GUAZHOU BEIDAQIAO NO.1 WIND FARM PROJECT IN GANSU PROVINCE, CHINA

Document Prepared by Beijing MD Energy Technology Co., Ltd.

Project Title	**Guazhou Beidaqiao No.1 Wind Farm Project in Gansu Province, China**
Version	03
Report ID	NA
Date of Issue	15/07/2022
Project ID	1037
Monitoring Period	01/01/2018 to 02/01/2021
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CONTENT

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The Guazhou Beidaqiao No.1 Wind Farm Project in Gansu Province, China (hereafter refers to "the project"), a wind power project, is located in Guazhou County, Jiuquan City, Gansu Province, China. The total installed capacity of the project activity is 201MW (67 sets of SL1500 wind turbine units and 67 sets of GW1500 wind turbine units). Dependent on the reliability of the local wind resource, the project is expected to supply 461,464 MWh of electricity annually. The electricity generated by the project activity is supplied to Northwest China Power Grid ("NWPG") through Gansu Grid, displacing part of electricity generated by NWPG which is dominated by thermal power plants, and thus greenhouse gas (GHG) emission reductions could be achieved.

As a renewable energy project, the project activity produces positive environmental and economic benefits and contributes to the local sustainable development. The implementation of the project achieves CO_2 emission reduction by replacing electricity generated by fossil fuel fired power plants. The estimated annual GHG emission reductions are 428,829 tCO_2e. The implementation of the project activity was:

Date	Key Events
28/10/2009	Construction start date
29/09/2011	Registered as a CDM project
03/01/2011	Operation start date
03/01/2011 to 28/09/2011	1st VCS monitoring period
29/09/2011 to 28/06/2012	1st CDM monitoring period
29/06/2012 to 31/12/2017	2nd VCS monitoring period
01/01/2018 to 02/01/2021	3rd VCS monitoring period (**This monitoring period**)

During this monitoring period, the Net electricity supplied to NWPG by the proposed project in year y by the project is 958135.424 MWh, and the emission reduction achieved is 796,594 tCO_2.

1.2 Sectoral Scope and Project Type

Sectoral Scope 1: Energy industries (renewable - / nonrenewable sources);

Project type: wind power generation project;

The project is not a grouped project.

1.3 Project Proponent

Organization name	**Hydrochina Guazhou Wind Power Co., Ltd.**
Contact person	Kong Weidou
Title	Project Manager
Address	7th Floor, Building A, NORTH STAR CENTURY CENTER, Beichen West Road 8#, Chaoyang District, Beijing
Telephone	+86 010-86301832
Email	kongweidou@hydrochina.com.cn

1.4 Other Entities Involved in the Project

Organization name	**Beijing MD Energy Technology Co., Ltd.**
Role in the Project	Consultancy
Contact person	Will Yang
Title	Project Manager
Address	Room 11-F, Beijing City Plaza, No.4 Office Building, Chaoyang District, Beijing, China
Telephone	+86--15311472896
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1.5 Project Start Date

The project started on 03/01/2011 (operation start date).

1.6 Project Crediting Period

The project is registered under VCS version 3 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 VCS crediting period of the project should be updated from 03/01/2011 - 28/09/2011 to 03/01/2011 - 02/01/2021.

1.7 Project Location

The project is located in Guazhou County, Jiuquan City, Gansu Province, China, about 18km northwest away from Guazhou County. The geographical coordinates of the project is the North Latitude of +40.6025°and the East Longitude of +95.8037°.

1.8 Title and Reference of Methodology

Methodology:

ACM0002 "Grid-connected electricity generation from renewable sources" (version 12.1.0)

Reference:

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

Tools:

Tool to calculate the emission factor for an electricity system

Reference:

https://cdm.unfccc.int/Reference/tools/index.html

1.9 Participation under other GHG Programs

The project was registered as a Clean Development Mechanism (CDM) project (reference number: 4254) in UNFCCC with 3*7 years renewable crediting period started from 29/09/2011. Please refer to the following link for details:

https://cdm.unfccc.int/Projects/DB/ERM-CVS1292512044.7/view

1.10 Other Forms of Credit

The project is a registered CDM project with reference No. 4254. GHG emission reductions from 29/09/2011 to 28/06/2012 by the project has been issued as CERs under CDM program, the detailed information can be found at https://cdm.unfccc.int/Projects/DB/ERM-CVS1292512044.7/view.

All emission reductions during 01/01/2018 to 02/01/2021 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 309,444 tCO_2e generated from 03/01/2011 to 28/09/2011 and 1,368,760 tCO_2e generated from 29/06/2012 to 31/12/2017 by the project has been issued as VCUs under VCS program.

The project proponent is not part of any emission trading program. The net GHG emission reductions from the project will not be used for compliance with emission trading programs or to

meet binding limits on GHG emissions. The project activity has not participated in any other GHG programs.

China has a national emissions trading scheme only cover the high-emission industries, such as thermal power generation, petrochemical, chemical, building materials, iron and steel, non-ferrous, paper, aviation and other key emission industries that emitted at least 26,000 tons of CO_2e/year[1]. And the project activity is not included the mandatory emission control scheme and there is no emission cap enforced for the project owner according to the enforced company list[2] in public information. Hence, it is confirmed that the emission reductions will not be double counted.

1.11 Sustainable Development

The contributions of this project to the sustainable development of the host country and project site are summarized as follows:

Because the wind power plants of the project will generate electricity without GHG emission, the project can help the local areas reduce GHG emissions by replacing some part of the electricity from coal-fired power plants. And the project also helps decrease the local environmental pollution caused by coal burning, which has remarkable environmental benefits. The project has achieved a GHG emission reduction of 796,594 tCO_2e during this monitoring period. Thus, the project achieved SDG 13 Climate Action[3].

During this monitoring period, 958135.424 MWh of electricity from renewable sources has been exported to the power grid. And the project makes good use of the local water resource to solve the difficulties of lack of power and unstable voltage, which help improve local life quality. Thus, the project achieved SDG 7 Affordable and Clean Energy[4].

