level 24, Jiangong Mansion, 33 Fushan Road, Pudong New Area, Shanghai, China 200120
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1.5 Project Start Date

The starting date of the project is 27/10/2009 (the date of project started operation).

1.6 Project Crediting Period

The project is applicable to renewable crediting period which shall be a maximum of ten years and may be renewed at most twice. However, as the project is also registered as a CDM project with a seven year twice renewable project crediting period, it is not eligible for VCU issuance beyond the end of those 21 years. The first renewable crediting period of the project is from 27/10/2009 to 26/10/2019 (with total 10 years). The second crediting period of the project is from 27/10/2019 to 26/10/2029 (with total 10 years).

1.7 Project Location

The project located in Suniteyouqi, Xilinguole League, Inner Mongolia Autonomous Region, P. R. China. The project has central geographical coordinates with east longitude of 112°51'00" and north latitude of 42°37'00".

Figure 1. Location of Inner Mongolia Autonomous Region in China

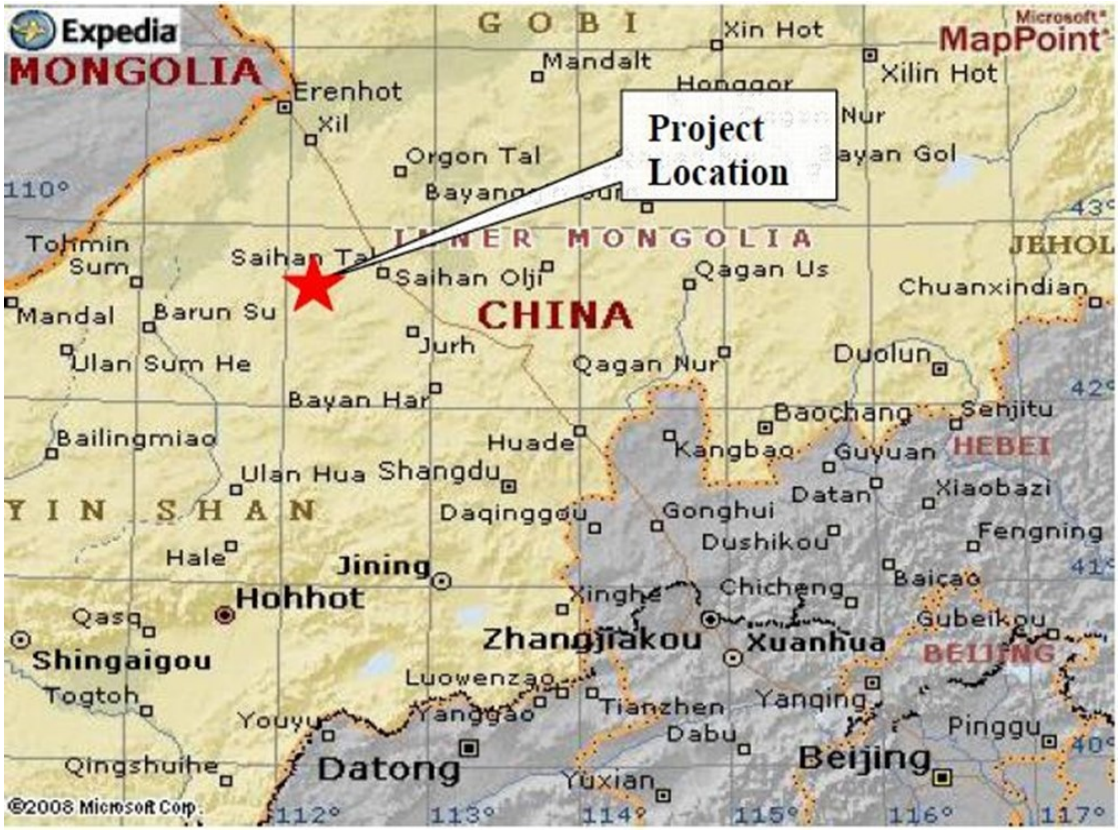

Figure 2. Location of the project

1.8 Title and Reference of Methodology

The selected methodology

For the first crediting period (27/10/2009~26/10/2019):

The approved methodology applied in the proposed project activity is ACM0002 (version 12.1.0) – "Consolidated methodology for grid-connected electricity generation from renewable sources" and monitoring methodology.

For the second crediting period (27/10/2019~26/10/2029):

ACM0002: "Grid-connected electricity generation from renewable sources" (version 20.0);

Reference: https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG

Tools applied

For the first crediting period (27/10/2009~26/10/2019):

"Tool to calculate the emission factor for an electricity system (version 02.1.0)"

Reference:

For the second crediting period (27/10/2019~26/10/2029):

"Tool to calculate the emission factor for an electricity system (version 07.0)" is applied in the project.

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

Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (Version 03.0).

Reference: http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v3.0.pdf.

1.9 Participation under other GHG Programs

The project has been registered as a Clean Development Mechanism (CDM) project in UNFCCC on 09/06/2011 (UNFCCC Ref. 4795), with the 7 years crediting period started from 09/06/2011. Please refer to the following link for details:
https://cdm.unfccc.int/Projects/DB/BVQI1305287203.94/view?cp=1

Except for CDM, the project did not register under any other GHG program.

1.10 Other Forms of Credit

Total GHG emission reductions of 70,876 tCO_2 generated from 09/06/2011 to 20/05/2012 (both days included) by the project has been issued as CER under CDM program.

The GHG emission reductions generated by the project from 21/09/2015 to 31/12/2020 will not be used for compliance with emission trading programs or to meet binding limits on GHG emissions.

All credits from 21/09/2015 to 31/12/2020 will be claimed under VCS program as VCUs for the project to avoid double counting.

The project hasn't sought or received another form of environmental credits.

