MONITORING REPORT OF CECIC GANSU YUMEN CHANGMA NO.3 WIND FARM PROJECT

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

Project Title	*CECIC Gansu Yumen Changma No.3 Wind Farm Project*
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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 located 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 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 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.

In revised CDM PDD (Version 11.0, 02/07/2012), 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. However, the readings of the ten electricity meters were not recorded since 01/01/2020, hence alternative measure is adopted for the monitoring of $EG_{facility,y}$ during this monitoring period (from 01/01/2020 to 27/01/2021), detail refer to section 3.2.2 of this report. The project has operated without any accidental or emergency events that might impact the accuracy and/or implementation of monitoring activities. The net feed-in electricity during this period is 461,874.502MWh, and the emission reduction achieved by the project in this monitoring period is 423,999tCO_2e. 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: Grid connected wind power project.

The project is not a grouped project.

1.3 Project Proponent

Organization name	**CECIC Wind-power (Gansu) Co., Ltd.**
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Title	office manager

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1.4 Other Entities Involved in the Project

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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 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. The VCS crediting period from 28/01/2011 ~ 27/01/2021 has been described in the monitoring report of previous monitoring 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.

1.8 Title and Reference of Methodology

Title: Approved consolidated baseline and monitoring methodology ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 12.1.0) 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 02.1).

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.

All emission reductions during 01/01/2020 to 27/01/2021 have not and will not seek CDM CER issuance. Emission reductions during this monitoring period will only seek issuance under VCS program. The GHG emission reductions of 1,170,755 tCO_2e generated from 01/01/2016 to 31/12/2019 by the project has been issued as VCUs 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

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.
- 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.

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 2009. 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 423,999tCO_2e 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 NOx associated with fossil fuel use.

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

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

[1] https://sdgs.un.org/goals/goal8

[2] https://sdgs.un.org/goals/goal13

[3] https://sdgs.un.org/goals/goal7

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.

Table E.2-1: Survey result

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 2020. 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.

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 1 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 (℃)	-20～+40
The wind direction	Upwind
Technical lifetime (y)	20
2. Blade	
Number of blades	3
Material of balde	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

3.2.1 Methodology Deviations

There is no deviation applied to this monitoring period.

3.2.2 Project Description Deviations

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. This monitoring period belongs to the first VCS crediting period.

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:

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

Where

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

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

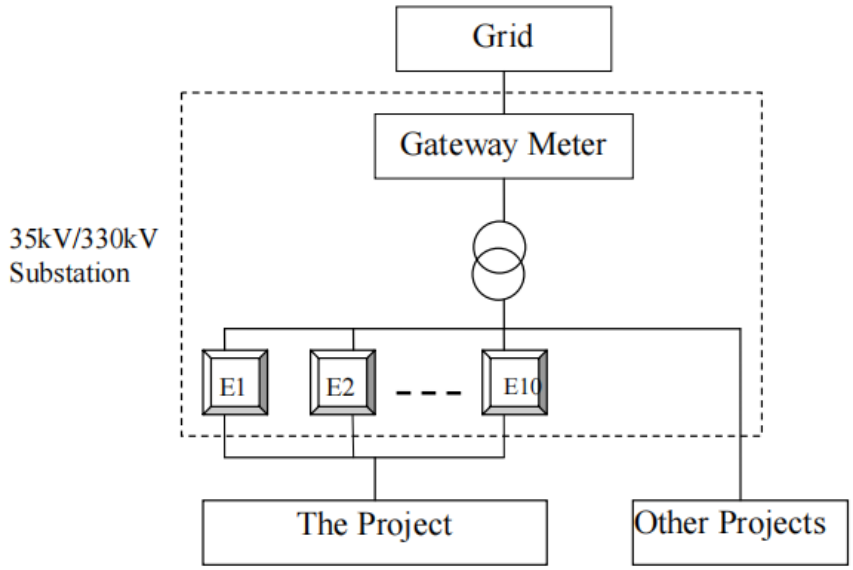


Figure 1 Monitoring Line Diagram in the revised CDM PDD (Version 11.0, 02/07/2012)

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 ($EG_{facility,y}$) during this monitoring period (from 01/01/2020 to 27/01/2021). The quantity of net electricity generation supplied by the project plant/unit to the grid ($EG_{facility,y}$) 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.

