



VCS VERIFICATION REPORT

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

(VCS PROJECT ID: 1453)



Document Prepared By

Shenzhen CTI International Certification Co., Ltd

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Summary:

Shenzhen CTI International Certification Co., Ltd (CTI) has performed the verification of the emission reductions reported for the project activity “Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project” (VCS Project ID: 1453) for the monitoring period 01/07/2020 to 31/12/2021, to review and determine the monitored reductions in GHG emissions that have occurred as a result of the project activity. These emission reductions are claimed as Verified Carbon Units (VCU) under the Verified Carbon Standard (VCS) version 4.2.

The verification was performed on the basis of VCS Program Guide version 4.1 and VCS Standard version 4.2 for the VCS projects, as well as criteria given to provide for consistent project operations, monitoring and reporting. The verification was conducted by means of document review, follow-up interviews and site inspections, and the resolution of outstanding issues. The verification team identified 2 CARs, 0 CL and 0 FAR in this monitoring period.

In CTI's opinion, the GHG emission reductions reported for the project in the monitoring report (version 2.1 dated 09/09/2022) are fairly stated. The GHG emission reductions of the monitoring period were calculated correctly on the basis of approved methodology ACM0002 “Consolidated methodology for grid-connected electricity generation from renewable sources” (Version 13.0.0).

CTI does not assume any responsibility towards the issuance and utilization of the VCUs hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration.

The verification of reported emission reductions is based on the information made available to CTI and the engagement conditions detailed in this report. CTI cannot be held liable by any party for decisions made or not made based on this report.

Hence, CTI is able to certify that the emission reductions from the “Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project” during the period amount to 101,965 tCO₂e.

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1 INTRODUCTION

Climate Bridge (Shanghai) Ltd. has commissioned Shenzhen CTI International Certification Co., Ltd (CTI) to carry out the verification and certification of emission reductions reported for the “Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project” (the project) for the period 01/07/2020 to 31/12/2021. This report contains the findings from the verification and includes a verification statement for the verified carbon units.

1.1 Objective

Verification is the periodic independent review and ex-post determination by an accredited verification body of the monitored reductions in GHG emissions that have occurred as a result of the registered VCS project activity during a defined verification period.

A verification statement is the written assurance by a verification body that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and provide a verification statement of emission reductions reported for the “Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project” for the period 01/07/2020 to 31/12/2021.

1.2 Scope and Criteria

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emissions reduction data is free from material misstatement;
- To verify that reported GHG emissions data is sufficiently supported by evidence.

The criteria of the verification are:

- VCS Program Guide (version 4.1) /25/
- VCS Standard (version 4.2) /24/ and other relevant requirements defined by VERRA;
- The approved methodology ACM0002 (Version 13.0.0) /27/ applied by the project.

The verification shall ensure that reported emission reductions are complete and accurate in order to be verified.

1.3 Level of Assurance

The verification report expresses a conclusion with a reasonable level of assurance about whether the reported GHG emissions reduction data is free from material misstatement. CTI applied a materiality threshold of 5% (for projects with ER less than 300,000 tCO₂e per year) with respect to emission or misstatements concerning reported quantities as per para 3.9.1 and 4.1.8 (4) of VCS Standard, v4.2.

1.4 Summary Description of the Project

Sectoral Scope and Project Type

According to the VCS Program Guide (version 4.1) /25/, the project is applicable under the following activity categories:

- Sectoral Scope: 1. Energy (Renewable/non-renewable).

According to Annex A of the Kyoto Protocol, the project is applicable under the Sectoral Scope 1: Energy Industries (renewable/ non-renewable sources).

Project Background

Project title:	Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project
Project proponent:	Gansu Heihe Hydropower New Energy Development Co., Ltd. (China)
Project location:	The southern area of Ganzhou District, Zhangye city, Gansu province, P.R. China
VCS Project ID:	1453
Applied methodology:	ACM0002 Version 13.0.0
VCS project crediting period:	20/12/2012 to 19/12/2022 (the first VCS crediting period)
VCU verification period:	01/07/2020 to 31/12/2021

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification was performed through means of the following three phases in accordance with the requirement of the registered VCS PD, the applied methodology, and the VCS Standard (version 4.2) and other relevant VCS requirements:

- A desk review of the monitoring report and all support documents;
- Follow-up interviews with project stakeholders and site inspection;
- The resolution of outstanding issues and the issuance of the verification report and statement.

The following sections outline each step in more detail.

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

- The emission reduction calculations and the relevant data records;
- The calibration and maintenance records for the monitoring instruments;
- The management systems to support the project operation and monitoring.

2.2 Document Review

Based on the requirements of competency, experience and qualified sectoral scopes, CTI appointed a verification team in accordance with CTI's internal procedures.