1.11 Sustainable Development

The project makes contribution to the local sustainable development as follows:

GHG emission reduction

The project will help reduce the greenhouse gas GHG emissions versus the high-growth, coal-dominated business-as-usual scenario in the North China Power Grid by reducing the electricity generation from the fossil-fuel fired power plants, particularly the emission of SO_x、 NO_x and dust.

Employment opportunities

The conducting of the project will offer job opportunities for local people, the estimated temporary job created in construction period and long-term job in the operational period are about 300 and 24, respectively.

Economic Improvement

The construction of the wind farm will promote local economy by contributing to local government with more tax revenues through selling power generation.

2 SAFEGUARDS

2.1 No Net Harm

There are no negative environmental and/or socio-economic impacts due to the project. In fact, the project as a clean renewable energy project can reduce greenhouse gas emissions and the environmental pollution caused by fossil fuels consumption. Meanwhile, the implementation of the project will improve local socio-economic development through creating career opportunities and paying taxes.

2.2 Local Stakeholder Consultation

Local Stakeholder Consultation during the project preparation stage:

On 21/03/2009, staff from the project owner carried out a survey of the local resident around the project location. The staff introduced the background of the project and then sent out 50 copies of questionnaire in a random way, 46 pieces of reply were received. Among the interviewees, 23 of them are governmental officials, 8 teachers, 3 workers, 1 student, 1 farmer and 10 others.

An invitation notice for stakeholder comments was later issued by the project developer, 23 representatives of local stakeholders, including governmental officials of local county and local resident, etc attended the meeting on 21/03/2009 to discuss the questionnaires collected and further introduce the project. No negative opinion on construction of the project is heard and environmental considerations expressed by stakeholders are discussed on the meeting.

The questions regarding the project were mainly as follows:

1. How is the current environment quality?

2. Do you currently experience electromagnetic interference when watching TV at home?

3. Are there any negative impacts of the project on the everyday life of local residents?

4. Is the project going to help improve the local economy?

5. Does the project impact on local sound/noise environment?

6. Which is the environmental topic that concerns you the most during the construction and operation of the project?

7. Do you support the project?

The summary of survey is listed as the following:

- 35 (76%) of them think the current environment quality is good, 10 (22%) think it is normal and 1 (2%) of them are unsure;

- 26 (57%) of them doesn't experience electromagnetic interference, 14 (30%) experiences and 6(13%) of them are not sure;

- 32 (70%) of them think there will not be any negative impacts on their everyday life, 7(15%) of them thinks there will be and 7(15%) of them are not sure;

- 42 (91%) of them think the project will help to improve the local economy, none of them don't think so and 4(9%) of them are not sure;

- 22 (48%) of them think the project doesn't impact on local sound/noise environment, 4 (9%) of them think it will, 20 (43%) of them are unsure;

- Regarding the construction and operation of the propose project, 20 (43%) of them are most concerned with the noise level and 23 (50%) of them are most concerned with wastewater;

- 45 (98%) of them support the implementation of the project and 1 (2%) of them don't care.

Conclusion: The local community possesses basically positive comments on the effects of the project. The interviewees considered that local social, economic and environmental development would be beneficial from the project. The response was overall supportive to the project implementation.

Local Stakeholder Consultation during the project implementation stage:

Communications with Local stakeholders were carried out at periodic intervals. Key implementation schedules or changes of the project will be communicated to the local authority, who will inform the neighbourhood committee and the local residents, the comments and suggestions from residents will be collected by the local authority meanwhile. And the local government agencies and competent authorities will conduct spot checks on the implementation of the project from time to time, and give suggestions on the involved rectification problems. There are no negative comments received for the project. In line with VCS requirements all the processes have been implemented to receive comments from local stakeholders as well as communicate with them at periodic intervals.

2.3 AFOLU-Specific Safeguards

NA

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project involves the installation of 24 wind turbines with capacities of 2000 kW each, which amount to a total installed capacity of 48MW, and the project started operation on 27/10/2009. There was no significant malfunction or any emergency reported for the Project during this VCS monitoring period from 21/09/2015 to 31/12/2020.

The wind turbines were supplied by Beijing Beizhong Steam Turbine Generator Co., Ltd. And the selected model is FD80-2000. The main technical specifications of the wind turbine are provided in the following table.

Table 1 The main technical specification

Item	Unit	Index
Rated capacity	kW	2000
Number of blades	piece	3
Rotor diameter	m	80
Rated wind speed	m/s	13.5
Rated Power	kW	2000
Rated voltage	V	690
Life time	Year	20
Plant load Factor	-	0.28

3.2 Deviations

3.2.1 Methodology Deviations

N.A.

3.2.2 Project Description Deviations

N.A.

3.3 Grouped Projects

The Project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,OM,y}$
Data unit	tCO_2e/MWh
Description	Operating margin emission factor for North China Power Grid
Source of data	"Baseline Emission Factors for Regional Power Grids in China" published by China DNA
Value applied	1.0069 for first crediting period (27/10/2009-26/10/2019) 0.9680 for second crediting period (27/10/2019-26/10/2029)
Justification of choice of data or description of measurement methods and procedures applied	As per the requirements in "Tool to calculate the emission factor for an electricity system"
Purpose of Data	Calculation of $EF_{grid,CM,y}$
Comments	Calculated ex ante and fixed for the first and second crediting period

Data / Parameter	$EF_{grid,BM,y}$
Data unit	tCO_2e/MWh
Description	Build margin emission factor for North China Power Grid
Source of data	"Baseline Emission Factors for Regional Power Grids in China" published by China DNA
Value applied	0.7802 for first crediting period (27/10/2009-26/10/2019) 0.4578 for second crediting period (27/10/2019-26/10/2029)
Justification of choice of data or description of measurement methods and procedures applied	As per the requirements in "Tool to calculate the emission factor for an electricity system"
Purpose of Data	Calculation of $EF_{grid,CM,y}$
Comments	Calculated ex ante and fixed for the first and second crediting period

