VERIFICATION REPORT FOR DATONG RIVER TIANWANGGOU HYDROPOWER STATION

Document Prepared by China Classification Society Certification Company (CCSC)

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Summary:

China Classification Society Certification Company (hereafter referred to as "CCSC") has been commissioned by Gansu Heihe Electric Power Sales Co. Ltd. to perform the verification of greenhouse gas emission reductions of the project activity "Datong River Tianwanggou Hydropower Station " (UNFCCC Ref. No. 2840, VCS Ref. No. 823, hereafter referred to as "the project activity") reported in the monitoring report during monitoring period 30/12/2015 to 19/06/2018.

The verification scope is defined as a periodic independent and objective review and ex-post determination by the Designated Operational Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up on-site visit and interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using CCSC internal procedures.

In summary, CCSC confirms that the Project is implemented as planned and described in the validated VCS-PD. Deviations from the monitoring plan are sufficiently justified. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the Project is ready to reduce GHG emission. The GHG emission reduction is calculated without material misstatements, and the emission reductions verified totalize 484,727 tons of CO_2e for the monitoring period.

Our opinion relates to the Project's GHG emissions and the resulting GHG emission reductions viz. Voluntary Carbon Units (VCUs) reported are based on the valid project baseline, deviation on the monitoring plan and associated documents. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, CCSC confirms following statement:

Vintage	*BE (tCO_2)*	*PE (tCO_2)*	*LE (tCO_2)*	*ER (tCO_2)*
30/12/2015 – 31/12/2015	*532*	*0*	*0*	*532*
01/01/2016 – 31/12/2016	*187,466*	*0*	*0*	*187,466*
01/01/2017 – 31/12/2017	*215,368*	*0*	*0*	*215,368*
01/01/2018 – 19/06/2018	*81,361*	*0*	*0*	*81,361*
Total	***484,727***	***0***	***0***	***484,727***

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1 INTRODUCTION

1.1 Objective

Gansu Heihe Electric Power Sales Co. Ltd. has commissioned Classification Society Certification Company (hereafter referred to as "CCSC") to verify the emission reductions of the Verified emission reduction (VER) of Datong River Tianwanggou Hydropower Station (hereafter referred to as "the Project"), which is located in Yongdeng County, Lanzhou City, Gansu Province, the People's Republic of China for the period from 30/12/2015 to 19/06/2018.

CCSC as the validation/verification body (VVB) of the Project has been accredited as a DOE by UNFCCC and also meets the competence requirements as set out in ISO 14065.

The objective of verification is to verify the reported voluntary emission reductions generated by the Project for the period from 30/12/2015 to 19/06/2018 and to confirm that actual monitoring systems and procedures are in compliance with that described in the monitoring plan and the additional requirements stated by Verra.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of the registered PD, the Project's baseline study and Monitoring Report (MR) and other relevant documents. The information in these documents is reviewed against VCS Version 4.1 requirements, UNFCCC rules and associated interpretations.

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

CCSC has undertaken a reasonable assurance engagement in accordance with VCS version 4.1. It requires a reasonable level of assurance in verification that GHG assertions are free of material errors, omissions and misrepresentations. The verification conclusion is based on the VCS-PD, VCS-MR, CDM-PDD, supporting evidences made available to the verifier and information collected through performing interviews and during the on-site inspection.

1.4 Summary Description of the Project

Project title	*Datong River Tianwanggou Hydropower Station*

UNFCCC reference number *VCS reference number*	*2840* *823*
Crediting period (VCS)	*1st : 20/06/2008 – 19/06/2018, totally 10 years.*
Project Participants	*GEPIC Darong Electric Power Company Ltd. (Project Owner, host country, P. R. China)*
Location of the project	*Located in Yongdeng County, Lanzhou City, Gansu Province, the People's Republic of China* *Geographic coordinates:* *Dam: 102°44'57" E and 36°42'49" N* *Powerhouse: 102°46'20" E and 36°39'58" N*
Monitoring period	*30/12/2015 to 19/06/2018*
Applied	*ACM0002, Ver.7*
Scope/Technical Area	*Scope 1/ TA 1.2*
UNFCCC link:	*https://cdm.unfccc.int/Projects/DB/TUEV-SUED1249300679.15/view*
VCS	*https://registry.verra.org/app/projectDetail/VCS/823*

