VCS VERIFICATION REPORT

YANGCUN HYDROPOWER STATION PROJECT (VCS PROJECT ID: 77)

Monitoring Period:

26 December 2012 to 25 November 2013

Prepared by: Shenzhen CTI International Certification Co., Ltd
Report No.: CTI/NB-2013-1105-02
Rev. No.: 01
Date: 6 January 2014

Project Title	Yangcun Hydropower Station Project
Version	01
Report ID	CTI/NB-2013-1105-02

Report Title	VCS Verification report for Yangcun Hydropower Station Project
Client	South Pole Carbon Asset Management Ltd.
Pages	18
Date of Issue	6 January 2014
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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 "Yangcun Hydropower Station Project" (VCS Project ID: 77) for the period 26 December 2012 to 25 November 2013, 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 3.4.

The verification was performed on the basis of VCS Programme Guide version 3.5 and VCS Standard version 3.4 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 three CARs in this monitoring period, and no CL or FAR

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was raised. The CARs were satisfactorily addressed by the project proponents in the revised monitoring report.

In CTI's opinion, the GHG emission reductions reported for the project in the monitoring report (version 2.0 dated 24 December 2013) are fairly stated. The GHG emission reductions were calculated correctly on the basis of approved methodology ACM0002 (version 06) and the monitoring plan contained in the registered VCS PD of (version 2.1 dated 25 June 2007).

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 "Yangcun Hydropower Station Project" during the period amount to 248,725 tCO_2e.

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Abbreviations

CAR	Corrective Action Request
CCPG	Central China Power Grid
CER	Certified Emission Reduction(s)
CL	Clarification request
CO_2	Carbon Dioxide
CO_2e	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)
MR	Monitoring Report
PD	Project Description
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association
VCU	Verified Carbon Unit

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1 INTRODUCTION

South Pole Carbon Asset Management Ltd. has commissioned Shenzhen CTI International Certification Co., Ltd (CTI) to carry out the verification and certification of emission reductions reported for the "Yangcun Hydropower Station Project" (the project) for the period 26 December 2012 to 25 November 2013. 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 "Yangcun Hydropower Station Project" for the period 26 December 2012 to 25 November 2013.

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 3.5) /23/;
- VCS Standard (version 3.4) /22/ and other relevant requirements defined by VCSA;
- The approved methodology ACM0002 (version 06) /31/ 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

1.4.1 Sectoral Scope and Project Type

According to the VCS Program Guide (version 3.5) /23/, 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).

1.4.2 Project Background

Project title:	Yangcun Hydropower Station Project
Project proponent:	Sichuan Daduhe Power Co., Ltd from China
Project location:	Yangcun Town, Ebian Yi Autonomuous County, Leshan City, Sichuan Province, China
VCS Project ID:	77
Applied methodology:	ACM0002 (version 06)
VCS project crediting period:	1 January 2004 to 31 December 2013 (Renewable)
VCU verification period:	26 December 2012 to 25 November 2013

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 3.4) 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	Lin Wu	1.1, 1.2, 2.1, 3.1, 4.1, 13.1, 13.2	☒DR ☒SV ☒RP ☐TR
Technical Reviewer	Zhang Lei	1.2, 4.1, 4.3, 4.4, 13.1, 13.2	☒DR ☐SV ☐RP ☒TR

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

In addition to the VER/VCU monitoring report /1/, VCS PD /18/, emission reduction calculation spreadsheet /2/, the following documents also were assessed as a part of the verification audit:

- The VCS validation report /19/;
- Previous verification reports /19//20/;
- Revised monitoring plan /21/;
- Baseline and monitoring methodology ACM0002 (version 06) applied by the project /31/;
- Relevant decisions, clarifications and guidance from the VCSA /22/-/30/; and
- Other information and references relevant to the project activity /3/-/17/.

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 19 December 2013, CTI visited Sichuan Daduhe Power Co., Ltd, and performed on-site assessment. The key personnel of the project were interviewed or assisted the verification team /32/-/34/. Main topics of the interview cover implementation of the project construction, applicability of selected methodology, implementation of project monitoring, emission reduction calculation, etc.

