VERIFICATION REPORT

THREE GORGES NEW ENERGY JIUQUAN CO., LTD GUAZHOU 100MW SOLAR POWER PROJECT

Document Prepared By TÜV NORD CERT GmbH

Project Title	Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project
Version	01
Report ID	8000452488 - 15/152

Report Title	VCS Verification Report for Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project
Client	Climate Bridge Ltd.
Pages	27
Date of Issue	06-10-2015
Prepared By	TÜV NORD CERT GmbH
Contact	TÜV NORD CERT GmbH JI/CDM Certification Program Langemarckstraße, 20 45141 Essen, Germany Phone: +49-201-825-3335 Fax: +49-201-825-3290 www.tuev-nord.de www.global-warming.de
Approved By	Rainer Winter

Work Carried Out By	Zhao Xuejiao(TL) Christina Stöhr (TR)

Summary:

The Climate Bridge Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the VCS verification of the project, Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project (PL1444) with regard to the relevant requirements of VCS standard version 3.5.

The proposed VCS project activity consistent of a newly built grid-connected photovoltaic power plant with installed capacity of 100MWp which is located in Solar Power Industry Zone, Guazhou County, Jingyuan City, Gansu Province of P. R. China. The electricity generated by solar cell module runs through a header box, then to dc-to-ac inverter, inverters are connected to 35kV box transformers, and then transformed to 110kV through the main transformer before delivered to Bulongji 330kV Substation and finally the power is fed into North West Power Grid of China (NWPG). The approved CDM methodology ACM0002 is applied to quantify the GHG removals achieved by this project. The project will help reduce GHG emissions generated from the high-growth, coal-dominated power generation.

Reporting period: From 30/12/2013 to 29/08/2015

In the course of the verification 1 Corrective Action Requests (CARs), 0 Clarification Requests (CLs) were raised and successfully closed.

The verification is based on the draft monitoring report, the monitoring plan as set out in the validated PD / GHG Report PD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As the result of this VCS verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period (30/12/2013 to 29/08/2015) as follows:

174,793 tCO_2e for period from 30/12/2013 to 29/08/2015.

Total Emission reductions 174,793 t CO_2 equivalents

ABBREVIATIONS

BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CL	Clarification Request
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
NWPG	North West Power Grid
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCS - PD	VCS - Project Description
VCU	Verified Carbon Unit
VT	Verification team

Table of Contents

1 INTRODUCTION

The Climate Bridge Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the project:

Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project

With regard to the relevant requirements of the Verified Standard version 3.5[/VCS/]. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered VCS-PD for the monitoring period 30/12/2013 to 29/08/2015.

The applied monitoring methodology is ACM0002 “Grid-connected electricity generation from renewable sources” (version 16.0).

1.1 Objective

The purpose of this verification, by independent checking of objective evidence, is as follows:

- to verify that the project is implemented as described in the project design document/GHG Report PD;
- to assess the implementation of the monitoring plan (MP) content in the VCS-PD;
- to assess the project’s compliance with other relevant rules, including the host country legislation;
- to confirm that the monitoring system is implemented and fully functional to generate verified emission reductions (VERs / VCUs) or ERs without any double counting; and
- to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification of this project is based on the validated project design document[/VCS-PD/] / GHG Report PD, the monitoring report[/MR/], GHG Report MR, emission reduction calculation spread sheet[/XLS/], supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The TÜV NORD JI/CDM CP has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

1.3 Level of Assurance

The verification has been planned and organized to achieve a

☒ Reasonable level of assurance

☐ Limited level of assurance

1.4 Summary description of the project

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity:	Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project
Monitoring Period Covered in this report	30/12/2013 to 29/08/2015
Project Participant	Three Gorges New Energy Jiuquan Co., Ltd.
Location of the project	Solar Power Industry Zone, Guazhou County, Jingyuan City, Gansu Province, P.R. China

The proposed project involves the installation of a grid-connected photovoltaic power plant. The total installed capacity of the grid connected photovoltaic power station is 100MW (100.39MWp of total solar cell modules) which form 100 sets of power generation units (sub-systems). Each of the power generation unit is equipped with 2 inverters (each inverter is 0.5MW). Each power generation unit is equipped with one 35kV box transformer (each box transformer is 1MW). About 399,459 polycrystalline silicon solar cells with fixed bracket were installed. The electricity to be generated will be sold to NWPG through Power Purchase Agreement[/PPA/]. The project will help reduce GHG emissions generated from the high-growth, coal-dominated power generation. The estimated annual GHG emission reductions are 126,206 tCO_2e. The project started construction on 22/09/2013 and was put into commercial operation on 30/12/2013 (i.e. the project start date) as stated in the VCS PD[/PD/].