The Datong River Tianwanggou Hydropower Station (hereafter referred to as the project) developed by GEPIC Darong Electric Power Company Ltd. (hereafter referred to as the project proponent) is a run-of-river hydropower project located in Yongdeng County, Lanzhou City, Gansu Province, the People's Republic of China . The Project involves the installation of 3 turbine/generator units with the individual capacity of 17MW, for a total installed capacity of 51MW. The area measured in the surface of the water at full level of the new reservoir is 237,400m^2, thus the power density is 215W/m^2. The purpose of the Project is to utilise the hydrological resources to generate electricity which would otherwise have been produced by fuel-fired power plants and deliver the electricity to the Northwest China Power Grid. The expected annual electricity supplied to the power grid is 211,576MWh. The Project will achieve greenhouse gas (GHG) emission reductions by avoiding CO_2 emission from the baseline scenario, electricity generated by those fossil fuel-fired power plants connected into Northwest China Power Grid. The estimated average annual emissions reductions over the first crediting period are 179,797tCO_2e, according to the PDD Version 04.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using CCSC internal procedures. CCSC verified the information contained in the documents reviewed against the requirements set in VCS Standard Version 4.1, CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant UNFCCC requirements and applying standard auditing techniques.

2.2 Document Review

Verification was conducted using CCSC's procedures in line with the requirements specified in the VCS Standard version 4.1, CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant UNFCCC requirements and applying standard auditing techniques.

The CDM Project Design Document (CDM-PDD) and the Monitoring Report (VCS-MR) submitted by Gansu Heihe Electric Power Sales Co. Ltd. and additional background documents related to the project design and baseline, i.e. country Law, registered CDM-PDD, validation report, Approved methodology, Clarifications on Validation Requirements to be Checked by a certified validation body were reviewed.

Furthermore, crosschecks were made between information provided in the VCS-PD, CDM-PDD and information from sources other than those used.

2.3 Interviews

The follow-up interview was conducted during the site visit from 20/06/2021 to 21/06/2021 by Mr. LI Xingtong (Team Leader), Mr.TAN Wenbin (Team Member) and Mr.MA Yuxiang (Trainee) from CCSC, which is focused on the issues identified during the desk review. The main topics of the interviews are summarized in ***Table 1****.*

Table 1. Interview topics

Interviewed Organization and Persons	*Interview Topics*
GEPIC Darong Electric Power Company Ltd. Tianwanggou Power Plant – *Mr. DUO Xiaohui, Deputy General Manager of the Branch* – *Mr. ZHANG Wanming, Assistant of Director* – *Mr. ZHANG Jianlong, Senior Shift Chief* – *Ms. SHANG Huijing, Operator* – *Mr. SUN Wenxiang, Operator*	*Project background information* *Project technology, operation, maintenance and monitoring capability.* *Project monitoring and management plan.* *The evidences of construction status and operation of key equipment, parameters monitoring and data processing activities, monitor equipment and calibration.* *Monitoring data.* *Quality Management; organizational structure, responsibilities and competencies; Internal QA/QC Management procedures and document control.* *Compliance with National Laws and Regulations.*
Gansu Heihe Electric Power Sales Co. Ltd. – *Mr. LIU Mengde, Manager*	*Applicability of selected methodology.* *Baseline determination.* *Emission reductions calculation.* *Emission reduction monitoring plan.*

2.4 Site Inspections

The assessment team performed the on-site verification from 20/06/2021 to 21/06/2021. The interviewed personnel and objective are listed in above table.

2.5 Resolution of Findings

The objective of this phase of the validation is to resolve issues that require further elaboration, research or expansion prior to CCSC's positive conclusion on the project design.

A Corrective Action Request (CAR) is raised, if one of the following situations occurs:

(a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable, verifiable and additional emission reductions;

(b) The applicable VCS requirements have not been met;

(c) There is a risk that emission reductions cannot be monitored or calculated.

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

A Forward Action Request (FAR) may also be raised during validation, to identify issues related

to project implementation that require review during the first verification of the project activity.

To guarantee the transparency of the validation process, the issues raised, the responses provided by the project participants, the means of validation of such responses and references to any resulting changes in the VCS-PD or supporting annexes are documented in the Appendix A.

