



CECIC GANSU YUMEN CHANGMA NO.3 WIND FARM PROJECT



Document Prepared by Profit Carbon Environmental Energy Technology
(Shanghai) Co., Ltd.

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

CECIC Gansu Yumen Changma No.3 Wind Farm Project (hereinafter referred as "the Project") is in Yumen Town, Yumen City, Gansu Province, the People's Republic of China. The purpose of the Project is to generate electricity using wind power resources in the project region and to deliver to the Northwest China Power Grid (NWPG) which is predominated by connected fossil fuel fired power plants, especially coal fired plants. So, the Project can reduce GHG emissions by replacing the electricity generated by fossil fuel fired power plants in NWPG.

The purpose of the project is to generate renewable wind power and deliver it to NWPG. Currently, most of the electricity in the region is generated through conventional fossil fuel based thermal power plants, according to the China Electricity Power Yearbook. Through combustion of fossil fuels, they emit a large volume of Greenhouse gasses (GHG) into the atmosphere, which has a negative effect on global society.

The Project involves the installation of 134 wind turbines with 1.5MW capacity per unit, with a total installed capacity of 201 MW. Totally 463,714 MWh of clean electricity generated by the Project are expected to be delivered to the NWPG annually.

The baseline scenario of the project is the electricity supply of equal amount as the project from the NWPG. The baseline scenario of the project is the same against the scenario prior to the start of the implementation of the project activity.

The Project started construction on 19/09/2009. The first wind turbine of the Project commissioning started on 28/01/2011. The Project started fully commissioning on 23/10/2012.

The Project is developed by CECIC Wind-power (Gansu) Co., Ltd. (hereinafter referred as "the Project owner" or "PP"), a solely owned subsidiary company of China Energy Conservation Investment Corporation Wind Power Investment Co., Ltd. the emission reduction achieved by the project in this monitoring period is 348,411 tCO₂e. The emission reductions in the monitoring period will be verified and issued under VCS rules.

1.2 Sectoral Scope and Project Type

Sectoral scope: 1 energy industries (Renewable sources).

Project type I: Renewable energy Projects. Grid connected wind power project.

The project is not a grouped project.

1.3 Project Proponent

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1.4 Other Entities Involved in the Project

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Role in the Project	Consultancy
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1.5 Project Start Date

28/01/2011 (It is the date when the first turbine was commissioned).

1.6 Project Crediting Period

The first crediting period: 28/01/2011-27/01/2021

The second crediting period: 28/01/2021-27/01/2031

This monitoring period belongs to the second VCS crediting period.

1.7 Project Location

The Project site is located 18-31 km southwest of Yumen Town, Yumen City, Gansu Province in the People's Republic of China. It is located at Latitude from N 40°05'39" to N 40°09'52" and Longitude from E 96°46'22" to E 96°51'57". The altitude of the Project site ranges from between 1690 m to 1825 m above the sea level.

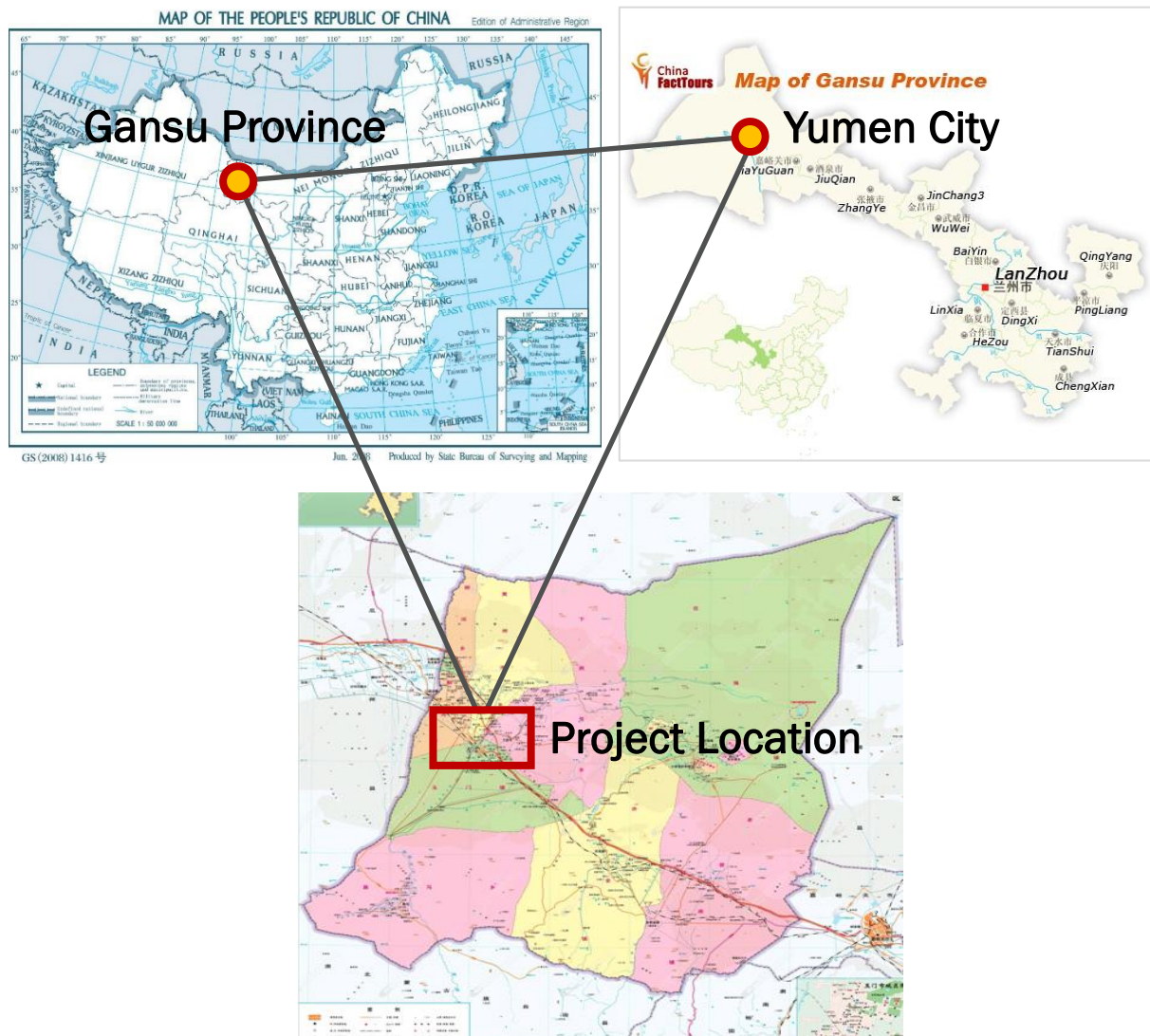


Figure1. Map of Project Location

1.8 Title and Reference of Methodology

Title: Approved consolidated baseline and monitoring methodology ACM0002: “Grid connected electricity generation from renewable sources” (Version 20.0) is applied by the Project.

The methodology also refers to the approved versions of the following tools:

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

1.9 Participation under other GHG Programs

The project is a registered CDM project with reference No. 4734. Total GHG emission reductions of 1,348,338 tCO₂ generated from 28/04/2011 to 31/12/2015 by the project has been

issued as CERs under CDM program, the detailed information can be found at <https://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1303442859.42/view>.

