SHIYAZI HYDRO POWER PROJECT IN GUIZHOU PROVINCE CHINA

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Project Title	*Shiyazi Hydro Power Project in Guizhou Province China*
Version	*01.1*
Report ID	*01 996 9105069692*

Report Title	*VCS Verification report of Shiyazi Hydro Power Project in Guizhou Province China*
Client	*Guizhou Zhongshui Energy Co., Ltd*
Pages	*Page 1 of 23*
Date of Issue	*22-11-2012*
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Summary:

The verification team assigned by the DOE (TÜV Rheinland (China) Ltd.) has performed the verification of the project "Yunnan Sinanjiang Hydropower Project" (hereafter referred to as "the project") in China, on the basis of requirements of VCS Standard version 3.3.

The project is newly-built hydropower project with total installed capacity of 140MW. All electricity generated by the project will be supplied to the China Southern Power Grid in which the fossil-fuel based power plants are mainly dominated, thus the project achieves GHG emission reductions.

The project has been registered as a CDM project (UNFCCC Ref. No.4768) with the renewable crediting period starting from 05 September 2011. As reflected on the UNFCCC website, the CDM GHG programme validation of the project was completed and submitted to the CDM EB to request for registration on 5 September 2011, which is within two years of the project start date, i.e. starting power generation on28/04/2011. Therefore, the monitoring period for this verification is selected from 28/04/2011 to 04/09/2011(incl. both days).

The verification was conducted by the following four steps:

i) Desk review of the VCS monitoring report (Version 01, dated 05/03/2012), the registered CDM PDD, the CDM validation report, emission reductions calculation spreadsheet and supporting documents made available to the verification team by the project participant;

ii) Follow-up interviews and site inspection (11/05/2012);

iii) Resolution of outstanding issues and desk review of the revised VCS monitoring report (version 02, 12/11/2012); and

iv) Issuance of final verification report.

The verification team confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. Hence, TÜV Rheinland (China) Ltd. is able to certify that the emission reductions resulted from the project is as following:

Reporting Period: From 28/04/2011 to 04/09/2011

- *Emission Reductions: 116,782 tCO2e*

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1 INTRODUCTION

The Guizhou Zhongshui Energy Co., Ltd has commissioned the DOE (TÜV Rheinland (China) Ltd.) to carry out the verification of the project "Shiyazi Hydro Power Project in Guizhou Province China" for the monitoring period from 28/04/2011 to 04/09/2011(incl. both days) prior to its CDM first crediting period, on the basis of requirements of VCS Standard version 3.3.

For the purpose of the verification report, the following abbreviations apply in the project,

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification request
CO2e	Carbon dioxide equivalent
DOE	Designated Operation Entity
EB	Executive Board
FAR	Further Action Request
GHG	Greenhouse Gases
MR	Monitoring Report
MW	Mega Watt
OSO	On Site Observation
PD	Project Description
PDD	Project Design Document
SN	Series No.
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCUs	Verified Carbon Units

1.1 Objective

Verification is the periodic independent formal review by the accredited verification body and expost determination of the monitored GHG emission reductions during a defined verification period.

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

The objective of this verification is to verify and provide a verification statement of emission reductions of the project "Shiyazi Hydro Power Project in Guizhou Province China" during the monitoring period from 28/04/2011 to 04/09/2011 (incl. both days).

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 emission 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 Standard version 3.3 and other relevant requirements defined by VCSA;
• Approved consolidated baseline and monitoring methodology ACM0002 (version 12.1).

The verification is not meant to provide any consulting towards the client. However, stated requests for forward actions and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

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

Project owner:	*Guizhou Zhongshui Energy Co., Ltd*
Host Party:	*People's Republic of China*
Title of project activity:	**Shiyazi Hydro power Project in Guizhou Province China.**
UNFCCC registration No:	*UNFCCC registration No. 4768*
Baseline and monitoring methodology:	ACM0002 (Version 12.1.0)
Location of the project activity:	Meilin canyon which lies between Daping town and Baicun town, Wuchuan Country, Zunyi City, Guizhou Province, P. R. China. The GPS coordinates of the dam and powerhouse is: 107°58'7''(107.9686°)E, 28°39'9''(28.6525°)N.
Project's crediting period:	28/04/2011 to 04/09/2018
Period verified in this verification:	28/04/2011 to 04/09/2011

The verification team implemented an onsite visit and would like to confirm:

Ref.	Parameter	Type/Figure	MoV
1	Project type	Greenfield	OSO
2	Site number	one	OSO
3	Location	Meilin canyon which lies between Daping town and Baicun town, Wuchuan Country, Zunyi City, Guizhou Province, P. R. China.	OSO
	GPS coordinates of Dam and powerhouse	107°58'7''(107.9686°)E, 28°39'9''(28.6525°)N	/31/
4	Turbine		
	Type	HLA630-LJ-280	/11/
	Quantity	2	OSO
	Rated rotate speed	272.7 r/min	/11/
	Rated water head	109 m	/11/
	Rated flow	72.37 m3/s	/11/
5	Generator		
	Type	SF70-22/6400	/11/
	Quantity	2	OSO
	Rated power	70MW	/11/
	Rated voltage	105KV	/11/
6	Electricity absorber	SCPG	/12/ /13/

During the monitoring period from 25/05/2011 to 26/06/2012, the total net electricity supplied by the grid by the project is verified to be 148,210.240MWh, thus the VCUs generated by the project is determined as 116,782tCO_2e, detailed assessment as seen in the following section 3.

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

The project is a registered CDM project activity (UNFCCC Ref. No. 4768) under the approved CDM methodology ACM0002 Version 12.1 "Consolidated methodology for grid-connected electricity generation from renewable sources", as confirmed from the UNFCCC website:

http://cdm.unfccc.int/Projects/DB/CEC1304557710.86/view

The CDM Project activity Registration Form of the project "Shiyazi Hydro power Project in Guizhou Province China" was checked, and can confirm that the CDM validation report of the project was submitted to the CDM EB to request for registration on 5 September 2011. As reflected in the daily operation & maintenance logs of the project /7/ and its electricity trading notes/18/, the project is verified to start operation on 28/04/2011, which is also correctly reported in the VCS monitoring report/9/.

In accordance with the section 3.7 and the item 3) of section 3.11.8 of VCS Standard version 3.3 /3/, the CDM validation of the project is deemed to have been completed within two years of the project start date.

2.2 Validation Findings

2.2.1 Gap Validation

In accordance with the item 1) of section 3.11.8 of the VCS Standard version 3.3 /3/, the cover page and sections 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of the VCS Project Description Template/3-3/ have been correctly completed in the VCS Project Description of the project/4/, other part in VCS-PD template/3-3/ has been covered by the registered CDM-PDD/6/, so no need to depict again, comply with VCS-standard. And the verification team also have undertaken a validation of same to validate the project's compliance with the VCS rules as following:

No.	*Scope in VCS-PD*	*Means of Verification*	*Verification team's conclusion*
1.	*Cover page*	*Project title "Shiyazi Hydro power Project in Guizhou Province China" complies with A.1 of the registered CDM-PDD/6/;The entity which prepares the VCS-PD complies with section B.8 of the registered CDM-PDD/6/.*	*Verified in conformity with VCS.*
2.	*Section 1.2*	*Sectoral scope "1 energy industies (renewable sources)" and sub-class "Hydro power" comply with A.4.2 of registered CDM-PDD/6/; the project is not a Grouped project, which is consistent with the description in A.4 of the registered CDM-PDD/6/;*	*Verified in conformity with VCS.*
3.	*Section*	*The project proponent "Guizhou Zhongshui Energy Co., Ltd" and*	*Verified in*

	1.3	*its detailed information comply with annex1 of registered CDM-PDD/6/.*	*conformity with VCS.*
4.	*Section 1.5*	*The two hydro turbines and generators started commissioning on 28/04/2011, which is substantiated by Monthly Electricity records /23/, Newsletter on the 1# & 2# generator units start-up /25/ /26/ and interview /i/.*	*Verified in conformity with VCS.*
5.	*Section 1.6*	*The only crediting period (also the monitoring period) for VCS is 28/04/2011-04/09/2011, i.e. from the commissioning start date to the last date of registration as a CDM project, because according to section C of registered CDM-PDD/6/, and the registered page on CDM-EB's website:* *http://cdm.unfccc.int/Projects/DB/CEC1304557710.86/view* *The period from 05/09/2011 onwards belongs to the crediting period of CDM.*	*Verified in conformity with VCS.*
6.	*Section 1.7*	*According to the registered CDM-PDD/6/, the total installed capacity of the Project is 140MW,and the estimated emission reduction is 368,209 tCO2e annually. so it falls into the project.*	*Verified in conformity with VCS.*
7.	*Section 1.9*	*The infomation of the project location complies with that in A.4 of registered CDM-PDD/6/.*	*Verified in conformity with VCS.*
8.	*Section 1.10*	*Prior to the project initiation, the equivalent electricity produced by the proposed project will be provided by China Southen Power grid, which is dominated by fossil fuel-fired power plants, which is consistent with A.2 and B.4 of the registered CDM-PDD/6/.*	*Verified in conformity with VCS.*
9.	*Section 1.12.1*	*The project title "Shiyazi Hydro power Project in Guizhou Province China" is consistent with that in the project approval/35/ and EIA approval/34/; the title of the project proponent "Guizhou Zhongshui Energy Co., Ltd" is consistent with that in the business licence/36/. Thus the above document can substantiate the project owner owns the right of use of the project.*	*Verified in conformity with VCS.*
10.	*Section 1.12.2*	*According to the registered page on CDM-EB's website:* *http://cdm.unfccc.int/Projects/DB/CEC1304557710.86/view* *The period from 05/09/2011 onwards belongs to the crediting period of CDM.* *By searching on the internet and interviewing with the representative of the project owner/i/, the verification team confirms*	*Verified in conformity with VCS.*