2.4 SITE INSPECTIONS

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 Sichuan Daduhe Power Co., Ltd and project consultant South Pole Carbon Asset Management 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 06), and the management system were assessed during the site visit.

2.5 RESOLUTION OF FINGDINGS

A corrective action request (CAR) is issued, 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 three CARs in this monitoring period, and no CL was raised. The CARs were satisfactorily addressed by the project proponents in the revised MR (refer to Appendix A for further details). All changes made to the MR (version 2.0 dated 24 December 2013) are as a result of the verification findings.

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. No FAR was raised during the verification.

2.6 ELIGIBILITY FOR VALIDATION ACTIVITIES

The project was validated on 30 June 2007 against Voluntary Carbon Standard version 1 during the combined validation and first periodic verification /19/. The proposed monitoring period 26 December 2012 to 25 November 2013 is 6th verification, and CTI just undertaken verification activites for the project according to the VCS Program Guide. This section is thus not applicable.

3 VALIDATION FINDINGS

The project was validated on 30 June 2007 against Voluntary Carbon Standard version 1 during the combined validation and first periodic verification /19/. According to the VCS Project Registration and VCU Issuance Process version 3.5, projects where a validation report under an approved GHG Program was issued to the project before 19 March 2008 do not need to complete a further validation of the required sections of the *VCS Project Description Template*. Therefore, CTI only performed verification activities on the proposed monitoring period for the project according to the VCS Program Guide.

3.1 PARTICIPATION UNDER OTHER GHG PROGRAMS

The project was validated on 30 June 2007 against Voluntary Carbon Standard version 1 during the combined validation and first periodic verification /19/, 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 /19/ has assessed all factors and issues that constitute the basis for emission reductions from the project according to the applicable CDM methodology ACM0002 (version 06) /31/. There was not any methodology deviation applied to this project. Details refer to section 4.1.

3.3 PROJECT DESCRIPTION DEVIATIONS

According to the validated VCS PD, the monitoring parameter EG_y (electricity quantity exported to the grid) is measured continuously by a meter and recorded monthly. However, in the verification (for monitoring period 26 May 2008 to 25 May 2009), the verification body SGS found that EG_y was calculated based on the readings of several meters in the actual monitoring practice. A revision to the monitoring plan was requested and validated by SGS in this verification report /20/. It was concluded by SGS that the revised monitoring plan is in accordance with the methodology applied by the project, and ensured the level accuracy or completeness in the monitoring and verification process is not reduced as a result of the revision. Such revision was prior to the start of this verification and applicable to this verification.

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 validated VCS PD (version 2.1 dated 25 June 2007) and revised monitoring plan. 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 “Yangcun Hydropower Station Project” for the period 26 December 2012 to 25 November 2013.

4.1 PROJECT IMPLEMENTATION STATUS

4.1.1 Project Implementation in accordance with the registered project design document

The project is a hydro power grid-connected plant and locates at Yangcun Town, Ebian Yi

Autonomuous County, Leshan City, Sichuan Province of China. The project's installed capacity is 66 MW, consisting of 3 set of hydro turbines with unit capacity of 22 MW. The actual implementation of the project during this verification period was verified in terms of name plate capacities of each turbine and monitoring equipment. The details of the turbines with respect to installation and capacity have been verified to be consistent with description indicated in the validated VCS PD /18/. The project started trial run on 8 August 2002 and commercial operation on 9 August 2002 when the first turbine was put into operation, and was put into full operation when all sets operated on 28 March 2003 /20/. The electricity generated by the project activity was supplied to the CCPG, which can be confirmed by the Power Purchase Agreement (PPA) /3/.