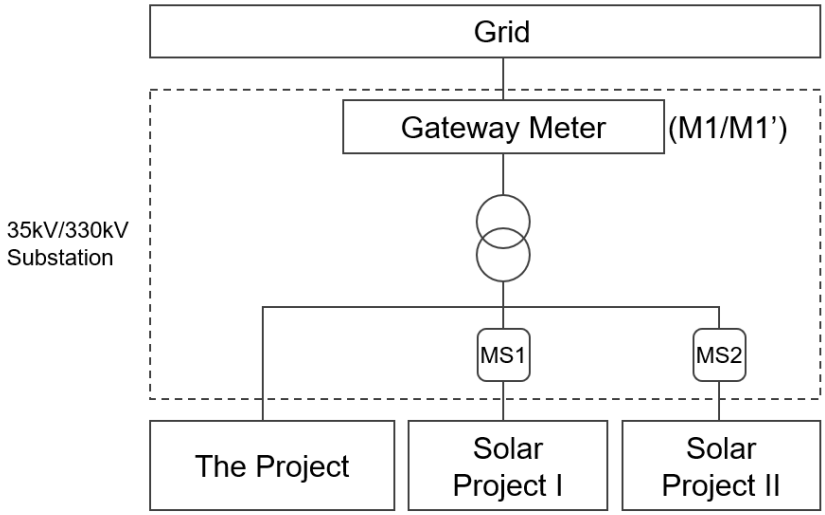


Figure 2 Monitoring Line Diagram in this monitoring period (from 01/01/2020 to 27/01/2021)

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

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

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

Where

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

$EG_{grid\ to\ PJ,\ y}$ 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 ($EG_{grid\ to\ PJ,\ y}$) use the value measured by the meter M1 (and/or M1')[4], 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.

The monitoring of remaining data parameters in revised CDM PDD (Version 11.0, 02/07/2012) during this monitoring period is following the registered monitoring plan.

This deviation from the registered 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.

3.3 Grouped Projects

The Project is not a grouped project.

4 DATA AND PARAMETERS

[4] When main meter M1 is not working, meter readings from backup meter M1' will be used. During this monitoring period, main meters M1 was running properly, hence meter readings from backup meter M1' has not been applied.

4.1 Data and Parameters Available at Validation

The specific parameter information is shown in B.6.2. Data and parameters that are available at validation of revised CDM PDD (Version 11.0, 02/07/2012), These parameters are used to calculate $EF_{gird,CM,y}$.

Data / Parameter	$EF_{gird,CM,y}$
Data unit	tCO_2e/MWh
Description	Baseline emission factor: the combined emission factor of the project grid system.
Source of data	Revised CDM PDD (Version 11.0, 02/07/2012)
Value applied	0.9180
Justification of choice of data or description of measurement methods and procedures applied	Fixed before registration
Purpose of Data	Calculation of baseline emissions
Comments	The emission factor of the Project was ex-ante determined and is fixed during the first crediting period. All data and parameters had been determined at registration.

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{facility,y}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Meter reading and electricity receipts
Description of measurement methods and procedures to be applied	Measured
Frequency of monitoring/recording	Measuring continuously/Reading monthly/Recording monthly
Value monitored	461,874.502
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 page 19) 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 the data	Calculation of baseline emissions
Calculation method	N/A
Comments	-

4.3 Monitoring Plan

The CECIC Wind-power (Gansu) Co., Ltd. holds the overall responsibility for the monitoring process. The plant operation staff record the electricity exported to and imported from the grid and keep record of daily operation of the Project.

