



HANGJIN YIHEWUSU PHASE I 49.5MW WIND POWER PROJECT



Document Prepared by Climate Bridge (Shanghai) Ltd.

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CONTENTS

1	PROJECT DETAILS.....	4
1.1	Summary Description of the Implementation Status of the Project	4
1.2	Sectoral Scope and Project Type	4
1.3	Project Proponent	5
1.4	Other Entities Involved in the Project	5
1.5	Project Start Date	5
1.6	Project Crediting Period	5
1.7	Project Location	6
1.8	Title and Reference of Methodology	6
1.9	Participation under other GHG Programs.....	7
1.10	Other Forms of Credit.....	7
1.11	Sustainable Development Contributions	8
2	SAFEGUARDS	10
2.1	No Net Harm	10
2.2	Local Stakeholder Consultation	10
2.3	AFOLU-Specific Safeguards	11
3	IMPLEMENTATION STATUS	11
3.1	Implementation Status of the Project Activity	12
3.2	Deviations	13
3.3	Grouped Projects	15
4	DATA AND PARAMETERS.....	15
4.1	Data and Parameters Available at Validation	15
4.2	Data and Parameters Monitored.....	15
4.3	Monitoring Plan.....	17
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	19
5.1	Baseline Emissions	19
5.2	Project Emissions	25
5.3	Leakage.....	25
5.4	Net GHG Emission Reductions and Removals.....	25

APPENDIX 1: <SUPPORTING EVIDENCE>	26
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The Hangjin Yihewusu Phase I 49.5MW Wind Power Project (hereafter, “the project”) utilizes wind resources for electricity generation through the construction of a windfarm in Hangjin County, Ordos City, in the western part of the Inner Mongolia Autonomous Region in China.

The timeline of the project is as below:

Start date of construction	26-Feb-2009
Start date of operation	28-Dec-2011
Registered as a CDM project (UNFCCC registration reference number of 7221 ¹)	07-Sep-2012
Registered as a VCS project (VCS ID 1128)	29-Sep-2013

The first crediting period of the VCS project is from 28-Dec-2011 to 27-Dec-2021. The renewed VCS PD for the 2nd crediting period will be submitted with this monitoring report simultaneously. And the PD and previous monitoring reports are used as basic documents for this verification.

The project installed and operated 33 sets wind turbines with capacity of 1.5 MW each, which amount to a total capacity of 49.5 MW. The electricity generated by the project supplied to the North China Power Grid (NCPG), displacing part of electricity generated by NCPG which is dominated by fossil fuel-fired power plants. The estimated annual net electricity generation supplied to the grid is 117,784 MWh². The estimated annual emission reductions are 105,520 tCO₂e in the 1st crediting period and 97,395 tCO₂e in the 2nd crediting period.

In this monitoring period (from 26-Mar-2021 to 25-Jul-2022, the first and last days included), the total net electricity supplied to NCPG is 152,494.352 MWh, and the emission reductions achieved are 132,371 tCO₂e.

1.2 Sectoral Scope and Project Type

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

Project type: Wind power generation project;

¹ <https://cdm.unfccc.int/Projects/DB/JCI1346997827.74/view>

² Source: Feasibility Study Report

The project is not a grouped project.

1.3 Project Proponent

Organization name	Inner Mongolia Guodian New Energy Co.,Ltd.
Contact person	Wa Gao
Title	Project Manager
Address	Room 2, Guibin Building, Dianli Community, Jinchuan Development District
Telephone	+86 0471 2653 722
Email	3542346576@qq.com

1.4 Other Entities Involved in the Project

Organization name	Climate Bridge (Shanghai) 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

28-Dec-2011 (operation started date)

1.6 Project Crediting Period

The first crediting period of the project is from 28-Dec-2011 to 27-Dec-2021 (10 years). The second crediting period is from 28-Dec-2021 to 27-Dec-2031 (10 years).³

³ Please refer to section 3.2.2 in this MR for details.

1.7 Project Location

The project is located in Hangjin County, Ordos City, in the western Inner Mongolia of China. The geographical coordinates of the centre of the project area are E107.5411°, N40.0589°.

The detail location of the project is shown as below:

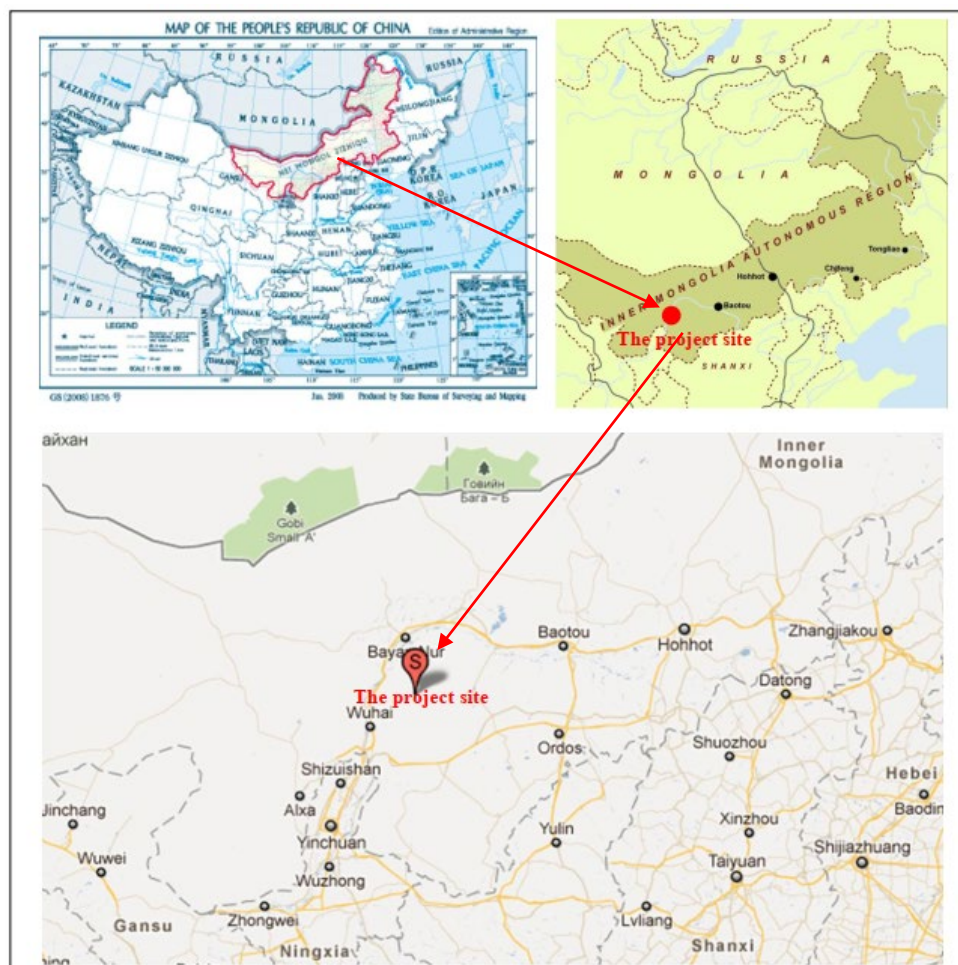


Figure 1 Location of the Project

1.8 Title and Reference of Methodology

Following approved baseline & monitoring methodology and tools are applied:

In the 1st crediting period:

ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 12.3.0);

Tool for the demonstration and assessment of additionality (Version 06.0.0)

Tool to calculate the emission factor for an electricity system (Version 02.2.1)

In the 2nd crediting period:

ACM0002 “Grid-connected electricity generation from renewable sources” (Version 21.0);

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)

Tool to calculate the emission factor for an electricity system (Version 07.0)

For more information regarding the methodology, please refer to the link:

<https://cdm.unfccc.int/UserManagement/FileStorage/ZPFJL01OU2RYC6N3HASIXV7K84QBG9>

1.9 Participation under other GHG Programs

The project has been registered as a Clean Development Mechanism (CDM) project in UNFCCC on 07-Sep-2012 (UNFCCC Ref. 7221), with the renewable crediting period of 3*7 years started from 07-Sep-2012. The project issued 189,860 tCO₂e during the first CDM monitoring period from 07-Sep-2012 to 20-Nov-2014 and 135,902 tCO₂e during the second CDM monitoring period from 21-Nov-2014 to 20-Mar-2016 under CDM program.

The details of the issued emission reductions of the project so far are listed as below:

Period	Issued emission reductions (t CO ₂ e)	VCUs or CERs
28-Dec-2011 to 06-Sep-2012	58,339	VCUs
07-Sep-2012 to 20-Nov-2014	189,860	CERs
21-Nov-2014 to 20-Mar-2016	135,902	CERs
21-Mar-2016 to 25-Mar-2021	501,498	VCUs
26-Mar-2021-25-Jul-2022	132,371	In requesting for VCUs

Please refer to the following link for more information:

<https://cdm.unfccc.int/Projects/DB/JCI1346997827.74/view>

1.10 Other Forms of Credit

Emission Trading Programs and Other Binding Limits

China has a national emissions trading scheme only cover the high-emission industries, such as thermal power generation, petrochemical, chemical, building materials, iron and steel, nonferrous, paper, aviation and other key emission industries that emitted at least 26,000 tons of CO₂e/year, not including renewable projects.

Also, the project has not been registered as a CCER (Chinese Certified Emission Reductions) project in China, thus it is not eligible for emission reductions transaction under the China's ETS.

Therefore, the project does not reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading. The net GHG emission reductions generated during this monitoring period have not been used for compliance under such programs or mechanisms.

Furthermore, as a voluntary emission reduction project, the GHG emission reductions and removals generated by the project will not be enforced to be used for compliance in China. The credits in this monitoring period have not been counted and will not be counted under emission trading programs for compliance and other binding limits.

Other Forms of Environmental Credit

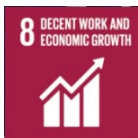
The project has not sought or received another form of GHG-related environmental credit, including renewable energy certificates, during this monitoring period.

1.11 Sustainable Development Contributions

The project generated electricity using wind resources and the electricity is fed into NCPG, displacing energy that would otherwise be generated by fossil fuels. In this monitoring period,



The project supplied 152,494.352 renewable clean energy to NCPG, which contributes to SDG 7.



The project provides long-term job opportunities for local people, which has a positive effect on the local economy and contributes to SDG 8.



The project achieved 132,371 tCO₂e emission reductions which contributes to SDG 13.

These contribute to achieve China's stated sustainable development priorities, included strengthening resistance capacity to climate risks, increasing labor force participation rate, increasing the share of clean energy consumption.