The GHG emission reductions of 1,594,675 tCO₂e generated from 01/01/2016 to 27/01/2021 by the project has been issued as VCUs under VCS program.

All emission reductions during 28/01/2021 to 31/12/2021 have not and will not seek CDM CER issuance. Emission reductions during this monitoring period will only seek issuance under VCS program.

1.10 Other Forms of Credit

Emission Trading Programs and Other Binding Limits

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.

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 is expected to produce various benefits to society as well as the environment. Therefore, the Project will significantly contribute to national as well as local sustainable development, including:

- Job creation: Implementation of the Project will generate employment opportunities for local contractors and suppliers, while operation and maintenance of the plant will create additional long-term employment opportunities for skilled professionals. For the Project operation PP is planning to employ a number of skilled workers, while more additional jobs were created by sub-contractors for construction of the Project. The project activity generates long-term working opportunities for 15 people during the construction period. From the operation start date of this project activity to the end of this monitoring period, 15 people were employed including 7 females and 8 males.
- Increase of power supply: Due to rapid economic growth in recent years, China is experiencing a serious shortage of electricity, causing blackouts and brownouts throughout the country. Such power outage reduces economical activity and has a negative effect on daily life. With the new wind farm, the grid is expected to improve its supply while contributing to steady and reliable economical growth in the region. From the operation start date of this project activity to the end of this monitoring period 3,660,878.67 MWh of electricity from renewable sources has been exported to the power grid.

Thus, the project achieved **SDG 8 Decent Work and Economic Growth**¹.

- Reduction in GHG emissions: Currently, most of the electricity in the region is generated through conventional fossil fuel based thermal power plants, according to the China Electricity Power Yearbook. Through combustion of fossil fuels, they emit a large volume of Greenhouse gasses (GHG) into the atmosphere, which has a negative effect on global society. Generation of GHG emission free electricity, such as wind, will displace electricity generated by these fossil fuel based thermal plants, therefore reducing GHG emissions. The project activity achieves 348,411 tCO₂e emission reduction in this monitoring period.

Thus, the project achieved **SDG 13 Climate Action**².

- Reduction of fossil fuel use: The Project Activity will reduce reliance on imported fossil fuels, which will contribute to increasing China's energy security, and will also improve local air quality as it reduces the emissions of SO₂, and NO_x associated with fossil fuel use. During this monitoring period, 447,464.841 MWh of electricity from renewable sources has been exported to the power grid.

Thus, the project achieved **SDG 7 Affordable and Clean Energy**³.

¹ <https://sdgs.un.org/goals/goal8>

² <https://sdgs.un.org/goals/goal13>

³ <https://sdgs.un.org/goals/goal7>

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	7.2	7.2.1 Renewable energy share in the total final energy consumption	Implemented activities to increase	During this monitoring period, 447,464.841 MWh of electricity from renewable sources has been exported to the power grid.	From the operation start date of this project activity to the end of this monitoring period 3,660,878.67 MWh of electricity from renewable sources has been exported to the power grid.
2)	8.3	8.3.1 Proportion of informal employment in non - agriculture employment, by sex	Implemented activities to increase	During this monitoring period, 15 people including 7 females and 8 males were employed for operation, and maintenance of this project.	The project activity generates long-term working opportunities for 15 people during the construction period. From the operation start date of this project activity to the end of this monitoring period, 15 people were employed including 7 females and 8 males.
3)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	During this monitoring period, the project has achieved GHG emission reductions of 348,411 tCO ₂ e.	From the operation start date of this project activity to the end of this monitoring period, the project has achieved GHG emission reductions of 3,291,424 tCO ₂ e.

2 SAFEGUARDS

2.1 No Net Harm

In line with the requirements of local government, an Environmental Impact Assessment (EIA) for the proposed wind farm project was carried out. The EIA was completed by Lanzhou University and has been approved by the Environmental Protection Bureau of Gansu Province, indicating that the Project meets all national environmental protection regulations. The analysis and measures to be taken to mitigate the impacts are demonstrated in the following:

Impact on Air Quality

The air pollution during construction mainly comes from flying dust produced by excavating land as well as some exhaust discharge from transportation vehicles and construction machinery. To minimize effects from such activities, PP will take appropriate measures, such as watering the site regularly. In addition, since the project site is far away from the nearest local residential area (over 5Km), there is no impact on local residents from dust and air pollution. The main impact is on the construction staff and appropriate measures such as watering and converting will be taken to reduce any negative impact and ensure staff safety.

Noise Pollution

The noise mainly comes from the drilling machines and cement mixers during the construction period, and aerodynamic interaction between the wind and turbine blades during operation. Although the operating level of these turbines is around 100dB, at a range of 150 meters from the turbines the noise weakens to 33dB, which is below the national standard of 45dB. However, as the Project is far away from any residential area (5km), effects on the surrounding environment of noise pollution are not significant.

Impact of Solid Waste:

Solid waste mainly comes from construction and living waste. During the construction period, construction waste will be properly disposed to avoid water and soil erosion problems. The Project will generate living wastes of 150 kg per day during construction. This waste will be properly collected and delivered to the local county for disposal.

Impact on Waste Water:

The waste water generated during the construction includes washing water from machines and wastewater from the project office. Since the project site is located in the Gobi desert area, the waste water will be reused on the construction site or as fertilizer. During operation, the waste water and sewage will be treated by using a septic tank and all-in-one biochemical process

equipment to recycle and reuse water on the project site. The treated waste water will be used for on-site greening and road spreading. The treated waste water quality will meet the requirement of the Fields Irrigation Water Standard (GB 5084-1992), therefore, it has no negative impact on the surrounding environment.

Impact on Ecosystem:

The Project is located in the Gobi desert area with sparse vegetation. Through minimizing the construction area, backfilling the gravel, properly disposing of solid waste during construction, and growing drought-resistant, sand-fixing, and fast growing plants after construction, the impact on the ecological environment will be reduced.

2.2 Local Stakeholder Consultation

2.2.1 Stakeholder consultation during registration stage under CDM scheme

1. Brief description how comments by local stakeholders have been invited and compiled:

The local stakeholder's meeting was held in Yumen City on 18/06/2008. 45 participants attended the meeting including local residents, builders and members of the local authorities. The project owner introduced the Project, and then a survey was arranged through a one-page questionnaire, which was designed to be easily filled in. The opinions expressed by the stakeholders were recorded and are available on request. The survey includes the following sections:

(i) Project introduction;

(ii) Respondents' basic information and education level;

(iii) Questions;

Do you consider your current living, studying and working environment to be quiet?

Do you think that the project will have an impact on the environment, such as air quality, noise, water, etc.?

Will the project construction have a negative impact on the living, studying and working environment of you and your family?

Do you think the project implementation will have some positive impact on your life?

During the project construction which of the following problems concerns you most: noise, air pollution, equipment safety, wastewater discharge, electromagnetic interference, landscape destruction?

Do you agree with the development and construction of the project?

Do you have any suggestion regarding the kind of measures which should be applied during the project construction and operation in order to protect the environment?

Do you have any suggestions/advice for the developer of the Project?

(iv) Space for the date of stakeholder meeting.

