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Standard**

GANSU GANZHOU DISTRICT NANTAN PHASE I 50MWP SOLAR PHOTOVOLTAIC POWER PROJECT

Document Prepared by Gansu Heihe Electric Power Sales Co., Ltd.

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Project Title	Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project (hereafter simplified as “the project”) is a newly built grid-connected solar photovoltaic power plant with installed capacity of 50 MWp, which is located in southern area Ganzhou district, Zhangye City, Gansu Province, China. Power generated by the project replaces part of electricity generated by fossil-fuel dominated Northwest China Power Grid (NWCPG), thus the project achieves GHG emission reductions.

The project started construction on 25/08/2012. The start date of commercial operation is 20/12/2012 and runs continuously since then. All project equipment and facilities as described in the registered VCS PD have been correctly installed. Please refer to section 3.1 for details.

This monitoring period covers the period from 01/07/2020 to 31/12/2021. The project operated in accordance with the registered VCS PD (version 02) and CDM PDD (version 02).

Total GHG emission reduction achieved in this monitoring period is 101,965 tCO₂e.

1.2 Sectoral Scope and Project Type

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

Project Type: Grid-connected renewable power generation

The project is not a grouped project.

1.3 Project Proponent

Organization name	Gansu Heihe Hydropower New Energy Development Co., Ltd.
Contact person	Du Yong
Title	Legal Representative
Address	Cross of Qingnian East Street in Ganzhou district, Zhangye City, Gansu Province, China
Telephone	+86-2162462036
Email	3542346576@qq.com

1.4 Other Entities Involved in the Project

Organization name	Climate Bridge (Shanghai) Ltd.
Role in the Project	Consultant and VCU Buyer
Contact person	Gao Zhiwen
Title	General Manager
Address	Block B, Level 24, Jiangong Mansion, 33 Fushan Road, Pudong New Area, Shanghai, China 200120
Telephone	+86-2162462036
Email	gao.zhiwen@climatebridge.com

Organization name	Gansu Heihe Electric Power Sales Co., Ltd.
Role in the Project	Consultant
Contact person	Liu Mengde
Title	Project Manager
Address	6th floor of Heihe Hydropower Complex Building, 116 Changshou Road, Ganzhou District, Zhangye City, Gansu Province, China 734000
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1.5 Project Start Date

20/12/2012 (commercial operation started date)

1.6 Project Crediting Period

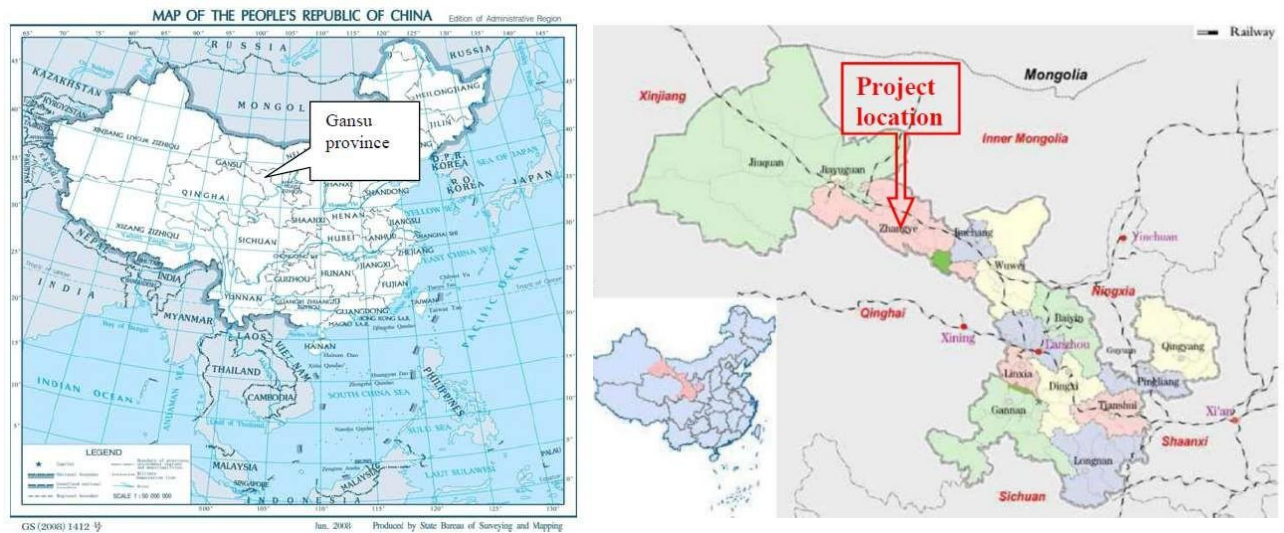
In the project description the crediting periods was 21 years (from 20/12/2012 to 19/12/2033), the first 7-year crediting period is from 20/12/2012 to 19/12/2019 (both days included).