Table 1: Sustainable Development Contributions⁴

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	7.2	Amount of Renewable energy in the total final energy consumption.	Implemented activities to increase	152,494.352 MWh of electricity from clean and renewable sources through making use of wind resources has been supplied to the power grid during this monitoring period, replacing fossil fuel generated electricity.	From 28-Dec-2011 to 25-Jul-2022, 1,176,700.920 MWh of electricity from clean and renewable sources through making use of wind resources has been supplied to the power grid.
2)	8.5	The number of long-term jobs by the implementation of the project.	Implemented activities to increase	10 employees have signed long term labor contracts and receive stable payments due to the implementation of the project activity.	Provided 10 employment positions for local villagers in the reporting period.
3)	13.0	Tonnes of greenhouse gas emissions avoided or removed.	Implemented activities to increase	The project achieved a GHG emission reduction 132,371 tCO ₂ e during this monitoring period.	From 28-Dec-2011 to 25-Jul-2022, the project has achieved a GHG emission reduction of 1,017,970 tCO ₂ e.

⁴ Please refer to appendix 1 for supporting evidence

2 SAFEGUARDS

2.1 No Net Harm

The Environmental Impact Assessment (EIA) Report for the project has been approved by Inner Mongolia Environmental Protection Bureau on 01-Feb-2008, with approval No. “Neihuanbao [2008] No.25”. The environmental impacts, treatment, and effects arising from the Project during construction and operation of the project have been considered in the EIA report with corresponding measures during project development, and no net harm has been detected.

Meanwhile, the implementation of the project improves local socio-economic development and contribute to sustainable development as described in section 1.11 of this report above.

In conclusion, the project has no negative impacts on the local environment and socio-economy. No net harm to the local environment and social community has been detected for the project.

2.2 Local Stakeholder Consultation

LSC prior to the Project activity:

Between 17 August 2011 and 19 August 2011, the staff from the Inner Mongolia Guodian New Energy Co., Ltd. carried out a survey among local villagers and residents living in the project area. The questionnaires used for assessing the project’s impacts on the local environment, as well as on the region’s social and economic development were sent out to local villagers and residents. 50 questionnaires were distributed, and 46 questionnaires had been returned. The response rate is 92%. The respondents are representative in terms of age, occupation and education, so their attitude towards the impacts of the project can therefore be seen as a comprehensive reflection of the attitudes of the residents possibly affected by the project. The results of the survey are presented in the table 2-1 below.

Table 2-1 Summary of Questionnaires

Item	Response		
	Yes	No	No comments
1. Do you agree with the development of the project?	89.13%	0	10.87%
2. What do you think the project’s impact on the local job market will be?	Positive	No impact	Negative
	54.35%	45.65%	0
3. What do you think the project’s impact on the local economy will be?	Positive	No Impact	Negative
	82.61%	17.39%	0
4. What do you think the	Positive	No Impact	Negative

project's impact on the local people's way of living, studying and working will be?	50%	50%	0
5. Will the project have a negative impact on the environment, such as noise, water or electromagnetism?	No	Air pollution	
	95.65%	4.35%	
6. What do you think the project's impact on the ecosystem?	Positive	No Impact	Negative
	26.09%	73.91%	0%
7. Will the project have a negative impact on your studying and work?	Yes	No	Not Sure
	0	95.65%	4.35%
8. What will be the general impact of the project's construction and operation?	Positive	No impact	Negative
	97.83%	2.17%	0

In summary, the local people support and agree with the construction of the project. They believe that the project will have a positive impact on the local economic development and their living conditions, without having negative impacts on the environment and the ecosystem.

LSC during the Project implementation stage:

Communications with local stakeholders are being 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 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. The comments from local stakeholder have been collected by sending out questionnaires during this monitoring period in May 2021 and June 2022. 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

Not applicable due to the project is not an AFOLU project.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project involves the installation of 33 sets of wind turbines with capacity of 1.5 MW each, which amounts to a total installed capacity of 49.5MW. The selected wind turbines are based on the signed contract with models of WD82-1500. The construction of the project was started in 26-Feb-2009. Turbines and generators started operation on 28-Dec-2011, and the operational lifetime is 20 years. The estimated net annual power supplied to the grid is 117,784 MWh.

The timeline of the project is as below:

Start date of construction	26-Feb-2009
Start date of operation	28-Dec-2011
Registered as a CDM project (UNFCCC registration reference number of 7221 ⁵)	07-Sep-2012
Registered as a VCS project (VCS ID 1128)	29-Sep-2013

The first crediting period of the VCS project is from 28-Dec-2011 to 27-Dec-2021. The second crediting period is from 28-Dec-2021 to 27-Dec-2031.

During this monitoring period, the electricity delivered to the NCPG by the project is 152,494.352 MWh and the emission reductions achieved are 132,371 t CO₂e. Neither emergencies happened to the monitoring system, nor events or situations occurred, which may impact the applicability of the methodology or the GHG emission reductions or removals and monitoring.

The main technical parameters of the wind turbine generators are presented in Table 3-1.

