



VCS VERIFICATION REPORT
SHANDAN DONGLE BEITAN 50MW
SOLAR POWER GENERATION PROJECT
(VCS PROJECT ID: 1362)



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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 "Shandan Dongle Beitan 50MW Solar Power Generation Project" (VCS Project ID: 1362) for the monitoring period 28/10/2019 to 31/10/2020, 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 4.0.

The verification was performed on the basis of VCS Programme Guide version 4.0 and VCS Standard version 4.0 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 1 CL, no CAR or FAR in this monitoring period.

In CTI's opinion, the GHG emission reductions reported for the project in the monitoring report (version 2.0 dated 11/12/2020) are fairly stated. The GHG emission reductions were calculated correctly on the basis of approved methodology ACM0002 "Grid-connected electricity generation from renewable sources" (Version 15.0) and the monitoring plan contained in the registered PD version 2 dated 14/10/2014.

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 "Shandan Dongle Beitai 50MW Solar Power Generation Project" during the period amount to 67,894 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 "Shandan Dongle Beitan 50MW Solar Power Generation Project" (the project) for the period 28/10/2019 to 31/10/2020. 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 "Shandan Dongle Beitan 50MW Solar Power Generation Project" for the period 28/10/2019 to 31/10/2020.

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 4.0) /17/
- VCS Standard (version 4.0) /16/ and other relevant requirements defined by VERRA;

- The approved methodology ACM0002 (Version 15.0) /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% with respect to omission or misstatements concerning reported quantities as per VCS standard.

1.4 Summary Description of the Project

Sectoral Scope and Project Type

According to the VCS Program Guide (version 4.0) /17/, 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:	Shandan Dongle Beitan 50MW Solar Power Generation Project
Project proponent:	Shandan Xiehe Solar Power Generation Co., Ltd. (China)
Project location:	Dongle Beitan, Shandan County, Zhangye City, Gansu Province of China
VCS Project ID:	1362
Applied methodology:	ACM0002 (Version 15.0)
VCS project crediting period:	28/12/2013 to 27/12/2023 (the first VCS crediting period).
VCU verification period:	28/10/2019 to 31/10/2020

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 4.0) 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	Wang Guolian	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/, Registered PD (version 2 dated 14/10/2014) /10/, emission reduction calculation spreadsheet /2/, the following documents also were assessed as a part of the verification audit:

- the Validation Report /14/;

- Baseline and monitoring methodology ACM0002 applied by the project /27/;
- Relevant decisions, clarifications and guidance from the VERRA /18/-/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 07/12/2020, CTI visited Shandan Xiehe Solar Power Generation Co., Ltd. performed on-site assessment. The key personnel of the project were interviewed or assisted the verification team /28/. 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 /28/ are summarized in the table below:

Interviewed personnel	Role	Organization	Subject
Mr. Zhu Hongde	Plant Director	Shandan Xiehe Solar Power Generation Co., Ltd.	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; Data collection and ER calculation.
Ms. Ding Yanling	Duty Director	Shandan Xiehe Solar Power Generation Co., Ltd.	
Mr. Liu Hai	Staff	Shandan Xiehe Solar Power Generation Co., Ltd.	
Mr. Shan Bin	Technical Manager	Shandan Xiehe Solar Power Generation Co., Ltd.	
Ms. Chen Genrong	Project Manager	Climate Bridge (Shanghai) Ltd.	

2.4 Site Inspections

The verification team performed the on-site verification (southwest of Dongle Beitao, Shandan County, Zhangye City, Gansu Province of China) on 07/12/2020. 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 VCS PD for the project activity;
- 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 monitoring plan in the VCS PD;
- 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 VCS PD 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 Shandan Xiehe Solar Power Generation 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 15.0), 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 no CAR, 1 CL 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 /16/, and no FAR was raised during this verification.

2.6 Eligibility for Validation Activities

The project was validated by TÜV NORD CERT GmbH on 19/10/2014 against Voluntary Carbon Standard version 3.4 during the validation /14/. The first periodic verification was carried out by LGAI Technological Center, S.A. (Applus+ Certification) on 05/12/2019 against Voluntary Carbon Standard version 4.0. The proposed monitoring period 28/10/2019 to 31/10/2020 is 2nd verification, and CTI just undertook verification activities for the project according to the VCS Program Guide. This section is thus not applicable.