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification of the project consisted of the following steps:

- Contract review,
- Appointment of team members and technical reviewers,
- Desk review of the Monitoring Report/MR/ submitted by the client and additional supporting documents,
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the Project developer and its contractors,
- Draft verification reporting,
- Resolution of corrective actions (if any),
- Final verification reporting,
- Technical review,
- Final approval of the verification

Table 2-1: Verification sequence

Topic	Time
Assignment of verification	2015-08-28
On-site visit	2015-09-22~23
Draft reporting finalised	2015-09-23
Final reporting finalised	2015-10-06
Technical review on final reporting finalised	2015-10-06
Final corrections	2015-10-06

Appointment of team members and technical reviewer

On the basis of a competence analysis and individual availabilities a verification team was appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 2-2 below.

Table 2-2: Involved Personnel

	Name	Company	Function [1)]	Qualification Status [2)]	Scheme competence [3)]	Technical competence [4)]	Verification competence [5)]	Host country Competence	On-site visit
☐ Mr. ☒ Ms.	Zhao Xuejiao		TL/ ETE		☒	1.2	☒	☒	☒
☐ Mr. ☒ Ms.	Christina Stöhr	TN Cert	TR [B)]	A	☒	1.2	☒	☐	-
☒ Mr. ☐ Ms.	Rainer Winter	TN Cert	FA [B)]	SA	☒	1.2	☒	☐	-

1) TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval
2) GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert
3) GHG auditor status (at least Assessor)
4) As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, …)
5) In case of verification projects
A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE
B) No team member

2.2 Document Review

The VCS PD[/PD/], GHG Report PD and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The references used in the course of this verification are summarized in section 7.

2.3 Interviews

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS/ISO 14064. During verification the verification team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews were summarized in Table 2-2.

Table 2-2: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Project Owner & Operations Personnel /IM01/ 2. Consultant /IM02/	• General aspects of the project • Technical equipment and operation • Changes since implementation • Monitoring and measurement equipment • Remaining issues from validation • Calibration procedures • Quality management system • Involved personnel and responsibilities • Training and practice of the operational personnel • Implementation of the monitoring plan • Monitoring data management • Data uncertainty and residual risks • GHG calculation • Procedural aspects of the verification • Maintenance • Environmental aspects • Editorial issues of the Monitoring Report

2.4 Site Inspections

As part of the verification, the following on-site inspections have been performed by members of the assessment team:

1. Assessment of the implementation and operation of the project activity as per the registered VCS PD,

2. Review of information flows for generating, aggregating and reporting the monitoring parameters,

3. Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the monitoring plan,

4. A cross-check between information provided in the monitoring report and data from other sources such as Electricity Balance Sheets /EBS/, Meter Readings /MRD/ and Emission Reduction Calculation Sheet /XLS/.

5. A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PD and the selected methodology,

6. Review of calculations and assumptions made in determining the GHG data and emission reductions,

7. Identification of quality control and quality assurance procedures in place to prevent or identity and correct any errors or omissions in the reported monitoring parameters.

2.5 Resolution of Findings

Material discrepancies identified in the course of the verification are addressed either as CARs, CLs or FARs.

A Corrective Action Request (CAR) is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for verification of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A Clarification Request (CL) will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

2.5.1 Forward Action Requests

A Forward Action Request (FAR) will be issued when certain issues related to project implementation should be reviewed during the first verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in the next section 4 of this report.

2.6 Eligibility for Validation Activities

N/A

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project is only registered under VCS program, not participated under any other GHG programs.

3.2 Methodology Deviations

There is no deviation to the methodology applied by the project.

3.3 Project Description Deviations

There is no deviation to project description of the project.

3.4 Grouped Project

N/A

4 VERIFICATION FINDINGS

In this section the assessments and findings from the desk review of the VCS PD / GHG Report PD, site visit, interviews and supporting documents as well as the final assessments are summarised. Table 4-1 includes an overview of all raised CARs, CLs and FARs.

Table 4-1: Overview of CARs, CLs and FARs issued

No.	Topic / Chapter	CAR	CL	FAR
4.1	Project implementation status	0	0	0
4.2	Accuracy of GHG emission reduction or Removal calculations	1	0	0
4.3	Quality of evidence to determine emission reductions or removals	0	0	0
4.4	Management and operational system	0	0	0
	SUM	1	0	0

4.1 Project Implementation Status

4.1.1 Implementation status of the project activity

Description

The monitoring period under verification is verified under VCS Standard Version 3.5.