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:

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

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

Where

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

$EG_{grid\ to\ PJ,\ y}$ 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 figure1.

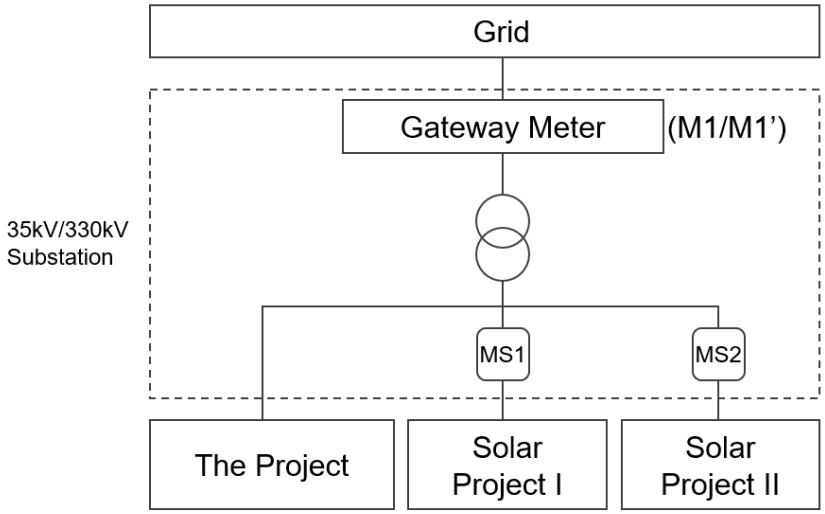


Figure3. The distribution of meters installation

3. Meters Calibrations

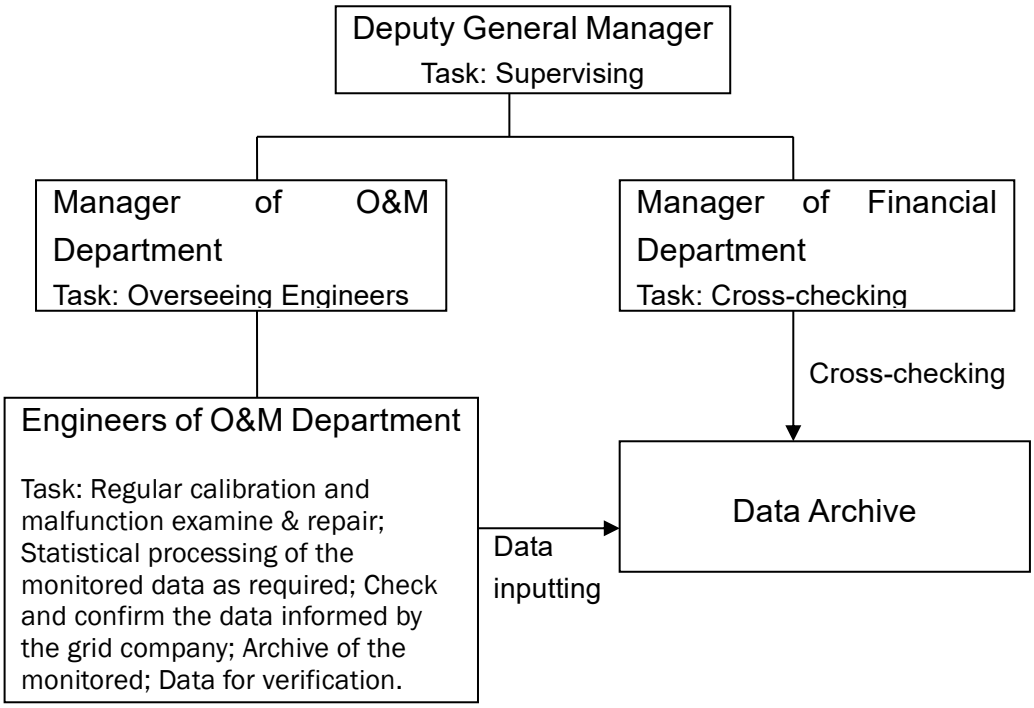
In revised CDM PDD (Version 11.0, 02/07/2012), measurement meters have accuracy range of no less than 0.5S. M1 as main meter and M1' as backup meter with accuracy 0.2s. Two solar projects electricity meters MS1 (accuracy 0.5s) and MS2 (accuracy 0.5s) can meet the requirement of revised CDM PDD (Version 11.0, 02/07/2012). 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 Table2.