2.5.1 Forward Action Requests

No FAR was raised during the verification process. Also there are no remaining from former verification and validation.

2.6 Eligibility for Validation Activities

Not applicable as China Classification Society Certification Company holds the accreditation for the validation and verification for projects under scope 1.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

Through reviewing the registered PD and validation report at UNFCCC website, it was validated that the project has also been registered as a CDM project with reference No. 2840. By checking https://registry.verra.org/app/projectDetail/VCS/823, it is confirmed that the project also registered as a VCS project. The project does not participate in the other emissions trading program by checking public information on Internet and interviewing with project owner. The project would claim for either CERs or VCUs, however CERs and VCUs would not been claimed together in the same period confirmed by checking statement issued by project owner.

The verification team reviewed issuance information in VCS/CDM registry system, and confirmed that GHG Emission Reductions Credits have been issued as follows:

Table 2. List of GHG emission reduction credits issued

Monitoring period	*GHG emission reductions (tCO_2e)*	*Credit Type*	*Program*
20/06/2008-24/10/2010	467,771	VCU	VCS
25/10/2010-29/12/2015	966,228	CER	CDM

Therefore, CCSC consider the project is eligible to participate under the VCS Program as there is no double counting for the emission reduction during any period.

Since China has initiated ETS in July 2021, and As per the Notice (Huan ban qi hou [2021]No.9)

issued by Ministry of Ecology and Environment of P.R.China (MEE), the fossil fuel power and/or heat generation plants in Gansu Province are covered by China ETS, and also other seven industries will be included in the future.

However, as per the notice, the project activity is not covered by the mandatory emission control scheme and there is no emission cap enforced for the project owner.

Also, the CCSC verification team reviewed the regulation, and realises that the allowance (CEA) for power generation industries will be allocated on the basis of carbon emission intensity, i.e. the CEA allocation is not related with the components of local grid.

Furthermore, the CCSC verification team checked the No Double Counting Statement issued by the project owner, and confirms the PP has not issued and will not issue the GHG emission reductions generated during this monitoring period.

In summary, CCSC verification team can conclude that net GHG emission reductions generated during this monitoring period have not been used and will not be used for compliance under other programs or mechanisms.

3.2 Methodology Deviations

Not applicable as not deviation for methodology.

3.3 Project Description Deviations

Not applicable as not deviation for project description.

3.4 Grouped Project

Not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

CCSC verification team has performed an on-site visit and found that the Project has been put into operation and the electricity generated is supplied to NWCPG according to the signed Power Purchase Agreement (PPA). It's witnessed that the Project involves the installation of three hydraulic turbine generator units with capacity 17MW each, with a total installed capacity of 51MW, thus the power density is 215W/m^2 as per the registered PDD. Through checking the nameplates of turbines and generators on-site, the verification team can confirm the information

of the physically installed facilities has been consistently reported in the MR. The parameters of the hydro turbine generators are listed as following tables:

Table 3. Key technical data for the equipment of the Project

Parameter		*Value*
Installed capacity (MW)		*51*
Designed water head (m)		*50*
Model of turbine		
HLA551-LJ-215	*Units*	*3*
	Lifetime (year)	*25*
Model of generator		
SF-J17-22/4250	*Units*	*3*
	Lifetime (year)	*25*

Therefore, the verification confirmed there is no changes from the project design to actual implementation have been identified during this verification. The operation of the project activity has been conducted in accordance with the description of the registered VCS-PD.

As per previous validation report and verification reports, it's confirmed that the construction of the project started since 24/10/2005 and the start date of the continued operation period is 20/06/2008.

[Power System]

As shown in the diagram of the power connection system, the electricity generated by the Project is delivered to the onsite step-up substation, which connected to the Transformer Substation of the grid via 110kV line and then delivered to the Northwest China Power Grid.