Through the onsite visit, it has been confirmed that the project was implemented and the equipment were installed as indicated in the registered VCS PD/PD/. The project consists of only one site and is not implemented in phases. The construction of the project started on 22/09/2013 and commissioned on 30/12/2013. All 399,459 polycrystalline silicon solar cells with fixed bracket were installed. The electricity generated by solar cell module runs through a header box, then to dc-to-ac inverter, inverters are connected to 35kV box transformers, and then transformed to 110kV through the main transformer before delivered to Bulongji 330kV Substation and finally the power is fed into NWPG. It has been confirmed by the verification team through on-site visit that all physical features of the project activity proposed in the registered PD are in place. Through interviewing with the project proponent and reviewing the operation logs/LOG/, the project operated smoothly and normally during this monitoring period. No events or situations occurred during the monitoring period which may impact the applicability of the methodology.

Through reviewing the Power Purchase Agreement/PPA/, and line connection schematic of the electricity system of the solar power farm/PWD/, it is confirmed that the electricity generated by the project is supplied to the NWPG and the project boundary is consistent with the registered VCS PD. As per the registered VCS PD, there are no other sources of GHG emissions attributable to the project activity which has been verified through onsite visit and interview with

the project owner[/IM01/]. No fossil fuels were observed to be used for power generation by the project during this monitoring period.

The project owner has set up monitoring manual[/MM/] and other internal management procedures[/O&M/] referring to the monitoring plan in the registered PD. During this monitoring period, the project has been well operated following monitoring manual and management procedure. The staffs are well trained and are qualified[/TCR/]. Through document review and on-site visit, it has been confirmed by the assessment team that the PP has operated the project activity as per the registered PD. All the information (data and variables) provided in the monitoring report are in compliance with that is stated in the registered PD.

Essential data of the project is presented in the following Table 4-1a.

Table 4-1a: Project Characteristics

Item	**Data**			
Project title	Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project			
Project owner	Three Gorges New Energy Jiuquan Co., Ltd.			
Any specific project categories	☐ Mega project (> 10^6 t CO_{2eq} / a) ☐ Micro project (< 5000 t CO_{2eq} / a) ☐ AFOLU project ☐ Grouped project ☒ No specific project category			
VCS MR dated	Draft:	2015-09-21	Final:	2015-09-25
Applied Methodology	ACM0002 "Grid-connected electricity generation from renewable sources".(version 16.0)			
Project starting date	30/12/2013			
Crediting period	☒ Renewable Crediting Period ☐ Fixed Crediting Period (10 y)			
Start of crediting period	30/12/2013			

The details of the project location are given in table 4-1b:

Table 4-1b: Project Location

No.	**Project Location**
Host Country	P.R.China
Region:	Gansu Province
Project location address:	Solar Power Industry Zone, Guazhou County, Jingyuan City
Latitude:	40°36′21.40" - 40°37′502.90"N
Longitude:	96°24′6.30" - 96°25′38.30"E

The key parameters of the project are given in table 4-1c:

Table 4-1c: Technical data of the project

Photovoltaic Modules(Polysilicon)			
Manufacturer	Changshu Artes sunshine Power Technology Co., Ltd.		
Type	CS6P-250P	CS6P-255P	
Quantity	294,315	105,144	
Rated maximum power (Pmax)	250 W	255 W	
Rated power voltage (V_{mp})	30.1 V	30.2 V	
Rated power current (I_{mp})	8.30 A	8.43 A	
Open circuit voltage (V_{oc})	37.2 V	37.4 V	
Short circuit current (I_{sc})	8.87 A	9.00 A	
Lifetime	25 years	25 years	
Decay rate in 25 years	≤ 20%	≤ 20%	
Conversion Efficiency	15.54%	15.54%	
Inverter			
Manufacturer	Sungrow Power Supply Co., Ltd.	Wuxi Sineng New Energy Co. , Ltd	
Type	SG500MX	EP-0500-A	
Quantity	98	102	
V MPPmax. voltage	850 V	1,000 V	
Max. Input current	1,120 A	1,128 A	
Rated output power	500 kW	500 kW	
Rated output voltage	3-315 V	315V	
Max. Output current	1,008A	1,008A	
Box transformer			
Manufacturer	Ningbo Tian'an Transformer Co., Ltd.	Sunel Transformer Co., Ltd.	Jiangsu Huapeng Transformer Co., Ltd.
Type	ZGS-Z.G-1000/38.5	YBF-1000/40.5	ZGSF11-Z.G-1000/35
Quantity	40	30	30
Rated power	1,000 kVA	1,000 kVA	1,000kVA
Rated voltage	38500±2x2.5/315/315 V	40.5kV	(38.5±2x2.5%)/0.315-0.315 kV
Rated frequency	50 Hz	50 Hz	50 Hz

4.1.2 Remaining Issues from Previous Validation or Verification

Description

This is the 1st VCS verification. There are no remaining issues for this project during the VCS Validation.