The project is registered under VCS Standard V3, in which the crediting period is set as “a maximum of ten years which may be renewed at most twice.”, meanwhile, “Projects registered under other GHG programs are not eligible for VCU issuance beyond the end of the total project crediting period under those programs”. In the project situation, the project crediting period can

be 21 years (from 20/12/2012 to 19/12/2033), and the first 10-year crediting period is from 20/12/2012 to 19/12/2022 (both days included).

1.7 Project Location

The Project is located in the southern area of Ganzhou District, Zhangye city, Gansu province, P.R. China. The geographical coordinate range of the Project are 100°11'42.58" -



100°13'48.48" east longitude and 38°50'11" - 38°51'00" north latitude.

Figure 1 Location of this project

1.8 Title and Reference of Methodology

ACM0002: "Grid-connected electricity generation from renewable sources" (Version 13.0.0);

The methodology also refers to:

"Tool for the demonstration and assessment of additionality" (Version 07.0.0);

"Tool to calculate the emission factor for an electricity system" (Version 03.0.0);

For more information regarding the methodology, please refer to the following website:
<http://cdm.unfccc.int/methodologies/PAmethodologies/approved>

1.9 Participation under other GHG Programs

The project has been registered as CDM project with UNFCCC ref. No. of 9667 on 27/06/2013. And there is no GHG credit claimed under this CDM project, for detail information please refer to the website: <https://cdm.unfccc.int/Projects/DB/China%20Quality1372055565.71/view>.

Except for CDM Program, the project does not reduce GHG emissions from activities that are included in an emission trading program or any other mechanism that includes GHG allowance trading.

1.10 Other Forms of Credit

Emission Trading Programs and Other Binding Limits

China has a national emissions trading scheme only cover the high-emission industries, such as thermal power generation, petrochemical, chemical, building materials, iron and steel, non-ferrous, paper, aviation and other key emission industries that emitted at least 26,000 tons of CO₂e/year, not including renewable project¹.

Also, the project has not been registered as a CCER (Chinese Certified Emission Reductions) project in China, thus it is not eligible for emission reductions transaction under the China's ETS. Therefore, the project does not reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading. The net GHG emission reductions generated during this monitoring period have not been used for compliance under such programs or mechanisms.

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

Other Forms of Environmental Credit

Some periods of the project in this crediting period have registered and issued as international renewable energy certificates (I-REC), the information of I-REC is listed below: <https://evident.services/device-register/NANTAN01>

Details of the project, monitoring periods and details of I-REC sought are listed below:

Details of the project		Monitoring periods for I-REC	Details of I-REC	
Project title	Device ID		Volumes (MWh)	Issue ID
Gansu Ganzhou District	NANTAN01	2015/5/1~2015	11,140	PPENG-2016-

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

Nantan Solar Phase I		/7/12		0525-0545-32
Gansu Ganzhou District Nantan Solar Phase I	NANTAN01	2016/1/1~2016 /2/1	3,676	PPENG-2016- 0525-0608-57

And monitoring periods and details of VCS sought are listed below:

Start Date	End Date	GHG Emission Reduction (CO ₂ e)	Credit	Program
20/12/2012	19/12/2018	306,461	VCU	VCS
20/12/2018	30/06/2020	98,802	VCU	VCS
01/07/2020	31/12/2021	101,965	In requesting for VCUs	VCS

The GHG emission reductions generated by the project from 01/07/2020 to 31/12/2021 will not be used for compliance with emission trading programs or to meet binding limits on GHG emissions.

All credits from 01/07/2020 to 31/12/2021 will be claimed under VCS program as VCUs for the project to avoid double counting.

1.11 Sustainable Development Contributions

As a renewable solar power project, the Project will contribute to the region's sustainable development through the following ways:

SDG 7: 116,081.640 MWh of electricity from renewable sources were supplied to the power grid during this monitoring period. Thus, the project achieved SDG 7 Affordable and Clean Energy².

SDG 8: Creating short-term and long-term job opportunities in the project area during the project construction and operation. Thus, the project achieved SDG 8 Decent Work and Economic Growth³.