Table 3-1 Key technical parameters of the equipment

Parameters	Data
Model	WD82-1500
Rated power (kW)	1500
Rotor diameter (m)	82
Cut-in wind speed (m/s)	3
Rated wind speed (m/s)	10.5
Cut-out wind speed (m/s)	25
Quantity	33
Operation Lifetime (y)	20

⁵ <https://cdm.unfccc.int/Projects/DB/JC11346997827.74/view>

The diagram of connection structure and the meter location and the corresponding meter equipment description in the project are shown in figure 3-1 and table 3-2:

Table 3-2 Meter equipment in the Project

Meter	Description	Accuracy
M_I	M_I meter to record the electricity imported from the 10kV backup power supply grid for emergencies from the grid. Controlled by the grid company.	0.5s
M_S	Main meter, bi-directional meter which is used to record the electricity exported by the project to the grid and the amount of electricity imported from the grid. Controlled by the grid company.	0.2s
$M_{S'}$	Back up meter of M_S . Controlled by the grid company.	0.2s

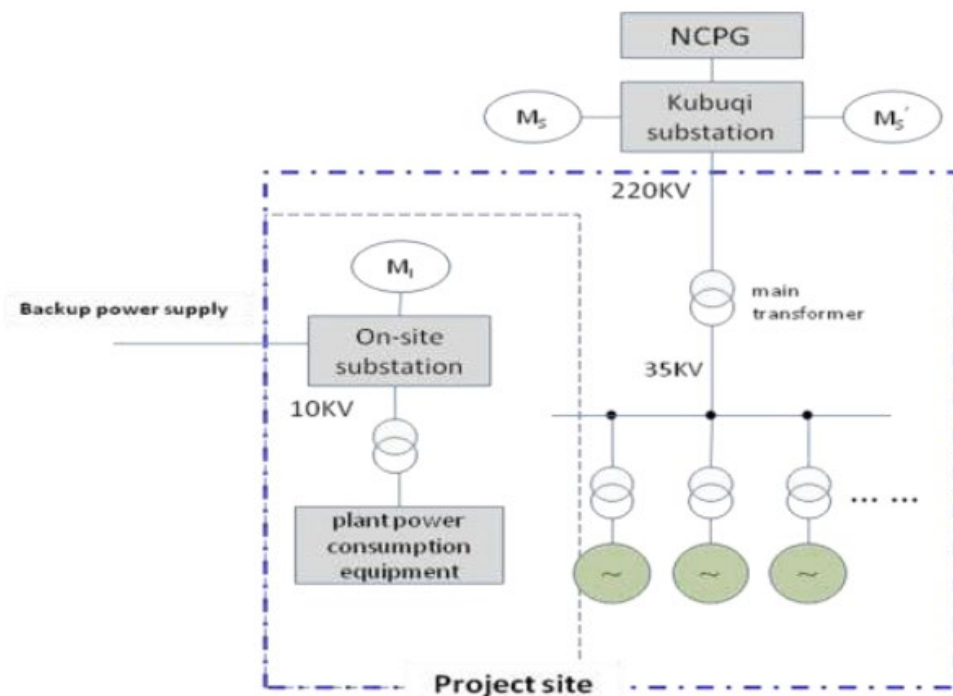


Figure 3-1 Connection structure and the meter location

3.2 Deviations

3.2.1 Methodology Deviations

There is no methodology deviation applied during this monitoring period.

3.2.2 Project Description Deviations

Deviations applied in this monitoring reports:

There is no deviation applied in this monitoring report.

Deviations applied in previous monitoring reports:

1.Crediting periods:

The project is registered under VCS standard Version 3.3 and completed validation before 19-Mar-2020. Thus, as per VCS standard 4.3, registered projects and projects that complete validation on or before 19-Mar-2020 remain eligible to apply the crediting period requirements under VCS standard Version 3.3 which shall be a maximum of ten years and may be renewed at most twice. However, the project is also registered as a CDM project (UNFCCC Ref. 7221) and the crediting period under CDM is 21 years (7*3 renewable), therefore the total length of VCS crediting period should be no more than 21 years which is from 28-Dec-2011 to 27-Dec-2032. Meanwhile, considering the lifetime of the project are 20 years, the project is not eligible for VCU issuance beyond 27-Dec-2031. Thus, the first renewable crediting period of the project have been updated to 28-Dec-2011 to 27-Dec-2021. The second renewable crediting period of the project have been updated to 28-Dec-2021 to 27-Dec-2031.

2.The name of the location of the meter M_s and M_s' :

The project was registered as a CDM project by UNFCCC on 07-Sep-2012 (UNFCCC Ref. 7221) and post registration change occurred and the revised CDM PDD was approved by UNFCCC on 17-Apr-2015. According to the revised CDM PDD, the name of the substation where the meter M_s and M_s' actually locate is named Kubuqi Substation, instead of the previous Balagong Substation.

3.The location of the meter M_1 :

In the first monitoring period, the location of the meter M_1 (unidirectional meter) measured the electricity imported from the 10kV backup power line for emergencies, is located in the on-site substation in the project site, instead of the Yihewusu Substation that was described in the registered PDD. The meter is owned by the grid company and this change of location of meter is beyond project proponents' control. During the first monitoring period, only in the first month after the operation of the project, some electricity (30.060 MWh) was imported from this backup power line, no electricity was imported in other months of the first monitoring period.

4.The change of the meter M_1 :

In the second VCS monitoring period, the meter M_1 (DSSD566, 0.5s) measured the electricity imported from the 10kV backup power line for emergency was changed to new meter M_1 (DHZ719, 0.5s) on 09-Nov-2018, and the accuracy is not changed and remains 0.5s. In addition, old M_1 meter was installed, calibrated and checked in accordance with the JJG 1055-97 technical norm of the calibration of AC watt-hour meters at place of installation during the period from 20-Sep-2015 to 08-Sep-2018. In the period from 09-Nov-2018 to 19-Aug-2020, new M_1 meter was installed, calibrated, and checked in accordance with the national standard the latest version 'Electricity meter installation technical management code' consistent with the registered CDM

PDD. And the meter is owned by the grid company and these changes of meter are beyond project proponents' control.

However, these changes do not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario.