3 VALIDATION FINDINGS

The project was validated by TÜV NORD CERT GmbH on 19/10/2014 against VCS Standard version 3.4 during the validation/14/.

3.1 Participation under Other GHG Programs

The project was validated by TÜV NORD CERT GmbH on 19/10/2014 against VCS Standard version 3.4 during the validation/14/, and CTI only performed verification activities on the proposed monitoring period for the project according to the VCS Program Guide.

3.2 Methodology Deviations

The validation process /14/ has assessed all factors and issues that constitute the basis for emission reductions from the project according to the applicable CDM methodology ACM0002 (Version 15.0) /27/. There was not any methodology deviation applied to this project. Details refer to section 4.1.

3.3 Project Description Deviations

There were not project description deviations identified by CTI to this monitoring period. The verification team assessed through visual inspection and document review that all physical features of the proposed project activity including data monitoring, reporting and collecting systems have been implemented in accordance with the monitoring plan included in the registered PD /10/ (version 2 dated 14/10/2014). Details refer to section 4.1.

3.4 Grouped Project

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

4 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the “Shandan Dongle Beitan 50MW Solar Power Generation Project” for the period 28/10/2019 to 31/10/2020.

4.1 Project Implementation Status

Project Implementation in accordance with the registered project design document

The project is a grid-connected photovoltaic power plant, which is located in Dongle Beitan, Shandan County, Zhangye City, Gansu Province of China. The installed capacity of the project activity is 50 MWp, consisting of 3,014 sets of polycrystalline silicon modules with unit capacity of 245 W (type: TW245P660), 44,273 sets of polycrystalline silicon modules with unit capacity of 245 W (type: DHP60-245) and another 153,658 sets of polycrystalline silicon modules with unit capacity of 250 W (type: JKM250P-60). The average annual power delivered to the grid by the project is expected to be 75,564.33 MWh in the first 10 years. The actual implementation of the project during this verification period was verified in terms of name plate capacities of each solar turbine and monitoring equipment. The details of the solar turbines with respect to installation and capacity have been verified to be consistent with description indicated in the registered PD. The commissioning date was 28/12/2013 verified by site visit interview, checking validation report and verification report of 1st monitoring period. /14//16/. The electricity generated by the project activity was supplied to the Northwest Power Grid (NWPG), which can be confirmed by the Power Purchase Agreement (PPA) signed between Shandan Xiehe Solar Power Generation Co., Ltd. and State Grid Gansu Electric Power Co., Ltd /3/.

The project start date was identified as 28/12/2013 when the project started to operate and began generating GHG emission reductions. According to VCS Standard 3.4, the project crediting period under VCS Version 03 shall be deemed as 10 years and commences at the specific project crediting period start date. The project was validated by TÜV NORD CERT GmbH on 19/10/2014 against VCS Standard version 3.4 and the starting date of the crediting period was chosen by the project proponent as 28/12/2013. Hence, the crediting period of the project is from 28/12/2013 to 27/12/2023. The selected monitoring period 28/10/2019 to 31/10/2020 is the 2nd monitoring period of the project, which is within the crediting period 28/12/2013 to 27/12/2023.

All the monitoring system in operation period is consistent with the description in the

registered PD and monitoring plan. The control system at the power plant is automated and assures continuous operation, including monitoring on malfunction of equipment. By checking the daily operation and maintenance records /6/, CTI can confirm that no serious malfunction happened and the plant was under a normal operation as expected in this monitoring period.

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 /28/ and observing the operation.

As part of the site visit, CTI confirms that the project implementation is in accordance with the project description contained in the registered PD (version 2 dated 14/10/2014) and monitoring plan. The verification team confirmed through visual inspection and document review that all physical features of the proposed project activity including data collection systems and storage systems have been implemented in accordance with the registered PD (version 2 dated 14/10/2014) and monitoring plan.

Compliance of monitoring plan with monitoring methodology

CTI is able to confirm that the monitoring plan in the registered PD (version 2 dated 14/10/2014) is in accordance with the approved methodology applied by the project activity, i.e. ACM0002 (Version 15.0).

Compliance of monitoring with the monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the registered PD (version 2 dated 14/10/2014). 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 15.0) 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 is further verified in the following sections.