During the construction, operation, and maintenance of this project, the project, directly and indirectly, generates more job opportunities, which helps improve local employment and reduce local poverty. Thus, the project achieved SDG 8 Decent Work and Economic Growth[5].

Refer to table 1 for detail. The evidence of the project's SD contributions have been provided in the Appendix of this report.

1 http://www.mee.gov.cn/xxgk2018/xxgk/xxgk05/202103/t20210330_826728.html

2 http://mee.gov.cn/xxgk2018/xxgk/xxgk03/202012/W020201230736907682380.pdf

3 https://sdgs.un.org/goals/goal13

4 https://sdgs.un.org/goals/goal7

5 https://sdgs.un.org/goals/goal8

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, 958,135.424 MWh of electricity from renewable sources has been exported to the power grid.	The SDG 7 contributions over project lifetime is 2,431,094.274MWh 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, 27 people including 3 females were employed for operation, and maintenance of this project.	The project activity generates temporary working opportunities during the construction period. From the operation start date of this project activity to the end of this monitoring period, 27 people were employed including 3 females.
3)	13	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	During this monitoring period, the project has achieved GHG emission reductions of 796,594 tCO_2e.	The SDG 13 contributions over project lifetime is 2,165,354 tCO_2e of GHG emission reductions.

2 SAFEGUARDS

2.1 No Net Harm

The Environmental Impact Assessment (EIA) of the project was completed by Resource and Environment & Quality Evaluation Research Center of Lanzhou University and approved by Gansu Environmental Protection Administration. The summary of this evaluation is as following:

1. Noise

The noises will be produced by the constructing equipments and transporting vehicle during construction period. The construction will be arranged by daylight mostly, and there is no residential area and industrial and mining enterprises a few kilometres around the project site, so the constructing noise will not interrupt the residents and the noise will disappear when the

project finishes construction. The measurements as arranging the transport time reasonably, limited the speed and no tooting of the vehicles in some environmental sensitive area will be carried out to reduce the noise impact of the transporting vehicle. The low-noise wind turbines will be employed to reduce the noise impact during operation period.

2. Air Pollution

The Powder and dust produced in the constructing process are the main factor for the air pollution during construction period. Sprinkling, covering the raw material and so on will be carried out to reduce the impact to lowest. The tail gas of transporting vehicles and constructing equipments will impact on part environment, but the impact will be over when the project finishes construction.

3. Wastewater

The wastewater during construction period involves equipment washing wastewater and domestic sewage. The evaporation tank will be built to treat the wastewater. When the project finishes construction, the evaporation tank will be buried. In the operation period, the domestic sewage will be drained into the water storage pit after treatment. Then it will be used for factory virescence. Therefore, there is no impact on the water environment.

4. Solid waste

The solid wastes include living garbage and construction garbage during construction period. The solid waste will be transported to the Guazhou County landfill. The smeary solid wastes will be set on fire or collected to treat. When the project finishes construction, the solid waste will be cleaned in time. The oilskin will be collected and sent to the hazardous waste treatment and disposal company during the operation period, so it will not impact on the environment.

5. Ecological environment

The impact on the ecological environment is mainly happened during construction period. The excavation, transport and the storage of equipments and materials will lead to the destruction of vegetation and changes of earth's surface structure. The construction area will be strictly arranged and will carry out the environment protecting and recovery measurements.

The project site is in the Gobi desert which is not the birds migrating channel, so there is no harm for the birds.

6. Conclusion

After the above measurements performed, the negative impacts on environment will be minimized below the requirements of laws and regulations during the construction and operation periods. Furthermore, as renewable power project, the project can reduce the consumption of fossil fuel sources and GHG emission. Besides, the project will become the special scenery in the Gobi desert and will improve the development of the local tourism.

According to EIA, no significant environmental impacts are discovered by the project participants or the host party. Gansu Environmental Protection Administration has approved the EIA in 06/08/2008.

2.2 Local Stakeholder Consultation

Local Stakeholder Consultation during the project preparation stage:

To ensure the sustainability of the project which is one of the key requirements of CDM project, the project owner has carried out a stakeholder investigation around the project site in April 2009. The stakeholder investigating summary is shown as below:

In 28/04/2009, a public stakeholder consultation was held by the developer. the project and the CDM procedures were introduced in detail to the publics on the meeting, and 45 questionnaires were distributed and 43 of the distributed questionnaires had been returned. The meeting participants includes: residents in the neighbouring area, governmental officials, staff from the project owner company, and other related persons.

The questions in the questionnaires including:

- What do you think is there any air pollution/water pollution /noise/electromagnetic interference? If any, what's the extent?

- What do you think the influence on the conditions of the local ecosystem?

- What do you think the influence on your life and income?

- What do you think the influence on local employment?

- What do you think the influence on local power distribution?

- What do you think the influence on the local economic development?

- From the perspective of environmental protection and residents' interest, do you have any suggestions about the project construction and operation?

50 questionnaires had been delivered and 50 of them had been collected, 90% support the construction of the project; other 5% shows that they are indifferent to the construction of the project. Over 95% think the positive influences will be brought to the local economic/social/cultural development.

The residents and local government are all very supportive to the project. No negative comments have been received on the project. The result of the stakeholder investigation with answers to the mainly cared issues was put up in the neighbouring area lasted for one month, and no objection or any more comments have been received.

Local Stakeholder Consultation during the project implementation stage:

To keep on-going communications with local stakeholders, the project owner public its telephone through bulletin and oral notice to local people. Anyone who have comments on the project could phone the project owner directly. Besides, the project owner also put a grievance book in the office of wind plant and some villages. People can leave their grievance or suggestions on the book.

Meanwhile, the local authority has also conducted spot checks on the implementation of the project from time to time as per the request from the local governments' regulations. There are no negative comments received for the project. In line with VCS requirements all the processes have been implemented to receive comments from local stakeholders as well as communicate with them at periodic intervals.