Data / Parameter	ω_{OM}
Data unit	-
Description	Weighting of operating margin emissions factor
Source of data	As per the requirements in "Tool to calculate the emission factor for an electricity system"
Value applied	0.75
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Calculation of $EF_{grid,CM,y}$
Comments	Calculated ex ante and fixed for the second crediting period

Data / Parameter	ω_{BM}
Data unit	-
Description	Weighting of build margin emissions factor
Source of data	As per the requirements in "Tool to calculate the emission factor for an electricity system"
Value applied	0.25
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Calculation of $EF_{grid,CM,y}$
Comments	Calculated ex ante and fixed for the second crediting period

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2e/MWh
Description	Baseline emission factor for North China Power Grid

Source of data	Registered and renewed PDD
Value applied	0.9502 for first crediting period (27/10/2009-26/10/2019) 0.8405 for second crediting period (27/10/2019-26/10/2029)
Justification of choice of data or description of measurement methods and procedures applied	As per the requirements in "Tool to calculate the emission factor for an electricity system"
Purpose of Data	Calculation of baseline emissions
Comments	The baselines emission factor was determined ex-ante and fixed during the first and second crediting period.

4.2 Data and Parameters Monitored

The Project shares the 35kV/220kV substation and gateway meters (M1 as the main meter and M2 as the backup meter) with Project B (Inner Mongolia Jingneng Saihan Wind Farm Phase I Project), and other project(s) (Inner Mongolia Jingneng Saihan Wind Farm Phase III Project). In order to deal with the jointly-reading problem, the project owner and the grid company set up the procedure and calculation method to determine the net electricity supplied to the grid by the Project, which is calculated according to the equation (1) in section 4.3.

Data / Parameter	$EG_{facility,y}$
Data unit	MWh/yr
Description	Quantity of net electricity generation supplied by the project plants/units to the grid in year y.
Source of data	Calculated according to the equation (1) in section 4.3
Description of measurement methods and procedures to be applied	The net electricity supplied to the Grid by the project are calculated through $EG_{export,y}$, $EG_{import,y}$, $EG_{A,y}$,$EG_{B,y}$, $EG_{c,y}$ and $EG_{im-spare,y}$ according to the equation (1) in section 4.3
Frequency of monitoring/recording	-
Value applied	

Year	Value
21/09/2015-31/12/2015	25,011.136
01/01/2016-31/12/2016	62,992.310
01/01/2017-31/12/2017	73,389.362
01/01/2018-31/12/2018	65,541.602

	01/01/2019-26/10/2019	59,791.145
	27/10/2019-31/12/2019	14,649.670
	01/01/2020-31/12/2020	113,043.012
	Total	414,418.236
Monitoring equipment	-	
QA/QC procedures to be applied	Electricity supplied to the grid is checked by internal verification procedure and electricity sales receipts.	
Purpose of data	Baseline emission calculation	
Calculation method	Calculated according to the equation (1) in section 4.3	
Comments	Uncertainty level of data is low	

Data / Parameter	$EG_{export,y}$	
Data unit	MWh/yr	
Description	Total electricity supplied to the grid via the main power line by the Project, Project B and other project(s) during year y	
Source of data	Readings of electricity Meter M1 installed at the Wenduer substation (M2 as its back up Meter, installed at the high voltage of the 35kV/220kV substation at the Project site)	
Description of measurement methods and procedures to be applied	Continuously measured and monthly recorded. Data are archived for 2 years following the end of the crediting period by means of electronic and paper backup.	
Frequency of monitoring/recording	Continuously measured and monthly recorded	
Value applied	Year	Value
	21/09/2015-31/12/2015	84,018.598
	01/01/2016-31/12/2016	260,642.110
	01/01/2017-31/12/2017	326,152.293
	01/01/2018-31/12/2018	326,239.004
	01/01/2019-26/10/2019	242,286.827
	27/10/2019-31/12/2019	53,508.773

01/01/2020-31/12/2020	389,860.494
Total	1,682,708.099

Monitoring equipment

	Main meter (M1)	Backup meter (M2)
Meter Type	ZMQ202C	ZMQ202C
Accuracy class	0.2S	0.2S
Serial No.	95303611	95303617
Calibration frequency	annually	annually

Serial No.	Calibration Date	Validity
95303611 95303617	11/06/2015	10/06/2016
	10/06/2016	09/06/2017
	09/06/2017	08/06/2018
	08/06/2018	07/06/2019
	01/06/2019	31/05/2020
	01/06/2020	31/05/2021

QA/QC procedures to be applied	The accuracy of electricity meters are 0.2s. The calibration frequency is one time/year in accordance with the national calibration standard. The data will be cross checked by sales receipt.
Purpose of data	Baseline emission calculation
Calculation method	-
Comments	Uncertainty level of data is low

Data / Parameter	$EG_{import,y}$
Data unit	MWh/yr
Description	Total electricity purchased from the grid by the Project, Project B and other project(s) during year y
Source of data	Readings of electricity Meter M1 installed at the Wenduer substation (M2 as its back up Meter, installed at the high voltage of the 35kV/220kV substation at the Project site)

Description of measurement methods and procedures to be applied

Continuously measured and monthly recorded. Data are archived for 2 years following the end of the crediting period by means of electronic and paper backup.