Parameters monitored

According to the VCS PD, there is three monitoring parameters of the project in the the registered PD:

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

Electricity generated by this project is connected to the Beitan 110kV Substation through a 110kV transmission line and then sent to the Gansu power grid, which is part of the Northwest Power Grid (NWPG). Finally the electricity is supplied to the Northeast Power Grid (NWPG) of China.

Quantity of net electricity generation supplied by the project plant/unit to the grid in year y ($EG_{\text{facility},y}$) is calculated by following formula:

$$EG_{\text{facility},y} = EG_{\text{out},y} - EG_{\text{in},y}$$

$EG_{\text{out},y}$ is Quantity of the electricity delivered to the grid by the project and $EG_{\text{in},y}$ is Quantity of the electricity consumed by the project which is imported from the grid. For $EG_{\text{out},y}$ and $EG_{\text{in},y}$ are sourced from Meter Reading Records (MRRs) /7/ issued by the project developer, and Electricity Transaction Notes (ETNs) /8//9/ issued by power grid company covering monitoring period.

For $EG_{\text{out},y}$

2 bidirectional electricity meters (1 main meter M1 and 1 backup meter M1') installed on Beitan substation was measured continuously, recorded monthly and archived electronically. The cut-off time was 24:00 hr of 27th each month before April 2020 and 24:00 hr of last day each month after April 2020. At the cut-off time, the staff from project developer and the grid company read the electricity meter together. The project developer record electricity meter's readings and form Monthly Reading Records (MRRs) /7/. The staff from power grid company record electricity meter's readings and then transcribes the data into Electricity Transaction Notes (ETNs) /8/, then after the confirmation of the project developer for the ETNs, the project developer will issue the invoice.

For $EG_{\text{in},y}$

2 bidirectional electricity meters (1 main meter M1 and 1 backup meter M1') installed on Beitan substation was measured continuously, recorded monthly and archived electronically. The cut-off time was 24:00 hr of 27th each month before April 2020 and 24:00 hr of last day each month after April 2020. At the cut-off time, the staff from project developer and the grid company read the electricity meter together. The project developer record electricity meter's readings and form Monthly Reading Records (MRRs) /7/. The staff from power grid company record electricity meter's readings and then transcribes the data into Electricity Transaction Notes (ETNs) /9/, then after the confirmation of the project developer for the ETNs, the power grid company will issue the invoice.

As described above, the meters have been installed in accordance with the MP of Registered PD. CTI has on-site checked the location of the meters against the diagram of power connection system and found them to be consistent.

Data in the monthly reading records were used to the report, through a cross check with ETNs, and the conservative values from electricity export and import were applied to calculate the net electricity supplied to the grid by the project. 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 the net electricity supplied to the grid by the project 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.

Meter	Serial Number	Type	Accuracy Class	Calibration Frequency	Calibration Date	Validity	Calibration Entity
M1 (main meter)	213211573	MK6E	0.2S	Annually	03/12/2018	02/12/2019	Electric energy Measuring and Testing centre of Gansu Electric Power Science Research Institute /11/ /12/
					03/12/2019	02/12/2020	
M1' (backup meter)	213211574	MK6E	0.2S	Annually	03/12/2018	02/12/2019	
					03/12/2019	02/12/2020	

Calibration records and accreditation certificates /11//12/ have been verified by the verification team. In the registered PD, the accuracy of meters are no less than 0.5. By checking the industrial metering configuration standard "Technical Administrative Code of Electric Energy Metering (DL/T 448-2016)" /13/, CTI can confirm that the accuracy level of all meters meet the requirement stipulated in this standard. CTI can thus confirm that the accuracy of the meters is in line with the monitoring plan of the registered PD and relevant industry standard.

In the registered PD, 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 calibrating standard "Technical Administrative Code of Electric Energy Metering (DL/T 448-2016)" /13/. Hence, CTI can confirm that the meters' calibration frequency is in line with the monitoring plan of the registered PD and relevant industry standard, and the calibrations of meters are verified to be valid for the whole reporting period.

Data management and control

Shandan Xiehe Solar Power Generation 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 /28/ 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.

The emission reduction resulted from the project during this monitoring period would apply for VCUs. There are no other forms of environmental credits applied or issued for the project activity. Therefore, the project has not been participated or been rejected under any other GHG programs since validation or previous verification.