The project start date was identified as 9 August 2002 when the project started to commercial operate and began generating GHG emission reductions. According to VCS Standard 3.4, the project crediting period under VCS Version 1 shall be deemed as 10 years and commences at the specific project crediting period start date. The project was validated on 30 June 2007 against Voluntary Carbon Standard version 1 and the starting date of the crediting period was chosen as 1 January 2004. Hence, the first crediting period of the project is from 1 January 2004 to 31 December 2013 and with a possibility of renewing twice. The selected monitoring period 26 December 2012 to 25 November 2013 is the 7th monitoring period of the project, which is within the first crediting period 1 January 2004 to 31 December 2013.

All the monitoring system in operation period is consistent with the description in the validated VCS PD and revised 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 /7/, 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 /6/ and their implementation was confirmed by interview with the key operators /32/ 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 validated VCS PD (version 2.1 dated 25 June 2007) and revised 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 validated VCS PD (version 2.1 dated 25 June 2007) and revised monitoring plan.

4.1.2 Compliance of monitoring plan with monitoring methodology

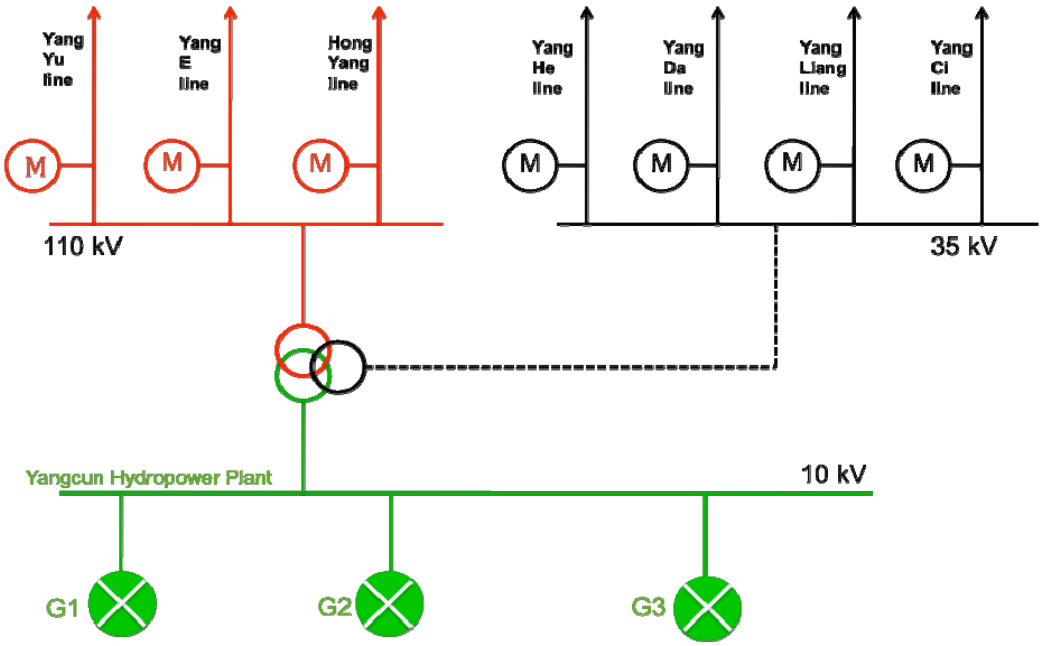
CTI is able to confirm that the monitoring plan in the validated VCS PD (version 2.1 dated 25 June 2007) and revised monitoring plan is in accordance with the approved methodology applied by the project activity, i.e. ACM0002 (version 06).

4.1.3 Compliance of monitoring with the monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the validated VCS PD (version 2.1 dated 25 June 2007) and revised monitoring plan. 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 06) and the management system were assessed during the site visit. The monitoring report lists each parameter required by the monitoring plan and the information flow (i.e. from data generation, aggregation, recording, calculation and reporting) for these parameters is provided. The information flow for the each parameter in further verified in the following sections.