Frequency of monitoring/recording

Continuously measured and monthly recorded

Value applied

Year	Value
21/09/2015-31/12/2015	168.546
01/01/2016-31/12/2016	556.464
01/01/2017-31/12/2017	523.360
01/01/2018-31/12/2018	499.499
01/01/2019-26/10/2019	513.144
27/10/2019-31/12/2019	94.319
01/01/2020-31/12/2020	510.500
Total	2,865.832

Monitoring equipment

	Main meter (M1)	Backup meter (M2)
Meter Type	ZMQ202C	ZMQ202C
Accuracy class	0.2S	0.2S
Serial No.	95303611	95303617
Calibration frequency	annually	annually

Serial No.	Calibration Date	Validity
95303611 95303617	11/06/2015	10/06/2016
	10/06/2016	09/06/2017
	09/06/2017	08/06/2018
	08/06/2018	07/06/2019
	01/06/2019	31/05/2020
	01/06/2020	31/05/2021

QA/QC procedures to be applied

The accuracy of electricity meters is 0.2s. The calibration frequency is one time/year in accordance with the national calibration standard. The data will be cross checked by sales receipt.

Purpose of data	Baseline emission calculation
Calculation method	-
Comments	Uncertainty level of data is low

Data / Parameter	$EG_{A\text{-}i,y}$
Data unit	MWh/yr
Description	Quantity of electricity supplied to the grid by Group A-i (i=1,2,3,4) of the Project in year y.
Source of data	Readings of electricity meters (A-1, A-2, A-3 and A-4 described in B.5.3) installed at the 35kV transmission line of the Project site.
Description of measurement methods and procedures to be applied	Continuously measured and monthly recorded. Data are archived for 2 years following the end of the last crediting period by means of electronic and paper backup.
Frequency of monitoring/recording	Continuously measured and monthly recorded.
Value applied	

Year	Value
21/09/2015-31/12/2015	25,700.681
01/01/2016-31/12/2016	64,571.842
01/01/2017-31/12/2017	72,041.085
01/01/2018-31/12/2018	66,487.077
01/01/2019-26/10/2019	61,720.416
27/10/2019-31/12/2019	21,085.775
01/01/2020-31/12/2020	106,846.405
Total	418,453.281

Monitoring equipment	

	Meter A-1	Meter A-2	Meter A-3	Meter A-4
Meter Type	DTSD341	DTSD341	DTSD341	DTSD341
Accuracy class	0.5S	0.5S	0.5S	0.5S
Serial No.	4690001	4690002	4690003	4690004
Calibration frequency	annually	annually	annually	annually

Serial No.	Calibration Date	Validity
4690001 4690002 4690003 4690004	11/06/2015	10/06/2016
	10/06/2016	09/06/2017
	09/06/2017	08/06/2018
	08/06/2018	07/06/2019
	01/06/2019	31/05/2020
	01/06/2020	31/05/2021

QA/QC procedures to be applied	The accuracy of electricity meters (A-1, A-2, A-3 and A-4) is 0.5s. The calibration frequency is one time/year in accordance with the national calibration standard.
Purpose of data	Baseline emission calculation
Calculation method	-
Comments	Uncertainty level of data is low

Data / Parameter	$EG_{B\text{-}i,y}$
Data unit	MWh/yr
Description	Quantity of electricity supplied to the grid by Group B-i (i=1,2,3,4) of the Project B in year y.
Source of data	Readings of electricity meters (B-1, B-2, B-3 and B-4 described in B.5.3) installed at the 35kV transmission line of the Project B site.

Description of measurement methods and procedures to be applied

Continuously measured and monthly recorded. Data are archived for 2 years following the end of the last crediting period by means of electronic and paper backup.

Frequency of monitoring/recording

Continuously measured and monthly recorded.

Value applied

Year	Value
21/09/2015-31/12/2015	25,891.889
01/01/2016-31/12/2016	90,709.953
01/01/2017-31/12/2017	108,757.598
01/01/2018-31/12/2018	114,209.923
01/01/2019-26/10/2019	81,058.841
27/10/2019-31/12/2019	24,796.062
01/01/2020-31/12/2020	114,201.153
Total	559,625.419

Monitoring equipment

	Meter B-1	Meter B-2	Meter B-3	Meter B-4
Meter Type	DTSD341	DTSD341	DTSD341	DTSD341
Accuracy class	0.5S	0.5S	0.5S	0.5S
Serial No.	9020390	9020463	9020465	9020392
Calibration frequency	annually	annually	annually	annually

Serial No.	Calibration Date	Validity
9020390 9020463 9020465 9020392	11/06/2015	10/06/2016
	10/06/2016	09/06/2017
	09/06/2017	08/06/2018
	08/06/2018	07/06/2019
	01/06/2019	31/05/2020
	01/06/2020	31/05/2021

QA/QC procedures to be applied	The accuracy of electricity meters (B-1, B-2, B-3 and B-4) is 0.5s. The calibration frequency is one time/year in accordance with the national calibration standard.
Purpose of data	Baseline emission calculation
Calculation method	-
Comments	Uncertainty level of data is low

Data / Parameter	$EG_{C\text{-}i,y}$
Data unit	MWh/yr
Description	Quantity of electricity supplied to the grid by Group C-i (i=1,2,…, i) of the other project(s) in year y.
Source of data	Readings of electricity meters (C-1, C-2…C-i described in B.5.3) installed at the 35kV transmission line of the other project(s) site.
Description of measurement methods and procedures to be applied	Continuously measured and monthly recorded. Data are archived for 2 years following the end of the last crediting period by means of electronic and paper backup.
Frequency of monitoring/recording	Continuously measured and monthly recorded.