² <https://sdgs.un.org/goals/goal7>

³ <https://sdgs.un.org/goals/goal8>

SDG 13: The project achieved 101,965 tCO₂e emission reduction during this monitoring period. Thus, the project achieved SDG 13 Climate Action⁴.

⁴ <https://sdgs.un.org/goals/goal13>

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	Renewable energy share in the total final energy consumption	Implemented activities to increase	The project generated renewable energy and export electricity to state grid. During this monitoring period, 116,081.640 MWh of electricity has been exported.	From 20/12/2012 onwards, about 597,825.026 MWh of electricity has been exported.
2)	8.5	The number of long-term jobs provided by the implementation of the project	Implemented activities to increase	30 employees have signed long-term contracts and receive stable payments due to the implementation of the project activity.	Provided 30 long-term employment positions for local villagers in the reporting period.
3)	13.2	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	The project achieved GHG emission reductions of 101,965 tCO ₂ e during the reporting period.	From 20/12/2012 onward, the project has achieved a GHG emission reduction of 507,228 tCO ₂ e.

2 SAFEGUARDS

2.1 No Net Harm

The project has no potential negative environmental and socio-economic impact.

The project will not cause significant impact on the environment and socio-economic as to the conclusion of the EIA. The conclusions of EIA are documented below:

Noise:

The noise during construction period is sourced from different equipment, such as loader, excavator, concrete mixer, etc. Some effective measures are adopted, such as strengthen the maintenance of machinery to keep mechanical lubrication and reduce its operation noise; take temporary acoustic measures on high noise equipment and forbid night construction. There is no noise-sensitive target near the project site and the influence on local environment caused by noise produced on project site is insignificant.

The noise of the operation period comes from water pump running and transformer operation noise. Through acoustical insulation and distance decay, the noise can be reduced and reach the relevant standard. Therefore, it will bring little influence on the environment.

Air

The dust and soot during construction period is mainly generated by foundation excavation of PV panels and the transport vehicles. During the construction period, effective measures will be taken in order to prevent dust pollution. These measures will include spraying water regularly, sealing vehicles with tarpaulin, avoiding construction on windy days and piling up construction materials in the open air.

The dust and soot during operation period is mainly from the ingress and egress of vehicles; through timely sprinkler cleaning, greening measures as well as small traffic flow, there will be slight impact to the environment.

Waste water

Waste water during construction period mainly includes plant staffs' general domestic sewage, but its amount is small and comparatively scattering. As the project area is dry and lack of rain but with big evaporation capacity, the management measures taken by the project owner are as follows: splashing the cleaned domestic sewage for evaporating. Due to its small amount, it will not influence surface runoff and bring little influence on the environment.

During the operation period, sewage from human daily activities will be treated in a digestion tank before it is used for irrigating trees. The waste water from flushing the solar cells will also

be collected and deposited and finally recycled for irrigation. So, there will be slight impact to the environment.

Solid waste

Waste residue during the construction period is mainly the construction garbage (e.g., discarded building material and domestic garbage, etc.). Therefore, through balancing the earthwork excavation, the rest of earthwork could be fully used for backfilling. The domestic garbage should be cleaned and sent to dump in time to reduce the impact to the surrounding environment.

Waste residue during operation period especially after the plant has been operated for over 10 years, due to renewal of solar cell module, it will generate a certain amount of wasted polycrystalline silicon battery. This part of garbage will be recycled by the manufacturer to realize the comprehensive utilization of resources which will not bring bad influence on the environment. Another part of garbage during operation period is also the domestic garbage. As the garbage is little due to the small number of staff, it just needs to be collected and sent to landfill, which will eliminate the impact to environment.

Ecological environment

The proposed project is located in a barren and desolate area with sparse vegetation, exposed to dust and high soil erosion. The construction may exacerbate this erosion, but the impact on the ecological environment can be reduced through some preventive and restorative measures, such as minimizing the construction area, replanting drought-proof vegetation, etc. The outmost layer of the solar cell module of the proposed project uses the special tempered low radiation glass, thus it will not bring obvious light pollution.

Electromagnetic radiation of the project operation is comparatively low and is far from the residential area which will not bring negative influence on residents' health and surrounding radio electrical equipment.

In conclusion, the project activity does not have any major adverse impacts on the environment during its construction and operation. The proposed project is definitely an environment-friendly method for power generation. Meanwhile, the implementation of the project will improve local socio-economic development through creating career opportunities and paying taxes.