3.3 Grouped Projects

The project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

The parameters ($FC_{i,j,y}$, NCV_i , $OXID_i$, EG_y , $EF_{CO_2,i}$, $COEF_{j,y}$, and $GEN_{j,y}$) used for calculation of the baseline grid emission factor ($EF_{grid,CM,y}$) available at validation in the registered PD during the 1st crediting period are replaced by the parameter of $EF_{grid,CM,y}$ directly here.

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO ₂ e/MWh
Description	The baseline grid emission factor (1 st crediting period) Combined margin CO ₂ emission factor for grid connected power generation in year y (2 nd crediting period)
Source of data	The registered PDD (1 st crediting period) 2019 Baseline Emission Factors for Regional Power Grids (2 nd crediting period)
Value applied	0.8959 (1 st crediting period) 0.8269 (2 nd crediting period)
Justification of choice of data or description of measurement methods and procedures applied	As per the registered PDD (1 st crediting period) As per the requirements in "Tool to calculate the emission factor for an electricity system version 07.0" (2 nd crediting period)
Purpose of Data	Calculation of baseline emissions
Comments	-

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{facility,y}$
Data unit	MWh

Description	Quantity of net Electricity delivered to the grid by the proposed project (1 st crediting period)			
	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (2 nd crediting period)			
Source of data	Monitoring electricity meter			
Description of measurement methods and procedures to be applied	Calculated based on M _s and M _l (1 st crediting period)			
	Calculated based on the electricity delivered to the grid by the project (EG _{net, mS, y}) and the electricity imported from the grid by the project (EG _{imp, m1, y}) (2 nd crediting period)			
	The cut-off time of the exported and imported electricity is 24:00 of 25 th every month except January and February in 2022. The recording of the exported and imported electricity is 24:00 of 24 th in January in 2022 and is 24:00 of 22 nd in February in 2022.			
Frequency of monitoring/recording	Continuously measured and monthly recorded.			
Value monitored	Period		Value	
	26-Mar-2021~27-Dec-2021 (1 st CP)		90,945.400	
	28-Dec-2021~31-Dec-2021 (2 nd CP)		1,114.700	
	01-Jan-2022~25-Jul-2022 (2 nd CP)		60,434.252	
	Total		152,494.352	
Monitoring equipment	Electricity meter			
	Type	M _s	M _s ’	M _l
		ZMQ202C bi-directional meter	ZMQ202C bi-directional meter	DH719 unidirectional meter
	Serial No.	96913470	96867840	040120570073
	Accuracy	0.2s	0.2s	0.5s
	Calibration frequency	yearly	yearly	yearly
	Date of last calibration	10-Apr-2020 05-Apr-2021 02-Apr-2022	10-Apr-2020 05-Apr-2021 02-Apr-2022	19-Aug-2020 10-Aug-2021
	Validity	09-Apr-2021 04-Apr-2022 01-Apr-2023	09-Apr-2021 04-Apr-2022 01-Apr-2023	18-Aug-2021 09-Aug-2022
QA/QC procedures to be applied	The accuracy of meters M _s , M _s ’ and M _l is 0.2s, 0.2s and 0.5s, respectively. The meters are calibrated annually by the independent qualified party. Data measured by meters has been cross checked with Electricity Sales and Purchase Receipts in this monitoring period.			

Purpose of the data	Calculation of baseline emission
Calculation method	$EG_{facility,y} = EG_{net,m_s,y} - EG_{imp,m_i,y}$ $EG_{net,m_s,y}$ is calculated via equation “the amount of electricity supplied to the grid - the amount of electricity imported from the grid” measured by the Ms (Ms’ as backup) $EG_{imp,m_i,y}$ is the electricity imported from the grid through meter M_i
Comments	-

4.3 Monitoring Plan

1. Operation and management structure

The project owner has established a specialized organization for project monitoring, which is shown as follows:

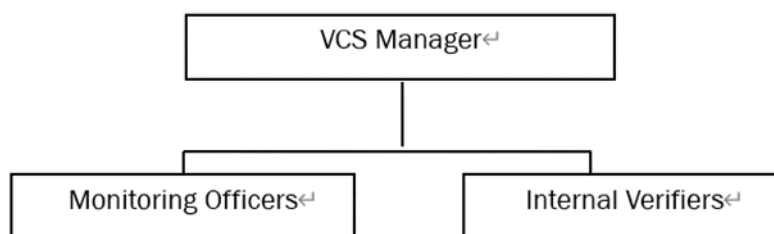


Figure 4-1 Management Structure of Monitoring Plan

The key responsibilities of each role are described as follows:

A VCS manager is appointed who has the overall responsibilities of monitoring the project. The measurement of the electricity exports and imports are carried out by the monitoring officers. In addition, the project developer designates internal verifiers who are responsible for the internal verification of the measurement, the collection of electricity records, and the calculation of the emission reductions.

2. Monitoring equipment and installation

The electricity generated by the 33 wind turbine generators is transformed to 35kV by the 33 box-type transformers, connected to the on-site main transformer which increases the voltage to 220kV, and then delivered to the nearby Kubuqi substation. All electricity is finally delivered to the Inner Mongolia Grid and the NCPG.

The metering systems include M_s , M_s' , M_i , of which M_s and M_s' are installed at the Kubuqi substation in Balagong town, and M_i is installed at the onsite substation. All the electricity meters except M_i are bi-directional meters which measure the amount of electricity supplied to the grid

and the amount of electricity imported from the grid. M_I measures the electricity imported from the 10kV backup power supply grid for emergencies.