2. Summary of the comments received:

Stakeholder Meeting

Every stakeholder expressed their comments in favour of the Project. To date, no negative comments have been received. The summary of stakeholder meeting's comments is as following:

- Promote the local economic development

The local government strongly supports the development and construction of the proposed Project. It will increase local financial income and promote technological progress of local building materials, tower tube manufacturing, and other related industries. This project will provide clean energy ("green energy") to the Northwest grid and promote the sustainable development of the local economy.

- Local environment protection

According to the project EIA report, the noise level of the installed turbines is within below the national standard. The proposed Project site is located in the Gobi desert, the underdeveloped region. Moreover, there are no residents or industrial firms near the project site. Furthermore, there are no issues related to noise and communications signal interference, or to bird migration. The project will play an exemplary role on energy saving, pollution reduction and the environment protection.

- Improve the living condition of local residents

The project site is located in Gobi desert and there are no residents around the project site, so the local residents will not be impacted by the noise from the construction and operation of the project. The proposed project will create new employment opportunities through the project construction and operation. For the construction, the PP is planning to employ a number of skilled workers for the operation, while creating more jobs by sub-contractors for construction work. The project will also purchase the raw materials for construction and other supplies from the local market. Therefore, the local people will benefit from the Project.

Questionnaire Survey

The survey had a 100% response rate with all questionnaires returned. The key findings of the survey and the summary of the consultation are as following:

- 86.67% of respondents agree with the development and construction of the project.
- 86.67% of the respondents believe that the Project will have no negative impact on their living, studying, and working environments.
- 71.11% of the respondents believe that the project implementation will have a positive impact on their lives.

The stakeholder meeting and the survey showed that the Project receives strong support from the local community. The result and comments received in the survey is shown below. They all believe the Project will promote local economic development and agree with the project development and construction.

Questions	Answer	Number	Ratio
1. Is your current living, working and study environment quiet?	Quiet	38	84.44%
	Not Quiet	2	4.44%
	Not sure	4	8.89%
	No answer	1	2.22%
2. Do you think the project will affect the surrounding environment (air, noise and water)?	Yes	8	17.78%
	No	31	68.89%
	Not sure	5	11.11%
	No answer	1	2.22%
3. Will the project construction have a negative impact on the living, studying and working environment of you and your family?	Yes	2	4.44%
	No	39	86.67%
	Not sure	2	4.44%
	No answer	2	4.44%
4. Do you think the project implementation will have some positive impact on your life?	Yes	32	71.11%
	No	6	13.33%
	Not sure	6	13.33%
	No answer	1	2.22%
5. What do you concern the most during the project construction and operation?*	Noise	10	17.86%
	Air pollution	10	17.86%
	Equipment safety	16	28.57%
	Wastewater discharge	9	16.07%
	Electromagnetic	9	16.07%
	Landscape destruction	2	3.57%
6. Do you agree with development of this project?	Agree	39	86.67%
	Not agree	0	0.00%
	No sure	1	2.22%
	No answer	5	11.11%

(*For the question 5, multiple answers per survey was allowed)

Report on how due account was taken of any comments received:

Although there was no negative comment directly opposing the Project implementation, there were several concerns and suggestions raised by stakeholders, especially on possible effects on the environment. However, for these concerns, PP has already taken necessary measures to minimize such effects, as shown in the below table.

Issues	Preventative actions taken by CECIC
Equipment safety	Wind turbine and hub are the key equipment used for the Project. The Project will install efficient and highly reliable turbines manufactured by Dongfang Steam Turbine Manufacture.
Electromagnetic	Radiation of electromagnetism arising from generators, transformer substations and transmission lines is considered insignificant in terms of intensity, and is unlikely to have a negative impact on residents' health because of the long distance between the project site and the nearest residential area. The project has 134 units of 35kv medium-pressure transformer substation which are each covered in a metal cabinet and electromagnetic radiation is kept low.
Air pollution	Air pollution during construction mainly comes from flying dust produced by excavating land as well as some exhaust discharge from transportation vehicles and construction machinery. To minimize effects from such activities, the PP will take appropriate measures, such as watering the site regularly. In addition, since the project site is far away from the nearest local residential area (over 5Km), there is no impact on local residents from dust and air pollution. The main impact is on the construction staff and appropriate measures such as watering and covering will be taken to reduce any negative impact and ensure staff safety.
Noise	The noise mainly comes from the drilling machines and cement mixers during the construction period, and aerodynamic interaction between the wind and turbine blades during operation. Although the operating level of these turbines is around 100dB, at a range of 150 meters from the turbines the noise weakens to 33dB, which is below the national standard of 45dB. However, as the Project is far away from any residential area (5km), effects on the surrounding environment of noise pollution are not significant.

Waste water	The waste water generated during the construction includes washing water from machines and wastewater from the project office. Since the project site is located in the Gobi desert area, the waste water will be reused on the construction site or as fertilizer. During operation, the waste water and sewage will be treated by using a septic tank and all-in-one biochemical process equipment to recycle and reuse water on the project site. The treated waste water will be used for on-site greening and road spreading. The treated waste water quality will meet the requirement of the Fields Irrigation Water Standard (GB 5084-1992), therefore it has no negative impact on the surrounding environment.
Solid Waste	Solid waste mainly comes from construction and living waste. During the construction period, construction waste will be disposed of properly to avoid water and soil erosion problems. The Project will generate living waste of 150 kg per day during construction. This waste will be properly collected and delivered to the local county for disposal.
Landscape destruction	The Project is located in the Gobi desert area with sparse vegetation. The Project construction could exacerbate the soil erosion and blown sand hazards. Through minimizing the construction area, backfilling the gravel, properly disposing of solid waste during construction, and growing drought-resistant, sand-fixing, and fast growing plants after construction, the impact on the ecological environment will be reduced. Furthermore, there is no farmland or residential area near the Project site, therefore, damage to such farmland or residential areas are considered minimum.
Protection from heavy vehicles on Gobi desert, road, city and residential area	Since the Project is located in the Gobi desert, damage caused by heavy vehicles at the Project site is considered minimum. In addition, CECIC will plant fast-growing plants upon completion of the Project, which will restore any damage caused by the Project. In addition, heavy vehicles used for construction would not cause excess wear and tears to the road, and will avoid driving in the city or close to residential areas to minimize any impact.

2.2.2 Stakeholder consultation during this monitoring period

Communications with local stakeholders are being carried out at periodic intervals. In this monitoring period, the project owner carried out questionnaire survey for the local stakeholder to collect the relevant comments and suggestions in August 2021. And 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.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The Project started construction on 19/09/2009. The first wind turbine of the Project started commissioning on 28/01/2011. The Project started fully commissioning on 23/10/2012. The electricity generated by the Project is delivered to NWPG, according to the signed power purchase agreement (PPA) with Gansu Electric Power Grid Co.

During this monitoring period, the Project is operated and implemented smoothly. There are no emergencies happened to the monitoring system in this monitoring period, or events or situations occurred during the monitoring period, which may impact the applicability of the methodology.

Total 134 sets of wind power turbine and generators with 1.5MW unit capacity each, are installed in the Project, forming 201MW of total capacity. These wind turbines are manufactured by China's Dongfang Steam Turbine Co., Ltd and the model type of these wind turbines is FD82A-1500/11. The main technology parameter of this type of wind power turbine can be found at Table1, which is in line with the specification made in the PD.