4.1.3 Compliance of the monitoring plan with the monitoring methodology

Description

The project was registered under the VCS against the approved consolidated methodology ACM0002 Version 16.0 "Consolidated methodology for grid-connected electricity generation from renewable sources"/ACM0002/. By observing and interviewing during site visiting, the monitoring plan in the registered VCS PD and the applied methodology was properly implemented and followed by the project proponent (PP). It is confirmed that the monitoring plan in the registered VCS PD is in accordance with the approved methodology ACM0002

Version 16.0.

4.1.4 Implementation Status of the Monitoring Plan and Completeness of Monitoring

Description

During the verification a site visit was carried out. On the basis of this site visit and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipments, as well as the monitoring and metering equipment, the project has been implemented and operated as described in the registered Monitoring Plan/PD/.

The project exported electricity to the Gansu Province Power Grid, which is a part of North West Power Grid (NWPG). The recorded generation data/LOG/, meter readings/MRS/, meter calibration certificates/CAL/, monthly electricity sale receipts, electricity balance sheet/EBS/, and plant operation records/O&M/ were verified by the verification team during the on-site visit.

The electricity generated by the project is transformed to 110kV through the onsite 110kV substation before connected to the Bulongji Substation of NWPG through 110kV transmission line. NWPG contains Shaanxi Province, Gansu Province, Qinghai Province, Ningxia Hui Autonomous Region and Xinjiang Uyghur Autonomous Region power grids/GEF/.

All required equipment and procedures are available and implemented in an appropriate manner. All necessary monitoring instruments are installed. The measuring devices are well known and state-of-the-art. All required instruments including stand by and operating procedures for the same have been implemented in an appropriate manner.

For the metering purpose, one bidirectional sealed meters i.e. M1 is installed at the onsite 110kV substation. The meter has an accuracy of 0.2s and measures both the electricity delivered to the grid by the project ($EG_{export,y}$) and the electricity imported from the grid by the project ($EG_{import,y}$). The meter readings are reported at 24:00h on the 29th of each month/PPA/.

Another bidirectional sealed meters i.e. M2 is installed at the Bulongji substation. The meter has an accuracy of 0.2s and measures both the electricity delivered to the grid by the project ($EG_{export,y}$) and the electricity imported from the grid by the project ($EG_{import,y}$).

Meter M1 is owned, operated and maintained by the project owner and meter M2 is owned, operated and maintained by the grid company.

The electricity recorded by the meter M1 is the basis of the emissions reduction verification. When M1 is out of order, the readings from meter M2, which are provided by the grid company only under such circumstances, are used instead. If the all the monitoring meters break down, PP confirms that the electricity generated by the proposed project will be zero during the malfunction period.

The meter was duly calibrated (annually) by a qualified third party institute. Neither mistakes nor malfunction on the meter M1 have been observed during this monitoring period. The DOE has checked related calibration certificates/CAL/ and can confirm that the calibration of meter is valid for the entire monitoring period.

Please refer to table 4-1d for detailed meter information

Table 4-1d: Meter information

	M1	
Type	WU.TE432q	
Serial No.	41600811	
Manufacturer	ISKRA	
Accuracy	0.2s	
Calibration data	Calibrated	Valid until
	15/11/2013	14/11/2014
	14/11/2014	13/11/2015

During the verification all relevant monitoring parameters (as listed in chapter 4.3 of the PD) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist.

It can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.

Quantity of net electricity generation supplied by the Project Plant to the Grid – $EG_{facility,y}$

According to the methodology and registered PD, $EG_{facility,y}$ is calculated with the following equation:

$$EG_{facility,y}=EG_{export,y}-EG_{import,y}$$

Where:

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the Project plant to the Grid
$EG_{export,y}$ = Quantity of the electricity generation delivered to the grid by the project
$EG_{import,y}$ = Quantity of the electricity imported from the grid by the project

Quantity of the electricity generation delivered to the grid by the project –$EG_{export,y}$

The meter M1 is installed to measure the quantity of the electricity delivered to the grid by the project. The project owner reads the meter and records the data at 24:00h on 29th of every month. Then, the project owner submits the reading results to the grid company for crosscheck with meter readings of meter M2. Upon the agreement from both parties, the electricity balance sheets are issued by the grid company/EBS/. Then the project owner issued the relevant receipts

to the grid company. The electricity quantities are crosschecked by the receipts of sales or relevant commercial data, to ensure the accuracy and integrality of the data collected/EBS/.

Quantity of the electricity imported from the grid by the project – $EG_{import,y}$

The meter M1 is installed to measure the quantity of the electricity imported from the grid by the project. The project owner reads the meter and records the data at 24:00h on 29th of every month. Then, the project owner submits the reading results to the grid company for crosscheck with meter readings of meter M2. Upon the agreement from both parties, the electricity balance sheets are issued by the grid company/EBS/. Then the grid company issued the relevant receipts to the project owner. The electricity quantities are crosschecked by the receipts of purchases or relevant commercial data, to ensure the accuracy and integrality of the data collected/EBS/.