[Metering System]

Five electricity meters involved in the monitoring system:

- *The M2 (Main meter) and M2' (Backup meter) have been installed at high voltage output of the onsite substation, to measure the on-grid electricity supplied to the grid by the Project and on-grid electricity imported from the grid.*
- *The meters (M3, M4 and M5) have been installed at output of each generator, to monitor the electricity produced by each generator, including the electricity supplied to the grid and the electricity supplied to internal loads.*

4.2 Safeguards

4.2.1 No Net Harm

By checking the EIA summary and conclusion provided in the registered PD, it is confirmed that

the project does not have significant impacts on the environment or on the local society and economy. There is no transboundary impact involved with the project. Negative impacts are mitigated with a set of environmental protection measures in consistent with national and local laws and regulations.

After the completion of the construction, the project was put into operation after inspection and acceptance by the local environmental protection department. During the project operation, the project continues to contribute to the local society and economy.

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

4.2.2 Local Stakeholder Consultation

According to the VCS-PD, local stakeholders were invited to provide comments in 2006 and 2007. The processes by which comments from local stakeholders have been invited and compiled, has been described within the VCS-PD. Furthermore, representatives from the local community were interviewed, the relevant evidences were presented to CCSC for assessment. In general, the interviewees show adequate understanding of the nature of the Project and agreed that the Project would benefit the environment, society and economic development. The response is overall supportive.

Furthermore, the project owner conducted regular local stakeholder consultation during this monitoring period, i.e. in 2016, 2017 and 2018 respectively. The verification team checked the questionnaires and confirmed that no negative comments were received. The respondents generally expressed their support to the project.

4.3 AFOLU-Specific Safeguards

Not applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

[Fixed ax-ante parameters]

The data and parameters fixed ex-ante have been reported in the MR, and have been checked against the registered monitoring plan and the applied methodology by the verification team.

$EF_{grid,CM,y}$, emission factor of the grid

The emission factor of the grid has been determined ex-ante in the registered monitoring plan for the crediting period and thus is applicable to this monitoring period.

$EF_{grid,CM,y}$ in the monitoring report is 0.8498 tCO_2/MWh, which has been verified against the VCS-PD and confirmed as consistent.

Cap_{BL}, Installed capacity of the hydropower plant before the implementation of the Project; it's zero for the project.

A_{BL}, Area of the reservoir measured in the surface of the water, before the implementation of the Project, when the reservoir is full. It's zero for it's a new reservoir for the project.

[Monitoring parameters]

The monitoring parameters have been carried out in accordance with the monitoring plan contained in the registered VCS-PD. All parameters were monitored and determined as per the monitoring plan which is listed in below table:

Means of verification	*The verification team has performed the following activities to determine whether the monitoring of parameters related to the GHG emission reductions has been implemented in accordance with the registered monitoring plan.* • *Through the on-site inspection of the monitoring system, interview with the operation staff, document review including relevant records, procedures and technical specifications, the verification team has assessed the implementation of the registered monitoring plan followed by the PP;* • *The parameters stated in the registered monitoring plan have been checked by means above;* • *The verification team has checked the installation of the electricity meter by onsite inspection against PPA, diagram of power connection system and calibration reports by qualified third party;* • *The MRRs and sales receipts were checked by the team to confirm the monitoring results;* • *Based on the interview with the top management and operation staff and the review of the VCS Monitoring & Management Manual, the verification team has assessed the quality assurance and quality control procedures applied by the PP.* *No sampling plan was involved in the project activity.*
Findings	*According to the registered monitoring plan, the parameters which need to be monitored include:* ***Baseline emission parameters:*** *The baseline emissions are the baseline emission factor times the net electricity supplied to the grid. Therefore,* $BE_y = EF_{grid,CM,y} \times EG_y = EF_{grid,CM,y} \times (EG_{out,y} \times (1\text{-}TLR) - EG_{in,y} \times (1+TLR))$ *$EF_{grid,CM,y}$: GHG emission factor of the Northwest China Power Grid (NWCPG), calculated ex-ante in the registered PDD as 0.8498 tCO_2/MWh* *EG_y: Net electricity supplied to the NWCPG* *$EG_{out,y}$: Annual on-grid electricity supplied to NWCPG by the project.* *$EG_{in,y}$: Annual on-grid electricity imported from NWCPG by the project for the plant operation.*