2.2 Local Stakeholder Consultation

Local Stakeholder Consultation during the project preparation stage:

In order to invite stakeholders' comments, during 15/08/2012~16/08/2012, representatives from the project owner conducted a survey among local officials, villagers and residents living in the project area by means of questionnaires. The questionnaires are related to the project's impacts on the local environment, as well as on the region's social and economic development.

30 questionnaires were sent out and all of them were returned. The following table is the information of the respondents.

Item		Number	Percentage (%)
Total collected questionnaires		30	100
Gender	Male	25	83.30%
	Female	5	16.70%
	Junior Middle School and below	15	50%
	High School	5	16.70%
	College and above	10	33.30%
Age	20~50	28	93.30%
	More than 50	2	6.70%
Occupation	Peasant	20	66.70%
	Government officials	8	26.70%
	Others	2	6.60%

The respondents are representative in terms of age, occupation and education, so their attitude towards the impacts of the project can therefore be seen as a comprehensive reflection of the attitudes of the residents possibly affected by the project.

The results of the survey are presented in the following table:

Item	Response (%)		
1. How much do you know about PV Power generation project?	A lot	A little	Nothing
	73.3	20	6.7
2. What do you think the project's impacts on the local electricity supply will be?	Positive	Negative	No impact
	96.7	0	3.3
3. What do you think the project's impacts on the local employment will be?	Positive	Negative	No Impact
	86.7	0	13.3
4. What do you think about the impacts of the project on the current environment?	Positive	Negative	No Impact
	6.7	0	93.3
5. What do you think the project's impact on the local economy will be?	Promoting	Abating	No change
	86.7	0	13.3

6. What's your attitude towards the project?	Positive	Negative	Indifferent
	100	0	0
7. Are you supportive for developing the proposed project as a VCS project?	Positive	Negative	Indifferent
	100	0	0

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

Local Stakeholder Consultation during the project implementation stage:

Communications with local stakeholders are being carried out at periodic intervals on 22/11/2020. Key implementation schedules or changes of the project will be communicated to the local authority, who will inform the neighbourhood committee and the local residents, the comments and suggestions from residents will be collected by the local authority meanwhile. And the local government agencies and competent authorities will conduct spot checks on the implementation of the project from time to time and give suggestions on the involved rectification problems. 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. There are no negative comments received for the project during this monitoring period.

2.3 AFOLU-Specific Safeguards

Not applicable.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The proposed project generates electricity from solar energy using photovoltaic technology. The key components of the proposed project consist of polycrystalline silicon modules (70,000 sets with each rated power of 290W and 105,000 sets with each rated power of 285W), DC/AC (Direct Current/Alternating Current) inverters (each with rated power of 500kW) and box-type transformers (with transmission voltage of 35kV). The DC electricity is transformed to AC power by inverters and then boosted up to 35kV by box-type transformers, merged and transformed to 110kV by the onsite main transformer and then delivered to the Heihe 110kV substation and finally to NWCPG. The main technical parameters of the proposed project are shown in the following table:

Equipment	Parameters	Unit	Value	Module	Quantity
Solar Modules	Rated power	Wp	290	JKM- 290P-72	70,000

	Operating voltage	V	36.4	JKM285P-72	105,000
	Operating current	A	7.97		
	Lifetime	year	25		
	Rated power	Wp	285		
	Operating voltage	V	36		
	Operating current	A	7.92		
	Lifetime	year	25		
Inverter	Rated power	kW	500	SG500KTL	80
	AC voltage	V	270		
	DC current	A	1,176		
	Lifetime	year	25		
	Rated power	kW	500	EHE- N500KTL	20
	AC voltage	V	270		
	DC current	A	1,070		
	Lifetime	year	25		

It is demonstrated by the design institute that the annual average operating hours of the proposed project is 1,422 hours, correspondingly the plant load factor (PLF) is 16.23%, and the operational lifetime of the project is 25 years.

The project started commissioning on 20/12/2012. The project operated smoothly without any emergencies or special events that would impact the applicability of the applied methodology. No events that may impact the GHG emission reductions or removals and monitoring occurred Deviations

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviations.

3.2.2 Project Description Deviations

A change of project crediting period is requested.

In the project description the crediting periods was 21 years (from 20/12/2012 to 19/12/2033), the first 7-year crediting period is from 20/12/2012 to 19/12/2019 (both days included).