2.3 AFOLU-Specific Safeguards

NA.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project installed and operated four sets 134 wind turbine-generators, each with a capacity of 1,500 kW, forming a total capacity of 201 MW. The 67 sets of wind turbines model SL1500/77 are manufactured by Sinovel Wind Technology Co., Ltd, and the other 67 sets of wind turbines model GW77/1500 are manufactured by Xinjiang Goldwind Technology Co., Ltd. The technology is introduced from Germany and produced under license. Therefore, the establishment and operation of the project activity will promote technology transfer and utilization in China. The technology is considered good practice in China.

The details of the equipment can be referred to Table 1 below.

Table 1. Summary of key equipment in the project

Parameter of Turbines	Unit	Value	
Type	/	SL1500/77	GW77/1500
Quantity of Turbine	/	67	67
Rated Power	kW	1500	1500
Cut-in Wind Speed	m/s	3.0	3.0

Cut-out Wind Speed	m/s	20.0	22.0
Rated Wind Speed	m/s	11.0	11.5
Rated Voltage	V	690	690

The project adopts turbine-transformer units to boost voltage from 690V to 35 kV. All the turbine-transformers are linked with the 35 kV suspension lines and are connected to West Beidaqiao Substation, which boosts the voltage from 35kV to 330 kV. The electricity will then be boosted to 750kV through Anxi Substation and be transmitted to NWPG through the 750kV transmission line. In this monitoring period, the project was running orderly without any overhauling and downtimes of equipment. No special events occurred during the monitoring period which may impact the applicability of the methodology.

3.2 Deviations

3.2.1 Methodology Deviations

There is no methodology deviation applied to this monitoring period.

3.2.2 Project Description Deviations

The project is registered under VCS version 3 and completed validation before 19/03/2020, thus it remains eligible to apply the crediting period requirements under VCS version 3, the first crediting period of the project should be updated from 03/01/2011 - 28/09/2011 to 03/01/2011 - 02/01/2021 (3*10 years). The deviation for the crediting period is applicable to this monitoring period (01/01/2018 to 02/01/2021) and it has no impacts on the applicability, additionality or baseline of the project.

Furthermore, as per revised CDM PDD, the accuracy of the meter M_{21} is changed from 0.5 to 1.0, which has been approved by CDM EB on 15/01/2013. The net electricity will be determined by the following formula:

$$EG_{facility,y} = EG_{export,y} - EG_{import1,y} - EG_{import2,y} \times (1+0.5\%)$$

Except these, there are no other project description deviations occurred in this monitoring period or a previous monitoring period.

3.3 Grouped Projects

NA.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2e/MWh
Description	Combined margin CO_2 emission factor for grid connected power generation in year y
Source of data	registered CDM PDD
Value applied	0.92928
Justification of choice of data or description of measurement methods and procedures applied	The $EF_{grid,CM,y}$ is ex-ante decided in the registered CDM PDD
Purpose of Data	Calculation of baseline emissions
Comments	Calculated ex ante and fixed for the first crediting period. Parameters EG_y, $EF_{CO2,i,y}$, $NCV_{i,y}$, $CAP_{i,y}$, Auxiliary Power Ratio, $EF_{Coal,Adv}$, $EF_{Oil,Adv}$, $EF_{Gas,Adv}$ that deteremined ex ante in section B.6.2 of the registered CDM PDD were used to calculate $EF_{grid,CM,y}$.

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{Facility,y}$
Data unit	MWh
Description	Net electricity supplied to NWPG by the proposed project in year y
Source of data	Calculated
Description of measurement methods and procedures to be applied	Calculated based on parameters $EG_{export,y}$ and $EG_{import,y}$
Frequency of monitoring/recording	Measured continuously and recorded monthly
Value monitored	958135.424
Monitoring equipment	/
QA/QC procedures to be applied	/

Purpose of the data	Calculation of baseline emissions
Calculation method	$EG_{facility,y} = EG_{export,y} - EG_{import,y}$ $EG_{import,y} = EG_{impor1,y} + EG_{import2,y}*(1+0.5\%)$ $EG_{export,y}$ is Electricity supplied by the project activity to the grid in year y; $EG_{import,y}$ is Electricity imported from the grid by the project in year y;
Comments	NA

Data / Parameter	**$EG_{export,y}$**
Data unit	MWh
Description	Electricity supplied by the project activity to the grid in year y
Source of data	Monthly Meter Records and electricity sales receipts
Description of measurement methods and procedures to be applied	This parameter is monitored through bi-directional meters M_{11} and M_{12}. M_{11} is main meter while M_{12} is back up meter. Both meters are installed at the 330kV West Beidaqiao Substation. Back up meter M_{12} is used when main meter M_{11} is out of order. In this monitoring period, main meter M_{11} is working well. The cut off time was 24:00 of the last day of each month since July 2012. At the cut off time, staff from the project owner and the grid company will read the main meter M_{11} together.
Frequency of monitoring/recording	Measured continuously and recorded monthly
Value monitored	962,869.828

<table>
<tr><td>Monitoring equipment</td><td>The information of the electricity meters are shown in the following table. The main information of the meters is shown below:
<table>
<tr><th>Meter No.</th><th>Type</th><th>Serial No.</th><th>Accuracy</th><th>Calibration Date</th><th>Valid Date</th></tr>
<tr><td rowspan="4">M_{11} (main meter) Old meter</td><td rowspan="4">SL7000</td><td rowspan="4">57036843</td><td rowspan="4">0.2S</td><td>23/03/2017</td><td>22/03/2018</td></tr>
<tr><td>23/03/2018</td><td>22/03/2019</td></tr>
<tr><td>23/03/2019</td><td>22/03/2020</td></tr>
<tr><td>23/03/2020</td><td>22/03/2021</td></tr>
<tr><td>M_{11} (main meter) New meter</td><td>MK6E</td><td>219208569</td><td>0.2S</td><td>23/03/2020</td><td>22/03/2021</td></tr>
<tr><td rowspan="4">M_{12} (backup meter) Old meter</td><td rowspan="4">SL7000</td><td rowspan="4">57036839</td><td rowspan="4">0.2S</td><td>23/03/2017</td><td>22/03/2018</td></tr>
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<tr><td>23/03/2019</td><td>22/03/2020</td></tr>
<tr><td>23/03/2020</td><td>22/03/2021</td></tr>
<tr><td>M_{12} (backup meter) New meter</td><td>MK6E</td><td>219208564</td><td>0.2S</td><td>23/03/2020</td><td>22/03/2021</td></tr>
<tr><td colspan="6">Calibration entity: Electric Energy measurement Center Gansu Electric Power Corporation</td></tr>
</table>
Main meter M_{11} and Backup meter M_{12} were replaced by a new meter on 03/04/2020.</td></tr>
<tr><td>QA/QC procedures to be applied</td><td>Data measured by meter will be crosschecked by electricity receipt.</td></tr>
<tr><td>Purpose of the data</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Calculation method</td><td>Measured directly by electricity meters.</td></tr>
<tr><td>Comments</td><td>NA</td></tr>
</table>