Major technical parameters of the key equipments employed by the project are illustrated in the following table.

Table 2 Major technical parameters of key equipment

Item	FD82A/1500
1. Data for Unit	
Rated capacity (kW)	1500
Number of unit	134
Capacity control method	Adjusting the pitch of blade and wind wheel speed control
Turbine diameter (m)	82
Hub height (m)	70
Cut in wind speed (m/s)	3.0
Rated wind speed (m/s)	11
Cut out wind speed (m/s)	20.0
Wind speed limit (m/s)	52.5
Operating temperature (°C)	-20~+40
The wind direction	Upwind
Technical lifetime (y)	20
2. Blade	
Number of blades	3
Material of blade	GRP
End profiles of blades speed (m/s)	74.3
3. Generator	
Type of generator	Double-fed slip ring asynchronous generator
Rated capacity (kW)	1500
Output Voltage (V)	690
Rated speed (rpm)	1000~1800 ±10%
4. Machinery space & Tower	
Machinery space (t) (exclude blade)	61
blade	3×6.2
Type of tower	Conical steel tube
High of tower (m)	70
Weight of tower (t)	127.66

The electricity generated by the Project is exported to the local Yumen town grid via a newly built 35kV/330kV transformer station, which is then exported to the NWPG.

3.2 Deviations

2.1.1 Methodology Deviations

As per renewed VCS PD, there is a deviation on calculation of Build Margin when adopting the methodological tool - "Tool to calculate the emission factor for an electricity system" by the Chinese DNA in calculation of emission factors of regional power grids. The deviation has been approved by the EB Board in a response letter entitled "Request for clarification on use of approved methodology AM0005 for several projects in China"⁴. The same deviation method has been adopted in this (2nd) crediting period (also this monitoring period) of the project by the Chinese DNA.

⁴ http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_QEJWJEF3CFBP1OZAK6V5YXPQKK7WYJ

Moreover, the parameter $EF_{grid,BM,y}$ and $EF_{grid,OM,y}$ determined ex-ante for the 2nd crediting period are sourced from local government⁵. The deviation has no impact on conservativeness of the quantification of GHG emission reductions or removals.

2.1.2 Project Description Deviations

There is no project description deviations applied to this monitoring period.

The project description deviations during previous monitoring period are described as follows:

1. Deviation in relation with VCS crediting period

The project is registered under VCS standard Version 3.2 and completed validation before 19/03/2020. Thus, it remains eligible to apply the crediting period requirements under VCS Version 3 which shall be a maximum of ten years and may be renewed at most twice, so the first renewable crediting period of the project should be updated from 28/01/2011~27/04/2011 to 28/01/2011 ~ 27/01/2021.

2. Deviation in relation with monitoring plan

In revised CDM PDD (Version 11.0, 02/07/2012), two solar projects (other projects) shared bi-directional gateway meter (M1 as main meter and M1' as backup meter) with the project activity. The quantity of net electricity generation supplied by the Project plant/unit to the grid ($EG_{facility,y}$) is continuous monitored through ten bi-directional meters installed at the 35kV side of 35kV/330kV transformer. The quantity of net electricity generation supplied by the project plant/unit to the grid ($EG_{facility,y}$) is calculated as follow:

$$EG_{facility,y} = EG_{PJ \text{ to grid}, y} - EG_{grid \text{ to PJ}, y}$$

Where:

$EG_{PJ \text{ to grid}, y}$ is the electricity exported to the grid by the Project is the sum of values measured by the ten meters for exported electricity.

$EG_{grid \text{ to PJ}, y}$ is the electricity imported from the grid by the Project is the sum of values measured by the ten meters for imported electricity.

⁵ https://www.mee.gov.cn/ywgz/ydqhbh/wsqtgz/202012/t20201229_815386.shtml

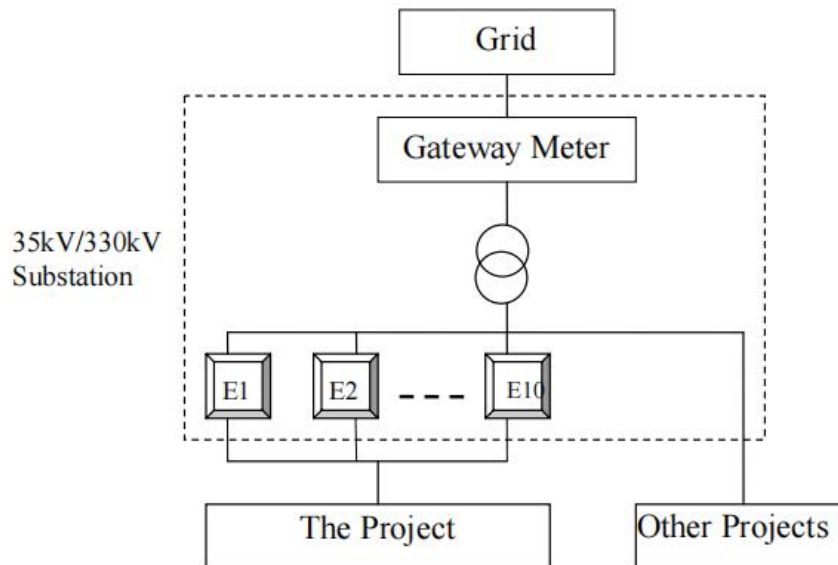


Figure 1 Monitoring Line Diagram in the revised CDM PDD (Version 11.0, 02/07/2012)

However, the readings of the 10 electricity meters were not recorded since 01/01/2020, An alternative measure is adopted for the monitoring of net electricity generation supplied by the project plant/unit to the grid ($EG_{\text{facility},y}$).

As stated in renewed VCS PD (version 02, 17/02/2022), the quantity of net electricity generation supplied by the project plant/unit to the grid ($EG_{\text{facility},y}$) were continuously monitored through bi-directional gateway meter (M1 as main meter and M1' as backup meter with accuracy 0.2s) share with two solar projects (other projects), as well as, electricity meters MS1 (accuracy 0.5s) and MS2 (accuracy 0.5s), which measures the electricity output and input of two Solar Projects.

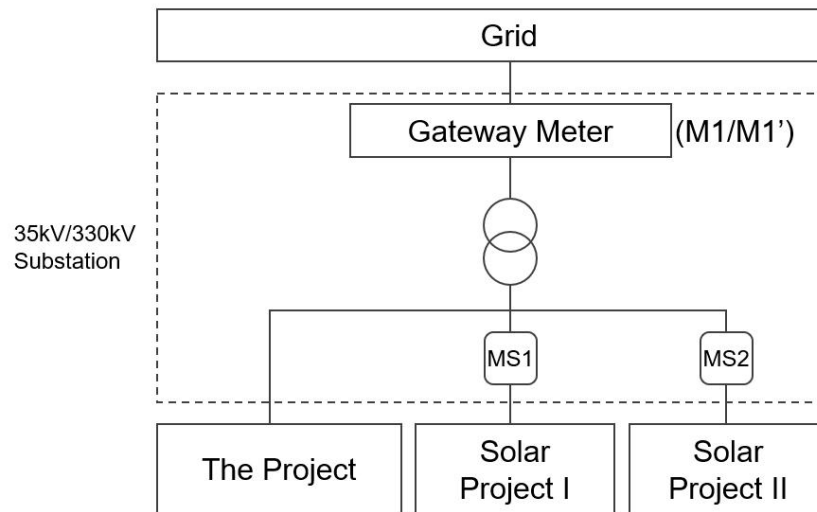


Figure 2 Monitoring Line Diagram since 01/01/2020

The quantity of net electricity generation supplied by the project plant/unit to the grid ($EG_{facility,y}$) is calculated as follow:

$$EG_{facility,y} = EG_{PJ \text{ to grid}, y} - EG_{grid \text{ to PJ}, y}$$

$$EG_{PJ \text{ to grid}, y} = EG - EG_{solar1,y} - EG_{solar2,y}$$

Where

$EG_{PJ \text{ to grid}, y}$ is the Electricity exported to the grid by the Project.