Function	Name	Technical competence	Task Performance*
Team Leader	Zhang Lei	1.2	☒ DR ☒ SV ☒ RP ☐ TR
Technical Reviewer	Lin Shunrong	1.2	☒ DR ☐ SV ☐ RP ☒ TR

*DR=Document review; SV=Site visit; RP=Reporting; TR=Technical review

In addition to the VER/VCU monitoring report /1/, emission reduction calculation spreadsheet /2/, the following documents also were assessed as a part of the verification audit:

- Registered CDM PDD (version 02 dated 21/05/2013) /15/;
- Registered VCS PD (version 02 dated 02/06/2015) /17/;
- Validation Report of registered CDM PDD /16/;
- Validation Report of registered VCS PD /18/;
- Baseline and monitoring methodology ACM0002 applied by the project /27/;
- Relevant decisions, clarifications and guidance from the VERRA /24/-/26/; and
- Other information and references relevant to the project activity.

During the desk review, CTI has applied standard auditing techniques to assess the quality of information provided. The following activities were performed:

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures; and

An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

2.3 Interviews

On 09/05/2022, CTI visited Gansu Heihe Hydropower New Energy Development Co., Ltd. performed on-site assessment. The key personnel of the project were interviewed or assisted the verification team. Main topics of the interview cover implementation of the project construction, applicability of selected methodology, implementation of project monitoring, emission reduction calculation, etc.

The key personnel interviewed are summarized in the table below:

Interviewed personnel	Role	Organization	Subject
Mr. Ren Hunian	Vice General Manager	Gansu Heihe Hydropower New Energy Development Co., Ltd. (the project owner)	Operation of the project activity; Implementation of the monitor plan of the project activity; Data collection and data achievement; Calibration of meters and equipment maintenance; The on-going local stakeholder consultation;
Mr. Meng Jipeng	Duty Director		
Mr. Wang Peng	Vice Plant Manager	Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Plant	Project's sustainable development contributions
Mr. Liu Junbao	Plant Manager		
Ms. Ding Li	Villager	Local resident	The impact of the project activity; The complaint by local stakeholders;
Mr. Wang Shiqiang	Villager		
Mr. Liu Mengde	Vice General Manager	Consultacy	The stakeholder consultation during the operation of the project activity.
Mr. Zhang Qingfeng	Staff	Consultacy	
Mr. Zhang Zixiao	Project Manager	Climate Bridge (Shanghai) Ltd.	Data collection and ER calculation.

2.4 Site Inspections

The verification team performed the on-site verification (the southern area of Ganzhou District, Zhangye city, Gansu province, P.R. China) on 09/05/2022. The interviewed personnel and objective are listed in above table. During the on-site assessment, CTI has applied standard auditing techniques to assess the quality of information provided. The following aspects of the project activity have been verified:

- An assessment of the implementation and operation of the registered project activity is as per the registered CDM PDD (version 02 dated 21/05/2013);
- A review of information flows for generating, aggregating and reporting the monitoring parameters; and
- Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the registered CDM PDD;
- A cross-check between information provided in the monitoring report and data from other sources such as plant logbooks and electricity sale receipts;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the registered CDM PDD and the selected methodology;
- A review of calculations and assumptions made in determining the GHG data and emission reductions; and
- An identification that quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The data presented in the monitoring report were assessed by review of the detailed project documentation and production records, as well as by interviews with personnel from the project developer Gansu Heihe Hydropower New Energy Development Co., Ltd. and observation of collection of measurements, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. This has enabled the verification team to assess the accuracy and completeness of reported monitoring results, to verify the correct application of the approved monitoring methodology and the determination of the emission reductions.

In addition all parameters required by the monitoring methodology ACM0002 (Version 13.0.0), and the management system were assessed during the site visit.

2.5 Resolution of Findings

A corrective action request (CAR) shall be raised, where:

- i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- ii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- iii. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project proponents.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

The verification team identified 2 CAR, 0 CL and 0 FAR in this monitoring period.

2.5.1 Forward Action Requests

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

CTI confirmed that there was no FAR identified in previous verification /11/, and no FAR was raised during this verification.

2.6 Eligibility for Validation Activities

The registered CDM PDD of the project activity was validated by China Quality Certification Centre (CQC) on 17/06/2013 /16/. The registered VCS PD of the project activity was validated by TÜV NORD CERT GmbH on 02/06/2015 /18/. 2 periodic verifications were carried out by LGAI Technological Center, S.A. (Applus+ Certification) and Earthood Services Private Limited respectively on 22/02/2020 and 12/08/2020 under VCS scheme /20/. The verification for the proposed monitoring period 01/07/2020 to 31/12/2021 is the 3rd VCS verification undertaken by CTI and CTI did not verify more than six consecutive years of this project's GHG emission reductions or removals, which satisfies with 4.1.20 of VCS Standard version 4.2.