		the project is not included in an emission trading program. *Therefore, CO_2 emission reductions generated by the Project during the CDM crediting period will be verified as unique CERs but not VCUs to avoid double counting. As to the project under VCS only emission reductions achieved from 28/04/2011 to 04/09/2011 will be considered as VCUs, which will be sold only once to one particular buyer.*	
11.	*Section 1.12.3*	*According to the registered page on CDM-EB's website:* *http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1303198150.8/view* *The project has been registered as a CDM project on 05/09/2011 with registration reference number 4768. but the period from 28/04/2011 to 04/09/2011 is free for VCS program.*	*Verified in conformity with VCS.*
12.	*Section 1.12.4*	*The project will generate CERs from 05/09/2011 onwards, but in the only crediting period from 28/04/2011 to 04/09/2011 for VCS application, no any other environmental credit is found by the verification team by internet searching and interviewing /i/.*	*Verified in conformity with VCS.*
13.	*Section 1.13*	*The project is not a grouped project, but a single project, confirmed by the verification team via checking the registered CDM-PDD/6/ and onsite observation.* *No leakage, verified via onsite observation and checking the registered CDM-PDD/6/.* *No commercially sensitive information, verified by the verification team via interviewing the project owner/i/.* *The proposed project will produce positive environmental and economic benefits and contribute to the local sustainable development, verified by the verification team via checking the registered CDM-PDD/6/.* *Key documents of the approval of EIA and FSR are also verified via document review/34/ /35/.*	*Verified in conformity with VCS.*

2.2.2 Methodology Deviations

N/A

2.2.3 Project Description Deviations

N/A

2.2.4 New Project Activity Instances

N/A

2.3 Validation Conclusion

Based on the assessment in both the above section 2.1 and section 2.2.1, as per VVVM/3-5/ the verification team can state that the project described in the VCS PD/4/, conforms to the validation criteria for projects as set out in the VCS Standard version 3.3 /3/ and the VCS Registration and Issuance Process version 3.3 /3-1/.

3 VERIFICATION PROCESS

3.1 Method and Criteria

The verification team is selected for the project as showed in the below table,

Verification Team			Role									
Full name	**Affiliation TÜV Rheinland**	**Appointed for Sectoral Scopes (Technical Areas)**	Team leader	Acting Team Leader	Local Expert	Team Member (Auditor)	Technicla Expert	Acting Tech. Expert	Trainee Auditor	Technical Reviewer	Expert to TR	Trainee TR
Yakin Ma	China	1.2; 6.1	X		X		X					
Kai Zhou	China	1.2, 5.1, 11.1, 12.1,								**X**		

The verification of the project was performed through means of the following three phases in accordance with the requirement of the registered CDM PDD/6/, the applied methodology, and the VCS Standard version 3.3, VVVM/3-5/ 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.

3.2 Document Review

The following table outlines the documentation reviewed during the verification:

Ref no.	*Reference Document*	Date of issuance	Editor/issuer
1	CDM Validation and Verification Manual (Version 01.2) (VVM)	30/07/2010	CDM-EB55, Annex 01
2	ACM0002 (Version 12.1.0)	12/02/2010	EB58, Annex 07
3	VCS Standard, version 3.3	04/10/2012	VCS Association (VCSA)
3-1	VCS Registration and Issuance Process, version 3.4	04/10/2012	VCS Association (VCSA)
3-2	VCS Monitoring Report Template, version 3.2	04/10/2012	VCS Association (VCSA)
3-3	VCS Project Description Template, version 3.1	04/10/2012	VCS Association (VCSA)
3-4	VCS Program Definitions, version 3.4	04/10/2012	VCS Association (VCSA)
3-5	VCS Validation and Verification Manual version 3.0 (VVVM)	04/10/2012	VCS Association (VCSA)
4	VCS-PD, version 03	12/11/2012	Guizhou Honor Carbon Asset Management Co., Ltd
5	CDM-Validation Report, Version 03	26/08/2011	China Environmental United Certification Center Co., Ltd
6	CDM-Registered PDD[1], version 06	22/08/2011	Guizhou zhongshui Hengyuan Project Management and Consulation Co.,Ltd.
7	Logbook	Up-to-date	Shiyazi power plant
8	VCS Monitoring Report, Version 01	05/03/2012	Guizhou Honor Carbon Asset Management Co., Ltd
9	VCS Monitoring Report, Version 02	12/11/2012	Guizhou Honor Carbon Asset Management Co., Ltd
10	ER spreadsheet	17/07/2012	Guizhou zhongshui Hengyuan Project Management and Consulation Co.,Ltd.

[1] http://cdm.unfccc.int/Projects/DB/CEC1304557710.86/view

11	Name plate of the hydro turbine and generator	Mar 2010	Sichuan Dongfang Electric Machinery Works Co., Ltd.
12	Grid Interconnecting Agreement	Apr 2011	Guizhou Power Grid Co., Ltd. and Guizhou Zhongshui Energy Co., Ltd
13	Power Purchase Agreement (PPA) in Year 2011	12/07/2011	Guizhou Power Grid Co., Ltd. and Guizhou Zhongshui Energy Co., Ltd
15	Onsite calibration records of meter M1 (main meter) and M2 (backup meter) on: 22/04/2011; 22/07/2011;	 25/04/2011 25/07/2011	Zunyi Power supply Bureau
16	Calibration Certificate of Meter M1 (main meter), valid until 21/10/2015	22/10/2010	Guizhou Electric Power Test and Research Institute
17	Calibration Certificate of Meters M2 (backup meter), valid until 21/10/2015	22/10/2010	Guizhou Electric Power Test and Research Institute
18	Qualification Certificates of the meter calibration entity – Guizhou Electric Power Test and Research Institute, valid to 01/11/2013, Certificate No.: 2010240168D	02/11/2010	The Quality and Technical Supervision Bureau of Guizhou Province
19	Qualification Certificates of the meter calibration entity – Zunyi Power Supply Bureau, valid to 04/11/2012, Certificate No.: [2008]nanwang Liangbiao Neng Zhengzidi D52888#	05/11/2008	Measurement Office of Guizhou Power Grid Co., Ltd.
20	Training plan	Received on 04/05/2012	Guizhou Zhongshui Energy Co., Ltd
21	Training records	08/04/2011 01/03/2012	Guizhou Zhongshui Energy Co., Ltd
22	CDM Monitoring Manual	Apr 2011	Guizhou zhongshui Hengyuan Project Management and Consulation Co.,Ltd.
23	Monthly Electricity records of Meter M1 (main meter)	from Apr to Sep 2011	Shiyazi power plant
24	Measurement report on the water surface area of the reservoir when it is full	10/05/2011	Guizhou Water Conservancy and Hydropower Survey & Design Institute
25	Newsletter on the 1# generator units start-up	04/05/2011	Shiyazi Power Plant of Guizhou

			Zhongshui Energy Co., Ltd
26	Newsletter on the 2# generator units start-up	04/05/2011	Shiyazi Power Plant of Guizhou Zhongshui Energy Co., Ltd
27	Sales receipts of electricity output in: Apr 2011; May 2011; Jun 2011; Jul 2011; Aug 2011; Sep 2011;	 15/05/2011 11/06/2011 14/07/2011 13/08/2011 10/09/2011 15/10/2011	Shiyazi Power Plant of Guizhou Zhongshui Energy Co., Ltd
28	Clarification on the Electricity output from 01/09/2011 to 04/09/2011 and from 05/09/2011 to 30/09/2011 respectively	10/04/2012	Guizhou Power Grid Co., Ltd.
29	Main Wiring diagram in the practical situation	09/02/2012	Shiyazi power plant
30	Technical Administrative Code of Electric Energy Metering, DL/T448-2000	03/11/2000	Economic & Trad Commission P.R. China
31	Measuring result of the geographical coordinates of the project after completion	20/04/2011	HydroChina Guiyang Corporation
32	Sales receipts of electricity input in: Apr 2011; May 2011; Jun 2011; Jul 2011; Aug 2011; Sep 2011;	09/04/2012	Wuchuan Electric Power Co., Ltd. of Guizhou province
33	Clarification on the Electricity input from 01/09/2011 to 04/09/2011 and from 05/09/2011 to 30/09/2011 respectively	10/04/2012	Wuchuan Electric Power Co., Ltd. of Guizhou province
34	Approval of EIA, file No. [2006]326#	18/08/2006	EPB of Guizhou province
35	Approval of the project, file No. [2007]174#	13/02/2007	DRC of Guizhou province
36	Business Licence of the project owner, Guizhou Zhongshui Energy Co.Ltd.	28/06/2011	Industrial and Commercial Administration bureau of Guizhou province