The project is registered under VCS Standard V3, in which the crediting period is set as “a maximum of ten years which may be renewed at most twice.”, meanwhile, “Projects registered under other GHG programs are not eligible for VCU issuance beyond the end of the total project

crediting period under those programs”. In the project situation, the project crediting period can be 21 years (from 20/12/2012 to 19/12/2033), and the first 10-year crediting period is from 20/12/2012 to 19/12/2022 (both days included).

3.3 Grouped Projects

The project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

The ex-ante fixed data and parameters listed in CDM PDD are used for the calculation of EF, thus only EF is listed in MR.

Data / Parameter	EF _{grid,CM,y}
Data unit	tCO ₂ e/MWh
Description	Combined margin CO ₂ emission factor for Northwest China Power Grid in year y.
Source of data	Registered PDD
Value applied	0.8784
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) and based on 2012 Baseline Emission Factors for Regional Power Grids in China issued by China DNA on 15/10/2012.
Purpose of Data	Calculation of baseline emissions
Comments	Applicable to the first 10 years crediting period and will be renewed at the second crediting period.

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 to the grid in year y
Source of data	Calculated
Description of measurement methods and procedures to be	Calculated based on the quantity of electricity supplied by the project to the grid (EG _{export,y}) and the quantity of electricity delivered to the project from the grid (EG _{import,y})

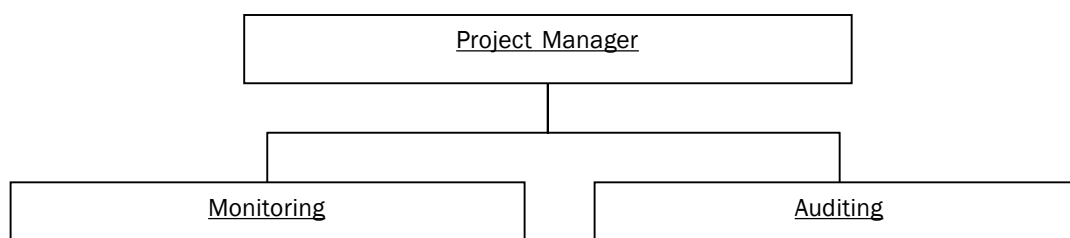
applied																									
Frequency of monitoring/recording	Measured continuously and recorded monthly																								
Value monitored	In this monitoring period, the grid company and the plant operation staff read and record the meters at 24:00 of the last day of each month. The $EG_{\text{facility},y}$ is listed below: <table><tr><th colspan="2">Period</th><th>Value</th></tr><tr><th>Start Date</th><th>End Date</th><th>MWh</th></tr><tr><td>01/07/2020</td><td>31/12/2020</td><td>36,409.086</td></tr><tr><td>01/01/2021</td><td>31/12/2021</td><td>79,672.554</td></tr><tr><td colspan="2">Total</td><td>116,081.640</td></tr></table>	Period		Value	Start Date	End Date	MWh	01/07/2020	31/12/2020	36,409.086	01/01/2021	31/12/2021	79,672.554	Total		116,081.640									
Period		Value																							
Start Date	End Date	MWh																							
01/07/2020	31/12/2020	36,409.086																							
01/01/2021	31/12/2021	79,672.554																							
Total		116,081.640																							
Monitoring equipment	Main meter M1 installed at Heihe 110kV substation and backup meter M2 installed at the project site When meter M1 is not working, M2 will be used as reference, both meters are working well in this monitoring period.																								
QA/QC procedures to be applied	The quantity of electricity delivered to the grid by the project ($EG_{\text{export},y}$) and the electricity imported from the grid by the project ($EG_{\text{import},y}$) is crosschecked with electricity sales and purchase receipts.																								
Purpose of the data	Calculation of baseline emissions.																								
Calculation method	$EG_{\text{facility},y}=EG_{\text{export},y}-EG_{\text{import},y}$ Where $EG_{\text{export},y}$ and $EG_{\text{import},y}$ are measured continuously and recorded monthly. The $EG_{\text{export},y}$ is listed below: <table><tr><th colspan="2">Period</th><th>Value</th></tr><tr><th>Start Date</th><th>End Date</th><th>MWh</th></tr><tr><td>01/07/2020</td><td>31/12/2020</td><td>36,985.090</td></tr><tr><td>01/01/2021</td><td>31/12/2021</td><td>81,086.942</td></tr><tr><td colspan="2">Total</td><td>118,072.032</td></tr></table> The $EG_{\text{import},y}$ is listed below: <table><tr><th colspan="2">Period</th><th>Value</th></tr><tr><th>Start Date</th><th>End Date</th><th>MWh</th></tr><tr><td>01/07/2020</td><td>31/12/2020</td><td>576.004</td></tr></table>	Period		Value	Start Date	End Date	MWh	01/07/2020	31/12/2020	36,985.090	01/01/2021	31/12/2021	81,086.942	Total		118,072.032	Period		Value	Start Date	End Date	MWh	01/07/2020	31/12/2020	576.004
Period		Value																							
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01/07/2020	31/12/2020	36,985.090																							
01/01/2021	31/12/2021	81,086.942																							
Total		118,072.032																							
Period		Value																							
Start Date	End Date	MWh																							
01/07/2020	31/12/2020	576.004																							