	TLR: Transmission Losses Rate (TLR), which is 0.41% as per the approved revised monitoring plan *As described above, the meter has been installed in accordance with the approved revised monitoring plan. The verification team 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 monitored and monthly recorded by the PP in its Monthly Reading Records (MRRs) and by the grid company. 24:00 o'clock on third last day each month is the cut-off time to calculate the monthly net electricity supplied to the grid by the Project. The PP provided the grid company with the records containing the electricity exported to and imported from the grid by the Project. After a cross-check, the grid company provided the sales receipts to the PP to confirm the data.* ***(2) Project emission parameters:*** *The Project is a newly built hydropower plant with the total installed capacity of 51MW and a reservoir of which the surface area is 237,400m^2, so the power density is calculated as 215W/m^2 and thus the project emission are zero according to the registered PDD.* *Three parameters are to be monitored regarding the project emissions:* ● ***TEG_y**, Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads* *The parameter has been monitored continuously by the meters M3, M4 and M5 installed at the output of each generator, and recorded monthly by the PP. The values of the TEG_y are the sum of the electricity measured by the meters M3, M4 and M5. The data weren't used for the calculation of ERs in this monitoring period for PD>10W/m^2.* ● ***Cap_{PJ}**, Installed capacity of the hydro power plant after the implementation of the project activity.* *The parameter has been monitored yearly by the PP, and the installed capacity keeps 51MW in the monitoring period, which has been checked against the nameplate of the turbine generators to be consistent.* ● ***A_{PJ}**, Area of the reservoir measured at the surface of the water, after the implementation of the project activity, when the reservoir is full.* *As per the Survey Reports on Surface Area of the Reservoir issued by Northwest Hydro Consulting Engineers, CHECC in 2015, 2016, 2017 and 2018 respectively, which is the entity authorized by the National Administration of Surveying and Mapping, the area of the reservoir measured at the surface of the water is 237,400m^2.* ***(3) Leakage emission parameters:***

	No parameters related to leakage need to be considered according to ACM0002 Version 07. *No parameters are to be monitored regarding the leakage emissions.* ***Management and operational system:*** *The PP has the responsibility of overall monitoring, which has established a monitoring team for monitoring of power generation, maintenance and operation of the CDM Project activity. All the records related to generation and maintenance have been satisfactorily maintained.* *Responsibilities have been allocated to well-trained monitoring staff as per the monitoring plan.* *The QA/QC procedures are part of management system and are documented in management procedures.* *The records and all relevant paper-based information are well archived by the project owner and available for verification.* *The responsibilities and the procedures included in the CDM Monitoring & Management Manual have been verified. VCS Monitoring & Management Manual and internal training records have been provided and verified by the verification team.*
Conclusion	*CCSC verification team confirms that:* • *The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD.* • *All parameters required by the monitoring plan have been sufficiently monitored and correctly listed. The monitored data for required parameters have been verified by checking the whole information flow.*

[Calculation information]

Meter ID	*Type*	*Serial Number*	*Accuracy*	*Calibration Date*	*Valid to*
M2	*SL7000*	*36088342*	*0.2S*	*21/01/2015*	*21/01/2015-20/01/2016*
				19/01/2016	*19/01/2016-18/01/2017*
				17/01/2017	*17/01/2017-16/01/2018*
				15/01/2018	*15/01/2018-14/01/2019*
M2'	*SL7000*	*36088343*	*0.2S*	*21/01/2015*	*21/01/2015-20/01/2016*

				19/01/2016	*19/01/2016-18/01/2017*
				17/01/2017	*17/01/2017-16/01/2018*
				15/01/2018	*15/01/2018-14/01/2019*
M3	*DTSD341*	*323030238*	*0.5*	*17/04/2015*	*17/04/2015-16/04/2018*
				15/04/2018	*15/04/2018-14/04/2021*
M4	*DSSD331*	*323030237*	*0.5*	*19/06/2015*	*19/06/2015-18/06/2018*
				15/06/2018	*15/06/2018-14/06/2021*
M5	*DSSD331*	*323030239*	*0.5*	*19/06/2015*	*19/06/2015-18/06/2018*
				15/06/2018	*15/06/2018-14/06/2021*
Calibration Entity	*Power Measurement Center of Gansu Power Supply Company*				

[Calculation of baseline GHG emissions]