A draft monitoring report was submitted to the verification team by the project participants. During the verification, mistakes and needs for clarification were identified. The PP has carried out the requested corrections so that it can be confirmed that the Monitoring report is complete and transparent and in accordance with the registered PD and other relevant requirements.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed:

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

Description

The ER calculation spreadsheet had been provided by PP and has been verified by verification team as reproducible, thus it is confirmed that the ER calculation is overall correct.

The GHG emission reduction is calculated as baseline emission minus project emission and leakage emission.

For the calculation of baseline emissions the ex-ante determined value of baseline parameters, i.e., NWPG Emission Factor is taken into account which is a validated value.

Baseline Emissions:

The formula used for the determination of baseline emissions is consistent with the PD:

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

$= 210{,}316.2 \text{ MWh} \times 0.8311 \text{ tCO}_2\text{e/MWh}$

$= 174{,}793 \text{ tCO}_2\text{e}$

Where:

BE_y : the baseline emission (tCO_{2e})
$EG_{facility,y}$: Quantity of net electricity generation supplied by the Project plant to the Grid
$EF_{grid,CM,y}$: the NWPG emission factor which is calculated ex-ante according to the applied methodology

Project Emission & Leakage:

According to methodology and registered PD, Project emission (PE_y) is 0 tCO_2e, and Leakage emission is not considered.

Emission Reduction:

Summary of emission reductions during the monitoring period:

$ER_y = BE_y - PE_y$

$= BE_y - 0$

$= BE_y$

Where:

ER_y Emission reductions (t CO_2e)
BE_y Baseline Emissions (t CO_2e)
PE_y Project Emissions (t CO_2e)

Table 4-2a: Emission reduction calculation

Parameters	Baseline Emissions			Emission Reductions ER_y
	Net Export to NWPG $EG_{facility,y}$	Grid Emission Factor of NWPG $EF_{grid,CM,y}$	Baseline Emissions BE_y	
	(MWh)	**(tCO_{2e}/MWh)**	**(tCO_{2e})**	**(tCO_{2e})**
30/12/2013-31/12/2013	0[1]	0.8311	0	0
01/01/2014-31/12/2014[2]	127,485.6	0.8311	105,953	105,953
01/01/2015-29/08/2015	82,830.6	0.8311	68,840	68,840
Subtotal	**210,316.2**	**-**	**174,793**	**174,793**

To re-produce the emission reductions, following documents/records were verified by the audit

[1] The project connected to the power grid on 30/12/2013 and started commissioning via checking the PPA/PPA/ and the operation log of the power plant/LOG/, however via cheking the PPA/PPA/ and the operation log of the power plant/LOG/ and the electricity balance sheets/EBS/, it is confiremd that all the power generated by the project from 30/12/2013 to 31/12/2013 was consumed by the project itself, there's no electricity transaction between the project and the power grid during 30/12/2013–31/12/2013/EBS/. Hence the baseline emission and emission reduction of this period is 0.

[2] The value of 30/12/2014 and 31/12/2014 was derived from Daily Electricity Balance Sheet of Meter M1 dated on 30/12/2014 and 31/12/2014/EBS/

team:

- Meter readings of M1/MRD/
- Receipts raised via M1/EBS/
- Monthly electricity balance sheet issued based on M1/EBS/
- Meters calibration records (covering the monitoring period)/CAL/
- Daily Electricity Balance Sheet of Meter M1 dated on 30/12/2014 and 31/12/2014/EBS/

All the figures as per the monitoring report were cross-checked by the verification team against basic monitored data.

No malfunction of meter M1 was detected during the monitoring period and the troubleshooting process as indicated in the PD and monitoring report was not adopted.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	**CAR 1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	It is observed that the name and the description of the monitoring parameter $EG_{facility,y}$ is not consistent in the MR.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The name and the description of the monitoring parameter $EG_{facility,y}$ is revised in the MR version 02.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The revised MR has been checked, it is confirmed that the name and the description of the monitoring parameter $EG_{facility,y}$ is consistent in the revised MR and in line with the applied methodology and registered PD.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

Description

The key monitoring parameter with influence on the calculation of the emission reductions is

the $EG_{facility,y}$.

The power was calculated based on the measurement results of $EG_{export,y}$ and $EG_{import,y}$, while $EG_{export,y}$ and $EG_{import,y}$ are measured with high accuracy (0.2s) and duly calibrated power meter. All the meter readings are carried out at 24:00 on 29th of every month. All relevant evidence was fully checked by the verification team during the on-site visit. All evidence is clearly identifiable and assessed to be correct.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed:

4.4 Non-Permanence Risk Analysis

Description

A monitoring team has been set up and trained to conduct the monitoring. The monitoring procedures have been defined in the project management procedures/QA/&/O&M/. The internal audit for monitoring work has been carried out/TCR/. No major non-conformity was found in the internal audit which was checked via on-site interviews.