Value applied

Year	Value
21/09/2015-31/12/2015	34,134.328
01/01/2016-31/12/2016	109,336.588
01/01/2017-31/12/2017	136,950.313
01/01/2018-31/12/2018	147,570.916
01/01/2019-26/10/2019	105,037.738
27/10/2019-31/12/2019	30,579.510
01/01/2020-31/12/2020	145,650.286
Total	709,259.679

Monitoring equipment

	Meter C-1	Meter C-2	Meter C-3	Meter C-4
Meter Type	DTSD341	DTSD341	DTSD341	DTSD341
Accuracy class	0.5S	0.5S	0.5S	0.5S
Serial No.	2873616	2873617	2873618	2873619

	Calibration frequency: annually / annually / annually / annually
	Serial No. 2873616, 2873617, 2873618, 2873619 — Calibration Date / Validity: 11/06/2015 – 10/06/2016; 10/06/2016 – 09/06/2017; 09/06/2017 – 08/06/2018; 08/06/2018 – 07/06/2019; 01/06/2019 – 31/05/2020; 01/06/2020 – 31/05/2021
QA/QC procedures to be applied	The accuracy of electricity meters (C-1, C-2…C-i) is 0.5s. The calibration frequency is one time/year in accordance with the national calibration standard.
Purpose of data	Baseline emission calculation
Calculation method	-
Comments	Uncertainty level of data is low

Data / Parameter	$EG_{im\text{-}spare,y}$
Data unit	MWh/yr
Description	Total electricity purchased from the gird by the Project, Project B and Other project(s) through a spare 10 kV line in the year y
Source of data	Readings of electricity meter M3 installed on the spare 10 kV line
Description of measurement methods and procedures to be applied	Continuously measured and monthly recorded by the local power distributor. Data are archived for 2 years following the end of the last crediting period by means of electronic and paper backup.
Frequency of monitoring/recording	Continuously measured and monthly recorded.
Value applied	Year: 21/09/2015-31/12/2015 — Value: 8.856 Year: 01/01/2016-31/12/2016 — Value: 52.783

01/01/2017-31/12/2017	33.586
01/01/2018-31/12/2018	35.042
01/01/2019-26/10/2019	38.803
27/10/2019-31/12/2019	12.146
01/01/2020-31/12/2020	41.899
Total	223.115

Monitoring equipment

	Meter M3
Meter Type	DS862-4
Accuracy class	2.0
Serial No.	10669106
Calibration frequency	annually

Serial No.	Calibration Date	Validity
10669106	11/06/2015	10/06/2016
	10/06/2016	09/06/2017
	09/06/2017	08/06/2018
	08/06/2018	07/06/2019
	01/06/2019	31/05/2020
	01/06/2020	31/05/2021

QA/QC procedures to be applied	The accuracy of electricity meter is 2.0. The calibration frequency is one time/year in accordance with the national calibration standard. The data will be cross checked by sales receipt.
Purpose of data	Baseline emission calculation
Calculation method	-
Comments	Uncertainty level of data is low

4.3 Monitoring Plan

The monitoring plan of the project is designed according to the approved consolidated monitoring methodology ACM0002 “Grid-connected electricity generation from renewable sources”.This Monitoring plan sets out a number of monitoring tasks in order to ensure the complete, consistent,

clear and accurate monitoring and the accurate calculation of the emission reduction in the crediting period. This plan is mainly implemented by the project owner with the cooperation of the grid company.

1. Monitoring Object

The main objective data is the power supplied to and purchased from the grid, which is calculated according to the generated electricity and the purchased electricity and supplied to the grid, thus to calculate the emission reduction of the project.

2. Monitoring Implementers

The General Manager of the project entity appoints a VCS project manager or a chief officer. The operational and monitoring manager of the plant, the Financial Chief, and the Technical Chief are responsible for the collection of the data and information required in the monitoring plan. The collected information is documented and sent to the VCS manager or responsible staffs of the project entity monthly. The VCS manager in charge of the implementation of the Monitoring Plan and report to the General Manager of the company. The General Manager of the company makes the confirmations on monitoring, calculation data and reports.

The organization of the monitoring implementers is illustrated in the table below:

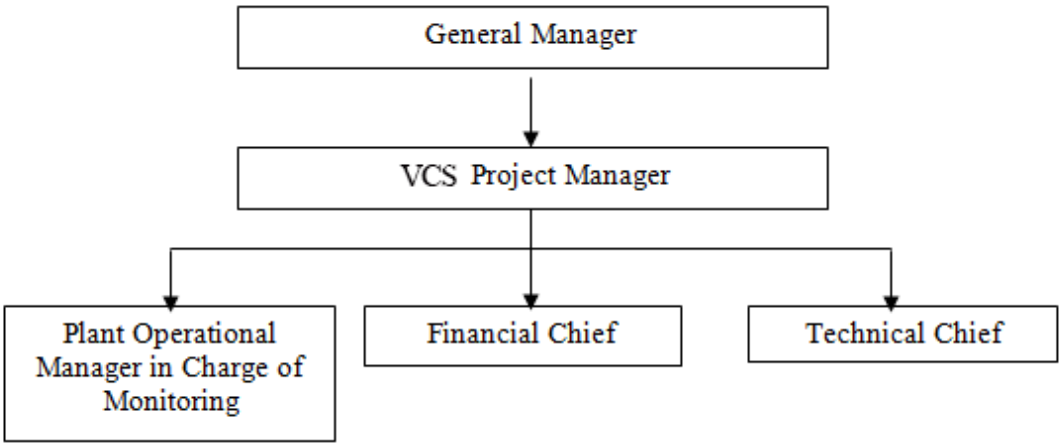

Figure 3: Monitoring structure of the project

3. Monitoring Program and Equipment

The power connection and monitoring system is shown as below:

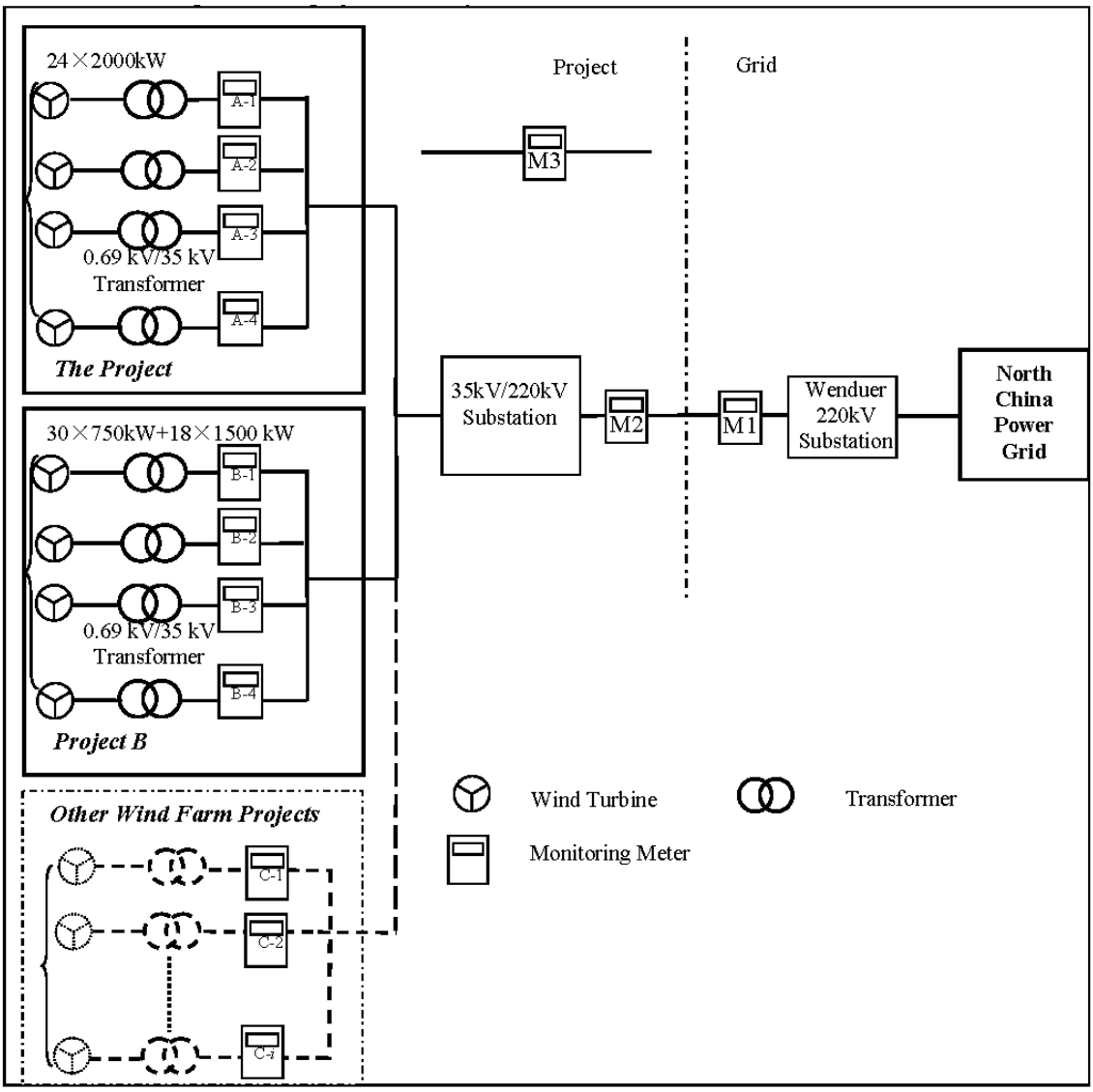

Figure 4: The location of meters

The Project shares the 35kV/220kV substation and gateway meters (M1 as the main meter and M2 as the backup meter) with Project B (Inner Mongolia Jingneng Saihan Wind Farm Phase I Project), and other project(s) which are under construction and will be connected to the 35kV/220kV substation. Before other project(s) (so called other project(s), of which Inner Mongolia Jingneng Saihan Wind Farm Phase III Project is in operation on 14/12/2012[2] , and other more projects will be planed for construction) puts into operation, monitoring equipment include M1, M2, M3, A-1, A-2, A-3, A-4, B-1, B-2, B-3 and B-4; After other project(s) puts into operation, C-1, C-2…C-i will be included in the monitoring equipment.

[2] Inner Mongolia Jingneng Saihan Wind Farm Phase III Project quality supervision and inspection reports

The main meter M1 is employed at the grid company substation and the grid company is responsible for conducting the monitoring. The backup meter M2 is equipped at the high voltage of the 35kV/220kV substation at the Project site and the project owner is responsible for conducting its monitoring. The accuracy of the meters M1 and M2 is 0.2s. At the same time, the data measured by M1 and M2 can be monitored and recorded at the on-site control centre using a computer system.

Additionally, a spare 10 kV line is used for supplying electricity to the Project, Project B and Other project(s) in emergencies. $EG_{im\text{-}spare,y}$ is measured by the meter M3 which is owned, operated and installed by local power distributor. Sales receipt will be cross-check with the meter reading. The accuracy of M3 is 2.0, which meets the national requirement. The calibration will be done in line with the national calibration standard.

The 24 sets of wind turbines of the Project were divided into 4 groups, and each group is connected with a 35kV transmission line and installed with a meter at the low voltage side of 35kV/220kV substation. These meters (A-1, A-2, A-3, A-4) are installed as the auxiliary meters to calculate the electricity supplied to the grid by Group A-i (i=1,2,3,4) of the Project. Similarly, Four meters (B-1, B-2, B-3, B-4)) are installed as auxiliary meters to calculate the electricity supplied to the grid by Group B-i (i=1,2,3,4) of the Project B. The accuracy of these eight meters is 0.5s.

Moreover, considering there are other wind farm project(s) (so called other project(s),of which currently Inner Mongolia Jingneng Saihan Wind Farm Phase III Project is in operation, and other more projects will be planed for construction) , will share the 35kV/220kV substation on the Project site, the gateway meters (M1 and M2) in Wenduer 220kV substation and the M3 on a 10kV spare line, more meters (C-1, C-2,...C-i) will be installed on the 35kV transmission line at the other project(s) site to monitor the supplied electricity by other project(s). The accuracy of these meters (C-1, C-2...C-i) will be no lower than 0.5s and they will be calibrated in accordance with national standards.