3.3 Interviews

The onsite visit was implemented on 11/05/2012, after two weeks of the MR publication (26/04/2012 – 10/05/2012). The interviewee and corresponding topics and schedule are tabulated as follows:

	Date	Name	Organization
/i/	11/05/2012	**Wang Wenqing**	Vice Director of Shiyazi power plant of Guizhou Zhongshui Energy Co., Ltd
/ii/	11/05/2012	**Dan Yanyan**	Guizhou zhongshui Hengyuan Project Management and Consulation Co.,Ltd.

Interview topic:

Time	Duration	Organization	Agenda / Topics / Objectives	Interviewees
11/05/2012	09:00~ 17:00	AT	***Project site visit and inspection*** Management representative and technical manager debrief the project operation status, maintenance status, any accidents if applicable. Audit and interview the implementation of the project, i.e.physical components, monitoring and metering systems, data acquisition and data processing systems, reporting procedures, monitoring report, troubleshooting procedures, emergency procedures, QA/QC procedures, qualification and training. ***Documents review*** Documents Review, such as calibration records, maintenance records, monitoring manual, operation records, data recording logging books, receipt/invoice, training records etc.	PP, as needed
11/05/2012	17:00~ 18:00	Close	Presentation of audit results	PP

3.4 Site Inspections

On 11/05/2012, the verification team carried out an on-site inspection at Shiyazi Hydro Power Project in Guizhou Province China. During the visit, the verification team verified the actual implementation of the project as described in the VCS monitoring report/9/. The applied turbine-generator details were checked against the Name plate of the hydro turbine and generator /11/, and then confirmed to be correct. The involved electric meters were checked against the line diagram in the computer monitoring system/29/. The evidences of the reported net electricity generation were also verified, i.e. the monthly electricity generation gate meter reading records/23/. In addition, the electricity sales receipts /27/ /32/ were verified to cross-check the gate meter reading records/23/. All calibration certificates of electric meters involved in the monitoring plan of the project /15/ /16/ /17/ and the accreditation of calibration entity/18/ /19/ were

verified authoritative, and found to be valid for the complete reporting period from 28/04/2011 to 04/09/2011.

3.5 Resolution of Any Material Discrepancy

A Corrective Action Request (CAR) shall be raised, where:

a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;

b) Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate or emission reductions;

c) Issues identified in a FAR during validation to be verified verification have not been resolved by the project participants.

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

A Forward Action Request (FAR) shall be raised if the monitoring and reporting require attention and/or adjustment for the next verification period.

During the VCS verification of the project, 2 CARs and are raised by the verification team and successfully closed, No CL or FAR is raised. Details as following,

No. & Type of request	Observation	Reference	Summary of project owner response	Verification team conclusion
CAR1	In the published MR, the net electricity supplied to the grid is crosschecked by the Electricity Trade Note, but according to the registered CDM-PDD, it shall be crosschecked by the sales receipts, please revise it accordingly.	MR	The electricity has been crosschecked by electricity sales receipts, and it has been revised in the MR and calculation spreadsheet.	Having reviewed the revised ER worksheet, the verification team is able to confirm this CAR is closed.
CAR2	The description in E.2 of MR shall be revised according to the actual aspects after operation.	MR	The description in E.2 of MR has been revised according to the actual aspects after operation.	Having reviewed the revised MR, the verification team is able to confirm this CAR is closed.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The verification team has performed an on-site visit to verify the real implementation of the project against

the description in the VCS PD. There are two units of generator sets in Azhu station, the two units started operation from 28/04/2011 /23/ /25/ /26/. All facilities and equipments as described in the VCS PD are in place and the PP has operated the Project as per the VCS PD/4/.