Furthermore, CTI just undertook verification activities for the project according to the VCS Program Guide. This section is thus not applicable.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity was registered as a CDM project (UNFCCC ID. 9667) on 27/06/2013 as per UNFCCC website (<https://cdm.unfccc.int/Projects/DB/China%20Quality1372055565.71/view>). The CDM crediting period of the project activity is 3*7 years renewable and the first CDM crediting period is from 01/07/2013 to 30/06/2020. By checking <http://www.irecstandard.org/>, it is confirmed the project has been registered as an I-REC project.

3.2 Methodology Deviations

The validation process /16/ /18/ have assessed all factors and issues that constitute the basis for emission reductions from the project according to the applicable CDM methodology ACM0002 (Version 13.0.0) /27/. There was not any methodology deviation applied to this project. Details refer to section 4.1.

3.3 Project Description Deviations

The project was registered under CDM scheme on 27/06/2013 (UNFCCC ID. 9667). By checking UNFCCC website (<https://cdm.unfccc.int/Projects/DB/China%20Quality1372055565.71/view>), the verification team confirmed that for the project activity, the first CDM crediting period is from 01/07/2013 to 30/06/2020. As per relevant CDM standard, the crediting period of the project could be renewed twice.

As per registered VCS PD, the total VCS crediting periods was 21 years (from 20/12/2012 to 19/12/2033), the first 7-year VCS crediting period is from 20/12/2012 to 19/12/2019 (both days included).

As per VCS scheme under which the project was registered, the project crediting period is allowable for 10 years and could be renewed twice. Considering 3*7-year CDM crediting period, it is reasonable that the total VCS crediting period was determined from 20/12/2012 to 19/12/2033, of which the first VCS crediting period is from 20/12/2012 to 19/12/2022.

This deviation has no impact on the applicability of the methodology, additionality or the appropriateness of the baseline scenario and meet all appropriate rules and requirements of VCS standard. This deviation has been approved by VERRA via checking monitoring reports /19/ and verification reports /20/ of previous VCS monitoring period.

3.4 Grouped Project

The project was not a grouped project; hence this clause is not applicable.

4 VERIFICATION FINDINGS

This section summarizes the findings from the verification of the emission reductions reported for the “Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project” for the period 01/07/2020 to 31/12/2021.

4.1 Project Implementation Status

Project Implementation in accordance with the registered project design document

The project is a grid-connected solar power project, which is located in the southern area of Ganzhou District, Zhangye city, Gansu province, P.R. China. The installed capacity of the project activity is 50 MWp, consisting of 70,000 sets of polycrystalline silicon modules with unit capacity of 290 W and another 105,000 sets of polycrystalline silicon modules with unit capacity of 285 W. The average annual power delivered to the grid by the project is expected to be 71,125 MWh. The actual implementation of the project during this verification period was verified in terms of name plate

capacities of solar modules and monitoring equipment. The details of solar modules with respect to installation and capacity have been verified to be consistent with description indicated in the registered CDM PDD. The project started operation on 20/12/2012, which has been verified by site visit interview, checking verification report of previous VCS monitoring period /20/. The electricity generated by the project activity was supplied to the Northwest China Power Grid (NWCPG), which can be confirmed by the Power Purchase Agreement (PPA) signed between Gansu Heihe Hydropower New Energy Development Co., Ltd. and local Electric Power Company /3/. The project start date was identified as 20/12/2012 when the project started to operate and began generating GHG emission reductions. As justified in section 3.3 of this report, the 1st VCS crediting period of the project is determined as from 20/12/2012 to 19/12/2022. The selected monitoring period is from 01/07/2020 to 31/12/2021, which is within the 1st VCS crediting period.

The technical parameters have been verified with the nameplates /10/ as below:

Equipment	Parameters	Unit	Value	Module	Quantity
Solar Modules	Rated power	Wp	290	JKM- 290P-72	70,000
	Operating voltage	V	36.4		
	Operating current	A	7.97		
	Lifetime	year	25		
	Rated power	Wp	285	JKM285P-72	105,000
	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		

Via onsite investigation and checking daily operation and maintenance records /6/, the verification team confirmed that:

- there is no proposed or actual change to the registered CDM PDD during this monitoring period;
- all required equipments and procedures are available and implemented in an appropriate manner;
- the project is completely operational and all necessary monitoring instruments are installed;
- all required instruments including standby and operating procedures for the same have been implemented in an appropriate manner;
- neither mistakes nor malfunction on main meters have been observed during this monitoring period.

- the control system at the power plant is automated and assures continuous operation, including monitoring on malfunction of equipment;
- no serious malfunction happened and the plant was under a normal operation as expected in this monitoring period.

Furthermore, on-site training for the related procedures including monitoring, recording and reporting was verified to be in place /5/ and their implementation was confirmed by interview with the key operators and observing the operation.