The project would contribute to sustainable development in as below:

- Reducing greenhouse gas emissions compared to a business-as-usual scenario;
- Displacing the power generation of fossil fuel power plants, reducing CO₂, SO_x and NO_x emissions significantly, thus mitigating the air pollution and its adverse impacts on human health;
- Providing clean and renewable energy source, and help to improve energy supply security;
- Promoting application and diffusion of the innovative/creative solar PV technology in China through the demonstrative practice of the project activity.

The technical parameters have been verified with the nameplates /17/ as below:

Photovoltaic Modules (Polysilicon)			
Manufacturer	Tianwei New Energy (Yangzhou) Co., Ltd.	Shandong Dahai Group Co., Ltd.	Jinko Solar Holding Co., Ltd.
Quantity	3,014	44,273	153,658
Type	TW245P660	DHP60-245	JKM250P-60
Rated maximum power (Pmax)	245 W	245 W	250 W
Maximum power voltage	30.0 V	31.00 V	30.4 V

(Vmp)			
Maximum power current (Imp)	8.17 A	7.90 A	8.23 A
Open circuit voltage (Voc)	37.2 V	37.35 V	37.6 V
Short circuit current (Isc)	8.74 A	8.56 A	8.81 A
Lifetime	25 years	25 years	25 years
Inverter			
Manufacturer	Sungrow Power Supply Co., Ltd		
Quantity	100		
Type	SG500MX		
Rated power	500 kW		
Rated output voltage	3-315 V		
Max output current	1,008 A		
Lifetime	25 years		
Box transformer			
Manufacturer	Jiangsu Huapeng Transformer Co., Ltd.		
Quantity	50		
Type	ZGSF11-Z.G-1100/35		
Rated power	1100/550 - 550 kVA		
Rated voltage	38.5±2×2.5%/0315 - 0.315 kV		
Rated current	16.5/1008.1 – 1008.1 A		
Rated frequency	50 Hz		
Lifetime	25 years		

The verification team confirmed that there is no proposed or actual change to the Registered PD during this monitoring period. All required equipments and procedures are available and implemented in an appropriate manner. All necessary monitoring instruments are installed. All required instruments including standby and operating procedures for the same have been implemented in an appropriate manner. The project is completely operational and the same has been confirmed on-site. Neither mistakes nor malfunction on main meters have been observed during this monitoring period.

4.2 Safeguards

4.2.1 No Net Harm

By checking the EIA summary and conclusion provided in the registered PD, 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

The local stakeholder's meeting was held in Dongle Beitan, Shandan County Sep 2013. 30 participants attended the meeting including local residents, builders and members of the local authorities. The project developer introduced the proposed project, and then a survey was arranged through a one-page questionnaire, which was designed to be easily filled in. The opinions expressed by the stakeholders were recorded and are available on request.

The stakeholder meeting and the survey showed that the proposed project receives strong support from the local community. They all believe the proposed project will promote local economic development and agree with the project development and construction.

Communications with Local stakeholders was being carried out at periodic intervals. There are no negative comments received for the project.

All such conclusion has been verified through site visit and check registered Registered PD.

4.3 AFOLU-Specific Safeguards

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

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

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:

$$ER_y = BE_y - PE_y$$

Baseline emissions

The baseline reductions are determined as multiplying Quantity of net electricity generation supplied by the project plant/unit to the grid in year y ($EG_{facility,y}$) by the validated ex-ante fixed grid emission factor ($EF_{grid,CM,y}$):

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

Grid emission factor ($EF_{grid,CM,y}$)

EF is the grid emission factor of the which has been verified ex-ante in the validation stage in the registered PD (version 2 dated 14/10/2014) as 0.8568 tCO₂e/MWh.

Quantity of net electricity generation supplied by the project plant/unit to the grid in year y ($EG_{facility,y}$)

$EG_{facility,y}$ is the quantity of net electricity generation supplied by the project plant/unit to the grid in year y, which is calculated by following formula:

$$EG_{facility,y} = EG_{out,y} - EG_{in,y}$$

$EG_{out,y}$ is Quantity of the electricity delivered to the grid by the project in year y which is determined by readings of main meter M1. $EG_{in,y}$ is Quantity of the electricity consumed by the project which is imported from the grid in year y which is determined by the readings of main meter M1. Data in the ETNs were used to cross-checked with that in the Monthly Reading Records (MRRs). The most conservative values have been applied to calculate the electricity delivered to and consumed from the grid by the project.