M_S is the main meter and M_S' is the backup meter, which will be used when main meter is malfunctioning. The net electricity delivered to the grid of M_S (M_S') minus the electricity imported from the grid through M_I is the total net electricity delivered to the grid of the project ($EG_{facility,y} = EG_{net,m_s,y} - EG_{imp,m_I,y}$), which is used as for the ER calculation.

During this monitoring period, all meters ran continuously with no malfunction and there were no non-conformities identified.

See the location of each electricity meter in Figure 4-2.

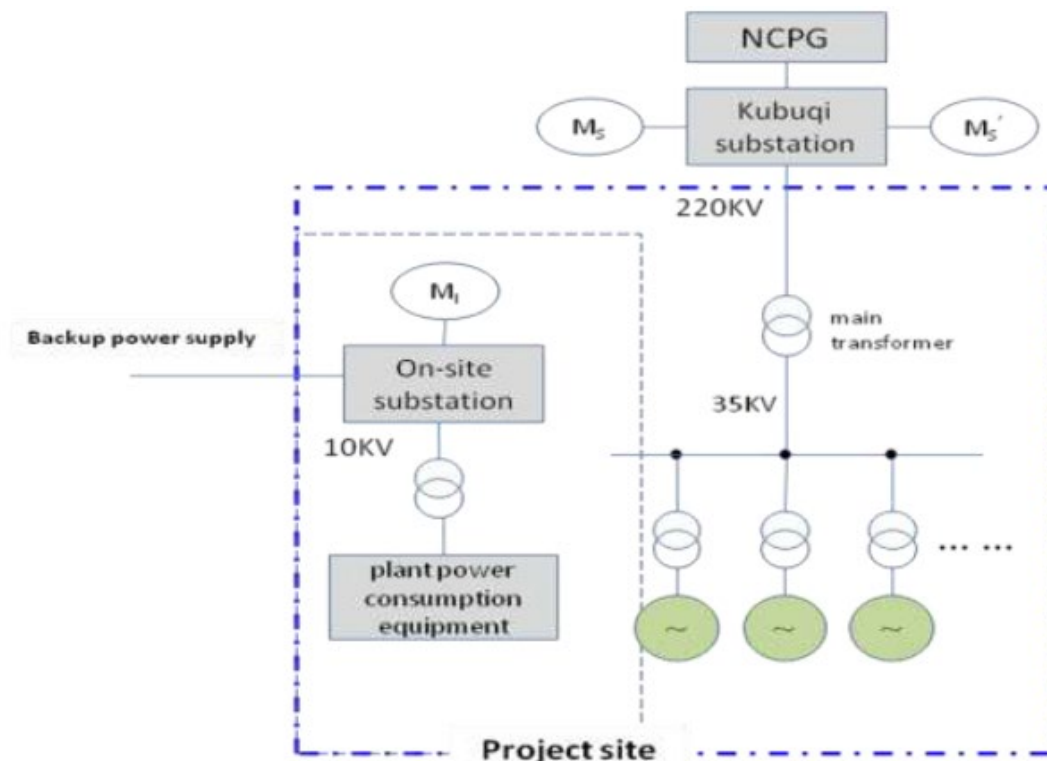


Figure 4-2 Power line diagram of the monitoring system

The transaction notes of the electricity supplied to the grid by this project and the electricity imported from the grid are issued based on the power purchase agreement (PPA) between the project entity and the power grid company and the readings from the meters.

3. Data collection and management

The project owner and the local power grid company read and confirmed the meters and recorded the data on a regular basis. The monitored data will be archived electronically each month.

During this monitoring period, all electricity transaction notes and electricity monthly reports were stored and made available to the verifier, so that the reliability of the information can be checked. All data should be archived for 2 years after the end of the last monitoring period.

4. Quality assurance and quality control

The meters should be installed in accordance with the relevant national and industrial regulations. Prior to the project operation, the project owner and the grid company should check the meters according to the relevant national and industrial regulations. The meters should be calibrated annually by an independent qualified calibration entity in accordance with the relevant national and industrial regulations.

Data and records are checked prior to being recorded and archived, and possible errors should be identified at this step. In case the main meter operates abnormally, the readings from the backup meter will be adopted. If both the main and back-up meters are out of order, the data monitored within this certain period shall not be counted.

Training on VCS monitoring is provided to the relevant staff in order to guarantee the implementation of the monitoring plan. During this monitoring period from 26-Mar-2021 to 25-Jul-2022, the workers were trained to be competent and the metering equipment were calibrated according to the national rules of the latest version Electricity meter installation technical management code at place of installation, and sealed as per the industry practices at regular intervals, with the purpose to provide credible, accurate, transparent and conservative monitoring data and ensure the real, measurable, long-term GHG emission reduction from this project.

Monthly net on-grid electricity supplied data is approved and signed off by the Manager before it is accepted and stored. The monthly electricity data has been crosschecked with the records of electricity transaction notes. This audit can guarantee the compliance with monitoring procedures in this monitoring plan. This internal audit can also identify potential improvements to procedures to improve monitoring and reporting in future years. The monitoring officers will also attend a training session organized by the VCS consultant. The purpose of training is to assure those staffs are competent to conduct the monitoring plan, thus to make the monitored data accurate.