In conclusion, as part of the site visit, CTI confirms that:

- the monitoring plan contained in the registered CDM PDD (version 02 dated 21/05/2013) is in accordance with the approved methodology applied by the project activity, i.e. ACM0002 (Version 13.0.0);
- the project implementation is in accordance with the registered CDM PDD (version 02 dated 21/05/2013);
- all the monitoring system in operation period is in accordance with the registered CDM PDD (version 02 dated 21/05/2013);
- all physical features of the proposed project activity including data collection systems and storage systems have been implemented in accordance with the registered CDM PDD (version 02 dated 21/05/2013) through visual inspection and document review.

Participation or any rejection under any other GHG programs, any other form of environmental credit or emissions trading program since validation or previous verification

Firstly, by checking UNFCCC website (<https://cdm.unfccc.int/Projects/DB/China%20Quality1372055565.71/view>), it is confirmed by CTI that the project has been registered as CDM project activity on 27/06/2013 with reference No. 9667. By checking <http://www.irecstandard.org/>, it is confirmed the project has been registered as an I-REC project.

Secondly, the verification team checked the REC Mechanism database of China, Chinese Emission Trading System (Chinese ETS) and Chinese Certified Emission Reduction Mechanism, and found that the project activity is not accredited / registered under China's REC mechanism, Chinese ETS, or CCER mechanism. Also, CCER mechanism is currently suspended by Chinese government, the project activity will not and is not allowed to registered under CCER mechanism. Thus, the assessment team concluded that the project activity not involved on other emissions trading programs and other binding limits.

Thirdly, as per "Notice on Strengthening Enterprise Greenhouse Gas Emission Report Management" /21/ issued by National Development and Reform Committee of P.R.China, China has a national emissions trading scheme only cover the high-emission industries, including 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. By checking "List of key emissions in the national carbon emissions transaction quota management in 2019-2020" /22/ issued by

Ministry of Ecology and Environment of P.R.China, the project owner is not included in the mandatory emission control scheme and thus no emission cap was enforced for the project activity.

Therefore, the verification team confirmed that:

- the project has registered under CDM, VCS and I-REC schemes;
- the project has applied VCUs under VCS standard and I-REC scheme;
- no CERs were issued or requesting for issuance;
- no rejection from these applied standards or scheme occurs;
- no other forms of environmental credits applied or issued for the project activity.

Also, the same has been confirmed through checking Declaration from PP /23/.

The emission reduction resulted from the project during this monitoring period would only apply for VCUs and will not be double counted. The forms of credits applied or issued for the project activity is as follows:

Details of the project		Monitoring periods for I-REC	Details of I-REC	
Project title	Device ID		Volumes (MWh)	Issue ID
Gansu Ganzhou District Nantan Solar Phase I	NANTAN01	01/05/2015 - 12/07/2015	11,140	PPENG-2016-0525-0545-32
Gansu Ganzhou District Nantan Solar Phase I	NANTAN01	01/01/2016 - 01/02/2016	3,676	PPENG-2016-0525-0608-57

Start Date	End Date	GHG Emission Reduction (tCO 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

SD contributions resulted by implementation of the project activity

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, By checking the approved VCS monitoring reports for previous monitoring periods, it is confirmed that the project contributions with all impacts were not included in previously approved VCS monitoring reports or Sustainable Development Contribution Reports, thus, all impacts during the previous monitoring periods from 20/12/2012 to 30/06/2020 have not been calculated in the cumulative impact. Therefore, the cumulative contributions over the project lifetime are considered as the same as the current project contributions. Also, by checking China's National Plan on Implementation of the 2030

Agenda for Sustainable Development and 17 SDGs defined by UNDP, VERRA website (<https://registry.terra.org/app/projectDetail/VCS/1453>) and interviewing with stakeholders during site visit, CTI confirmed that the project would contribute to sustainable development in as below:

- **SDG 13:** Reducing greenhouse gas emissions compared to a business-as-usual scenario. During this monitoring period, the emission reductions achieved were 101,965tCO₂e. By checking VERRA website and UNFCCC website, it is confirmed that the cumulative contributions over project lifetime since project start date, i.e. 20/12/2012 were 507,228tCO₂e achieved emission reductions.
- **SDG 7:** Providing clean and renewable energy source and displacing the power generation of fossil fuel power plants, reducing pollution emissions caused by coal burning significantly, thus mitigating the air pollution and its adverse impacts on human health, promoting sustainable economic development in local area. During this monitoring period, the renewable energy supplied to NWCPG was 116,081.640MWh. By checking VERRA website and UNFCCC website, it is confirmed that the cumulative contributions over project lifetime since project start date, i.e. 20/12/2012 was 597,825.026MWh renewable energy supplied to NWCPG (including electricity that has issued as I-REC).
- **SDG 8:** Providing direct and indirect employment opportunities during construction and operation period, which promotes sustained, inclusive and sustainable economic growth, full and productive employment and decent work for local residents. By checking Staff Roster /11/, it is confirmed that since operation of the project activity, 30 long term working opportunities are provided.