Quantity of the electricity delivered to the grid by the project in year y (MWh):

Monitoring period	$EG_{out,y}$ (MWh)		
	A (MRRs)	B (ETNs)	C=min(A,B)
28/10/2019~27/11/2019	6,207.679	6,207.679	6,207.679
28/11/2019~27/12/2019	6,043.875	6,043.875	6,043.875
28/12/2019~31/12/2019	689.436	6085.471*	689.436
01/01/2020~27/01/2020	5,396.035		5,396.035
28/01/2020~27/02/2020	6,742.883	6,742.883	6,742.883
28/02/2020~27/03/2020	7,008.823	7,008.823	7,008.823
28/03/2020~30/04/2020	7,980.424	7,980.424	7,980.424
01/05/2020~31/05/2020	6,852.546	6,852.546	6,852.546
01/06/2020~30/06/2020	6,431.446	6,431.446	6,431.446
01/07/2020~31/07/2020	6,470.090	6,470.090	6,470.090
01/08/2020~31/08/2020	6,746.813	6,746.813	6,746.813
01/09/2020~30/09/2020	6,924.326	6,924.326	6,924.326
01/10/2020~31/10/2020	6,867.467	6,867.467	6,867.467
Total	80,361.843	80,361.843	80,361.843

*Note: since before April 2020, the cut-off time was 27th of every month. This data was the total quantity of electricity delivered to the grid by the project in the period of 28/12/2019~31/12/2019 and 01/01/2020~27/01/2020. This data was used to crosscheck the sum of data recorded in MRRs of period 28/12/2019~31/12/2019 and 28/01/2020~27/02/2020.

Quantity of the electricity consumed by the project which is imported from the grid in year y (kWh):

Monitoring period	EG _{in,y} (MWh)		
	D (MRRs)	E (ETNs)	F=max(D,E)
28/10/2019~27/11/2019	108.240	108.240	108.240
28/11/2019~27/12/2019	117.480	117.480	117.480
28/12/2019~31/12/2019	13.332	100.32*	13.332
01/01/2020~27/01/2020	86.988		86.988
28/01/2020~27/02/2020	116.160	116.160	116.160
28/02/2020~27/03/2020	95.040	95.040	95.040
28/03/2020~30/04/2020	84.480	84.480	84.480
01/05/2020~31/05/2020	71.280	71.280	71.280
01/06/2020~30/06/2020	69.960	69.960	69.960
01/07/2020~31/07/2020	66.000	66.000	66.000
01/08/2020~31/08/2020	75.240	75.240	75.240
01/09/2020~30/09/2020	81.840	81.840	81.840
01/10/2020~31/10/2020	133.320	133.320	133.320
Total	1,119.360	1,119.360	1,119.360

*Note: since before April 2020, the cut-off time was 27th of every month. This data was the total quantity of electricity delivered to the grid by the project in the period of 28/12/2019~31/12/2019 and 01/01/2020~27/01/2020. This data was used to crosscheck the sum of data recorded in MRRs of period 28/12/2019~31/12/2019 and 01/01/2020~27/01/2020.

Hence, the Quantity of net electricity generation supplied by the project plant/unit to the grid during the monitoring period was calculated conservatively as:

$$EG_{\text{facility},y} = EG_{\text{out},y} - EG_{\text{in},y} = 80,361.843 - 1,119.360 = 79,242.483 \text{ MWh}$$

And the corresponding baseline emission reductions are calculated as:

$$BE_y = EG_{\text{facility},y} \times EF_{\text{grid,CM},y} = 79,242.483 \times 0.8568 = 67,894 \text{ tCO}_2\text{e}$$

Project emissions

As statement in the registered PD, for the solar power activities, the project emissions from the project is zero. Hence, PE_y during the monitoring period from Shandan Dongle Beitan 50MW Solar Power Generation Project is zero.

Leakages

Leakage does not need to be accounted for this project as per the registered PD.