Data / Parameter	$EG_{import1,y}$
Data unit	MWh
Description	Electricity imported from the grid through the main meter to the project
Source of data	Monthly Meter Records and electricity purchase receipts
Description of measurement methods and procedures to be applied	This parameter is monitored through bi-directional meters M_{11} and M_{12}. M_{11} is main meter while M_{12} is back up meter. Both meters are installed at the 330kV West Beidaqiao Substation. Back up meter M_{12} is used when main meter M_{11} is out of order. In this monitoring period, main meter M_{11} is working well. The cut off time was 24:00 of the last day of each month since July 2012. At the

<table>
<tr><td></td><td>cut off time, staff from the project owner and the grid company will read the main meter M_{11} together.</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>Measured continuously and recorded monthly</td></tr>
<tr><td>Value monitored</td><td>4,737.044</td></tr>
<tr><td>Monitoring equipment</td><td>The information of the electricity meters are shown in the following table. The main information of the meters is shown below:
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<tr><td>23/03/2020</td><td>22/03/2021</td></tr>
<tr><td>M_{12} (backup meter)
New meter</td><td>MK6E</td><td>219208564</td><td>0.2S</td><td>23/03/2020</td><td>22/03/2021</td></tr>
<tr><td colspan="6">Calibration entity: Electric Energy measurement Center Gansu Electric Power Corporation</td></tr>
</table>
Main meter M_{11} and Backup meter M_{12} were replaced by a new meter on 03/04/2020.</td></tr>
<tr><td>QA/QC procedures to be applied</td><td>Data measured by meter will be crosschecked by electricity receipt.</td></tr>
<tr><td>Purpose of the data</td><td>Calculation of baseline emissions</td></tr>
</table>

Calculation method	Measured directly by electricity meters.
Comments	NA

Data / Parameter	$EG_{import2,y}$
Data unit	MWh
Description	Electricity imported from the grid through the backup line to the project
Source of data	Monthly Meter Records
Description of measurement methods and procedures to be applied	This parameter is monitored through meter M_{21}. The meter is installed at the project site. The cut off time was 24:00 of the last day of each month since July 2012. At the cut off time, staff from the project owner and the grid company will read the meter M_{21} together. During this monitoring period, no electricity was imported by the project via the backup line
Frequency of monitoring/recording	Measured continuously and recorded monthly
Value monitored	0
Monitoring equipment	The information of the electricity meter is shown in the following table. The main information of the meter is shown below:

Meter No.	Type	Serial No.	Accuracy	Calibration Date	Valid Date
M_{21}	DTS607	1000759046	1.0	23/03/2017	22/03/2018
				23/03/2018	22/03/2019
				23/03/2019	22/03/2020
				23/03/2020	22/03/2021
Calibration entity: Electric Energy measurement Center Gansu Electric Power Corporation					

QA/QC procedures to be applied	Data measured by meter will be crosschecked by electricity receipt.
Purpose of the data	Calculation of baseline emissions
Calculation method	Measured directly by electricity meters.
Comments	NA

4.3 Monitoring Plan

Monitoring organization

The project developer had set up a VCS project team for monitoring of the project activity. Clear roles and responsibilities are assigned to all staffs involved in the VCS project and the prospect of nominating a VCS Manager has been considered. The VCS project manager authorized by the project developer is in charge of all the management works and the fulfilment of the Monitoring Plan. The operation and management structure is show as in Figure 2 below:

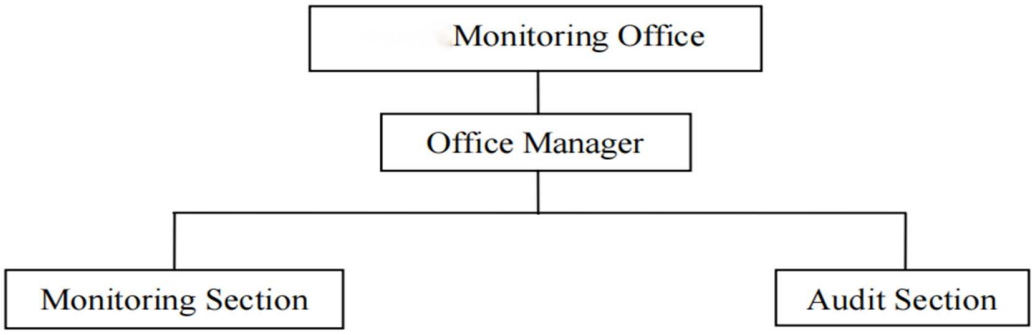


Figure 2: Monitoring and management Structure

Metering system

The net electricity supplied to the grid is monitored through the main meter M_{11} installed at the 330kV West Beidaqiao Substation and the meter M_{21} installed at the project site. The main meter M_{11} is bidirectional and has two-way metering, recording both exports to the grid $EG_{export,y}$ and imports from the grid $EG_{import1,y}$.

The back-up meter M_{12} is also installed at the 330kV West Beidaqiao Substation and used in case of the main meter is out of order.