	01/01/2021	31/12/2021	1,414.388
	Total		1,990.392
	EG_{export,y} and EG_{import,y} are measured by bidirectional electricity meter M1 and M2 Mode: MK6E Serial number: 210140205 (M1), 210140204 (M2) Accuracy: 0.2s Calibration frequency: Annually Date of calibration: 15/10/2019, 15/10/2020, 15/10/2021 Validity: 14/10/2020, 14/10/2021, 14/10/2022 Calibration entity name: Gansu Electric Power Company Energy Measurement Center. Meters are calibrated periodically by the third-party calibration entity. EG_{export,y} and EG_{import,y} are crosschecked by the electricity sales and purchase receipts.		
Comments	-		

4.3 Monitoring Plan

Operation and management structure of monitoring

In order to obtain reliable monitoring data, the project developer will establish a monitoring management structure. Clear responsibilities will be assigned to all staff involved in the project. A project manager will be appointed who will have the overall responsibilities of monitoring the project. The measurement of the electricity exports and imports will be carried out by the monitoring officers. In addition, the project developer will designate internal verifiers who will be responsible for the internal verification of the measurement, the collection of electricity receipts and invoices, and the calculation of the emission reductions. The structure of the monitoring group is as follows:



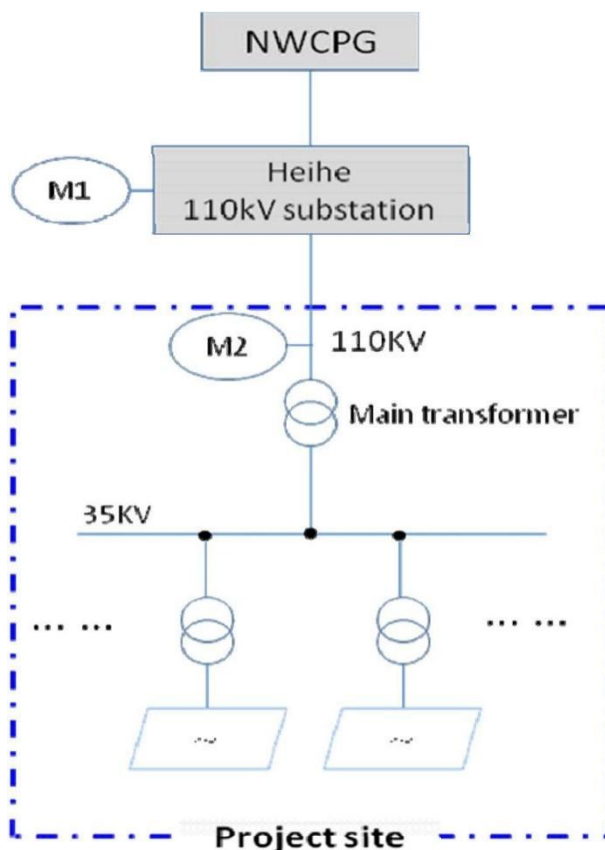
The responsibilities of different roles in operation and management structure are described as below:

Role	Responsibility
Project manager	• Coordinate with external consultant to design and execute the monitoring plan • Supervise the Monitoring section to ensure a timely, adequate and accurate date • Recording • Ensure the enforcement of QA/QC plan performed by the Audit section • Collect monitoring data, documents of settlement (transaction records and/or notes) issued by the grid company • Calculate emission reductions and make regular summary following requirements as VCS projects • Work with external consultant to prepare the monitoring report
Monitoring section	• Collect, record and archive the monitoring data • Maintain the monitoring meters
Audit section	• Perform the routine QA/QC procedure to ensure date accuracy • Ensure timely calibration of the monitoring meters

Monitoring equipment and installation

The quantity of electricity exported to the grid and electricity imported from the grid by the proposed project needs to be monitored. The electricity voltage is transformed to 35Kv by box-type transformers, merged and transformed to 110kV by the onsite main transformer and then delivered to the Heihe 110kV substation and finally to NWCPG.