The procedures of quality assurance and quality control have been continually supplemented and updated for perfection.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

For the period from 26-Mar-2021 to 27-Dec-2021 attributed to 1st crediting period,

In accordance with the calculating steps and formulas provided in ACM0002 (version12.3.0) “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, Baseline emissions are calculated according to the following formula:

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

$$EG_{facility,y} = EG_{net,M_s,y} - EG_{imp,M_I,y}$$

Where:

BE_y = Baseline emissions of the project in year y (tCO₂e)

$EF_{grid,CM,y}$ = Baseline emission factor (tCO₂e/MWh)

$EG_{facility,y}$ = Net electricity exported to the Grid by the project in year y (to calculate ER) (MWh)

$EG_{net,M_s,y}$ = Net electricity supplied to the grid measured by the M_s (M_s' as backup) in year y (MWh)

$EG_{imp,M_I,y}$ = Electricity consumed by the project for emergency measured by M_I in year y (MWh).

$EF_{grid,CM,y}$ is Baseline emission factor in the monitoring period. As per the registered PD of the project the value is 0.8959tCO₂e/MWh.

BE_y calculation process is shown below:

Table 5-1 The ex-post $EG_{\text{facility},y}$ of the project during this monitoring period in the 1st crediting period

Period		EG net, ms, y							EG imp, mly			EG facility,y
		the amount of electricity supplied to the grid			the amount of electricity imported from the grid			data used for ER calculation	Monthly imported electricit y recorded by M _i	Stateme nt from the grid	data used for ER calculation	
		Monthly exported electricity recorded by M _s	Exported electricity sales receipts	Conservative data	Monthly imported electricity recorded by M _s	Imported electricity purchase receipts	Conservativ e data					
		A	B	C=min(A, B)	D	E	F=max(D,E)	G=C-F	H	I	J=max(G,H)	
MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	
26-Mar-2021	25-Apr-2021	8,574.070	8,574.070	8,574.070	45.690	45.690	45.690	8,528.380	0.000	0.000	0.000	8,528.380
26-Apr-2021	25-May-2021	15,718.080	15,718.080	15,718.080	19.290	19.290	19.290	15,698.790	0.000	0.000	0.000	15,698.790
26-May-2021	25-Jun-2021	9,443.240	9,443.240	9,443.240	32.800	32.800	32.800	9,410.440	0.000	0.000	0.000	9,410.440
26-Jun-2021	25-Jul-2021	8,011.050	8,011.050	8,011.050	45.910	45.910	45.910	7,965.140	0.000	0.000	0.000	7,965.140
26-Jul-2021	25-Aug-2021	7,305.830	7,305.830	7,305.830	33.770	33.770	33.770	7,272.060	0.000	0.000	0.000	7,272.060
26-Aug-2021	25-Sep-2021	6,450.150	6,450.150	6,450.150	40.710	40.710	40.710	6,409.440	0.000	0.000	0.000	6,409.440
26-Sep-2021	25-Oct-2021	8,579.280	8,579.280	8,579.280	41.210	41.210	41.210	8,538.070	0.000	0.000	0.000	8,538.070
26-Oct-2021	25-Nov-2021	14,337.060	14,337.060	14,337.060	34.390	34.390	34.390	14,302.670	0.000	0.000	0.000	14,302.670
26-Nov-2021	25-Dec-2021	12,272.170	12,272.170	12,272.170	9.100	9.100	9.100	12,263.070	0.000	0.000	0.000	12,263.070
26-Dec-2021	27-Dec-2021	563.530	563.530	563.530	6.190	6.190	6.190	557.340	0.000	0.000	0.000	557.340
Subtotal for this monitoring period in 1st crediting period		/		91,254.460	/		309.060	90,945.400	/	/	0.000	90,945.400

Electricity data from the period from 26-Dec-2021 to 27-Dec-2021 was sourced from daily meter readings and have been confirmed by local power grid company.

Thus, in period from 26-Mar-2021 to 27-Dec-2021, $BE_y = 90,945.400 \text{ MWh} \times 0.8959 \text{ tCO}_2\text{e/MWh} = 81,477 \text{ tCO}_2\text{e}$

For the period from 28-Dec -2021 to 25-Jul-2022 attributed to 2nd crediting period:

According to ACM0002 (v 21.0) “Grid-connected electricity generation from renewable sources”, the baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The baseline emissions are to be calculated as follows:

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

Where:

BE_y = Baseline emissions in year y (t CO₂/yr)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the VCS project activity in year y (MWh/yr)

$EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y (t CO₂/MWh)

And for Greenfield power plant,

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

$EF_{grid,CM,y}$ is calculated using the latest version of “TOOL07: Tool to calculate the emission factor for an electricity system” according to the updated PD for the 2nd crediting period.

$$EF_{grid,CM,y} = \omega_{OM} \times EF_{grid,OM,y} + \omega_{BM} \times EF_{grid,BM,y}$$

Where,

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh)

$EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh)

ω_{OM} = Weighting of operating margin emissions factor (per cent)

ω_{BM} = Weighting of build margin emissions factor (per cent)

In the 2nd crediting period, $EF_{grid,CM,y} = 0.75 \times 0.9419 + 0.25 \times 0.4819 = 0.8269 \text{ tCO}_2\text{/MWh}$

BE_y calculation process is shown below:

Table 5-2 The ex-post $EG_{\text{facility},y}$ of the project during this monitoring period in the 2nd crediting period