Parameters monitored

The project exports to two different power grids, the Ebian power grid (local power grid, part of the CCPG) and the CCPG. Both grids are interlinked by the Jiu-Yong 110 kV transmission line. The following is the main electric connection diagram of the project:



Simplified diagram of main electric connection

The project exports its power via the 110 kV transmission line through YangE line and Hong Yang line to the grid, and the power transported through Yang Yu line also is exported to the grid via the 110 kV transmission line through YangE line and Hong Yang line. Under the normal conditions, the 35 kV transmission line is disconnected with Yangcun hydropower station. The three hydropower stations connected with the 35 kV transmission line exports their power through YangHe line to the grid. When the transformer station on 35 kV transmission line is under maintenance or malfunction, the three hydropower stations export their power via Yangcun hydropower station and 110 kV transmission line through YangE line and Hong Yang line to the grid. Hence, the total amount of electricity exported by the project activity to the grid was calculated based on the readings from meters measured power transported through YangE line, HongYang line, Yang Yu line and the 35 kV transmission line. According to the approved revised monitoring plan, the following internal parameters were monitored to determine the net electricity exported to the grid:

Data/Parameter	$EG_{export,YangE,y}$
Data Unit	kWh
Description	Electricity exported via 110 kV transmission line through YangE line to the grid
Source of data	Electricity meter reading
Means of verification	Monthly reading records

Data/Parameter	$EG_{import,YangE,y}$

Data Unit	kWh
Description	Electricity imported via 110 kV transmission line through YangE line from the grid
Source of data	Electricity meter reading
Means of verification	Monthly reading records

Data/Parameter	$EG_{export,,HongYang,y}$
Data Unit	kWh
Description	Electricity exported via HongYang line, which indicates electricity imported via 110 kV transmission line through HongYang line from the grid
Source of data	Electricity meter reading
Means of verification	Monthly reading records

Data/Parameter	$EG_{import,,HongYang,y}$
Data Unit	kWh
Description	Electricity imported via HongYang line, which indicates electricity exported via 110 kV transmission line through HongYang line to the grid
Source of data	Electricity meter reading
Means of verification	Monthly reading records

Data/Parameter	$EG_{import,,YangYu,y}$
Data Unit	kWh
Description	Electricity imported from YangYu line, which indicates electricity exported by YangYu line via 110 kV transmission line through YangE line and HongYang line to the grid
Source of data	Electricity meter reading
Means of verification	Monthly reading records

Data/Parameter	$EG_{YangCi,y}$
Data Unit	kWh
Description	Power generation of Cizhu hydropower station (YangCi line), which indicates electricity input from YangCi line to the grid via 110 kV transmission line through YangE line and HongYang line, when transformer station on 35 kV transmission line is in maintenance or malfunction
Source of data	Electricity meter reading
Means of verification	Monthly reading records

Data/Parameter	$EG_{YangLiang,y}$
Data Unit	kWh

Description	Power generation of Lianghekou hydropower station (YangLiang line), which indicates electricity input from YangLiang line to the grid via 110 kV transmission line through YangE line and HongYang line, when transformer station on 35 kV transmission line is in maintenance or malfunction
Source of data	Electricity meter reading
Means of verification	Monthly reading records

Data/Parameter	$EG_{import,\ YangDa,y}$
Data Unit	kWh
Description	Power generation of Dabao hydropower station (YangDa line), which indicates electricity input from YangDa line to the grid via 110 kV transmission line through YangE line and HongYang line, when transformer station on 35 kV transmission line is in maintenance or malfunction
Source of data	Electricity meter reading
Means of verification	Monthly reading records

Data/Parameter	$EG_{export,YangHe,y}$
Data Unit	kWh
Description	Electricity exported via Hetaoping substation (YangHe line)
Source of data	Electricity meter reading
Means of verification	Monthly reading records

Data/Parameter	$EG_{import,YangHe,y}$
Data Unit	kWh
Description	Electricity imported from Yanghe line
Source of data	Electricity meter reading
Means of verification	Monthly reading records

Further, there have two following parameters monitored for crosscheck/backup purpose:

Data/Parameter	$EG_{i,\ Yangcun,y}$
Data Unit	kWh
Description	Electricity generation by generator i at Yangcun hydropower station
Source of data	Electricity meter reading
Means of verification	Monthly reading records

The meters M1 to M7 and meters for generators have been installed in accordance with the revised monitoring plan. CTI has on-site checked the location of the meters against the diagram of power connection system and found them to be consistent.