The meter M_{21} is to record the electricity imports from the grid ($EG_{import2,y}$) through the backup line. The electricity imported from the grid $EG_{import,y} = EG_{import1,y} + EG_{import2,y}*(1+0.5\%)$. The net electricity supplied to the grid $EG_{facility,y} = EG_{export,y} - EG_{import,y}$.

Both the main meter M_{11} and the back-up meter M_{12} are in accuracy of 0.2S, the main meter M_{21} is in accuracy of 1.0. The electricity exported to the grid and imported from the grid will be cross-checked with sales receipts.

As per revised CDM PDD, the accuracy of the meter M_{21} is changed from 0.5 to 1.0, which has been approved by CDM EB on 15/01/2013. The difference of the accuracy is 0.5%. According to the revised CDM PDD approved by CDM EB, in order to approach conservation, the value is adjusted as follows: adjusted value = measured value – measured value * adjusted factor. Adjusting factor for electricity exported is (1-0.5%), adjusting factor for electricity imported is (1+0.5%), which in fact inhibits differences between the electric meters accuracy. The percentage is multiplied by the electricity generation in order to calculate the deduction of the measured value. In this project, there is only changed of the back-up meter which monitoring the imported electricity ($EG_{import2,y}$). Therefore, the imported electricity ($EG_{import2,y}$) should be multiplied the adjusting factor(1+0.5%).

The detail metering system please sees the figure 3 below:

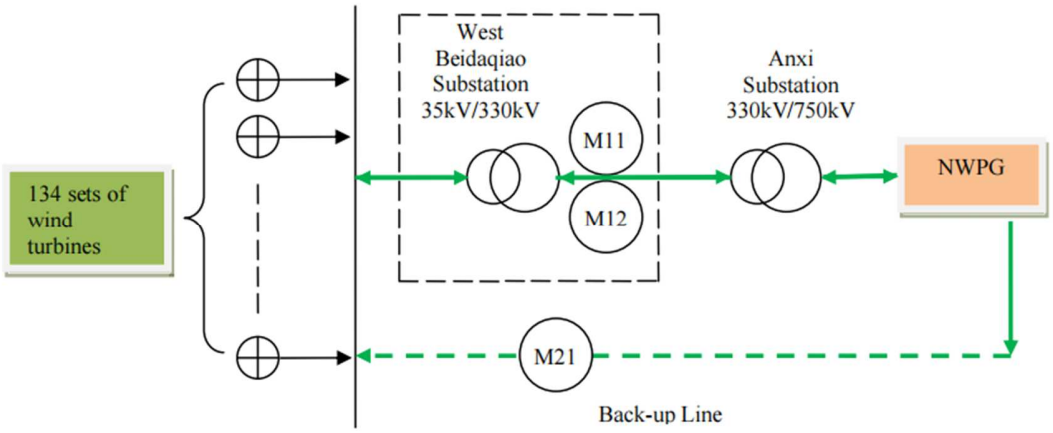


Figure 3: Monitoring System and Monitoring Meters

The electricity meters are properly calibrated following relevant provision in applicable national standard. Calibration is carried out by Electric Energy Measurement Center, Gansu Electric Power Corporation. The meter is calibrated no less than once a year.

All the meters have been jointly inspected and sealed on behalf of the parties concerned and shall not be interfered with by either party except in the presence of the other party or its accredited representatives.

Data collection procedures

a. The main meter M_{11} and meter M_{21} is read and reported to Northwest Power Grid Company monthly.

b. The backup meter M_{12} is read and reported monthly.

c. The project owner reports the readings, grid data and calculations to the VVB for verification.

QA & QC

The calibration of meters conducted by qualified organization must comply with national standard and sector regulations regularly to ensure the accuracy. The meters are calibrated no less than once a year and must be pasted with seal after calibration. The calibration records must be archived together with other monitoring records.

If any errors are detected the party owning the meters shall repair, recalibrate or replace the meter giving the other party sufficient notice to allow a representative to attend during any corrective activity. If the readings of the main meter are beyond allowable error, the backup mete will be used; if the readings of both the main meter and the backup meter are beyond allowable error, the project owner and Power Grid Company shall jointly prepare a reasonable and conservative estimate of the correct reading. In any case there is any problem for the meters, the relevant third party is responsible to correct the meters.

After handling of the emergency, the project owner must prepare a report regarding the emergency to explain to DOE that the handling method is reasonable.

Data management

The project owners keep the copies of sales receipts and prepare a monitoring report when necessary, which includes the net electricity generation, the calibration records and meters' corrective action records. The monitoring data are verified by the Office Manager once every quarter. If there is anything wrong for the data, the Office Manager will correct the data according to other meters and historical data and write the corrective action records for it.

All the electronic and paper documents are archived during the crediting period and two years after the end of the crediting period or the last issuance of ERs, whichever occurs later.

Training program

The project owner entrust the professional engineers and experts to train all the relative staffs before operation of generators. The training contains CDM knowledge, operational regulations, quality control (QC) standard flow, data monitoring requirements and data management regulations etc.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The emission reduction by the project is calculated according to approved consolidated methodology ACM0002 (version 12.1.0). The equation is showed below:

$ER_y = BE_y - PE_y$

Where:

ER_y is the emission reductions in year y (tCO_2e/yr)

BE_y is baseline emissions in year y (tCO_2e/yr)

PE_y is project emissions in year y (tCO_2e/yr)

To calculate BE_y:

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

Where:

$EG_{facility,y}$ = Net electricity supplied to NWPG by the proposed project in year y (MWh/yr).

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y (tCO_2e/MWh).

The emission factor $EF_{grid,CM,y}$, with the value of 0.92928 tCO_2e/MWh, is calculated ex-ante and is fixed during the crediting period. The details of the Net electricity supplied to NWPG by the proposed project in year y in this monitoring period (01/01/2018 ~ 02/01/2021) is shown in Table 2.