Period		EG _{net, ms, y}							EG _{imp, mly}			EG _{facility, y}
		the amount of electricity supplied to the grid			the amount of electricity imported from the grid			Data used for ER calculation	Monthly imported electricity recorded by M _I	State ment from the grid	data used for ER calculation	
		Monthly exported electricity recorded by Ms	Exported electricity sales receipt	Conservativ e data	Monthly imported electricit y recorded by Ms	Imported electricity purchase receipts	Conservativ e data					
A	B	C=min(A, B)	D	E	F=max(D,E)	G=C-F	H	I	J=max(G,H)	K=C-G		
MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	MWh	
28-Dec-2021	31-Dec-2021	1,127.070	1,127.070	1,127.070	12.370	12.370	12.370	1,114.700	0.000	0.000	0.000	1,114.700
1-Jan-2022	24-Jan-2022	6,762.400	6,762.400	6,762.400	74.240	74.240	74.240	6,688.160	0.000	0.000	0.000	6,688.160
25-Jan-2022	22-Feb-2022	5,627.940	5,627.940	5,627.940	70.950	70.950	70.950	5,556.990	0.000	0.000	0.000	5,556.990
23-Feb-2022	25-Mar-2022	11,963.570	11,963.570	11,963.570	37.210	37.210	37.210	11,926.360	0.000	0.000	0.000	11,926.360
26-Mar-2022	25-Apr-2022	13,041.971	13,041.971	13,041.971	16.340	16.340	16.340	13,025.631	0.000	0.000	0.000	13,025.631
26-Apr-2022	25-May-2022	10,940.380	10,940.380	10,940.380	75.218	75.218	75.218	10,865.162	0.000	0.000	0.000	10,865.162
26-May-2022	25-Jun-2022	2,202.450	2,202.450	2,202.450	77.431	77.431	77.431	2,125.019	0.000	0.000	0.000	2,125.019
26-Jun-2022	25-Jul-2022	10,318.040	10,318.040	10,318.040	71.110	71.110	71.110	10,246.930	0.000	0.000	0.000	10,246.930
Subtotal for this monitoring period in 2nd crediting period		/		61,983.821	/		434.869	61,548.952	/	/	0.000	61,548.952

Electricity data from the period from 28-Dec-2021 to 31-Dec-2021, 01-Jan-2022 to 24-Jan-2022 was sourced from daily meter readings and have been confirmed by local power grid company.

Thus, $BE_y = 61,548.952 \text{ MWh} * 0.8269 \text{ tCO}_2/\text{MWh} = 50,894 \text{ tCO}_2$

In summary, during this monitoring period, the annual baseline emission is listed as below.

Table 5-3 The annual baseline emission

Year	EG _{facility,y}	EF _{grid,CM,y}	Baseline Emission
	MWh	tCO _{2e} /MWh	tCO _{2e}
	C=A-B	D	E=C*D
26-Mar-2021~27-Dec-2021 (1 st CP)	90,945.400	0.8959	81,477
28-Dec-2021~31-Dec-2021 (2 nd CP)	1,114.700	0.8269	921
01-Jan-2022~25-Jul-2022 (2 nd CP)	60,434.252	0.8269	49,973
Total	152,494.352	/	132,371

5.2 Project Emissions

As a wind power generation project, according to ACM0002, the project emissions $PE_y = 0$.

5.3 Leakage

No leakage effects are accounted for under this methodology.

5.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
26-Mar-2021~31-Dec-2021	82,398	0	0	82,398
01-Jan-2022~25-Jul-2022	49,973	0	0	49,973
Total	132,371	0	0	132,371

This monitoring period is from 26-Mar-2021 to 25-Jul-2022, with 487 days in total (277 days in the 1st crediting period and 210 days in the 2nd crediting period). Based on the annual estimated emission reductions from the revised CDM PDD and renewed VCS PD, the amount of emission reductions for this monitoring period would be $105,520 \text{ tCO}_2\text{e} / 365 \text{ d} * 277 \text{ d} + 97,395 \text{ tCO}_2\text{e} / 365 \text{ d} * 210 \text{ d} = 136,115 \text{ tCO}_2\text{e}$. The actual emission reductions in this monitoring period are 132,371 tCO₂e, which is 2.75%⁶ less than the estimation in the revised CDM PDD and renewed VCS PD.

The reason is that the wind speed for the monitoring period is slight lower than available historical meteorological data used to calculate annual electricity output in CDM PDD. So, it is reasonable that during this monitoring period, the actual emission reduction is less than the estimated value.

⁶ -2.75% = $132,371 / 136,115 - 1$

APPENDIX 1: <SUPPORTING EVIDENCE>

Evidence for SDG 7 and 13: From project operation date onwards, the net electricity supplied to the grid and the emission reduction in every monitoring period have been listed in below table. Please refer to following links for details.

<https://registry.verra.org/app/projectDetail/VCS/1128>

<https://cdm.unfccc.int/Projects/DB/JCI1346997827.74/view>

Period		The net electricity delivered to CCPG	Emission Reduction
From	To	MWh	tCO ₂ e
28-Dec-2011	06-Sep-2012	65,118.530	58,339
07-Sep-2012	20-Nov-2014	247,623.190	189,860 ⁷
21-Nov-2014	20-Mar-2016	151,694.290	135,902
21-Mar-2016	25-Mar-2021	559,770.560	501,498
26-Mar-2021	25-Jul-2022	152,494.352	132,371
Cumulative impacts		1,176,700.920	1,017,970

Evidence for 8: The payroll of the project staff, including name, gender, wage, insurance and housing fund and other specific information has been submitted to VVB for verification. Thus, the payroll is not included as appendices to this report due to confidentiality requirement of the project proponent.

⁷ The project owner does not claim Emission Reduction Credits during the period from 07-Sep-2012 to 31-Dec-2012, this emission reductions are achieved from 01-Jan-2013 to 24-Mar-2014.