Means of verification	*The verification team has performed the following activities to assess the data and calculations of GHG emission reductions achieved by the Project as per the methodology:* • *Through desk review and on-site inspection on the monthly electricity reports and electricity invoice, to verify that a complete set of data for the specified monitoring period is available.* • *Information provided in the monitoring report has been cross-checked with other sources such as MRRs, sales receipts.* • *Review the calculations of baseline GHG emissions have been carried out in accordance with the formulae and methods described in the registered PDD, and the methodology;* • *Review emission factors, IPCC default values, GWPs and other reference values as per the registered PDD.*

Findings

According to the registered PDD and the applied methodology, the baseline emissions are the baseline emission factor times the net electricity supplied to the grid. Therefore,

$BE_y = EF_{grid,CM,y} \times EG_y = EF_{grid,CM,y} \times (EG_{out,y} \times (1\text{-}TLR) - EG_{in,y} \times (1+TLR))$

$EF_{grid,CM,y}$: GHG emission factor of the Northwest China Power Grid, calculated ex-ante in the registered PDD as 0.8498 tCO_2/MWh

EG_y: Net electricity supplied to the Northwest China Power Grid

$EG_{out,y}$: Annual on-grid electricity supplied to Northwest China Power Grid by the project.

$EG_{in,y}$: Annual on-grid electricity imported from Northwest China Power Grid by the project for the plant operation.

TLR: Transmission Losses Rate (TLR), which is 0.41% as per the approved revised monitoring plan

$EF_{grid,CM,y}$ is the emission factor of Northwest China Power Grid in year y, calculated in the registered PDD, which has been determined ex-ante as 0.8498tCO_2/MWh for this crediting period and thus is applicable to this monitoring period (30/12/2015 to 19/06/2018).

The verification team has cross-checked the values from the MRRs /19/ with the sales receipts /20/ for the period from 30/12/2014 to 29/12/2015, and found the data are totally consistent.

The net electricity supply (EG_y) is calculated as:

The verified EG_y of the Project (MWh)

Period	$EG_{out,y}$ (C)	$EG_{in,y}$ (F)	EG_y =99.59%*C-100.41%*F	Baseline emissions (tCO_2e)
30/12/2015 – 31/12/2015	629.870	0.094	627.193	533.0
01/01/2016 – 31/12/2016	221,531.382	22.336	220,600.676	187,466.5
01/01/2017 – 31/12/2017	254,485.224	6.946	253,434.860	215,368.9
01/01/2018 – 19/06/2018	96,149.643	12.926	95,742.450	81,361.9
Total monitoring period	572,796.119	42.302	570,405.179	484,727

	30/12/2015 to 19/06/2018 | | | | | *The verification team confirmed the calculation of baseline emissions as reported in the MR and the ER spreadsheet is correct and rounded down to integers.*
Conclusion	*CCSC verification team confirms that:* • *A complete set of data for the monitoring period is available.* • *Information on the baseline GHG emission calculation provided in the monitoring report has been cross-checked with other sources.* • *Calculations of baseline emissions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document.* • *There are no assumptions applied.* • *Appropriate emission factor of the power grid has been correctly applied.*

[Calculation of project GHG emissions]

Means of verification	*The verification team has reviewed the project emission calculation as per the registered PDD and the applied methodology.*
Findings	*According to the ACM0002 Version 07, if the power density (PD) of the power plant is greater than 10 W/m², and then PE_y= 0.* *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).* *Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W).* *Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero.* *A_{PJ} = Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m²).* *A_{BL} = 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 new reservoirs, this value is zero.* *The power density of the Project is calculated as 215W/m², higher than 10 W/m². Thus the Project emission (PE_y) in this monitoring period are zero according to ACM0002 Version 07. The team confirmed the description of project emission in the MR is correct.*

Conclusion	*CCSC verification team confirms that:* • *A complete set of data for the monitoring period is available.* • *Information on the project GHG emission calculation provided in the monitoring report has been cross-checked with other sources.* • *Calculations of project emissions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document.*

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The monitoring has been carried out in accordance with the monitoring plan contained in the VCS-PD.

As a result of verification of the ER calculation process, the assessment team confirmed that all the parameters required for the determination of the emission reductions have been included in the MR Report and ER Calculation Spreadsheet and are consistent with the applied methodology ACM0002 version 07 and the monitoring plan contained in the VCS-PD. The parameters are complete in this monitoring period.