Emission reductions

The emission reductions for this monitoring period was calculated as:

Monitoring period	GHG emission reductions or removals (tCO ₂ e)
28/10/2019~31/12/2019	10,883
01/01/2020~31/10/2020	57,011
Total ERs claimed (in 370 days)	67,894

Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in validated VCS PD

The emission reductions claimed are 67,894 tCO₂e in this monitoring period (i.e. 370 days). Compared with yearly expected emission reductions 65,630 tCO₂e (calculated as 64,743 tCO₂e/365 days*370 days) in the registered PD, the reported emission reductions in this monitoring period are 3.45% higher than the expected, which is considered to be in the reasonable variation range.

Moreover, when considering the total amount of actual annual electricity generation in the 1st and this (2nd) monitoring period, it can be found:

Monitoring period	Actual emission reductions (tCO ₂ e)	Estimated emission reductions in the registered GS PDD (tCO ₂ e)	Difference
1st monitoring period, 2130 days (28/12/2013 to 27/10/2019)	299,774	377,815	-20.65%
2 nd monitoring period, 370 days (28/10/2019 to 31/10/2020)	67,894	65,630	+3.45%
Total	367,668	443,445	-17.09%

From the above table, it can be found that the emission reductions generated in the two monitoring periods in the crediting period is 367,668 tCO₂e, which is 17.09% lower than that estimated in the registered PD /10/ /14/ /16/. Therefore, CTI confirmed that the actual emission reductions in this monitoring period, which is 3.45% higher than that estimated, will not impact the additionality of the project activity.

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 "Shandan Dongle Beitan 50MW Solar Power Generation Project" in China (VCS Project ID: 1362) for the period 28/10/2019 to 31/10/2020.

The verification is based on the baseline and monitoring methodology ACM0002 (Version 15.0), the registeted PD (version 2 dated 14/10/2014) and the monitoring report (version 2.0 dated 11/12/2020). 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 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 the registered PD;
- the monitoring plan in registered Registered PD is as per the applied methodology;
- the monitoring complies with the monitoring plan in the registered PD;
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS Verion 4 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 "Shandan Dongle Beitan 50MW Solar Power Generation Project" for the period 28/10/2019 to 31/10/2020 are fairly stated in the monitoring report (version 2.0 dated 11/12/2020). The GHG emission reductions were calculated correctly on the basis of the approved methodology ACM0002 (Version 15.0) and the monitoring plan contained in the registered PD (version 2 dated 14/10/2014).

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:

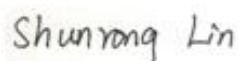
Verification period: From 28/10/2019 to 31/10/2020

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)
28/10/2019~31/12/2019	10,883	0	0	10,883
01/01/2020~31/10/2020	57,011	0	0	57,011
Total	67,894	0	0	67,894



Ms. Wang Guolian
Team Leader
12/12/2020



Ms. Lin Shunrong
Technical Reviewer
12/12/2020

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
ETN	Electricity Transaction Note
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
MP	MONITORING REPORT
MR	Monitoring Report
NWPG	Northwest 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 Shandan Dongle Beitan 50MW Solar Power Generation Project, version 1.0 dated 04/12/2020 and version 2.0 dated 11/12/2020.
- /2/ Climate Bridge (Shanghai) Ltd.: Emission reduction calculation spreadsheet for Shandan Dongle Beitan 50MW Solar Power Generation Project, version 2.0 dated 11/12/2020.
- /3/ Shandan Xiehe Solar Power Generation Co., Ltd. and State Grid Gansu Electric Power Co., Ltd: Power Purchase Agreement for Shandan Dongle Beitan 50MW Solar Power Generation Project.
- /4/ Shandan Xiehe Solar Power Generation Co., Ltd.: VER monitoring manual and management procedure.
- /5/ Shandan Xiehe Solar Power Generation Co., Ltd.: Records of training for on-site staff.
- /6/ Shandan Xiehe Solar Power Generation Co., Ltd.: Operation log sheets, from 28/10/2019 to 31/10/2020.
- /7/ Shandan Xiehe Solar Power Generation Co., Ltd.: Monthly reading records (MMRs) of electricity imported and exported by Shandan Dongle Beitan 50MW Solar Power Generation Project from 28/10/2019 to 31/10/2020.
- /8/ State Grid Gansu Electric Power Co., Ltd: Monthly electricity transaction notes of electricity delivered to the grid, from 28/10/2019 to 31/10/2020.
- /9/ State Grid Gansu Electric Power Co., Ltd: Monthly electricity transaction notes of electricity imported from the grid, from 28/10/2019 to 31/10/2020.
- /10/ Climate Bridge (Shanghai) Ltd.: the registered PD, version 2 dated 14/10/2014
- /11/ Gansu Provincial Quality and Technical Supervision Bureau: Accreditation certificate of Measurement Center of State Grid Gansu Electric Power Co., Ltd , issued on 22/09/2018, valid till 28/09/2022.
- /12/ Measurement Center of State Grid Gansu Electric Power Co., Ltd: Calibration