Shown in the following figure, the monitoring system includes a main meter (M1) installed at Heihe 110kV substation and a backup meter (M2) installed at the project site. The meters are bidirectional and are installed in accordance with the national standard 'Electricity meter installation technical management code' (DL/T448-2016). The accuracy of the meters is 0.2S.



Data collection and management

The project owner and the local power grid company read the meters and record the data on a monthly basis. The monitored data is archived electronically each month. The project owner also needs to keep and periodically back up the copies of electricity sales and purchase receipts provided by the power grid company for cross-check.

All written documents, such as diagrams and reports, should be stored and made available to the verifier, so that the reliability of the information may be checked. All data should be archived for 2 years after the end of the last crediting period.

Quality assurance and quality control

The meters should be installed in accordance with the relevant national and industrial regulations. Prior to the project operation, the project owner and the grid company should check the meters according to the relevant national and industrial regulations. The meters should be calibrated annually by an independent qualified calibration entity in accordance with the relevant national and industrial regulations. Data and records will be checked prior to being recorded and archived, and possible errors should be identified at this step. In case the main meter operates abnormally, the readings from the backup meter will be adopted. If both the main and back-up meters are out of order, the data monitored within this certain period shall not be counted. Emission reduction during malfunction periods will be calculated conservatively.

Training on monitoring has been provided to the relevant staff in order to guarantee the implementation of the monitoring plan.

Monitoring results and verification

The verification of the monitoring results of the project activity is required for each monitoring period. The monitoring results will be compiled in a monitoring report that will serve as a basis for project verification in each crediting year.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Baseline Emissions (BE_y) is determined by multiplying net electricity generation supplied by the project plant to the grid ($EG_{\text{facility},y}$) during the monitoring period by Emission Factor ($EF_{\text{grid,CM},y}$) of NWCPG.

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

Where

BE_y	Baseline emissions of the NWCPG during monitoring period
$EF_{\text{grid,CM},y}$	Combined margin CO ₂ emission factor for Northwest China Power Grid in year y
$EG_{\text{facility},y}$	Quantity of net electricity generation supplied by the project to the grid in year y

As stated in Section 4.1, the grid emission factor $EF_{\text{grid,CM},y}$ of the project during this crediting period is 0.8784 tCO₂e/MWh, the monthly electricity data for $EG_{\text{export},y}$ and $EG_{\text{import},y}$ and baseline emissions for the monitoring period are listed as follows:

Table 1 The monthly electricity data for EG_{export,y} and EG_{import,y}

Period		EG _{export,y} (MWh)			EG _{import,y} (MWh)			EG _{facility,y} (MWh)
		Measured by the main meter	Electricity data in Sales Receipts	Data For Calculation	Measured by the main meter	Electricity data in Purchas Receipts	Data For Calculation	EG _{export,y} - EG _{import,}
Start Date	End Date	A	B	C=min(A,B)	D	E	F=max(D,E)	H=C-F-G
01/07/2020	31/07/2020	6,179.518	6,179.518	6,179.518	60.016	60.016	60.016	6,119.502
01/08/2020	31/08/2020	6,630.997	6,630.997	6,630.997	71.920	71.920	71.920	6,559.077
01/09/2020	30/09/2020	6,492.550	6,492.550	6,492.550	77.208	77.208	77.208	6,415.342
01/10/2020	31/10/2020	6,695.472	6,695.472	6,695.472	122.348	122.348	122.348	6,573.124
01/11/2020	30/11/2020	5,414.393	5,414.393	5,414.393	112.824	112.824	112.824	5,301.569
01/12/2020	31/12/2020	5,572.160	5,572.160	5,572.160	131.688	131.688	131.688	5,440.472
Total in 2020		36,985.090	36,985.090	36,985.090	576.004	576.004	576.004	36,409.086
01/01/2021	31/01/2021	6,552.781	6,552.781	6,552.781	135.224	135.224	135.224	6,417.557
01/02/2021	28/02/2021	6,853.730	6,853.730	6,853.730	163.796	163.796	163.796	6,689.934
01/03/2021	31/03/2021	6,795.252	6,795.252	6,795.252	155.524	155.524	155.524	6,639.728
01/04/2021	30/04/2021	6,805.592	6,805.592	6,805.592	10.016	10.016	10.016	6,795.576
01/05/2021	31/05/2021	6,979.697	6,979.697	6,979.697	210.564	210.564	210.564	6,769.133
01/06/2021	30/06/2021	6,210.064	6,210.064	6,210.064	111.540	111.540	111.540	6,098.524
01/07/2021	31/07/2021	7,234.651	7,234.651	7,234.651	81.224	81.224	81.224	7,153.427
01/08/2021	31/08/2021	7,129.885	7,129.885	7,129.885	82.520	82.520	82.520	7,047.365
01/09/2021	30/09/2021	6,863.385	6,863.385	6,863.385	85.144	85.144	85.144	6,778.241
01/10/2021	31/10/2021	6,617.346	6,617.346	6,617.346	109.288	109.288	109.288	6,508.058
01/11/2021	30/11/2021	6,278.878	6,278.878	6,278.878	130.528	130.528	130.528	6,148.350
01/12/2021	31/12/2021	6,765.681	6,765.681	6,765.681	139.020	139.020	139.020	6,626.661
Subtotal 2021		81,086.942	81,086.942	81,086.942	1,414.388	1,414.388	1,414.388	79,672.554
Total		118,072.032	118,072.032	118,072.032	1,990.392	1,990.392	1,990.392	116,081.640