After verifying the reported figures with the raw data sources, it's confirmed that the values of the parameters from the raw data sources are consistent with those quoted in the ER Calculation Spreadsheet and the MR Report. The verification process for the same has been clearly described above in section 4.4 of the report.

4.6 Non-Permanence Risk Analysis

Not applicable as a renewable project.

5 VERIFICATION CONCLUSION

CCSC has been commissioned by Gansu Heihe Electric Power Sales Co. Ltd. to perform the verification of greenhouse gas emission reductions of the project activity "Datong River Tianwanggou Hydropower Station " (UNFCCC Ref. No. 2840, VCS Ref. No. 823).

The management of GEPIC Darong Electric Power Company Ltd. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project's Monitoring Plan in the VCS-PD.

Our verification approach was based on the requirements as defined under the applicable VCS standards and relevant UNFCCC requirements. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- *the project is implemented and operated as per the VCS-PD;*
- *the monitoring plan in VCS-PD is as per the applied methodology;*
- *the monitoring complies with the monitoring plan in the VCS-PD;*
- *the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS and CDM requirements;*
- *the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;*
- *the monitoring system is in place and generates GHG emission reductions data;*
- *the GHG emission reductions are calculated without material misstatements.*

In our opinion, the GHG emission reductions for "Datong River Tianwanggou Hydropower Station" during the monitoring period 30/12/2015 to 19/06/2018 as reported in Monitoring Report, prepared on the basis of the project's Monitoring Plan are fairly stated. Based on the information we have seen and evaluated, we confirm the following statement:

Verification period: 30/12/2015 to 19/06/2018

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

Vintage	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
30/12/2015 – 31/12/2015	*532*	*0*	*0*	*532*
01/01/2016 – 31/12/2016	*187,466*	*0*	*0*	*187,466*
01/01/2017 – 31/12/2017	*215,368*	*0*	*0*	*215,368*
01/01/2018 – 19/06/2018	*81,361*	*0*	*0*	*81,361*
Total	***484,727***	***0***	***0***	***484,727***

APPENDIX A: ABBREVIATIONS

Abbreviations	Full texts
AFOLU	Agriculture, Forestry and Other Land Use
BM	Build Margin
CAR	Corrective Action Request
CCSC	China Classification Society Certification Company
CCER	China Certified Emission Rrductions
CDM	Clean Development Mechanism
CL	Clarification Request
CCSC	China Classification Society Certification Company
CM	Combined Margin
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DOE	Designated Operation Entity
DNA	Designated National Authority
CDM-EB	CDM Executive Board
EF	Emission Factor
EIA	Environmental Impact Assessment
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG(s)	Greenhouse gas(es)
GS	Golden Standard
IPCC	Intergovernmental Panel on Climate Change
MEE	Ministry of Ecology and Environment of the People's Republic of China
MP	Monitoring Plan

NWCPG	Northwest China Power Grid
OM	Operating Margin
PD	Project Description
PP	Project Participant
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Voluntary Carbon Unit
VVB	Validation / Verification Body

APPENDIX B: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

CCS 认证公司
Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 23/01/2020

Mr. Li Xingtong

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.1/TA1.2/TA3.1/TA9.2/TA13.1

■ CDM verifier for Technical Area(s): TA1.1/TA1.2/TA3.1/TA9.2/TA13.1

☐ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

CCS 认证公司
Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 23/01/2020

Mr. Tan Wenbin

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.2/TA5.2/TA8.1/TA10.1

■ CDM verifier for Technical Area(s): TA1.2/TA5.2/TA8.1/TA10.1

☐ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

CCS 认证公司
Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 23/01/2020

Mr. Yong Hanlin

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.1/TA1.2/TA8.1/TA10.1

■ CDM verifier for Technical Area(s): TA1.1/TA1.2/TA8.1/TA10.1

☐ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

CCS 认证公司
Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 23/01/2020

Ms. Xie Fengjun

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

■ CDM validator for Technical Area(s): TA1.2/TA13.1/TA13.2

■ CDM verifier for Technical Area(s): TA1.2/TA13.1/TA13.2

☐ Technical expert for Technical Area(s):_____

Huang ShiYuan
CCSC General Manager

APPENDIX C: DOCUMENTS REVIEWED OR REFERENCED

/1/ *Monitoring report, version 1.0, dated 30/05/2021; Version 3.0 dated 30/07/2021*