Table 2. The summarization of emission reductions from 01/01/2018 ~ 02/01/2021[6]

Monitoring period		$EG_{export,y}$ (MWh)			$EG_{import,y}$ (MWh)						$EG_{facility,y}$ (MWh)	Emission reductions (ER_y)
					$EG_{import1,y}$ (MWh)			$EG_{import2,y}$ (MWh)				
From	To	Meter reading records	Electricity sales receipts	Data used for ER calculation	Meter reading records	Electricity sales receipts	Data used for ER calculation	Meter reading records	Electricity sales receipts	Data used for ER calculation	(MWh)	(tCO2e)
01/01/2018	31/01/2018	25813.920	25813.920	25813.920	195.360	195.360	195.360	0.000	0.000	0.000	25618.560	23806
01/02/2018	28/02/2018	13701.600	13701.600	13701.600	163.600	163.600	163.600	0.000	0.000	0.000	13538.000	12580
01/03/2018	31/03/2018	22297.440	22297.440	22297.440	113.520	113.520	113.520	0.000	0.000	0.000	22183.920	20615
01/04/2018	30/04/2018	27252.720	27252.720	27252.720	58.080	58.080	58.080	0.000	0.000	0.000	27194.640	25271
01/05/2018	31/05/2018	12421.200	12421.200	12421.200	55.440	55.440	55.440	0.000	0.000	0.000	12365.760	11491
01/06/2018	30/06/2018	26410.560	26410.560	26410.560	58.080	58.080	58.080	0.000	0.000	0.000	26352.480	24488
01/07/2018	31/07/2018	26194.080	26194.080	26194.080	66.000	66.000	66.000	0.000	0.000	0.000	26128.080	24280
01/08/2018	31/08/2018	31268.424	31268.424	31268.424	68.640	68.640	68.640	0.000	0.000	0.000	31199.784	28993
01/09/2018	30/09/2018	26553.120	26553.120	26553.120	84.480	84.480	84.480	0.000	0.000	0.000	26468.640	24596
01/10/2018	31/10/2018	32178.696	32178.696	32178.696	116.160	116.160	116.160	0.000	0.000	0.000	32062.536	29795
01/11/2018	30/11/2018	15760.800	15760.800	15760.800	174.240	174.240	174.240	0.000	0.000	0.000	15586.560	14484
01/12/2018	31/12/2018	23242.824	23242.824	23242.824	208.560	208.560	208.560	0.000	0.000	0.000	23034.264	21405
Sub Total		**283095.384**	**283095.384**	**283095.384**	**1362.160**	**1362.160**	**1362.160**	**0.000**	**0.000**	**0.000**	**0.000**	**168041**
01/01/2019	31/01/2019	7536.936	7536.936	7536.936	256.080	256.080	256.080	0.000	0.000	0.000	7280.856	6765
01/02/2019	28/02/2019	32168.400	32168.400	32168.400	129.360	129.360	129.360	0.000	0.000	0.000	32039.040	29773
01/03/2019	31/03/2019	35898.984	35898.984	35898.984	100.320	100.320	100.320	0.000	0.000	0.000	35798.664	33266
01/04/2019	30/04/2019	48367.176	48367.176	48367.176	68.640	68.640	68.640	0.000	0.000	0.000	48298.536	44882
01/05/2019	31/05/2019	32041.944	32041.944	32041.944	100.320	100.320	100.320	0.000	0.000	0.000	31941.624	29682
01/06/2019	30/06/2019	24084.720	24084.720	24084.720	108.240	108.240	108.240	0.000	0.000	0.000	23976.480	22280
01/07/2019	31/07/2019	24382.776	24382.776	24382.776	116.160	116.160	116.160	0.000	0.000	0.000	24266.616	22550
01/08/2019	31/08/2019	23155.704	23155.704	23155.704	71.280	71.280	71.280	0.000	0.000	0.000	23084.424	21451

[6] The amount of electricity exports and imports from the period of 01/01/2021 to 02/01/2021 have been confirmed by the grid company.

01/09/2019	30/09/2019	15760.536	15760.536	15760.536	108.240	108.240	108.240	0.000	0.000	0.000	15652.296	14545
01/10/2019	31/10/2019	28768.080	28768.080	28768.080	166.320	166.320	166.320	0.000	0.000	0.000	28601.760	26579
01/11/2019	30/11/2019	23936.880	23936.880	23936.880	171.600	171.600	171.600	0.000	0.000	0.000	23765.280	22084
01/12/2019	31/12/2019	7078.104	7078.104	7078.104	282.400	282.400	282.400	0.000	0.000	0.000	6795.704	6315
Sub Total		**303180.240**	**303180.240**	**303180.240**	**1678.960**	**1678.960**	**1678.960**	**0.000**	**0.000**	**0.000**	**301501.280**	**280172**
01/01/2020	31/01/2020	12513.600	12513.600	12513.600	294.780	294.780	294.780	0.000	0.000	0.000	12218.820	11354
01/02/2020	29/02/2020	23316.216	23316.216	23316.216	195.360	195.360	195.360	0.000	0.000	0.000	23120.856	21485
01/03/2020	31/03/2020	34747.944	34747.944	34747.944	105.600	105.600	105.600	0.000	0.000	0.000	34642.344	32192
01/04/2020	30/04/2020	50086.132	50086.132	50086.132	60.720	60.720	60.720	0.000	0.000	0.000	50025.412	46487
01/05/2020	31/05/2020	45778.920	45778.920	45778.920	62.394	62.394	62.394	0.000	0.000	0.000	45716.526	42483
01/06/2020	30/06/2020	32902.056	32902.056	32902.056	75.768	75.768	75.768	0.000	0.000	0.000	32826.288	30504
01/07/2020	31/07/2020	33486.288	33486.288	33486.288	88.970	88.970	88.970	0.000	0.000	0.000	33397.318	31035
01/08/2020	31/08/2020	35568.720	35568.720	35568.720	89.230	89.230	89.230	0.000	0.000	0.000	35479.490	32970
01/09/2020	30/09/2020	36849.384	36849.384	36849.384	59.140	59.140	59.140	0.000	0.000	0.000	36790.244	34188
01/10/2020	31/10/2020	25835.040	25835.040	25837.680	118.010	118.010	118.010	0.000	0.000	0.000	25719.670	23900
01/11/2020	30/11/2020	26493.984	26493.984	26493.984	177.410	177.410	177.410	0.000	0.000	0.000	26316.574	24455
01/12/2020	31/12/2020	17724.432	17724.432	17724.432	328.150	328.150	328.150	0.000	0.000	0.000	17396.282	16166
Sub Total		**375302.716**	**375302.716**	**375302.716**	**1655.532**	**1655.532**	**1655.532**	**0.000**	**0.000**	**0.000**	**373649.824**	**347219**
01/01/2021	02/01/2021	1291.488	1291.488	1291.488	40.392	40.392	40.392	0.000	0.000	0.000	1251.096	1162
Sub Total		**1291.488**	**1291.488**	**1291.488**	**40.392**	**40.392**	**40.392**	**0.000**	**0.000**	**0.000**	**1251.096**	**1162**
Total		**962869.828**	**962869.828**	**962869.828**	**4737.044**	**4737.044**	**4737.044**	**0.000**	**0.000**	**0.000**	**958135.424**	**796594**