Table2. 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	22/09/2019 02/09/2020	21/09/2020 01/09/2021	Electric Energy Measurement Centre of Gansu Electric Power Corporation
M1' (Backup meter)	Electric meter	57033312	0.2s	Annually	22/09/2019 02/09/2020	21/09/2020 01/09/2021	Electric Energy Measurement Centre of Gansu Electric Power Corporation
MS1	Electric meter	111520042063	0.5s	Annually	10/03/2019 02/03/2020	09/03/2020 01/03/2021	Shenzhen Zhongdian Metrology and Testing Technology Co., Ltd
MS2	Electric meter	111520042064	0.5s	Annually	10/03/2019 02/03/2020	09/03/2020 01/03/2021	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 and revised CDM PDD (Version 11.0, 02/07/2012) of the Project, 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,

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

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

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

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

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).

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

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

EG is the electricity 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 $EG_{grid\ to\ PJ,\ y}$ on the below table3:

The net electricity each year supplied by the project activity to the grid, $EG_{facility,\ y,}$ is listed in following table 4:

Table 3 The calculation of $EG_{PJ\ to\ grid,\ y}$ and $EG_{grid\ to\ PJ,\ y}$

Period	the Electricity exported to the grid by the Project ($EG_{PJ\ to\ grid}$) (MWh)	The Electricity imported from the grid by the Project ($EG_{grid\ to\ PJ,\ y}$) (MWh)	M1（SN: 57033315）		MS1 (SN:111520042063)	MS2 (SN:111520042064)
			Electricity exported to the grid measured by M1	Electricity imported from the grid measured by M1	Electricity supply by the Solar Project I measured by MS1	Electricity supply by the Solar Project I measured by MS2
	A = C - E - F	B = D	C	D	E	F
01/01/2020-31/01/2020	18,211.950	10.56	25615.92	10.56	3818.64	3585.33
01/02/2020-29/02/2020	25,524.780	10.56	31991.52	10.56	3270.54	3196.20
01/03/2020-31/03/2020	39,895.830	26.40	48348.96	26.40	4457.67	3995.46
01/04/2020-30/04/2020	38,334.579	26.40	46754.93	26.40	4311.62	4108.73
01/05/2020-31/05/2020	50,333.628	0.00	58845.60	0.00	4474.68	4037.29
01/06/2020-30/06/2020	33,960.327	26.40	41030.88	26.40	3661.90	3408.66
01/07/2020-31/07/2020	26,827.731	26.40	34154.74	26.40	3969.27	3357.73
01/08/2020-31/08/2020	39,213.879	26.40	47536.37	26.40	4489.95	3832.54
01/09/2020-30/09/2020	36,680.445	26.40	45197.86	26.40	4585.06	3932.36
01/10/2020-31/10/2020	30,546.237	52.80	38459.52	52.80	4248.30	3664.98
01/11/2020-30/11/2020	34,739.403	52.80	41521.92	52.80	3626.30	3156.22
01/12/2020-31/12/2020	31,003.851	79.20	37728.24	79.20	3480.46	3243.93
2020 total	**405,272.640**	**364.32**	**497186.45**	**364.32**	**48394.37**	**43519.43**
01/01/2021-31/01/2021	65,432.016	26.40	72642.24	26.40	3469.03	3741.19
2021 total	**65,432.016**	**26.40**	**72642.24**	**26.40**	**3469.03**	**3741.19**