4.2 Safeguards

4.2.1 No Net Harm

By checking the EIA summary and conclusion provided in the registered CDM PDD, it is confirmed that solar power is green power and the impact caused by solar power on the surrounding ecosystem and residents, wastewater, solid waste and atmosphere etc. is very little, there would be no net harm caused due to the project activity. Also, the EIA of the project are approved by the government.

Also, no potential environment or social economic matter was found during the site visit. The project is renewable energy project and thus no net harm observed in air or water quality on-site.

4.2.2 Local Stakeholder Consultation

As per the registered CDM PDD, a stakeholder consultation survey was conducted on 15/08/2012~16/08/2012 through distributing a one-page questionnaire, which was designed to be easily filled in. 50 copies of questionnaire were distributed and 30 pieces of reply were received. 30 participants filled in the questionnaires included local residents. The opinions expressed by the stakeholders showed that no negative comments were received and the proposed project receives support from the local community.

By checking questionnaires, the assessment team confirmed communications with Local stakeholders was being carried out at periodic intervals, i.e. 22/11/2020 in this monitoring period. Via interviewing with staff from local environmental protection bureau and local residents during the site visit, it is confirmed by the verification team that during the implementation stage of this monitoring period, local

authority has conducted spot checks on the implementation of the project periodically as per the request from the local governments' regulations. It is confirmed by the verification team that there were no negative comments and issues from the local stakeholders during this monitoring period and the project passed all the periodic spot checks by local government.

4.3 AFOLU-Specific Safeguards

For non-AFOLU projects, this section is not required.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The monitoring has been carried out in accordance with the monitoring plan contained in the registered CDM PDD (version 02 dated 21/05/2013). CTI confirms that all parameters stated in the monitoring plan are monitored and reported appropriately. All parameters required to be monitored by the monitoring plan as per the monitoring methodology ACM0002 (Version 13.0.0) and the management system were assessed during the site visit. The monitoring report lists each parameter required by the monitoring plan and the information flow (i.e. from data generation, aggregation, recording, calculation and reporting) for these parameters is provided. The information flow for the each parameter in further verified in the following sections.

Parameters monitored

According to the monitoring plan contained in the registered CDM PDD (version 02 dated 21/05/2013), there are 1 monitoring parameter of the project:

- **Quantity of net electricity generation supplied by the project plant to the grid in year y ($EG_{\text{facility},y}$)**

During this monitoring period, the parameter $EG_{\text{export},y}$ and $EG_{\text{import},y}$ were continuously measured by Main meter M1 installed at Heihe 110kV substation and backup meter M2 installed at the project site. The meter readings were recorded monthly. When meter M1 is not working, M2 will be used as reference. By checking operation log /6/, it is confirmed that both meters are working well.

The cut-off time was 24:00 hr of last day of each month. At the cut-off time, the staff from project developer and the grid company read the main meter together. The staff from project owner read the meter readings and record the same in Meter Reading Records (MRRs) /7/. The staff from power grid company record electricity meter's readings and then transcribes the data into Electricity Sales Receipts /8/ and Electricity Purchase Receipts /9/. $EG_{\text{export},y}$ and $EG_{\text{import},y}$ were sourced from Meter Reading Records (MRRs) /7/ issued by the project developer issued by power grid company covering monitoring period. Data in the monthly reading records were used to the report, through a cross check with Electricity Sales Receipts /8/ and Electricity Purchase Receipts /9/. The conservative values were applied to calculate net Quantity of electricity supplied by the project to the grid.

As described above, the meters have been installed in accordance with the monitoring plan contained in the registered CDM PDD (version 02 dated 21/05/2013). CTI has on-site checked the location of the meters against the diagram of power connection system and found them to be consistent. The data

reported in the monitoring report and ERs calculation spreadsheet has been verified by the verification team. Supporting references and data required to determine Quantity of net electricity generation supplied by the project plant to the grid in year y ($EG_{\text{facility},y}$) is found to be complete and transparent.

✓ **Monitoring equipment and calibration**

The meters have been calibrated periodically as per the relevant industrial standard by the qualified third party to ensure the monitoring equipments' accuracy and in good conditions. The relevant information of meters' calibration is listed as below.