Thus, the baseline emission during this monitoring period is 796,594 tCO_2e.

5.2 Project Emissions

As per the revised CDM PDD and the ACM0002 (version 12.1.0), for wind power plant, the project emission is 0.

5.3 Leakage

According to methodology ACM0002 (version 12.1.0), No leakage emissions should be considered.

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)
01/01/2018-31/12/2018	168,041	0	0	168,041
01/01/2019-31/12/2019	280,172	0	0	280,172
01/01/2020-31/12/2020	347,219	0	0	347,219
01/01/2021-02/01/2021	1,162	0	0	1,162
Total	**796,594**	**0**	**0**	**796,594**

According to the revised CDM PDD, the estimated value of emission reduction during this crediting period is 428,829 tCO_2e per year. The total estimated value of the emission reduction of this monitoring period is calculated as:

$$\text{Total Estimated } ER_y = \frac{428{,}829\ tCO2e \times \text{number of monitored days}}{365}$$

In the monitoring period from 01/01/2018 to 02/01/2021 (1,098 days, both days included), the estimated emission reduction is 1,290,012 tCO_2e while the actual emission reduction is 796,594 tCO_2e.

Table 3. The comparison of emission reductions between the estimated and actual value

Estimated ER_y during Monitoring Period (tCO_2e)	Actual ER_y during Monitoring Period (tCO_2e)	Difference Percentage (%)

1,290,012	796,594	-38.25

The actual emission reduction is 38.25% lower than the estimated emission reduction, which will not caused the over estimation of emission reductions. As per statistic data[7] which is public available, the difference is because of high wind abandonment rate caused by insufficient electricity demand or insufficient grid receiving capacity in local area.