Table 4 The calculation of $EG_{facility,y}$

Period	$EG_{PJ\ to\ grid,\ y}$ Electricity exported to the grid by the Project			$EG_{grid\ to\ PJ,\ y}$ Electricity imported from the grid by the Project			$EG_{facility,y}$
	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)	G=C-F
01/01/2020-31/01/2020	18,211.950	18,211.950	18,211.950	10.560	10.560	10.560	18,201.390
01/02/2020-29/02/2020	25,524.780	25,524.780	25,524.780	10.560	10.560	10.560	25,514.220
01/03/2020-31/03/2020	39,895.830	39,895.830	39,895.830	26.400	26.400	26.400	39,869.430
01/04/2020-30/04/2020	38,334.579	38,334.579	38,334.579	26.400	26.400	26.400	38,308.179

01/05/2020-31/05/2020	50,333.628	50,333.628	50,333.628	0.000	0.000	0.000	50,333.628
01/06/2020-30/06/2020	33,960.327	33,960.327	33,960.327	26.400	26.400	26.400	33,933.927
01/07/2020-31/07/2020	26,827.731	26,827.731	26,827.731	26.400	26.400	26.400	26,801.331
01/08/2020-31/08/2020	39,213.879	39,213.879	39,213.879	26.400	26.400	26.400	39,187.479
01/09/2020-30/09/2020	36,680.445	36,680.445	36,680.445	26.400	26.400	26.400	36,654.045
01/10/2020-31/10/2020	30,546.237	30,546.237	30,546.237	52.800	52.800	52.800	30,493.437
01/11/2020-30/11/2020	34,739.403	34,739.403	34,739.403	52.800	52.800	52.800	34,686.603
01/12/2020-31/12/2020	31,003.851	31,003.851	31,003.851	79.200	79.200	79.200	30,924.651
2020 total	**405,272.640**	**405,272.640**	**405,272.640**	**364.320**	**364.320**	**364.320**	**404,908.320**
01/01/2021-31/01/2021	65,432.016	65,432.016	65,432.016	26.400	26.400	26.400	65,405.616
2021 total	**65,432.016**	**65,432.016**	**65,432.016**	**26.400**	**26.400**	**26.400**	**65,405.616**

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)	$EF_{grid,CM,y}$ (tCO2e/MWh)	BE_y (tCO2e)
01/01/2020-31/01/2020	404,908.320	0.9180	371,705
01/01/2021-27/01/2021	56,966.182	0.9180	52,294
Total	461,874.502	0.9180	423,999

The quantity of net electricity generation supplied by the Project plant/unit to the grid during 01/01/2021-27/01/2021 is 56,966.182MWh, which had been confirmed by the grid company.

5.2 Project Emissions

Project emission (PE_y) is 0 tCO_2e as per revised CDM PDD (Version 11.0, 02/07/2012).

5.3 Leakage

Leakage is 0 tCO_2e as per revised CDM PDD (Version 11.0, 02/07/2012).

5.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
01/01/2020-31/01/2020	371,705	0	0	371,705
01/01/2021-27/01/2021	52,294	0	0	52,294
Total	423,999	0	0	423,999

Comparison of actual emission reduction and the estimation in revised CDM PDD (Version 11.0, 02/07/2012).

Year	Estimated ER in registered PD (tCO_2)	Emission reduction achieved (tCO_2)	Difference
01/01/2020 - 27/01/2021	457,178	423,999	-7.25%

The estimated annual emission reductions are 425,689tCO2e as per registered PD. The monitoring period covers 392days, 425,689*392/365=457,178tCO_2e, and the emission reduction achieved by the project in this monitoring period is 423,999tCO_2e, which is 7.25% lower than that of revised CDM PDD (Version 11.0, 02/07/2012). The difference is due to fluctuation of wind source at the project and is within reasonable variation range. Refer to ER calculation spreadsheet for detailed calculation process.