The readings of the meters are continuously measured, and monthly recorded at 24:00 on the 25th each month /7//8/. 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 installed at the project site 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 No.	0317	0422	0313	0431
Location	YangE line	YangHe line	YangDa line	YangYu line
SN	200106287A0317	200106287A0422	200104265A0313	200106287A0431
Accuracy class	1.0	1.0	1.0	1.0
Calibration frequency	Annual	Annual	Annual	Annual
Calibration date	2012-7-27 2013-7-26	2012-7-27 2013-7-26	2012-7-27 2013-7-26	2012-7-27 2013-7-26
Valid period	2014-7-25	2014-7-25	2014-7-25	2014-7-25
Calibration entity	Ebian measurement and Examination Station			

Meter No.	0478	0255	0301
Location	YangLiang line	YangCi line	HongYang line
SN	200106287A0478	200104265A0255	200106287A0301
Accuracy class	1.0	1.0	1.0
Calibration frequency	Annual	Annual	Annual
Calibration date	2012-7-27 2013-7-26	2012-7-27 2013-7-26	2012-7-27 2013-7-26
Valid period	2014-7-25	2014-7-25	2014-7-25
Calibration entity	Ebian measurement and Examination Station		

Meter No.	0066	0093	0105
Location	Generator 1	Generator 2	Generator 3
SN	200107071D0066	200107071D0093	200107071D0105
Accuracy class	0.5	0.5	0.5
Calibration frequency	Annual	Annual	Annual
Calibration date	2012-7-27 2013-7-26	2012-7-27 2013-7-26	2012-7-27 2013-7-26
Valid period	2014-7-25	2014-7-25	2014-7-25
Calibration entity	Ebian measurement and Examination Station		

Calibration records /14/-/15/ and accreditation certificate /13/ have been verified by the verification team. In the registered VCS PD /18/, there was not specific requirement on the accuracy of the meters. By checking the industrial metering configuration standard "Technical Administrative Code of Electric Energy Metering (DL/T 448-2000)" /16/, CTI can confirm that the accuracy level of meters (1.0 or 0.5) all meet the requirement stipulated in this standard.

In the registered VCS PD /18/, there was not specific requirement on the calibration frequency, which stated as "The verification of electric energy metering equipment is periodically carried out by a metrical institute authorized by the Administration of Standard Measurement according to relevant National electric industry standards and regulations". By checking the calibration reports, CTI found the calibration frequency of these meters is annual, which is in line with the calibrating standard "Verification Regulation of Electrical Energy Meters with Electronics (JJG596-1999)" /16/. Hence, CTI can confirm that the meters' calibration frequency is in line with the monitoring plan of the registered VCS PD and relevant industry standard.

Hence, CTI can confirm that the meters' calibration frequency is in line with the monitoring plan of the validated VCS PD and relevant industry standard, and the calibrations of meters are verified to be valid for the whole reporting period.

Data management and control

Sichuan Daduhe Power 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 CDM project management and monitoring manual /5/, including the organization structure with the responsibilities, personnel competencies, monitoring procedures and monitoring management. By interview with the staff /32/ and check records /5/-/7/ 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.

4.2 ACCURACY OF GHG EMISSION REDUCTION OR 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 ACM0002 (version 06) /31/, the emission reductions are determined as the difference between the baseline emissions, project emissions and leakage:

$$ER_y = BE_y - PE_y - LE_y$$

4.2.1 Baseline emissions

The baseline reductions are determined as multiplying the net electricity exported to the grid (EG_y) by the validated *ex-ante* fixed grid emission factor (EF_{CM}):

$$BE_y = EG_y \times EF_{CM}$$

Grid emission factor (EF_{CM})

EF_{CM} is the grid emission factor of the CCPG, which has been verified *ex-ante* in the validation stage

in the registered VCS PD as 0.94445 tCO_2e/MWh /18/.