[7] http://www.nea.gov.cn/2015-07/27/c_134451678.htm

https://www.sohu.com/a/125584518_472920

http://www.gov.cn/xinwen/2018-02/02/content_5263096.htm

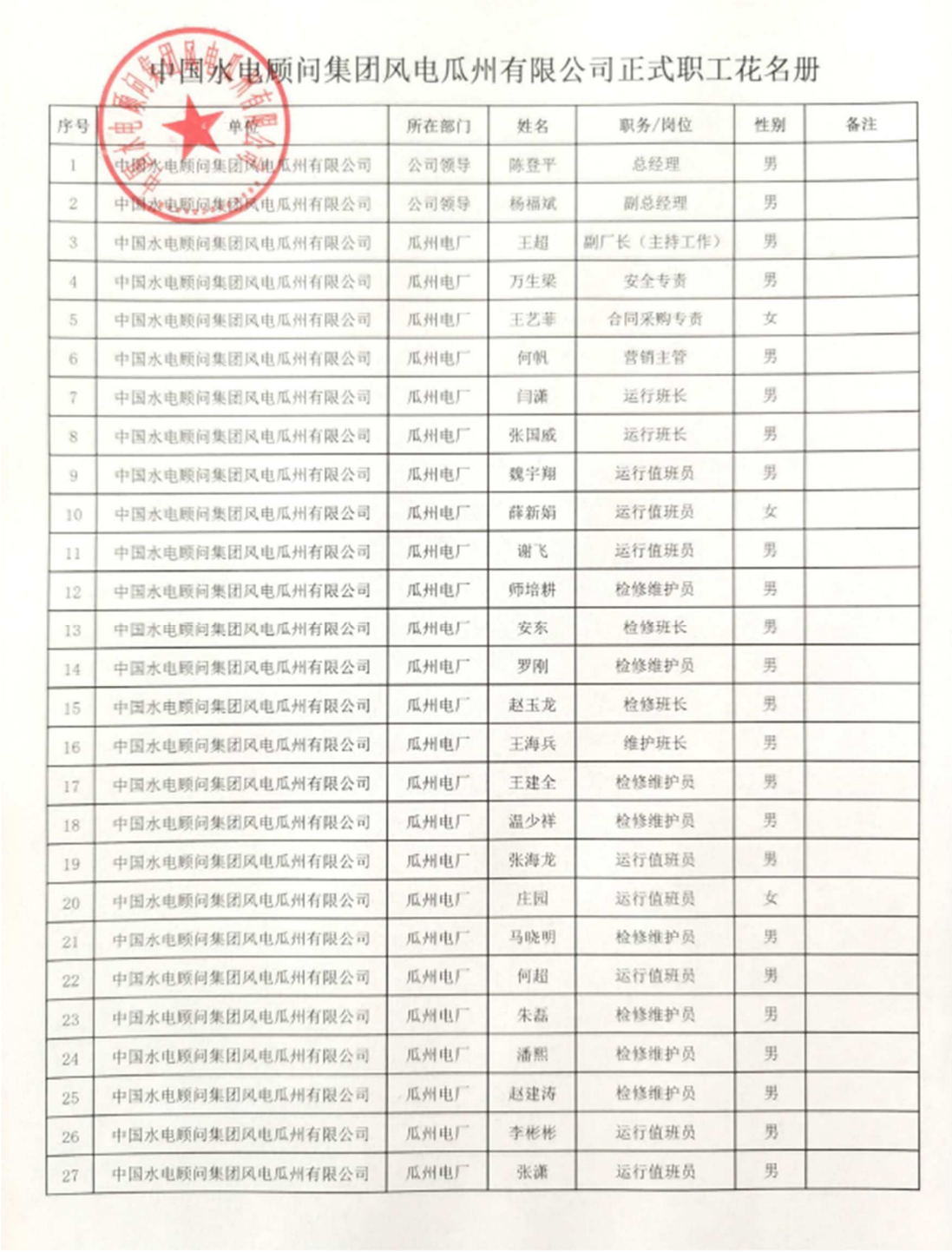
APPENDIX 1: <EVIDENCE OF ACHIEVED SD CONTRIBUTIONS>

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
03/01/2011 - 28/09/2011	332,994.0379	https://registry.verra.org/app/projectDetail/VCS/1037
29/09/2011 - 28/06/2012	212,656.2647	https://cdm.unfccc.int/Projects/DB/ERM-CVS1292512044.7/view
29/06/2012 - 31/12/2017	1,472,958.850	https://registry.verra.org/app/projectDetail/VCS/1037
01/01/2018 - 02/01/2021 (This monitoring period)	958,135.424	Section 5 of this report
Cumulative amount since operation start	**2,976,744.580**	/
Contributions over lifetime	**2,431,094.274**	

As per Instructions for Completing the Monitoring Report (Version 4.1), the cumulative impact should be calculated by summing the current project contributions with all impacts included in previously approved VCS monitoring reports or Sustainable Development Contribution Reports. The contributions over lifetime includes the SDG 7 contributions from the period from 29/06/2012 to 02/01/2021.

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



中国水电顾问集团风电瓜州有限公司正式职工花名册

序号	单位	所在部门	姓名	职务/岗位	性别	备注
1	中国水电顾问集团风电瓜州有限公司	公司领导	陈登平	总经理	男	
2	中国水电顾问集团风电瓜州有限公司	公司领导	杨福斌	副总经理	男	
3	中国水电顾问集团风电瓜州有限公司	瓜州电厂	王超	副厂长（主持工作）	男	
4	中国水电顾问集团风电瓜州有限公司	瓜州电厂	万生梁	安全专责	男	
5	中国水电顾问集团风电瓜州有限公司	瓜州电厂	王艺菲	合同采购专责	女	
6	中国水电顾问集团风电瓜州有限公司	瓜州电厂	何帆	营销主管	男	
7	中国水电顾问集团风电瓜州有限公司	瓜州电厂	闫潇	运行班长	男	
8	中国水电顾问集团风电瓜州有限公司	瓜州电厂	张国威	运行班长	男	
9	中国水电顾问集团风电瓜州有限公司	瓜州电厂	魏宇翔	运行值班员	男	
10	中国水电顾问集团风电瓜州有限公司	瓜州电厂	薛新娟	运行值班员	女	
11	中国水电顾问集团风电瓜州有限公司	瓜州电厂	谢飞	运行值班员	男	
12	中国水电顾问集团风电瓜州有限公司	瓜州电厂	师培耕	检修维护员	男	
13	中国水电顾问集团风电瓜州有限公司	瓜州电厂	安东	检修班长	男	
14	中国水电顾问集团风电瓜州有限公司	瓜州电厂	罗刚	检修维护员	男	
15	中国水电顾问集团风电瓜州有限公司	瓜州电厂	赵玉龙	检修班长	男	
16	中国水电顾问集团风电瓜州有限公司	瓜州电厂	王海兵	维护班长	男	
17	中国水电顾问集团风电瓜州有限公司	瓜州电厂	王建全	检修维护员	男	
18	中国水电顾问集团风电瓜州有限公司	瓜州电厂	温少祥	检修维护员	男	
19	中国水电顾问集团风电瓜州有限公司	瓜州电厂	张海龙	运行值班员	男	
20	中国水电顾问集团风电瓜州有限公司	瓜州电厂	庄园	运行值班员	女	
21	中国水电顾问集团风电瓜州有限公司	瓜州电厂	马晓明	检修维护员	男	
22	中国水电顾问集团风电瓜州有限公司	瓜州电厂	何超	运行值班员	男	
23	中国水电顾问集团风电瓜州有限公司	瓜州电厂	朱磊	检修维护员	男	
24	中国水电顾问集团风电瓜州有限公司	瓜州电厂	潘熙	检修维护员	男	
25	中国水电顾问集团风电瓜州有限公司	瓜州电厂	赵建涛	检修维护员	男	
26	中国水电顾问集团风电瓜州有限公司	瓜州电厂	李彬彬	运行值班员	男	
27	中国水电顾问集团风电瓜州有限公司	瓜州电厂	张潇	运行值班员	男	

SDG Target 13, SDG Indicator Tonnes of greenhouse gas emissions avoided or removed

period	Amount of emission reductions (tCO_2e)	Data source
03/01/2011 - 28/09/2011 (VER)	309,444	https://registry.verra.org/app/projectDetail/VCS/1037
29/09/2011 - 28/06/2012 (CER)	197,617	https://cdm.unfccc.int/Projects/DB/ERM-CVS1292512044.7/view
29/06/2012 - 31/12/2017 (VER)	1,368,760	https://registry.verra.org/app/projectDetail/VCS/1037
01/01/2018 - 02/01/2021 (This monitoring period)	796,594	Section 5 of this report
Cumulative amount since operation start	**2,672,415**	/
Contributions over lifetime	**2,165,354**	/

As per Instructions for Completing the Monitoring Report (Version 4.1), the cumulative impact should be calculated by summing the current project contributions with all impacts included in previously approved VCS monitoring reports or Sustainable Development Contribution Reports. The contributions over lifetime includes the SDG 13 contributions from the period from 29/06/2012 to 02/01/2021.