$EG_{grid \text{ to PJ}, y}$ is the Electricity imported from the grid by the Project.

EG is electricity exported to the grid measured by M1 (and/or M1').

$EG_{solar1,y}$ is the electricity supply by the Solar Project I measured by MS1.

$EG_{solar2,y}$ is the electricity supply by the Solar Project II measured by MS2.

Meanwhile, electricity imported from the grid by the project ($EG_{grid \text{ to PJ}, y}$) use the value measured by the meter M1 (and/or M1')⁶, including two solar projects, which is conservative.

The 10 electricity meters are no longer included in the monitoring system of the project during this monitoring period, calibration information of the 10 meters doesn't need to be reported in this monitoring report.

⁶ When main meter M1 is not working, meter readings from backup meter M1' will be used.

This deviation from the monitoring plan doesn't impact the applicability of the methodology, additionality, or the appropriateness of the baseline scenario. The deviation also doesn't lower the accuracy and conservativeness of the monitoring system and the project remains in compliance with VCS Program rules.

As stated in renewed VCS PD, this is a permanent project deviation, which is applied to this (5th) VCS monitoring period.

3.3 Grouped Projects

The Project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

The baseline grid emission factor $EF_{grid,CM,y}$ is obtained directly from the official source "2019 Baseline Emission Factors for Regional Power Grids in China" issued by China's DNA. Thus, the relevant basis parameters for calculation of $EF_{grid,CM,y}$ are not described in detail here. With consideration of the fact of the Project, data and parameters that are available at validation are summarized in below tables.

Data / Parameter	$EF_{grid,OM,y}$
Data unit	tCO ₂ e/MWh
Description	Operating margin emission factor for North China Power Grid
Source of data	"2019 Baseline Emission Factors for Regional Power Grids in China" published by China DNA
Value applied	0.8922
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per the latest version of "Tool to calculate the emission factor for an electricity system" (version 07.0) by China DNA
Purpose of Data	Calculation of $EF_{grid,CM,y}$
Comments	Calculated ex ante and fixed for the second crediting period

Data / Parameter	$EF_{grid,BM,y}$
Data unit	tCO ₂ e/MWh
Description	Build margin emission factor for North China Power Grid
Source of data	“2019 Baseline Emission Factors for Regional Power Grids in China” published by China DNA
Value applied	0.4407
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per the latest version of “Tool to calculate the emission factor for an electricity system” (version 07.0) by China DNA
Purpose of Data	Calculation of $EF_{grid,CM,y}$
Comments	Calculated ex ante and fixed for the second crediting period

Data / Parameter	ω_{OM}
Data unit	-
Description	Weighting of operating margin emissions factor
Source of data	“Tool to calculate the emission factor for an electricity system” (version 07.0)
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	"Tool to calculate the emission factor for an electricity system" (version 07.0)
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 ₂ e/MWh
Description	Baseline emission factor for North China Power Grid
Source of data	Calculated through $EF_{grid,OM,y}$, $EF_{grid,BM,y}$, ω_{OM} , ω_{BM}
Value applied	0.779325
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per the latest version of "Tool to calculate the emission factor for an electricity system" (version 07.0) by China DNA
Purpose of Data	Baseline emission calculation
Comments	Calculated ex ante and fixed for the second crediting period

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{facility,y}$
Data unit	MWh/yr
Description	Quantity of net electricity generation supplied by the project plants/units to the grid
Source of data	Meter reading and electricity receipts
Description of measurement methods and procedures to be	Measured The calculation of this parameter is shown as below:

applied	$EG_{\text{facility},y} = EG_{\text{PJ to grid},y} - EG_{\text{grid to PJ},y}$
Frequency of monitoring/recording	Continuously measured and monthly recorded
Value applied	447,068.841 MWh/yr
Monitoring equipment	Bi-directional meters (M1 as main meter and M1' as backup meter) installed at the 330kV side of 35kV/330kV transformer. MS1 and MS2 installed at the 35kV side of 35kV/330kV transformer. (Meter information and calibration see table 3 below) During this monitoring period, main meters M1 was running properly, hence meter readings from backup meter M1' has not been applied.
QA/QC procedures to be applied	Monthly power exported and imported to the NWPG are cross-checked against the electricity receipts. Based on the standard of DL/T448-2016, the calibrations are done by a qualified organization at least once per year for the monitoring meters.
Purpose of data	Calculation of baseline emissions
Calculation method	N/A
Comments	-

Data / Parameter	<i>EG</i>
Data unit	MWh/yr
Description	Total electricity supplied to the grid via the main power line by the Project and two solar projects.
Source of data	Readings of Bi-directional meters (M1 as main meter and M1' as backup meter) installed at the 330kV side of 35kV/330kV transformer. During this monitoring period, main meters M1 was running properly, hence meter readings from backup meter M1' has not been applied.
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	537069.720 MWh/yr.
Monitoring equipment	Bi-directional meters (M1 as main meter and M1' as backup meter)
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.
Purpose of data	Baseline emission calculation
Calculation method	-
Comments	Uncertainty level of data is low

Data / Parameter	$EG_{PJ \text{ to grid}, y}$
Data unit	MWh/yr
Description	The Electricity exported to the grid by the Project
Source of data	Calculated through equation: $EG_{PJ \text{ to grid}, y} = EG - EG_{\text{solar}1, y} - EG_{\text{solar}2, y}$
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	447,464.841 MWh/yr
Monitoring equipment	Bi-directional meters (M1 as main meter and M1' as backup meter) installed at the 330kV side of 35kV/330kV transformer. MS1 and MS2 installed at the 35kV side of 35kV/330kV transformer. (Meter information and calibration see table 3 below) During this monitoring period, main meters M1 was running properly, hence meter readings from backup meter M1' has not been applied.
QA/QC procedures to be applied	The accuracy of electricity meters M1 and M1' is 0.2s, while that of MS1 and MS2 is 0.5s. 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	$EG_{grid\ to\ PJ,y}$
Data unit	MWh/yr
Description	The Electricity imported from the grid by the Project.
Source of data	Use the value measured by the bi-directional meters (M1 as main meter and M1' as backup meter), including two solar projects, as the most conservative value. When main meter M1 is not working, the reading of backup meter M1' will be used.
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	396 MWh/yr
Monitoring equipment	Bi-directional meters (M1 as main meter and M1' as backup meter)
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 purchase receipts.
Purpose of data	Baseline emission calculation
Calculation method	-
Comments	<i>Uncertainty level of data is low</i> $EG_{grid\ to\ PJ,y}$ use the value measured by the meter M1 (and/or M1')⁷, including two solar projects, which is conservative.