Net electricity exported to the grid (EG_y)

According to the revised monitoring plan, the net electricity export of the project activity ($EG_{Yangcun,net,y}$) was calculated by the total amount of electricity exported to the grid ($EG_{Yangcun,total,y}$) and a default transmission loss factor (TLF):

$EG_{Yangcun,net,y} = EG_{Yangcun,total,y} \times (1-TLF)$

The total amount of electricity exported by the project ($EG_{Yangcun,total,y}$) was calculated based on electricity exported via 110 kV transmission line through YangE line and Hong Yang line to the grid ($Elec_{export,110kV,y}$), electricity imported via 110 kV transmission line through YangE line, Hong Yang line and YangYu line from the grid ($Elec_{import,110kV,y}$), and electricity imported from 35 kV transmission line ($Elec_{import,35kV,y}$) which indicated electricity input from 35 kV transmission line to the grid via 110 kV transmission line through YangE line and Hong Yang line:

$EG_{Yangcun,total,y} = Elec_{export,110kV,y} - Elec_{import,110kV,y} - Elec_{import,35kV,y}$

In which,

$Elec_{export,110kV,y} = EG_{export,YangE,y} + EG_{import,Hong\ Yang,y}$

$Elec_{import,110kV,y} = EG_{import,YangYu,y} + EG_{import,YangE,y} + EG_{export,Hong\ Yang,y}$

$Elec_{import,35kV,y} = EG_{import,YangDa,y} + EG_{YangLiang,y} + EG_{YangCi,y} – EG_{export,YangHe,y} + EG_{import,YangHe,y}$

By checking the latest China Electric Power Yearbook, CTI noted that the transmission loss rate of national power grid was 5.98%, 6.53% and 6.73% for the year 2011 to year 2013. The project proponent selected the higher rate 8.23% identified in previous verification /20/ to calculate the emission reductions, which was conservative and acceptable by CTI.

Data in the monthly reading records were used to report, and four types of evidences were used to cross check the amount of net electricity exported to the grid, including electricity meter readings from meters installed after generators, historical electricity data verified by Ebian Water Conservation Bureau, reservoir area fund declaration document verified by Ebain County Tax Authority and electricity data from sales receipts and internal invoices. Through a cross check, the most conservative values have been applied to calculate the net electricity exported to the grid by the project.

Period	Reported values (kWh)	Verified values (kWh)	Emission reductions (tCO_2e)
26/12/2012-25/01/2013	8,924,861	8,924,861	8,429
26/01/2013-25/02/2013	8,571,103	8,571,103	8,095
26/02/2013-25/03/2013	7,263,897	7,263,897	6,860
26/03/2013-25/04/2013	26,273,032	26,273,032	24,814
26/04/2013-25/05/2013	26,334,569	26,334,569	24,872
26/05/2013-25/06/2013	29,608,886	29,608,886	27,964
26/06/2013-25/07/2013	38,482,046	38,482,046	36,344
26/07/2013-25/08/2013	32,069,920	32,069,920	30,288

26/08/2013-25/09/2013	37,743,841	37,743,841	35,647
26/09/2013-25/10/2013	24,915,739	24,915,739	23,532
26/10/2013-25/11/2013	23,166,933	23,166,933	21,880
Total	**263,354,827**	**263,354,827**	**248,725**

Hence, the quantity of net electricity generation supplied by the project to the grid EGy during the monitoring period was calculated conservatively as 263,354.827 MWh, and the corresponding baseline emission reductions are calcualted as :

$BE_y = EG_y \times EF_{CM} = 263,354.827 \times 0.94445 = 248,725\ tCO_2e$

4.2.2 Project emissions

As statement in registerd VCS PD, the project emissions from the project are not considered. Hence, PE_y during the monitoring period from 26 December 2012 to 25 November 2013 is considered as zero.