Table 2 Calculation of the baseline emission

Period		EG _{facility,y} (MWh)	EF _{grid,CM,y} (tCO ₂ e/MWh)	Baseline Emission BE _y (tCO ₂ e)
Start Date	End Date			
01/07/2020	31/12/2020	36,409.086	0.8784	31,981
01/01/2021	31/12/2021	79,672.554	0.8784	69,984
Total		116,081.640	/	101,965

5.2 Project Emissions

The project is a renewable energy project, therefore, according to methodology ACM0002, there is no emission for the project, PE_y=0.

5.3 Leakage

According to methodology ACM0002, project leakage is not considered. Therefore L_y = 0.

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)
01/07/2020-31/12/2020	31,981	0	0	31,981
01/01/2021-31/12/2021	69,984	0	0	69,984
Total	101,965	0	0	101,965

Comparison of actual emission reductions with estimates during validation:

The emission reductions of 101,965 tCO₂e achieved in this monitoring period (01/07/2020 to 31/12/2021) are about 4.88%⁵ more than the estimated value 97,219 tCO₂e⁶ which is calculated in line with the registered PD (version 02), which is in the normal fluctuation range.

⁵ (101,965 tCO₂e - 97,219 tCO₂e) / 97,219 tCO₂e = 4.88%

⁶ As per the IRR calculation sheet, the estimated annual electricity delivered to the grid is 74,272 and 73,643 MWh in the 8th and 9th operation year. Thus, the estimated annual electricity delivered to the grid from 01/07/2020 to 31/12/2020 (covering 182 days) is 37,034.258 MWh (74,272 MWh/365 days*182days). Thus, the estimated emission reduction in the monitoring period (covering 549 days) is 97,219 tCO₂e, ie. 97,219 tCO₂e = (37,034.258 MWh + 73,643 MWh) * 0.8784 tCO₂e/MWh.

According to the IRR calculation sheet⁷, only when the net electricity generation was 10.81% more than the estimate value of the registered PDD, IRR would reach to benchmark 8% (after tax). It is observed that the project IRR is still lower than the benchmark 8% with 4.88% excess. Therefore, the exceeding electricity of this monitoring period does not influent the project additionality.

⁷ <https://cdm.unfccc.int/Projects/DB/China%20Quality1372055565.71/view>

APPENDIX: <SUPPORTING EVIDENCE>

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

<https://cdm.unfccc.int/Projects/DB/China%20Quality1372055565.71/view>

<https://registry.verra.org/app/projectDetail/VCS/1453>

This project has not been issued under CDM scheme, and the net electricity supplied to the NWCPG and corresponding emission reduction from 20/12/2012 and onwards are listed below:

Period		EG _y	ER
Start Date	End Date	MWh	CO ₂ e
20/12/2012	19/12/2018	369,261.540 ⁸	306,461
20/12/2018	30/06/2020	112,481.846	98,802
01/07/2020	31/12/2021	116,081.640	101,965
Total		597,825.026	507,228

Evidence for SDG 8: The roster of the project has been submitted as a separate document to Verra due to confidentiality requirement of the project proponent.

⁸ During the periods from 01/05/2015 to 12/07/2015 and from 01/01/2016 to 01/02/2016, there were 14,816MWh (11,140+3,676) electricity issued as I-REC, which were included in the SDG cumulative contributions over project lifetime since project start date.