The verification team has verified the nameplates of the hydro turbine/generator with HLA630-LJ-280, SF70-22/6400 are in consist with the VCS PD and confirmed that the turbines/generators have been installed in place. The electricity generated has been delivered properly to the grid/12/ /13/.

<Power System>
During on-site visit, electricity generated by the project is sent to Guizhou Province Grid, which is a part of the China Southern Power Grid (CSPG).When the project fails to generate power or under maintenance.

<Metering System and calibration>

Monitoring Equipment:	Meter M1	Meter M2
Function:	Sealed Bidirectional /OSO/	Sealed Bidirectional /OSO/
Ownership:	Grid company /13/	Grid company /13/
Location:	Outlet of Shiyazi power plant /OSO/	Outlet of Shiyazi power plant /OSO/
Monitored parameter:	($EG_{PJ\ to\ Grid,\ y}$), (EG Grid to PJ, y);	($EG_{PJ\ to\ Grid,\ y}$), (EG Grid to PJ, y);
Attribute	Main, sales receipts are based on this data	backup
Type:	MK6E20 /16/	MK6E20 /17/
Serial number:	208204632 /16/	208204631 /17/
Accuracy:	0.2s /16/	0.2s /17/
Last calibration date:	N/A.	N/A.
Expiration date of calibration:	N/A.	N/A.
Current calibration date:	22/04/2011; 22/07/2011; /15/	22/04/2011; 22/07/2011; /15/
Expiration date of calibration:	21/07/2011; 21/10/2011 /15/	21/07/2011; 21/10/2011 /15/
Frequency of calibration:	Three month /15/	Three month /15/
Relevant sectoral standard:	DL/T448-2000 /30/	DL/T448-2000 /30/

The validation report/5/ has been checked by the verification team and no remaining issue was found. Meanwhile there is no methodology deviation during previously validation and verification.

Therefore, the verification team can confirm that PP implemented and operated the project activity in accordance with the VCS PD/4/. The actual project activity does not contain changes which may impact the additionality or scale of the project activity or applicability of baseline methodology.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

Project Emissions:
The power density of the project activity is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:
PD = Power density of the project activity (W/m2).
CapPJ = Installed capacity of the hydro power plant after the implementation of the project activity (W).
*C*apBL = Installed capacity of the hydro power plant before the implementation of the project activity (W). For the new hydro power plant, this value is zero.
APJ = Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m2).
ABL = Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m2). For the new reservoir, this value is zero.

As per onsite observation and document review, the installed capacity of the project is 140MW /11/, the water surface area of the reservoir when it is full is measured /24/ by Guizhou Water Conservancy and Hydropower Survey & Design Institute to be 8.061 km^2, thus the power density is crosschecked as 17.4 W/m^2, consistent with that in the registered CDM-PDD/6/ and VCS-PD/4/. In accordance with the applied methodology/2/, the power density of the project is greater than $10W/m^2$, thus the project emissions is 0, i.e. PEy=0.

Leakage:
According to the applied methodology ACM0002/2/, the leakage can be not considered, i.e. LEy=0.

Baseline Emissions:
According to the applied methodology ACM0002 /2/and the VCS PD/4/, the baseline emissions of the project is determined as following formula,

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

Where:
BE_y: the baseline emission in year y (tCO_2/year)
$\boldsymbol{EG_{facility,\,y}}$: the net electricity exported (MWh).
$EF_{grid,CM,y}$ is Combined margin CO_2 emission factor for grid connected power generation in year y, the calculation is according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system.

According to the VCS monitoring report of the project /9/ and VCS PD/4/, the parameter $\boldsymbol{EG_{facility,\,y}}$ of net electricity supplied to the grid via two transformer stations shall be continuously measured and recorded monthly.

The net supplied electricity ($\boldsymbol{EG_{facility,\,y}}$) is calculated as the following equation:

$EG_{facility,\,y} = EG_{P\ to\ G} - EG_{G\ to\ P}$
In which:
$EG_{P\ to\ G}$ Electricity exported by the proposed project to the grid;
$EG_{G\ to\ P}$ Electricity imported from the grid by the proposed project;

The data used to calculate the emission reduction were measured by M1 and M2. The meters have been calibrated annually, and there is no malfunction happened during the proposed monitoring period.

Besides that, the data and parameters used to calculate the $EF_{Grid,CM,y}$ ($NCV_{i,y}$, $FC_{i,m,y}$,$EF_{CO2,I,y}$, installed capacity, electricity generation, efficiency of the best technology commercially, which are determined at registration and not monitored during the monitoring period, are included to be complete and established ex-ante in this reporting period of 28/04/2011-04/09/2011.