Electricity Meter	Main meter M1	Backup Meter M2
Mode	MK6E	MK6E
Accuracy class	0.2s	0.2s
Serial Number	210140205	210140204
Calibration frequency	Annually	Annually
Calibration date	15/10/2019	15/10/2019
	15/10/2020	15/10/2020
	15/10/2021	15/10/2021
Calibration validity	14/10/2020	14/10/2020
	14/10/2021	14/10/2021
	14/10/2022	14/10/2022

The meters were calibrated by Gansu Electric Power Company Energy Measurement Center. Calibration records and accreditation certificates /12//13/ have been verified by the verification team. The accuracy of meters is complied with that in the monitoring plan contained in the registered CDM PDD (version 02 dated 21/05/2013). By checking the applicable industrial metering configuration standard "Technical Administrative Code of Electric Energy Metering" /14/, CTI can confirm that the accuracy level of all meters meets the requirement stipulated in this standard. CTI can thus confirm that the accuracy of the meters is in line with the monitoring plan contained in the registered CDM PDD (version 02 dated 21/05/2013) and relevant industry standard.

In the monitoring plan contained in the registered CDM PDD (version 02 dated 21/05/2013), it stated that the meters will be calibrated and checked annually for accuracy. By checking the calibration reports, CTI found the calibration frequency of these meters is annual, which is in line with the applicable calibrating standard "Technical Administrative Code of Electric Energy Metering" /14/. Hence, CTI can confirm that the meters' calibration frequency is in line with the monitoring plan contained in the registered CDM PDD (version 02 dated 21/05/2013) and relevant industry standard, and the calibrations of meters are verified to be valid for the whole reporting period.

✓ **Data management and control**

Gansu Heihe Hydropower New Energy Development Co., Ltd. is responsible for operation and routine maintenance of power plant under the project activity. The quality assurance and quality control procedures have been addressed in the VER project management and monitoring manual /4/, including the organization structure with the responsibilities, personnel competencies, monitoring procedures and monitoring management. By interview with the staff and check records /4/-/6/ during

on-site visit, it can be confirmed that the monitoring management system is implemented following the project management and monitoring manual.

All monitoring devices have been calibrated and maintained periodically to ensure the accuracy of measurement. Calibration records of instruments used in measurements were made available during the verification visit and found to be valid for the entire period of the verification. Competence and training records of in-plant personnel engaged in measurement of plant parameters were presented during verification and found to be in order.

Emission reduction calculation

CTI confirms that appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed, and the assumptions, emission factors and default values that are applied in the calculation have been justified.

According to the applied methodology, the emission reductions are determined as the difference between the baseline emissions, project emissions and leakage:

$$ER_y = BE_y - PE_y - LE_y$$

✓ Baseline emissions

As per registered CDM PDD, Baseline emissions were calculated as follows:

$$BE_y = EG_{\text{facility},y} * EF_{\text{grid,CM},y} = (EG_{\text{export},y} - EG_{\text{import},y}) * EF_{\text{grid,CM},y}$$

Where:

BE_y = Baseline emissions in year y (tCO₂e/y);

$EG_{\text{facility},y}$ = Quantity of net electricity generation supplied by the project plant to the grid in year y (MWh);

$EG_{\text{export},y}$ = Quantity of electricity supplied by the project to the grid (MWh);

$EG_{\text{import},y}$ = Quantity of electricity delivered to the project from the grid (MWh);

$EF_{\text{grid,CM},y}$ = Combined margin CO₂ emission factor for Northwest China Power Grid in year y (tCO₂e/MWh).

$EF_{\text{grid,CM},y}$ is the Combined margin CO₂ emission factor for Northwest China Power Grid which has been verified ex-ante in the validation stage in the registered CDM PDD (version 02 dated 21/05/2013) /10/ as 0.8784 tCO₂e/MWh.

During this monitoring period, BE_y is calculated as:

Period		EG _{export,y} (MWh)			EG _{import,y} (MWh)			EG _{facility,y} (MWh)
		MRRs from main meter M1	Sales Receipts	Data For Calculation	MRRs from main meter M1	Purchase Receipts	Data For Calculation	EG _{export,y} - EG _{import,y}
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

Year	EG _{facility,y} (MWh)	EF _{grid,CM,y} (tCO ₂ e/MWh)	BE _y (tCO ₂ e) BE _y = EG _{facility,y} * EF _{grid,CM,y}
	G	H	I=Rounddown(G*H)
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
In total	116,081.640	/	101,965

✓ **Project emissions**

As statement in the registered CDM PDD, for the solar power activities, the project emissions from the project is zero. Hence, PE_y during the monitoring period from the project activity is zero.

✓ **Leakages**

Leakage does not need to be counted this project as per the registered CDM PDD and ACM0002 Version 13.0.0.

✓ **Emission reductions**

The emission reductions for this monitoring period was calculated as:

Monitoring period	GHG emission reductions or removals (tCO ₂ e)
01/07/2020 - 31/12/2020	31,981
01/01/2021 - 31/12/2021	69,984
Total ERs claimed (in 549 days)	101,965

Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered CDM PDD

The emission reductions claimed are 101,965 tCO₂e in this monitoring period (i.e. 549 days). by checking the IRR calculation sheet that is public available on EB website, it is confirmed that 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). Therefore, the estimated emission reduction in the monitoring period (covering 549 days) is 97,219 tCO₂e [(37,034.258 MWh + 73,643 MWh) * 0.8784 tCO₂e/MWh]. Compared with the expected emission reductions 97,219 tCO₂e, the reported emission reductions in this monitoring period are 4.88% more than the expected.