/2/ *ER calculation spreadsheet*

/3/ *Registered CDM-PDD, version 04, dated 01/10/2010*

/4/ *Validation report, Version 7, dated 22/10/2010*

/5/ *Previous CDM and VCS verification reports*

/6/ *VCS Standard version 4.1*

/7/ *Statement issued by project owner*

/8/ *Methodology ACM0002, version 07*

/9/ *VCS Monitoring Manual*

/10/ *Nameplates of the equipment*

/11/ *Diagram of the power connection system*

/12/ *Meter Reading Record (MRRs)*

/13/ *Electricity Transaction Notes covering the monitoring period*

/14/ *Signed Power Purchase Agreement (PPA) with grid company*

/15/ *Calibration certificates of meters covering the whole monitoring period issued by Gansu Province Power Company Electric Energy Measurement Centre*

/16/ *Accreditation certificates for Gansu Province Power Company Electric Energy Measurement Centre*

/17/ *Survey Reports on Surface Area of the Reservoir*

/18/ *The entity of Northwest Hydro Consulting Engineers, CHECC authorized by the National Administration of Surveying and Mapping*

/19/ *EIA questionnaires*

/20/ *Huanbanqihou[2021]No.9, http://www.mee.gov.cn/xxgk2018/xxgk/xxgk05/202103/t20210330_826728.html*

/21/ *No Double Counting Statement, issued by the Project Owner on 28/07/2021*

APPENDIX D: RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

Zero CAR, Three CLs and Zero FAR were raised in this verification.

Findings	PP's response	Verification teams conclusion
CL-1: In Section 3.1 of the monitoring report, the following information should be reported: the operation of the project activity during this monitoring period, including any information on events that may impact the GHG emission reductions and monitoring.	During this monitoring period, the project is normal operation, no special event occurred which may impact the applicability of the methodology, the GHG emission reductions or removals and monitoring.	The verification team checked the revised MR against operation log and confirmed consistent. Thus, the CL-1 was closed out.
CL-2: As per the methodology, the parameter Cap_{BL}, i.e. installed capacity of the hydropower plant before the implementation of the Project, should be reported as data and parameters available at validation.	The parameter Cap_{BL} has been added in the updated MR.	The verification team reviewed the revised MR with the registered PDD and applied methodology, and confirmed appropriate. Thus, the CL-2 was closed out.
CL-3: The emission reductions claimed during this monitoring period are about 8.97% higher than the estimation in registered PDD. Please elaborate the reason for the fluctuation and demonstrate the impact to the additionality of the project.	The clarification has been added in the updated MR. the total electricity exported to the grid is 8.97% higher than the ex-ante estimation in registered VCS PD, the main reason is that the net electricity supplied to the grid by the project in the vintages 2016 and 2017 of this monitoring period are 3.98% and 19.78% higher than that estimated in registered PD respectively. It is because the water flow of Datong River in Yellow River Valley caused by the abundant	The verification team checked the 2016 and 2017 Annual Report on Water Conditions and confirmed that the power generation was due to the reason of nature, which cannot fully control by the PP. The verification team also reviewed the IRR analysis against the registered CDM-PDD, and confirmed critical point for power generation would be

	rainfall for 2016 [1] and 2017[2] is higher than other seasons in previous year. As per the calculation of IRR under CDM program, if annual power supply increases 18.05% higher than the ex-ante estimation in registered CDM PDD, the IRR (after income tax) of the project will be 8% which does not impact the additionality. During this monitoring period, the electricity exported to the grid is only 8.97% higher than the ex-ante estimation in registered VCS PD, which is at normal fluctuation and not impact the additionality.	18.05%. Thus, the 8.97% increase in the ER during this monitoring period did not impact the additionality of the project. Therefore, the CL-3 was closed out.

[1] 2016 Annual Report on Water Conditions, http://www.mwr.gov.cn/sj/tjgb/sqnb/201708/t20170810_973261.html

[2] 2017 Annual Report on Water Conditions, http://www.mwr.gov.cn/sj/tjgb/sqnb/201902/P020190213636482806061.pdf