- certificates for meter M1 and M1' issued on 03/12/2018 and 03/12/2019.
- /13/ State Economic and Trade Commission: Technical administrative code of electric energy metering (DL/T 448-2016).
 - /14/ TÜV NORD CERT GmbH: the Validation Report, version 01, dated 19/10/2014.
 - Climate Bridge (Shanghai) Ltd.: VER/VCU Monitoring Report for Shandan Dongle Beitau 50MW Solar Power Generation Project of previous monitoring period, version 3.0 dated 05/12/2019
 - /15/ LGAI Technological Center, S.A. (Applus+ Certification): Verification Report for Shandan Dongle Beitau 50MW Solar Power Generation Project of previous monitoring period, version 01.1 dated 05/12/2019
 - /16/ Shandan Xiehe Solar Power Generation Co., Ltd.: nameplate of the equipment
 - /17/

Methodologies, tools and other guidance

- /18/ Verified Carbon Standard: VCS Standard, version 4.0.
- /19/ Verified Carbon Standard: VCS Program Guide, version 4.0.
- Verified Carbon Standard: VCS Sectoral Scopes
- /20/ <http://v-c-s.org/node/448>
- /21/ Verified Carbon Standard: VCS Verification Representation, version 3.1.
- /22/ Verified Carbon Standard: VCS Validation Representation, version 3.1.
- /23/ Verified Carbon Standard: VCS Monitoring Report Template, version 3.3.
- /24/ Verified Carbon Standard: VCS Project Description Template, version 3.2.
- /25/ Verified Carbon Standard: VCS Verification Report Template, version 3.3.
- /26/ Verified Carbon Standard: Registration and Issuance Process, version 4.0.
- /27/ UNFCCC EB: Approved methodology, ACM0002, Version 15.0

Persons interviewed

- /28/ Mr. Zhu Hongde, Plant Director, Shandan Xiehe Solar Power Generation Co., Ltd.
- Ms. Ding Yanling Duty Director, Shandan Xiehe Solar Power Generation Co., Ltd.
- Mr. Liu Hai, Staff, Shandan Xiehe Solar Power Generation Co., Ltd.

Mr. Shan Bin, Technical Manager, Shandan Xiehe Solar Power Generation Co., Ltd.

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

Table 1: Corrective Action Requests

CAR ID	Corrective Action Request	Response by Project Proponent	Verification Team Assessment
NA	NA	NA	NA

Table 2: Clarification Requests

CL ID	Clarification Request	Response by Project Proponent	Verification Team Assessment
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01	Please clarify in detail the impact to additionality of the project activity when the emission reductions of this monitoring period are 3.45% higher than estimated.	During the second monitoring period from 28/10/2019 to 31/10/2020, the emission reductions are 3.45% higher than estimated. However, taking the first monitoring period from 28/12/2013 to 27/10/2019 into account, the whole emission reductions from 28/12/2013 to 31/10/2020 (covering 2,500 days) are 367,668 tCO ₂ e, which is 17.09% less than the estimated emission reductions 443,445 tCO ₂ e (64,743 tCO ₂ e*2,500days/365days). Thus, there is no impact to additionality of the project.	The total emission reductions generated in 1 st and this (2 nd) monitoring period in the crediting period (367,668 tCO ₂ e) is 17.09% lower than that estimated in the registered PD. Therefore, CTI confirmed that the actual emission reductions in this monitoring period, which is 3.45% higher than that estimated, will not impact the additionality of the project activity. Such content has been added in the PD, hence the CL is closed.
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Table 3: Forward Action Requests

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