Quality management procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel in the framework of this CDM project activity have been defined. The procedures defined can be assessed as appropriate for the purpose. No significant deviations thereof have been observed during the verification.

The emission reductions (ERs) estimated in the VCS PD for this monitoring period of 608 days (from 30/12/2013 to 29/08/2015) is 219,129 tCO_2e (219,129tCO_2e=131,977tCO_2e *365day/365day+130,908tCO_2e*(608day-365day)/365day [3]). The verified actual emission reduction in this monitoring period is 174,793 tCO_2e, which is 20% lower than the estimated ERs for the same period as per the VCS PD. It is deemed reasonable as the estimation in the registered PD is based on long-term data while the actual solar resources can fluctuate over years.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed:

[3] According to the VCS PD and registered ER sheet, the estimated ER from 30/12/2013-29/12/2014 is 131,977tCO_2e and the estimated ER from 30/12/2014-29/12/2015 is 130,908tCO_2e.

5 VERIFICATION CONCLUSION

Climate Bridge Ltd. has commissioned the TÜV NORD JI / CDM Certification Program to carry out the VCS verification of the Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project (PL1444) in Solar Power Industry Zone, Guazhou County, Jingyuan City, Gansu Province, P. R. China with regard to the requirements of VCS standard version 3.5.

The proposed VCS project activity consistent of a newly built grid-connected photovoltaic power plant with installed capacity of 100MWp which is located in Solar Power Industry Zone, Guazhou County, Jingyuan City, Gansu Province of P. R. China. The electricity generated by solar cell module runs through a header box, then to dc-to-ac inverter, inverters are connected to 35kV box transformers, and then transformed to 110kV through the main transformer before delivered to Bulongji 330kV Substation and finally the power is fed into North West Power Grid of China (NWPG). The project will help reduce GHG emissions generated from the high-growth, coal-dominated power generation.

In the course of the verification 1 Corrective Action Requests (CARs), 0 Clarification Requests (CLs) were raised and successfully closed.

The verification is based on the draft monitoring report, the monitoring plan as set out in the validated PD / GHG Report PD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

In detail the conclusions can be summarised as follows:

- all operations of the project are implemented and installed as planned and described in the validated project description / GHG Report PD.
- the monitoring plan is in accordance with the applied approved methodology, ACM0002 Ver.16.0
- the installed equipment essential for measuring parameters required for calculating emission reductions is calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of this VCS verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Verification period: From 30/12/2013 to 29/08/2015

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
Year 2013	**0**	**0**	**0**
Year 2014	**105,953**	**0**	**105,953**
Year 2015	**68,840**	**0**	**68,840**
Total	**174,793**	**0**	**174,793**

Essen, 2015-10-06

Shanghai, 2015-10-06

Zhao Xuejiao
TÜV NORD JI/CDM Certification Program
Verification Team Leader

Rainer Winter
TÜV NORD JI/CDM Certification Program
Final Approval

APPENDIX 1: REFERENCES

Table Annex 1.1: Documents provided by the project participant

Reference	Document
/BL/	Business License of Three Gorges New Energy Jiuquan Co., Ltd.
/CAL/	Calibration certificates covering monitoring period (30/12/2013 to 29/08/2015) 1. Calibration Certificate of Meter M1 dated on 2013-11-15 and 2014-11-14, valid till 2015-11-13 issued by Gansu Electric Power Company Energy Measurement Center. 2. Procedure of control of monitoring meters. 3. Calibration Certificate for PT & CT issued by Gansu Electric Power Company Energy Measurement Center on 2013-11-15, valid period is ten years.
/CMA/	Certificate of Metrological Authorization of Gansu Electric Power Company Energy Measurement Center on 2011-01-26 issued by Gansu Province Bureau of Quality & Technical Supervision, the valid period is to 2016-01-25. Ref No. (Gan) faji (2011) 62055
/EBS/	Electricity Balance Sheet covering the monitoring period • Monthly and Daily Electricity Balance Sheet of Meter M1 • Electricity sales and purchases Receipts • Daily Electricity Balance Sheet of Meter M1 dated on 30/12/2014 and 31/12/2014
/LOG/	• Power plant daily operation log. • Power plant daily dispatch log. • Maintenance plan and records. • Electric equipment operation records. • Duty shift records. • Hourly power generation statistics from DCS. • Daily power generation statistics from DCS. • Monthly power generation statistics from DCS.
/MM/	Monitoring Manual for the project site
/MR/	Monitoring Report of Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project, dated 2015-09-21, version 01 Monitoring Report of Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project, dated 2015-09-25, version 02
/MRD/	Meter Reading Records of Meter M1 (30/12/2013 to 29/08/2015)