⁷ When main meter M1 is not working, meter readings from backup meter M1' will be used.

Data / Parameter	$EG_{solar1,y}$
Data unit	MWh/yr
Description	Total electricity purchased from the grid by the Solar Project I and during year y
Source of data	Readings of electricity Meters MS1 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 crediting period by means of electronic and paper backup.
Frequency of monitoring/recording	Continuously measured and monthly recorded
Value applied	46710.426 MWh/yr
Monitoring equipment	Electricity Meters MS1 installed at the 35kV transmission line of the Project site
QA/QC procedures to be applied	The accuracy of electricity meters 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	$EG_{solar2,y}$
Data unit	MWh/yr
Description	Total electricity purchased from the grid by the Solar Project II and during year y
Source of data	Readings of electricity Meters MS2 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 crediting period by means of electronic and paper backup.

Frequency of monitoring/recording	Continuously measured and monthly recorded
Value applied	42894.453 MWh/yr
Monitoring equipment	Electricity Meters MS2 installed at the 35kV transmission line of the Project site
QA/QC procedures to be applied	The accuracy of electricity meters 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

4.3 Monitoring Plan

1. Data collection and management

The electricity generated by the Project feeds to the Changma west 35kV/330kV substation through the 35kV transmission lines, then to NWPG after 35kV/330kV transformer. The project shares bi-directional electricity meters (M1 as main meter and M1' as backup meter) with two solar projects (the same owner with the project). Meanwhile, the electricity output and input of two Solar Projects can be measured by their own bi-directional meters (MS1, MS2). Hence the quantity of net electricity generation supplied by the project plant/unit to the grid ($EG_{facility,y}$) is calculated as follow:

$$EG_{facility,y} = EG_{PJ \text{ to grid}, y} - EG_{grid \text{ to PJ}, y}$$

$$EG_{PJ \text{ to grid}, y} = EG - EG_{solar1,y} - EG_{solar2,y}$$

Where

$EG_{PJ \text{ to grid}, y}$ is the Electricity exported to the grid by the Project.

$EG_{grid \text{ to PJ}, y}$ is the Electricity imported from the grid by the Project.

EG is the electricity exported to the grid measured by M1 (and/or M1').

$EG_{solar1,y}$ is the electricity supply by the Solar Project I measured by MS1.

$EG_{solar2,y}$ is the electricity supply by the Solar Project II measured by MS2.

Meanwhile, electricity imported from the grid by the project use the value measured by the meter M1 (and/or M1'), including two solar projects, as the most conservative value.

Consider of the transmission and line loss, the electricity exported to the grid by the Project and the electricity imported from the grid by the Project are calculated by the grid company according to the approach defined in the PPA. After both sides confirming, the electricity receipts, for the electricity exported to the grid by the Project and the electricity imported from the grid by the Project are issued separately by the grid company in the end of each month. During this monitoring period, the cut off time is the 24:00 of the last day of each month. At this time, Designated personnel of the grid company and project owner read and record the meter readings of main meter M1, MS1 and MS2 together. The manager of the Project wind farm counter-checked the reported data against with the electricity receipts before archived. The most conservative values have been used for the ERs calculation. The electricity imported from the grid by the Project has been deducted from the electricity exported to the grid by the Project to get the quantity of the net electricity supplied to the grid by the Project.

All data collected as part of monitoring is archived electronically and is kept until 2 years after the end of the total crediting period of the Project.

2. Meters Distribution

More details for the distribution of metering equipment installation and monitoring points can be found at following figure 2.

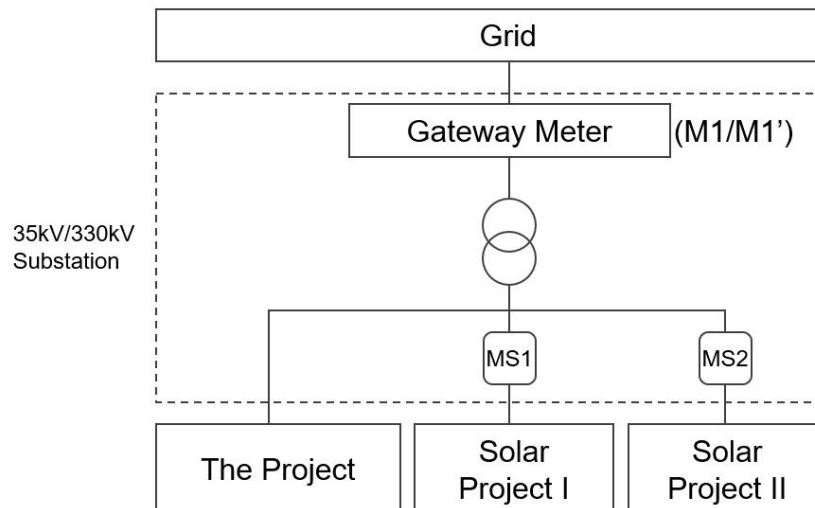


Figure2. The distribution of meters installation

3. Meters Calibrations

In renewed VCS PD, measurement meters have accuracy range of no less than 0.5S. M1 as main meter and M1' as backup meter with accuracy 0.2s. Two solar projects electricity meters MS1 (accuracy 0.5s) and MS2 (accuracy 0.5s) can meet the requirement of renewed VCS PD. The metering equipment are calibrated and checked in accordance with related regulations and