4.2.3 Leakages

Leakage does not need to be accounted for this project as per the applied methodology.

4.2.4 Emission reductions

The emission reductions for this monitoring period was calculated as:

Monitoring period	GHG emission reductions or removals (tCO_2e)
26/12/2012 – 25/11/2013, i.e. 335 days	248,725
Total ERs claimed (in 335 days)	248,725

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

The emission reductions claimed are 248,725 tCO_2e in this monitoring period (i.e. 335 days). Compared with yearly expected emission reductions 243,725 tCO_2e (365 days) in the registered VCS PD (corresponding to 223,693 tCO_2e for this monitoring period), the reported emission reductions in this monitoring period are 11.19% higher than the expected. According to the registered VCS PD, due to the lower electricity prices, compared to the thermal power plants the hydropower projects have less profitability and the project activity is not the least cost option for generating electricity in China. Hence, the increasing of electricity exported to the grid as well as emission reductions claimed in this monitoring period did not affect the additionality of the project. Considering the natural fluctuate of the water resource and actual turbine-generator operation conditions, 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.

4.3 QUALITY OF EVIDENCE TO DETERMINE GHG EMISSION REDUCTIONS OR 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.

4.4 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 "Yangcun Hydropower Station Project" in China (VCS Project ID: 77) for the period 26 December 2012 to 25 November 2013.

The verification is based on the baseline and monitoring methodology ACM0002 (version 06), the validated VCS PD (version 2.1 dated 25 June 2007) and the monitoring report (version 2.0 dated 24 December 2013). 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.

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 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.

In CTI's opinion the GHG emissions reductions of the "Yangcun Hydropower Station Project" for the period 26 December 2012 to 25 November 2013 are fairly stated in the monitoring report (version 2.0 dated 24 December 2013). The GHG emission reductions were calculated correctly on the basis of the approved methodology ACM0002 (version 06) and the monitoring plan contained in the validated VCS PD (version 2.1 dated 25 June 2007).

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:

Reporting period: From 26 December 2012 to 25 November 2013

Verified GHG emission reductions or removals in the above reporting period:

GHG Emission Reductions or Removals	tCO_2e
Baseline Emissions	248,725
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	248,725

Wu Lin

Mr. Lin Wu
Team Leader

6 January 2014

Zhang Lei

Mr. Zhang Lei
Technical Reviewer

6 January 2014

6 REFERENCES

Documentation used to verify the information provided by the project proponents

/1/ South Pole Carbon Asset Management Ltd.: VER/VCU Monitoring Report for Yangcun Hydropower Station Project, version 1.0 dated 3 December 2013 and version 2.0 dated 24 December 2013.

/2/ South Pole Carbon Asset Management Ltd.: Emission reduction calculation spreadsheet for Yangcun Hydropower Station Project.

/3/ Sichuan Daduhe Power Co., Ltd and Ebain power Grid Company (on behalf of CCPG): Power Purchase Agreement for Yangcun Hydropower Station Project.

/4/ Leshan City Ebian County Industrial and Commercial Administration: Business licence for Sichuan Daduhe Power Co., Ltd.

/5/ Sichuan Daduhe Power Co., Ltd: VCS monitoring manual and management procedure.

/6/ Sichuan Daduhe Power Co., Ltd: Records of training for on-site staff.

/7/ Sichuan Daduhe Power Co., Ltd: Operation log sheets, from December 2012 to November 2013.

/8/ Sichuan Daduhe Power Co., Ltd: Monthly reading records of electricity imported and exported by Yangcun Hydropower Station Project from December 2012 to November 2013.

/9/ Sichuan Daduhe Power Holding Co., Ltd: Monthly electricity transaction notes of electricity exported to the grid, from December 2012 to November 2013.

/10/ Sichuan Daduhe Power Co., Ltd: Invoice of electricity exported to the grid, from December 2012 to November 2013.

/11/ Ebian Water Conservation Bureau: Historical electricity data.

/12/ Ebian County Tax Authority: Reservoir area fund declaration.