Reference	Document
/O&M/	Project Operation and Maintenance Records 1. Sample copy of O&M records 2. Wind power Operation Safety Management Regulations
/PHT/	Photographs of Project Site, Central Control Room, DCS System, the meter and nameplate of the equipments.
/PPA/	Power Purchase Agreement signed by PP and Gansu Province Power (Group) Co., Ltd. in Dec. 2013 for year 2014 and 2015.
/PWD/	Power Wiring Diagram
/QA/	Monitoring manual and QA/QC procedures
/TCR/	Project Responsibilities, Training and Competence Records 1. Project Organization Chart and responsibilities 2. Staff Training Records 3. Sample Copy of Operator Certificates 4. Internal audit record covering this monitoring period
/TP/	Technical Particulars of Wind Turbine and Generator – the annex of equipment purchase contract
/XLS/	Emission Reduction Calculation sheets provided by the project participant (related to MR) dated 2015-09-21, version 01

Table Annex 1.2: Background investigation and assessment documents

Reference	Document
/ACM0002/	Grid-connected electricity generation from renewable sources
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/IPCC/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/JBT/	Model Compilation Method of Hydraulic Turbine (JB/T 9579-1999)
/JJG/	Verification regulation of electric watt-hour meters (JJG596-1999)

Reference	Document
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)
/MRT/	VCS Monitoring Report Template, version 3.3
/NS-METER/	DL/T 448-2000 technical administration code of electricity energy metering
/PD/	Registered Project Description "Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project" version 02, dated 2015-05-22
/PS/	CDM Project Standard (Version 09.0)
/RIP/	VCS Registration and Issuance Process, version 3.5
/VAL/	Validation Report for VCS project "Three Gorges New Energy Jiuquan Co., Ltd Guazhou 100MW Solar Power Project" version 2.0, dated 2015-06-01
/VCS/	Verified Standard version 3.5
/VVS/	CDM Validation and Verification Standard (Version 09.0)

Table Annex 1.3: Websites used

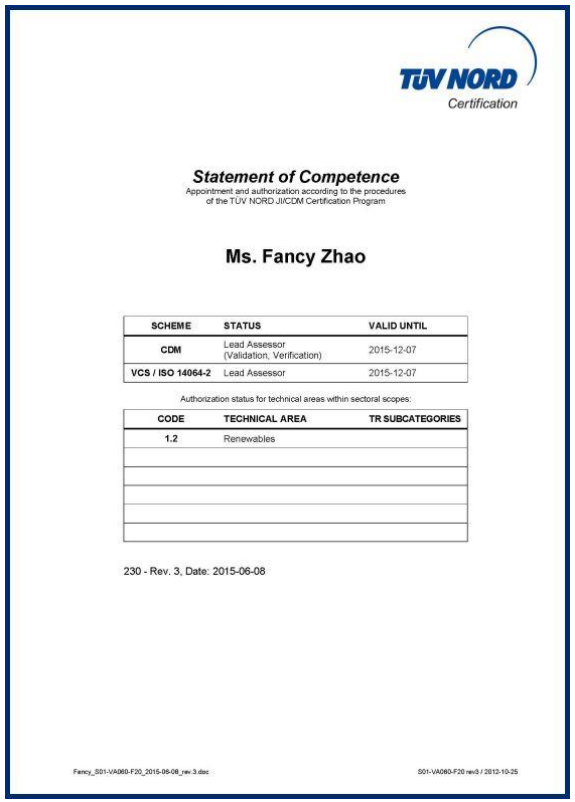
Reference	Link	Organisation
/dna-HP/	www.cdm.ccchina.gov.cn	DNA of China
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/vcs/	http://www.vcsprojectdatabase.org/?keyword=guazhou&submitSearch.x=47&submitSearch.y=10&submitSearch=Search#/project_details/1444	Project website in VCS

Table Annex 1.4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	Ding Xiao	Three Gorges New Energy Jiuquan Co., Ltd./ Office Director
/IM01/	V	☐ Mr. ☒ Ms	Su Yixuan	Three Gorges New Energy Jiuquan Co., Ltd./ Office Director
/IM01/	V	☒ Mr. ☐ Ms	Zhao Hongwei	Three Gorges New Energy Jiuquan Co., Ltd./Plant Duty Chief
/IM01/	V	☒ Mr. ☐ Ms	Li Shuangde	Three Gorges New Energy Jiuquan Co., Ltd./ Plant Vice Duty Chief
/IM02/	V	☒ Mr. ☐ Ms	Lin Keming	Climate Bridge Ltd./Project Manager