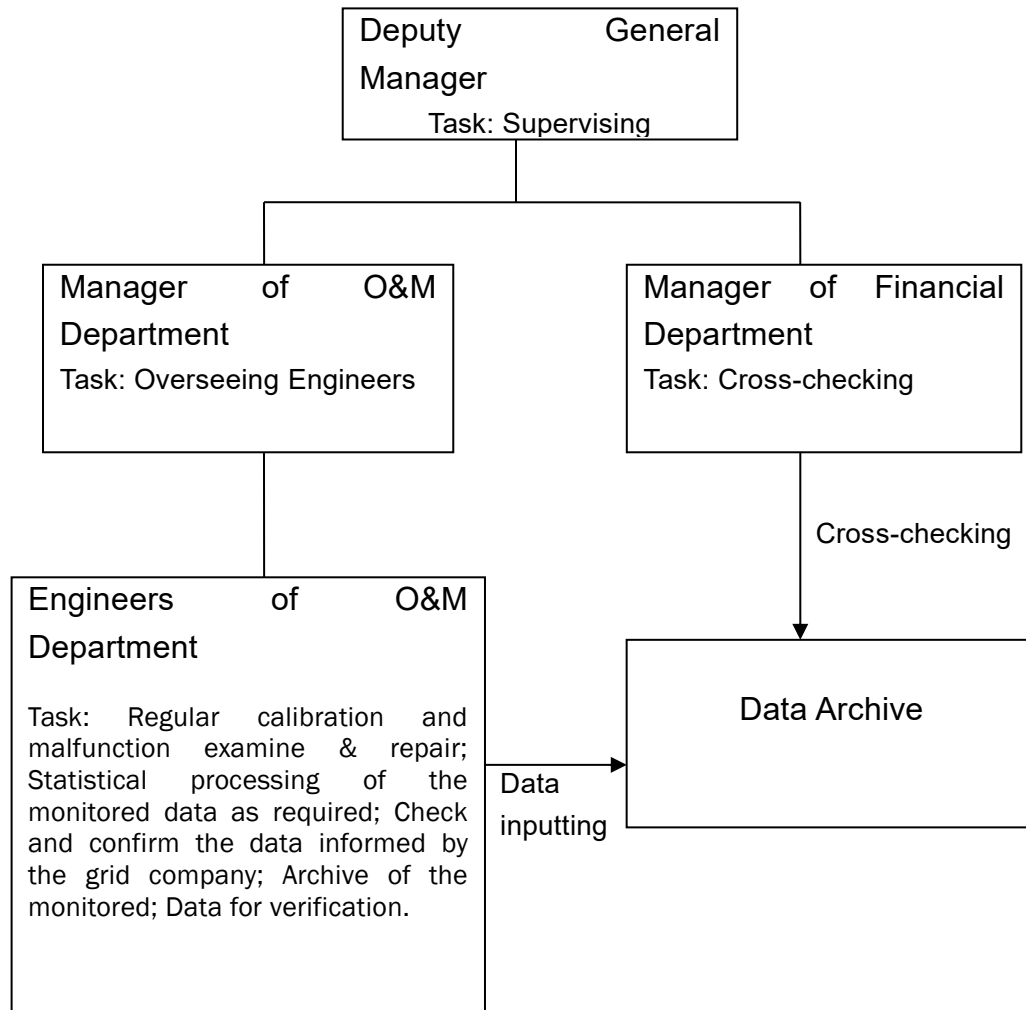
rules. Calibration is carried out by authorized and qualified calibration entity. The calibration record of the electricity measure-related meters can be found at Table 3.

Table 3. Calibration record of the meters

No.	Type	SN	Accuracy class	Required Calibration frequency	Calibration date	Calibration due on	Calibrated by
M1 (Main meter)	Electric meter	57033315	0.2s	Annually	02/09/2020 25/08/2021	01/09/2021 24/08/2022	Electric Energy Measurement Centre of Gansu Electric Power Corporation
M1' (Backup meter)	Electric meter	57033312	0.2s	Annually	02/09/2020 25/08/2021	01/09/2021 24/08/2022	Electric Energy Measurement Centre of Gansu Electric Power Corporation
MS1	Electric meter	111520042063	0.5s	Annually	02/03/2020 20/02/2021	01/03/2021 19/02/2022	Shenzhen Zhongdian Metrology and Testing Technology Co., Ltd
MS2	Electric meter	111520042064	0.5s	Annually	02/03/2020 20/02/2021	01/03/2021 19/02/2022	Shenzhen Zhongdian Metrology and Testing Technology Co., Ltd

4. Organizational structure and responsibilities

The Project owner (CECIC Wind-power (Gansu) Co., Ltd.) established a Project Management Office (PMO). The organization structure of PMO is illustrated as follows:



5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

According to ACM0002, the baseline emission BE_y during the monitoring period results from:

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

The Project is the installation of a new grid-connected renewable power plant at a site where no renewable power plant was operated prior to the implementation of the Project. So:

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

Accordingly,

$$\begin{aligned} BE_y &= EG_{PJ,y} \times EF_{grid,CM,y} \\ &= EG_{facility,y} \times EF_{grid,CM,y} \end{aligned}$$

$$EG_{facility,y} = EG_{PJ \text{ to grid, } y} - EG_{grid \text{ to PJ, } y}$$

$$EG_{PJ \text{ to grid, } y} = EG - EG_{solar1,y} - EG_{solar2,y}$$

Where:

BE_y is the baseline emissions in year y (tCO_2/yr);

$EG_{PJ,y}$ is the 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);

$EF_{grid,CM,y}$ is the combined margin baseline emission factor of the NWPG;

$EG_{facility,y}$ is the quantity of net electricity generation supplied by the Project plant/unit to the grid in year y (MWh/yr).

$EG_{PJ \text{ to grid, } y}$ is the Electricity exported to the grid by the Project.

$EG_{grid \text{ to PJ, } y}$ is the Electricity imported from the grid by the Project.

EG is the electricity exported to the grid measured by M1 (and/or M1').

$EG_{solar1,y}$ is the electricity supply by the Solar Project I measured by MS1.

$EG_{solar2,y}$ is the electricity supply by the Solar Project II measured by MS2.

The summary of $EG_{\text{grid to PJ},y}$ on the below table 4 and the net electricity each year supplied by the project activity to the grid, $EG_{\text{facility},y}$ is listed in following table 5.

Table 4 Determination of $EG_{PJ \text{ to grid, } y}$ and $EG_{grid \text{ to PJ, } y}$

Period	Electricity exported to the grid by the Project ($EG_{PJ \text{ to grid, } y}$) (MWh)	Electricity imported from the grid by the Project ($EG_{grid \text{ to PJ, } y}$) (MWh)	Data from meter readings			
			M1 (SN: 57033315)		MS1 (SN:111520042063)	MS2 (SN:111520042064)
			Electricity exported to the grid measured by M1 (EG)	Electricity imported from the grid measured by M1	Electricity supply by the Solar Project I measured by MS1 ($EG_{solar1,y}$)	Electricity supply by the Solar Project I measured by MS2 ($EG_{solar2,y}$)
	A = C - E - F	B = D	C	D	E	F
28/01/2021-31/01/2021	8,423.796	26.400	9368.040	26.400	489.090	455.154
01/02/2021-28/02/2021	45,359.694	52.800	52044.960	52.800	3532.431	3152.835
01/03/2021-31/03/2021	41,159.991	26.400	47118.720	26.400	3029.922	2928.807
01/04/2021-30/04/2021	52,404.663	26.400	60899.520	26.400	4503.345	3991.512
01/05/2021-31/05/2021	45,639.459	26.400	55527.120	26.400	5101.320	4786.341
01/06/2021-30/06/2021	34,023.774	26.400	42174.000	26.400	4254.117	3896.109
01/07/2021-31/07/2021	37,480.242	26.400	45872.640	26.400	4381.041	4011.357
01/08/2021-31/08/2021	35,550.837	26.400	45017.280	26.400	4951.653	4514.790
01/09/2021-30/09/2021	32,412.639	26.400	40859.280	26.400	4423.398	4023.243
01/10/2021-31/10/2021	43,309.467	52.800	51516.960	52.800	4231.920	3975.573
01/11/2021-30/11/2021	38,886.972	26.400	46601.280	26.400	4064.907	3649.401
01/12/2021-31/12/2021	32,813.307	52.800	40069.920	52.800	3747.282	3509.331
Total	447,464.841	396.000	537069.720	396.000	46710.426	42894.453