By checking the sensitivity analysis in the registered CDM PDD, it is confirmed that when the electricity generation increased by 10.81%, the IRR will reach the benchmark. Therefore, CTI Verification Team confirmed that the fluctuation of emission reductions in this monitoring period will not impact the additionality of the project activity.

In conclusion, CTI is able to confirm that the actual power supply and also emission reductions reported in this monitoring period are reasonable and appropriate. CTI verified the input data for calculating

emission reductions and the calculating process, and confirmed the result were complete and transparent.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

All necessary documentations are collected, referenced and aggregated, which is easily accessible in hard-copy or electronic format. Measurements are performed by calibrated equipment, and the key data can also be cross-checked via other sources, such as records, receipts and inventory data. No assumptions are used that have any material influence on reported emission reductions.

CTI concludes that during this monitoring period, the evidences for determination of emission reductions are sufficient and reasonable, and the calculation of emission reductions is reliable.

4.6 Non-Permanence Risk Analysis

The project is not AFOLU project, and thus non-permanence risk analysis is not applicable for the project.

5 VERIFICATION CONCLUSION

Shenzhen CTI International Certification Co., Ltd (CTI) has performed the verification of the emission reductions that have been reported for the project activity “Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project” in China (VCS Project ID: 1453) for the period 01/07/2020 to 31/12/2021.

The verification is based on the baseline and monitoring methodology ACM0002 (Version 13.0.0), Registered CDM PDD (version 02 dated 21/05/2013) and the monitoring report (version 2.1 dated 09/09/2022). The verification consisted of the following three phases:

- i) desk review of the project design and the baseline and monitoring plan;
- ii) follow-up interviews with project stakeholders;
- iii) resolution of outstanding issues and the issuance of the final verification and certification report.

The project proponents are responsible for the collection, calculation and determination of the GHG data in accordance with the monitoring plan and the reporting of GHG emission reductions on the basis set out within the project monitoring report.

Our verification approach was based on the requirements as defined under the applicable VCS version 4.2 and relevant UNFCCC requirements. Our approach is risk-based, drawing on an understanding of

the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the project is implemented and operated as per registered CDM PDD;
- the monitoring plan contained in the registered CDM PDD (version 02 dated 21/05/2013) is as per the applied methodology;
- the monitoring complies with the monitoring plan contained in the registered CDM PDD (version 02 dated 21/05/2013);
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS version 4.2 and CDM requirements;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.

It is CTI's responsibility to provide an independent verification statement on the reported GHG emission reductions for the project. Based on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these, CTI planned and performed our work to obtain the information and explanations that we considered necessary to provide reasonable assurance that reported GHG emission reductions are fairly stated.

CTI does not assume any responsibility towards the issuance and utilization of the VCU's hereby verified and certified. Request for issuance of VCU's shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration.

The verification of reported emission reductions is based on the information made available to CTI and the engagement conditions detailed in this report. CTI cannot be held liable by any party for decisions made or not made based on this report.

In CTI's opinion the GHG emissions reductions of the "Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project" for the period 01/07/2020 to 31/12/2021 are fairly stated in the monitoring report (version 2.1 dated 09/09/2022). The GHG emission reductions were calculated correctly on the basis of the approved methodology ACM0002 (Version 13.0.0) and the registered CDM PDD (version 02 dated 21/05/2013).

CTI can confirm that the GHG emission reductions are calculated without material misstatements. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, CTI confirms the following statement:

Verification period: From 01/07/2020 to 31/12/2021

Verified GHG emission reductions and removals in the above verification period:

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

Zhang Lei

Mr. Zhang Lei

Team Leader

06/09/2022

Shunrong Lin

Ms. Lin Shunrong

Technical Reviewer

06/09/2022

APPENDIX A: ABBREVIATIONS

CAR	Corrective Action Request
CER	Certified Emission Reduction(s)
CL	Clarification request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
CTI	Shenzhen CTI International Certification Co., Ltd
DOE	Designated Operational Entity
EF	Emission Factor
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
MP	MONITORING REPORT
MR	Monitoring Report
NWCPG	Northwest China Power Grid
PD	Project Description
PP	Project Proponent
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit

APPENDIX B: REFERENCES

Documentation used to verify the information provided by the project proponents

- /1/ Climate Bridge (Shanghai) Ltd.: VER/VCU Monitoring Report for Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project, version 1.0 dated 21/04/2022, version 2.0 dated 02/06/2022, version 2.1 dated 09/09/2022.
- /2/ Climate Bridge (Shanghai) Ltd.: Emission reduction calculation spreadsheet for Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project
- /3/ Gansu Heihe Hydropower New Energy Development Co., Ltd. and local Electric Power Company: Power Purchase Agreement for Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project.
- /4/ Gansu Heihe Hydropower New Energy Development Co., Ltd.: VER monitoring manual and management procedure.
- /5/ Gansu Heihe Hydropower New Energy Development Co., Ltd.: Records of training for on-site staff.
- /6/ Gansu Heihe Hydropower New Energy Development Co., Ltd.: Operation log sheets, from 01/07/2020 to 31/12/2021.
- /7/ Gansu Heihe Hydropower New Energy Development Co., Ltd.: Monthly reading records (MMRs) of Gansu Ganzhou District Nantan Phase I 50MWp Solar Photovoltaic Power Project from 01/07/2020 to 31/12/2021.
- /8/ Local Electric Power Company: Monthly Electricity Sales Receipts from 01/07/2020 to 31/12/2021.
- /9/ Local Electric Power Company: Monthly Electricity Purchase Receipts from 01/07/2020 to 31/12/2021.
- /10/ Gansu Heihe Hydropower New Energy Development Co., Ltd.: nameplate of the equipment.
- /11/ Staff Roaster
- /12/ Gansu Provincial Bureau of Quality and Technical Supervision: Accreditation certificate of Gansu Electric Power Company Energy Measurement Center valid till 28/09/2022.
- /13/ Gansu Electric Power Company Energy Measurement Center: Calibration certificates for meters covering this monitoring period.
- /14/ State Economic and Trade Commission: Technical administrative code of electric energy metering.
- /15/ UNFCCC Website: the registered CDM PDD, version 02 dated 21/05/2013.

- /16/ China Quality Certification Centre (CQC): the Validation Report for registered CDM PDD dated 17/06/2013.
- /17/ Verra Website: the registered VCS PD, version 02 dated 02/06/2015.
- /18/ TÜV NORD CERT GmbH: the Validation Report for registered VCS PD dated 02/06/2015.
- VERRA Website: VER/VCU Monitoring Report for Gansu Ganzhou District Nantan Phase I
- /19/ 50MWp Solar Photovoltaic Power Project of monitoring period 20/12/2012 to 19/12/2018, 20/12/2018 to 30/06/2020.
- VERRA Website: Final Verification Report of VER/VCU Monitoring Report for Gansu Ganzhou
- /20/ District Nantan Phase I 50MWp Solar Photovoltaic Power Project of monitoring period 20/12/2012 to 19/12/2018, 20/12/2018 to 30/06/2020.
- /21/ “Notice on Strengthening Enterprise Greenhouse Gas Emission Report Management” issued by National Development and Reform Committee of P.R.China
- /22/ “List of key emissions in the national carbon emissions transaction quota management in 2019-2020” issued by Ministry of Ecology and Environment of P.R.China
- /23/ Declaration about no double counting

Methodologies, tools and other guidance

- /24/ Verified Carbon Standard: VCS Standard, version 4.2.
- /25/ Verified Carbon Standard: VCS Program Guide, version 4.1.
- /26/ Verified Carbon Standard: Registration and Issuance Process, version 4.0.
- /27/ UNFCCC EB: Approved methodology, ACM0002, Version 13.0.0

APPENDIX C: CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS

Table 1: Clarification Requests

CL ID	Clarification Request	Response by Project Proponent	Verification Team Assessment
01	NA	NA	NA

Table 2:Corrective Action Requests

CAR ID	Corrective Action Request	Response by Project Proponent	Verification Team Assessment
01	As per “VCS-Monitoring-Report-Template-v4.1”, please provide evidences of the project’s SD contributions in appendix of the monitoring report.	The related evidence has been provided in the revised monitoring report.	The evidences of the project’s SD contributions have been supplemented in appendix of the monitoring report and verified by CTI to be correct. Therefore, CL01 was closed.

CAR ID	Corrective Action Request	Response by Project Proponent	Verification Team Assessment
02	The actual emission reduction is 4.88% more than that estimated. Please supplement the impact on additionality of increasing emission reductions.	According to the IRR calculation sheet , 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	By checking the sensitivity analysis in the registered CDM PDD, it is confirmed that when the electricity generation increased by 10.81%, the IRR will reach the benchmark. Therefore, CTI Verification Team confirmed that the fluctuation of emission reductions in this monitoring period will not impact the additionality of the project activity. Therefore, CAR 01 was closed.

CAR ID	Corrective Action Request	Response by Project Proponent	Verification Team Assessment
		does not influent the project additionality.	

Table 3: Forward Action Requests

FAR ID	Forward Action Request	Response by Project Proponent	Verification Team Assessment
NA	NA	NA	NA