In order to deal with the jointly-reading problem, the project owner and the grid company set up the procedure and calculation method to determine the net electricity supplied to the grid by the Project, which is calculated as follows:

$$EG_{facility,y} = \frac{EG_{A-i,y}}{EG_{A-i,y}+EG_{B-i,y}+EG_{C-i,y}} EG_{export,y} - EG_{import,y} - EG_{im-spare,y} \quad (1)$$

Where:

$EG_{facility,y}$	=	Quantity of net electricity generation supplied by the project plants/units to the grid in year y
$EG_{export,y}$	=	Total electricity supplied to the grid via the main power line by the Project, Project B and other project(s) during year y
$EG_{import,y}$	=	Total electricity purchased from the grid by the Project, Project B and other project(s) during year y
$EG_{A\text{-}i,y}$	=	Quantity of electricity supplied to the grid by Group A-i (i=1,2,3,4) of the Project in year y

$EG_{B\text{-}i,y}$	=	Quantity of electricity supplied to the grid by Group B-i (i=1,2,3,4) of the Project B in year y
$EG_{C\text{-}i,y}$	=	Quantity of electricity supplied to the grid by Group C-i (i=1,2,…,i) of the other project(s) in year y
$EG_{im\text{-}spare,y}$	=	Total electricity purchased from the gird by the Project, Project B and Other project(s) through a spare 10 kV line in the year y

4. Data Collection

Before other project(s) are connected to the 35kV/220kV substation at the Project site, the verification use the data of the main meter M1, the meter M3 installed on the spare 10 kV line and eight auxiliary meters on 35kV transmission line as long as the inaccuracy of these meters is within the permissible tolerance. The main procedures are as follows:

1) According to the requirements of power purchase/sales agreement, the project owner and the grid company should collect the data of both the main meter M1 and the backup meter M2 periodically, and check them at the same time.

2) For the electricity supplied to the grid by the project activity, the project owner collects and records the data of auxiliary meters and calculates the electricity supplied to the grid by the Project as per the procedure and calculation method jointly set up. Then the project owner provides sales receipt to the Grid Company. A copy of the sales receipt is stored for cross-check.

3) When the electricity generated by this project cannot meet the electricity requirement of the power plant, the grid company supplies the electricity to the project owner. The Grid Company provides an electricity sales receipt to the project owner and the sales receipt is stored by the project owner.

4) The project owner records the power supplied to and purchased from the grid as well as the electricity purchased from the spare 10 kV line, and hence calculate the net electricity supplied to the grid;

5) The project owner well keeps the records of the main meter, the meter installed on the spare 10 kV line and the eight auxiliary meters' data readings for verification by the DOE.

In any case that any of the eight auxiliary meters on 35kV transmission line exceeds the allowable tolerance or its malfunction occurs, the project owner will give up the emission reductions during the period when any of the eight auxiliary meters are inaccurate. Otherwise, if the fault of the main meter M1 exceeds the allowable tolerance or its malfunction occurs but the eight auxiliary meters are within the allowable tolerance, the grid-connected electricity generated by the Project will be resolved by following measures:

1) Adopting the backup meter M2, the meter M3 installed on the spare 10 kV line and the eight auxiliary meters' data, unless a test by either party reveals it is inaccuracy;

2) If the inaccuracy of the backup meter M2 is not within the acceptable limits or it cannot work properly, the project owner will give up the emission reductions during the period when both the main meter and the backup meter are inaccurate;

In addition, in any case that the fault of the meter M3 installed on the spare 10 kV line exceeds the allowable tolerance or its malfunction occurs, to be conservative, the project owner will apply the largest data over the years to calculate the emission reductions.

After the other project(s) connects to the shared 35kV/220kV substation at the Project site, the collection procedures of the data measured by the meter (C-1, C-2,...C-i) are similar to the above procedures of the Project and Projects B. If any meter (C-1, C-2,...C-i) exceeds the allowable tolerance or its malfunction occurs, the project owner will give up the emission reductions during the period when any of the meters (C-1, C-2,...C-i) are in malfunction.

5. Calibration of Meters & Metering

The metering equipment will be properly calibrated and checked annually for accuracy. The project owner will prepare backup procedures to deal with any errors occurred to the meters. The calibration records carried out by the grid company should be provided to the project owner, and these records will be maintained by the project owner and the third party designated.

Meters should be tested by a qualified metric organization co-authorized by the project owner and the grid company within 10 days after:

1) The detection of the reading difference between the main meter and the backup meter that exceeds the allowable tolerance.

2) The equipment's malfunction caused by improper operation

All the calibration test records should be maintained safely for the verification.

6. Data Management System

To keep safely the record of the data collected during monitoring, this project will set up a complete data management system. The project will perfect the whole monitoring procedure by developing the VCS manual, tracking information from the primary source to the end-data calculations in paper document format. It is the responsibility of the project owner to provide additional necessary data and information for validation and verification requirements of respective DOE. Physical documentation such as paper-based maps, diagrams and environmental assessment will be collated in a central place, together with this monitoring plan. All paper-based information will be stored by the project owner and kept at least one copy.

At the end of each month, the monitoring data will be filed in a spreadsheet, and the paper-based printout should be also archived. Furthermore, the project owner collects the sales receipts for the electricity supplied to the grid as a cross-check, and compiled the monitoring report including the monitoring data and relevant evidence at the end of each crediting year.

All the data will be kept for two years following the end of the last crediting period.