Table 5 The calculation of $EG_{\text{facility},y}$

Period	$EG_{\text{PJ to grid}, y}$ Electricity exported to the grid by the Project			$EG_{\text{grid to PJ}, y}$ Electricity imported from the grid by the Project			$EG_{\text{facility},y}$
	data from meter readings	data from electricity sales receipts	data used to calculate the ER	data from meter readings	data from electricity purchase receipts	data used to calculate the ER	
	A	B	C=MIN(A,B)	D	E	F=MAX(D,E)	
28/01/2021-31/01/2021	8,423.796	8,423.796	8,423.796	26.400	26.400	26.400	8,397.396
01/02/2021-28/02/2021	45,359.694	45,359.694	45,359.694	52.800	52.800	52.800	45,306.894
01/03/2021-31/03/2021	41,159.991	41,159.991	41,159.991	26.400	26.400	26.400	41,133.591
01/04/2021-30/04/2021	52,404.663	52,404.663	52,404.663	26.400	26.400	26.400	52,378.263
01/05/2021-31/05/2021	45,639.459	45,639.459	45,639.459	26.400	26.400	26.400	45,613.059
01/06/2021-30/06/2021	34,023.774	34,023.774	34,023.774	26.400	26.400	26.400	33,997.374
01/07/2021-31/07/2021	37,480.242	37,480.242	37,480.242	26.400	26.400	26.400	37,453.842
01/08/2021-31/08/2021	35,550.837	35,550.837	35,550.837	26.400	26.400	26.400	35,524.437
01/09/2021-30/09/2021	32,412.639	32,412.639	32,412.639	26.400	26.400	26.400	32,386.239
01/10/2021-31/10/2021	43,309.467	43,309.467	43,309.467	52.800	52.800	52.800	43,256.667
01/11/2021-30/11/2021	38,886.972	38,886.972	38,886.972	26.400	26.400	26.400	38,860.572
01/12/2021-31/12/2021	32,813.307	32,813.307	32,813.307	52.800	52.800	52.800	32,760.507
Total	447,464.841	447,464.841	447,464.841	396.000	396.000	396.000	447,068.841

The baseline emission during this monitoring period calculated as following:

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

Table5. Baseline emissions

Period	EG _{facility,y} (MWh)	EF _{grid,CM,y} (tCO ₂ e/MWh)	BE _y (tCO ₂ e)
27/01/2021-31/12/2021	447,068.841	0.779325	348,411
Total	447,068.841	0.779325	348,411

The quantity of net electricity generation supplied by the Project plant/unit to the grid during 28/01/2021-31/01/2021 is 8,423.796 MWh, which had been confirmed by the grid company.

5.2 Project Emissions

Project emission (PE_y) is 0 tCO₂e.

5.3 Leakage

Project leakage is 0 tCO₂e.

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)
28/01/2021-31/12/2021	348,411	0	0	348,411
Total	348,411	0	0	348,411

Comparison of actual emission reduction and the estimation in renewed VCS PD

Year	Estimated ER in renewed VCS PD (tCO ₂)	Emission reduction achieved (tCO ₂)	Difference
28/01/2021-31/12/2021	334,651	348,411	4.11%

The estimated annual emission reductions are 361,383 tCO₂e as in renewed VCS PD. The monitoring period covers 338 days, 361,383*338/365=334,651 tCO₂e, and the emission reduction achieved by the project in this monitoring period is 348,411 tCO₂e, which is 4.11% higher than that of renewed VCS PD. The difference is due to fluctuation of wind source at the project and is within reasonable variation range. As per registered CDM PDD, even if the power generation is increased by 10%, the project IRR will be 6.54%, lower than the benchmark.

Therefore, 4.11% increase of power generation during this monitoring period will not impact the additionality of the project activity.

APPENDIX I: <EVIDENCE OF ACHIVED SDGS>

SDG Target 7.2, SDG Indicator 7.2.1 Renewable energy share in the total final energy consumption

period	Amount of renewable energy (MWh)	Data source
28/04/2011-29/10/2011	166,671.12	https://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1303442859.42/view
30/10/2011-28/04/2012	163,150.38	
29/04/2012-28/09/2012	145,522.84	
29/09/2012-31/12/2012	104,555.01	
01/01/2013-31/12/2014	677,603.61	
01/01/2015-31/12/2015	215,115.35	
01/01/2016-31/12/2016	189,188.04	https://registry.terra.org/app/projectDetail/VCS/728
01/01/2017-31/12/2017	310,959.87	
01/01/2018-30/06/2018	200,969.28	
01/07/2018-31/12/2018	198,184.56	
01/01/2019-31/12/2019	379,231.95	
01/01/2020-27/01/2021	462,261.82	
28/01/2021-31/12/2021	447,464.84	Section 5 of this report
Cumulative amount since operation start	3,660,878.67	/

SDG Target 13.0, SDG Indicator Tonnes of greenhouse gas emissions avoided or removed

period	Amount of emission reductions (tCO2e)	Data source
28/04/2011-29/10/2011 (CER)	152,788	https://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1303442859.42/view
30/10/2011-28/04/2012 (CER)	149,391	
29/04/2012-28/09/2012 (CER)	133,408	
29/09/2012-31/12/2012 (CER)	95,757	
01/01/2013-31/12/2014 (CER)	619,987	
01/01/2015-31/12/2015 (CER)	197,007	
01/01/2016-31/12/2016 (VER)	172,884	https://registry.terra.org/app/projectDetail/VCS/728
01/01/2017-31/12/2017 (VER)	284,728	
01/01/2018-30/06/2018 (VER)	184,186	
01/07/2018-31/12/2018 (VER)	181,553	
01/01/2019-31/12/2019 (VER)	347,325	
01/01/2020-27/01/2021 (VER)	423,999	
28/01/2021-31/12/2021 (VER)	348,411	Section 5 of this report
Cumulative amount since operation start	3,291,424	/

SDG Target 8.3, SDG Indicator 8.3.1 Proportion of informal employment in non-agriculture employment, by sex

中节能(甘肃)风力发电有限公司昌西第三风电场

序号	单位	部门	姓名	岗位	性别	备注
1	中节能(甘肃)风力发电有限公司	昌西第三风电场	王明扬	厂长	男	
2	中节能(甘肃)风力发电有限公司	昌西第三风电场	陈果	副厂长	男	
3	中节能(甘肃)风力发电有限公司	昌西第三风电场	李茜	副厂长	女	
4	中节能(甘肃)风力发电有限公司	昌西第三风电场	曹欢	党建、档案	女	
5	中节能(甘肃)风力发电有限公司	昌西第三风电场	曹雪清	安全员	男	
6	中节能(甘肃)风力发电有限公司	昌西第三风电场	陈程	行政	女	
7	中节能(甘肃)风力发电有限公司	昌西第三风电场	陈伟林	组长	男	
8	中节能(甘肃)风力发电有限公司	昌西第三风电场	马静	组员	女	
9	中节能(甘肃)风力发电有限公司	昌西第三风电场	王帆	组员	女	
10	中节能(甘肃)风力发电有限公司	昌西第三风电场	汪浩	组员	男	
11	中节能(甘肃)风力发电有限公司	昌西第三风电场	李国栋	组员	男	
12	中节能(甘肃)风力发电有限公司	昌西第三风电场	汪海洋	组员	男	
13	中节能(甘肃)风力发电有限公司	昌西第三风电场	王敬	组员	女	
14	中节能(甘肃)风力发电有限公司	昌西第三风电场	王小军	检修员	男	
15	中节能(甘肃)风力发电有限公司	昌西第三风电场	张琳	检修员	女	