[1)] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

APPENDIX 2: STATEMENTS OF COMPETENCE OF INVOLVED PERSONNEL



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Ms. Fancy Zhao

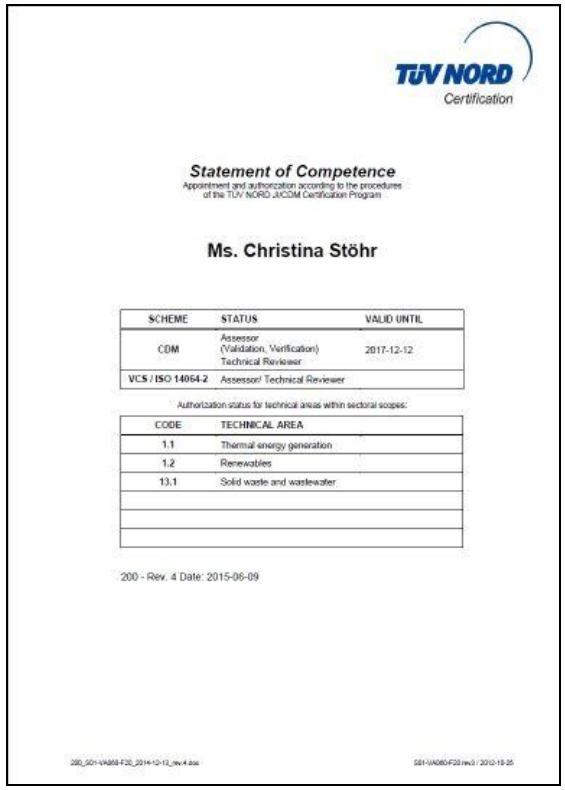
SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2015-12-07
VCS / ISO 14064-2	Lead Assessor	2015-12-07

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.2	Renewables	

230 - Rev. 3, Date: 2015-06-08

Fancy_S01-VA060-F20_2015-06-08_rev.3.doc S01-VA060-F20 rev3 / 2012-10-25



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Ms. Christina Stöhr

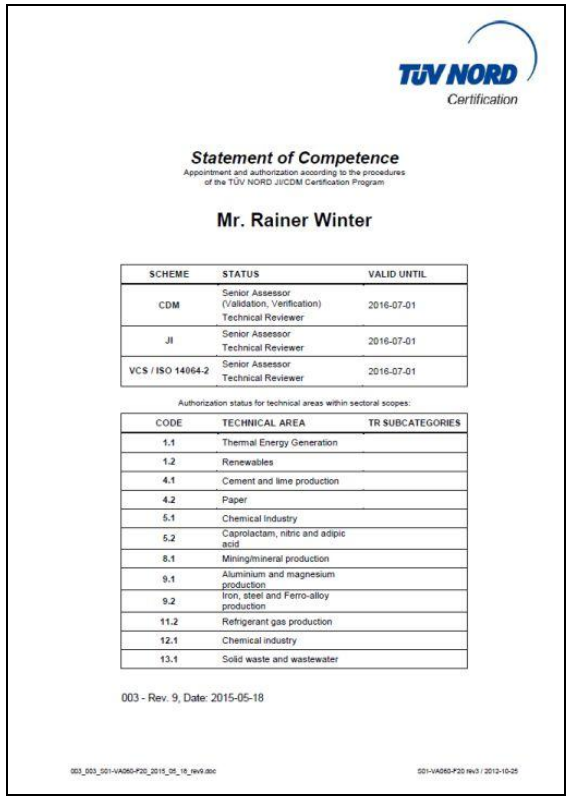
SCHEME	STATUS	VALID UNTIL
CDM	Assessor (Validation, Verification) Technical Reviewer	2017-12-12
VCS / ISO 14064-2	Assessor/ Technical Reviewer	

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
13.1	Solid waste and wastewater

200 - Rev. 4 Date: 2015-06-09

200_S01-VA060-F20_2014-12-12_rev.4.doc S01-VA060-F20 rev3 / 2012-10-25



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Rainer Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2016-07-01
JI	Senior Assessor Technical Reviewer	2016-07-01
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2016-07-01

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.1	Thermal Energy Generation	
1.2	Renewables	
4.1	Cement and lime production	
4.2	Paper	
5.1	Chemical Industry	
5.2	Caprolactam, nitric and adipic acid	
8.1	Mining/mineral production	
9.1	Aluminium and magnesium production	
9.2	Iron, steel and Ferro-alloy production	
11.2	Refrigerant gas production	
12.1	Chemical industry	
13.1	Solid waste and wastewater	

003 - Rev. 9, Date: 2015-05-18

003_S03_S01-VA060-F20_2015_05_18_rev9.doc S01-VA060-F20 rev3 / 2012-10-25