7. Monitoring Report

After the VCS project manager collects and sorts the monitored data, the monitoring report is prepared by the project developer. The project developer has to make sure that the format and content of the monitoring report are consistent with the monitoring methodology in the registered PD.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

According to the registered PDD, the baseline emissions are calculated as the electricity supplied by the project activity to the grid ($EG_{facility,\ y}$ in MWh) times the combined margin emission factor ($EF_{grid,CM,y}$ in tCO_2/MWh) as follows:

$$BE_y = EG_{facility,y} \times EF_{grid,CM,y} \quad (2)$$

Where:

BE_y	Baseline emissions in year *y* (tCO_2e)
$EG_{facility,y}$	Quantity of net electricity generation supplied by the project plants/units to the grid in year y
$EF_{grid,CM,y}$	Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_2e/MWh)

Quantity of net electricity generation supplied by the project plant/unit to the grid in year y （$EG_{facility,\ y}$）in this monitoring period (21/09/2015-31/12/2020) as in the table below:

Table E-1 Quantity of net electricity generation supplied by the project plant/unit to the grid during the Monitoring Period

Period[3]	$EG_{export,y}$ (MWh)			$EG_{import,y}$ (MWh)			$EG_{im-spare,y}$ (MWh)			$EG_{A-i,y}$ (MWh)	$EG_{B-i,y}$ (MWh)	$EG_{C-i,y}$ (MWh)	$EG_{facility,y}$ (MWh)
	Sales receipt	Reading records from the monthly report	Conservative value	Sales receipt	Reading records from the monthly report	Conservative value	Sales receipt	Reading records from the monthly report	Conservative value	Reading records from the monthly report	Reading records from the monthly report	Reading records from the monthly report	
21/09/2015 - 31/12/2015	84,018.598	84,018.598	84,018.598	168.546	168.546	168.546	8.856	8.856	8.856	25,700.681	25,891.889	34,134.328	25,011.136
01/01/2016 - 31/12/2016	260,642.110	260,642.110	260,642.110	556.464	556.464	556.464	52.783	52.783	52.783	64,571.842	90,709.953	109,336.588	62,992.310
01/01/2017 - 31/12/2017	326,152.293	326,152.293	326,152.293	523.360	523.360	523.360	33.586	33.586	33.586	72,041.085	108,757.598	136,950.313	73,389.362
01/01/2018 - 31/12/2018	326,239.004	326,239.004	326,239.004	499.499	499.499	499.499	35.042	35.042	35.042	66,487.077	114,209.923	147,570.916	65,541.602
01/01/2019 - 26/10/2019	242,286.827	242,286.827	242,286.827	513.144	513.144	513.144	38.803	38.803	38.803	61,720.416	81,058.841	105,037.738	59,791.145
27/10/2019 - 31/12/2019	53,508.773	53,508.773	53,508.773	94.319	94.319	94.319	12.146	12.146	12.146	21,085.775	24,796.062	30,579.510	14,649.670
01/01/2020 - 31/12/2020	389,860.494	389,860.494	389,860.494	510.500	510.500	510.500	41.899	41.899	41.899	106,846.405	114,201.153	145,650.286	113,043.012
Total	**1,682,708.099**	**1,682,708.099**	**1,682,708.099**	**2,865.832**	**2,865.832**	**2,865.832**	**223.115**	**223.115**	**223.115**	**418,453.281**	**559,625.419**	**709,259.679**	**414,418.236**

[3] The electricity transaction cut-off date is 24:00 on the 20th of each month, and the data from December 21st to December 31st, January 1st to January 20th is provided by the grid company.

Among which, $EF_{grid,CM,y}$ is 0.9502 tCO_2/MWh in the first crediting period, and $EF_{grid,CM,y}$ is 0.8405 tCO_2/MWh in the second crediting period, therefore:

For 21-09-2015 to 26-10-2019:

$BE_{y1} = EG_{facility,y} * EF_{grid,CM,y}$ = 286,725.554 MWh ×0.9502 tCO_2/MWh = 272,444 tCO_2

For 27-10-2019 to 31-12-2020:

$BE_{y2} = EG_{facility,y} * EF_{grid,CM,y}$ = 127,692.682 MWh ×0.8405 tCO_2/MWh = 107,325 tCO_2.

The Baseline Emission is:

$BE_y = BE_{y1} + BE_{y2}$=379,769 tCO_2

5.2 Project Emissions

According to ACM0002, no project emissions were to be counted by the Project.

Hence, PE_y=0.

5.3 Leakage

According to the ACM0002, no leakage emissions are considered.

5.4 Net GHG Emission Reductions and Removals

According to the Section 5.1, 5.2 and 5.3 above,

BE_y = 379,769 tCO_2e;

PE_y = 0 tCO_2e;

LE_y = 0 tCO_2e;

Therefore, $ER_y = BE_y - PE_y - LE_y$ =379,769 tCO_2e

This monitoring period started from 21/09/2015 to 31/12/2020, with totally 1,929 days. Among which, 1,497 days (21/09/2015-26/10/2019) in first crediting period, and 432 days (27/10/2019- 31/12/2020) in second crediting period. Based on the annual estimated emission reductions from the registered and renewed PDD, the amount of emission reductions for this monitoring period would be 112,655 tCO_2e/365d×1,497d + 99,643 tCO_2e/365d×432d =579.972 tCO_2e. The actual emission reductions in this monitoring period (1,929 days) are 379,769 tCO_2e, which is 34.52% less than the estimation in the registered PDD.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
21/09/2015-31/12/2015	23,765	0	0	23,765
01/01/2016-31/12/2016	59,855	0	0	59,855
01/01/2017-31/12/2017	69,734	0	0	69,734
01/01/2018-31/12/2018	62,277	0	0	62,277
01/01/2019-26/10/2019	56,813	0	0	56,813
27/10/2019-31/12/2019	12,313	0	0	12,313
01/01/2020-31/12/2020	95,012	0	0	95,012
Total	**379,769**	**0**	**0**	**379,769**