/13/ Sichuan Province Leshan City Quality and Technical Supervision Bureau: Accreditation certificate of Ebian measurement and Examination Station.

/14/ Ebian measurement and Examination Station: Calibration certificates for M1 to M7.

/15/ Ebian measurement and Examination Station: Calibration certificates for meters installed for generators.

/16/ Quality and Technical Inspection Bureau of the People's Republic of China: Verification Regulation of Electrical Energy Meters with Electronics (JJG596-1999).

State Economic and Trade Commission: Technical administrative code of electric energy metering (DL/T 448-2000).

/17/ China Electric Year Book 2011 to 2013.

/18/ South Pole Carbon Asset Management Ltd.: VCS PD for project activity Yangcun Hydropower Station Project.

/19/ TUV NORD: Validation report and Verification report of the 1st Monitoring Period (from 1 January 2004 to 31 May 2007) for project activity Yangcun Hydropower Station Project.

/20/ SGS United Kingdom Ltd: Verification reports of the 2nd Monitoring Period, 3rd Monitoring

Period, 4th Monitoring Period;

CEC: Verification report of the 5th Monitoring Period;

CTI: Verification report of the 6th Monitoring Period.

/21/ South Pole Carbon Asset Management Ltd.: Revised monitoring plan.

Methodologies, tools and other guidance

/22/ Verified Carbon Standard: VCS Standard, version 3.4.

/23/ Verified Carbon Standard: VCS Program Guide, version 3.5.

/24/ Verified Carbon Standard: VCS Sectoral Scopes

http://v-c-s.org/node/448

/25/ Verified Carbon Standard: VCS Verification Representation, version 3.1.

/26/ Verified Carbon Standard: VCS Validation Representation, version 3.1.

/27/ Verified Carbon Standard: VCS Monitoring Report Template, version 3.3.

/28/ Verified Carbon Standard: VCS Project Description Template, version 3.2.

/29/ Verified Carbon Standard: VCS Verification Report Template, version 3.3.

/30/ Verified Carbon Standard: Registration and Issuance Process, version 3.5.

/31/ CDM Executive Board: Consolidated baseline methodology for grid-connected electricity generation from renewable sources, ACM0002, version 06.

Persons interviewed

/32/ Sichuan Daduhe Power Co., Ltd:

Wang Shunguo, Secretary of board

Qin Qizhi, Director of accountant department

Xie Lihua, Operation department

/33/ South Pole Carbon Asset Management Ltd.:

Yang Xuan, Project manager

/34/ EcoChain (Beijing) Science & Technology Co., Ltd

Xie Limin, Project manager

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APPENDIX A

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
CAR 1	According to VCS Monitoring Report Template (version 3.30), for project description deviation, it requests "Describe and report on any project description deviations applied in previous monitoring reports." Since in 4th verification (for monitoring period 26 May 2008 to 25 May 2009) the project once, a revision of the monitoring plan was requested and validated by the verification body SGS, such project description deviation is requested to be addressed in the MR.	The relevant description has been added in the Monitoring Report Template (version 3.3).	The MR has been revised accordingly. CAR 1 is closed.
CAR 2	By checking the original records, CTI found the electricity generation by three generators in November 2013 shall be 11,005,640 kWh, 8,235,400 kWh and 6,553,000, respectively. The correction is requested.	The typo of the electricity generation by three generators in November 2013 has been revised in the MR and ER sheet.	The typo has been corrected in the updated MR and ER spreadsheet. CAR 2 is closed.
CAR 3	By checking the original records, CTI found the electricity export from the sale receipts in April, June, August and November were 1668.6693, 3126.2054, 3513.9440 and 2579.4040 MWh, respectively. The corrections are requested on these months in the ER spreadsheet.	The typos of the electricity export from the sale receipts in April, June, August and November have been revised in the MR and ER sheet.	The typo has been corrected in the updated MR and ER spreadsheet. CAR 3 is closed.

Table 2: Clarification Requests

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

Table 3: Forward Action Requests

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

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