According to ACM0002 version 12.1, there are no other external data are required for determining the emission reductions of the project as the emission factor of the proposed crediting period has been determined ex-ante in the registered VCS PD. The verification team has verified and confirmed that the emission factor used in the monitoring report is in compliance with the registered CDM-PDD/6/ and VCS-PD/4/.

A complete set of data of monitoring parameter $EG_{facility,\,y}$ from 28/04/2011-04/09/2011 are available for verification/23/ /27/ /32/. In order to ensure the accuracy of measurement, the net electricity supplied to the grid ($EG_{facility,\,y}$) has been cross-checked with sales receipts/27/ /32/ covering the reporting period. If the measured electricity is different from receipts electricity, the most conservative value is applied, in which the smaller value is taken as the electricity supplied to the grid, while the bigger value is taken as the electricity purchased from the grid, as presented in the emission reduction calculation spreadsheet/10/.

Table 3-1 ($EG_{PJ\ to\ Grid,\ y}$)

Settlement duration	Ref.	Starting meter Record	Ref.	Ending meter record	Ref.	Magnification	Ref.	Calculated quantity (MWh)	quantity for crosscheck (MWh)	Ref.	Confirmed value conservatively after crosscheck (MWh)
		A		B		C		D=(B-A)*C	E		F=Min (D,E)
00:00:00, 28/04/2011- 24:00:00, 30/04/2011	/13/	0.000	/23/	1.058	/23/	1,320,000	/23/	1,396.560	1,400.000	/28/	1,396.560
00:00:00, 01/05/2011- 24:00:00, 31/05/2011	/13/	1.058	/23/	8.027	/23/	1,320,000	/23/	9,199.080	9,200.000	/27/	9,199.080
00:00:00, 01/06/2011- 24:00:00, 30/06/2011	/13/	8.027	/23/	38.313	/23/	1,320,000	/23/	39,977.520	39,980.000	/27/	39,977.520
00:00:00, 01/07/2011- 24:00:00, 31/07/2011	/13/	38.313	/23/	75.521	/23/	1,320,000	/23/	49,114.560	49,110.000	/27/	49,110.000
00:00:00, 01/08/2012- 24:00:00, 31/08/2012	/13/	75.521	/23/	107.795	/23/	1,320,000	/23/	42,601.680	42,600.000	/27/	42,600.000
00:00:00, 01/09/2012- 24:00:00, 04/09/2012	/13/	107.795	/23/	112.668	/23/	1,320,000	/23/	6,432.360	6,430.000	/27/	6,430.000
In total								148,721.760	148,720.000		148,713.160

Table 3-2 ($EG_{Grid\ to\ PJ,\ y}$)

Settlement duration	Ref.	Starting meter Record	Ref.	Ending meter record	Ref.	Magnification	Ref.	Calculated quantity (MWh)	quantity for crosscheck (MWh)	Ref.	Confirmed value conservatively after crosscheck (MWh)
		A		B		C		D=(B-A)*C	E		F=Max (D,E)
00:00:00, 28/04/2011- 24:00:00, 30/04/2011	/13/	0.000	/23/	0.005	/23/	1,320,000	/23/	6.600	6.600	/33/	6.600
00:00:00, 01/05/2011- 24:00:00, 31/05/2011	/13/	0.005	/23/	0.109	/23/	1,320,000	/23/	137.280	137.280	/32/	137.280
00:00:00, 01/06/2011- 24:00:00, 30/06/2011	/13/	0.109	/23/	0.205	/23/	1,320,000	/23/	126.720	126.720	/32/	126.720
00:00:00, 01/07/2011- 24:00:00, 31/07/2011	/13/	0.205	/23/	0.288	/23/	1,320,000	/23/	109.560	109.560	/32/	109.560
00:00:00, 01/08/2012- 24:00:00, 31/08/2012	/13/	0.288	/23/	0.377	/23/	1,320,000	/23/	117.480	117.480	/32/	117.480
00:00:00, 01/09/2012- 24:00:00, 04/09/2012	/13/	0.377	/23/	0.381	/23/	1,320,000	/23/	5.280	5.280	/32/	5.280
In total								502.920	502.920		502.920

Based on the above analysis, in the proposed monitoring period from 28/04/2011 to 04/09/2011, ($EG_{PJ\ to\ Grid,\ y}$) is confirmed to be 148,713.160 MWh, ($EG_{Grid\ to\ PJ,\ y}$) is confirmed to be 502.920 MWh, thus the net electricity supplied to the grid by the project activity ($\boldsymbol{EG_{facility,\ y}}$) is confirmed to be:

($\boldsymbol{EG_{facility,\ y}}$)= ($EG_{PJ\ to\ Grid,\ y}$)- ($EG_{Grid\ to\ PJ,\ y}$)= 148,210.240 MWh; and the baseline emissions are confirmed to be:

$BE_y = EF_{grid,\ CM\ ,y}$ * **($\boldsymbol{EG_{facility,\ y}}$)** = 0.78795 tCO2e/MWh * 148,210.240 MWh = 116,782 tCO2e

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

As discussed in the above sections 4.1 and 4.2, the accuracy of GHG emission reductions for the reporting period is deemed credible via following quality assessments of evidences,

- The VCS monitoring report/9/ is prepared in line with the latest version 3.1 of VCS monitoring report template/3-2/;

- The daily operation & maintenance logs /7/ were verified and found that no any event or situation which may impact the applicability of the methodology ACM0002 version 12.1/2/ occurred to the project activity during the reporting period;

- All involved meters in the monitoring plan of the VCS PD/4/ are appropriately calibrated, and their calibration certificates were verified valid by checking the accreditation of calibration entity/18/ /19/. Further, the validity of calibration certificates is confirmed to cover the reporting period;

- All monitoring personal of the project were well trained /21/ /22/ /23/;

- A complete monitoring data records/23/ and survey reports of the project reservoir submerged surface area/24/ were provided for verification during the site inspection, and the electricity sales receipts/27/ /32/ are used to cross check both the electricity supplied to the grid and the electricity purchased from the grid, where conservative values are taken to determine the net electricity supplied to the grid for ensuring the quality of baseline emissions;

4.4 Management and Operational System

The verification team would like to confirm that during onsite visit the management and operation system was established and operated in accordance with the monitoring plan by reviewing some documents regarding staff training /20/ /21/, log book /7/ and monitoring manual /22/ and so on, interviewing the staff of the power plant /i/ and onsite observation, which are depicted as follow:

The person in charge of CDM, Mr. Wang Wenqing /i/ is responsible for the management and supervision of the monitoring plan, this includes:
(1) Track the development of CDM, keep communication with EB, DNA and related agencies;
(2) Supervise the project operation status related to data monitoring and the monitoring process as well, ensure a smooth and orderly monitoring process;
(3) In charge of activities related to CER issuance, ensure the completeness and accuracy of related data.

The verification team also confirms that the involved management and operation personal are fully aware of the responsibilities and perform all operations according to the registered monitoring plan and internally developed manuals by interviewing the staff of the power plant /i/, examining their operation process.

The QA/QC measures were further verified reliable by checking the daily operation &maintenance logs/9/. And the key parameters are measured and reviewed periodically as per the procedures.

5 VERIFICATION CONCLUSION

The verification team assigned by the DOE (TÜV Rheinland (China) Ltd.) has performed the verification of the project "Shiyazi Hydro Power Project in Guizhou Province China" in China, on the basis of requirements of VCS Standard version 3.3.

All electricity generated by the project will be supplied to the China Southern Power Grid in which the fossil-fuel based power plant are mainly dominated, thus the project achieves GHG emission reductions.

The verification was conducted by the following three steps:

i) Desk review of the VCS monitoring report (Version 1.0, dated 05/03/2012), the VCS PD Version 02 /4/, emission reductions calculation spreadsheet and supporting documents made available to the verification team by the project participant;

ii) Follow-up interviews and site inspection (11/05/2012); and

iii) Resolution of outstanding issues and desk review of the revised VCS monitoring report (Version 2.0, dated 12/11/2012).

Based on the above, the verification team can conclude as follows in detail,

- All operations of the project are implemented and installed as planned and described in the VCS PD /4/;

- The monitoring plan is in compliance with the applied approved methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 12.1)/2/;

- The electric meters applied to monitor parameters required for calculating emission reductions are calibrated appropriately/15/ /16/ /17/;

- The monitoring system and QA/QC procedures have been in place, and all operation staff has got training and are capable to operate and monitor the project activity.

Therefore, the verification team confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV Rheinland (China) Ltd.hereby is able to certify that the emission reductions resulted from the project "Shiyazi Hydro Power Project in Guizhou Province China" during the monitoring period from 28/04/2011 to 04/09/2011 amount to 116,782 tonnes of CO2 equivalent, detailed as below,

Reporting period: From 28/04/2011 to 04/09/2011

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

GHG Emission Reductions or Removals	tCO_2e
Baseline Emissions	116,782
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	116,782