



**Validation report form for renewal of crediting period for
CDM project activities
(Version 03.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Qinghai Maqin Gequ Level 2 hydropower Station Ref. No.7507
Number and duration of the next crediting period	2 nd , 7 years (01/01/2021 to 31/12/2027)
Version number of the validation report	01
Completion date of the validation report	10/07/2021
Version number of PDD to which this report applies	4.1
Project participants	Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD (Project Owner) Climate Wedge Ltd Oy (Buyer) Carbon & Energy Capital Co. LTD (Buyer) Carbon 350 Ltd. (Buyer)
Host Party	People's Republic of China
Applied methodologies and standardized baselines	Methodology: ACM0002 "Grid-connected electricity generation from renewable sources" (Version 20.0) Standardized baselines: Not applicable
Mandatory sectoral scopes	Sectoral scope 01: Energy industries (renewable/non-renewable sources)
Conditional sectoral scopes, if applicable	Not applicable
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period	123,721 tCO _{2e}
Name and UNFCCC reference number of the DOE	Name: China Classification Society Certification Company (CCSC) Reference number: 0046
Name, position and signature of the approver of the validation report	Mr. HUANG Shiyuan, General Manager 

SECTION A. Executive summary

>>

China Classification Society Certification Company (here after called CCSC) has performed an assessment of the request by Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD to renew the crediting period of CDM project Qinghai Maqin Gequ Level 2 hydropower Station (UNFCCC registration No.7507), which has been registered as a CDM project on 03/10/2012. From 01/01/2014 to 30/09/2015, total CERs of 276,440 tCO₂e has been issued. It is a hydropower project with the dam on the river, located in the Maqin County, Guoluo Zang Autonomous Prefecture, Qinghai Province, P.R. China. As per registered PDD (Version 3.0, 12/06/2012) within the 1st crediting period, the project involves a total install capacity of 48MW (2*24MW) and a designed operation life of 20 years. The annual operation hour is estimated to be 5,226hours, and the plant load factor (PLF) is therefore 59.7% ($5,226/8,760h \times 100\% = 59.7\%$). The area of the reservoir is 245,900m² with a corresponding power density of 195.2W/m² ($48,000,000W/245,900 = 195.2W/m^2$), which is greater than 4 W/m². The estimated annual in-grid electricity output of the project is 223,525MWh and the emission reductions in the 2nd crediting period (01/01/2021 to 31/12/2027) are estimated to be on average 123,721tCO₂e per year, and 866,047 tCO₂e over the chosen (second) crediting period. The construction of the project was started on 20/04/2011. The first hydro turbine started operation on 10/06/2014. All the hydro turbines started full operation on 21/06/2014. The project transfers the electricity generated by the hydro turbines to the Northwest China Power Grid (hereafter NWPG) and thus replaces the same amount of electricity generated by fossil fuel in the NWPG /1//2/

Objective

The validation of renewal of crediting period serves as assessment of validity of the updated sections of the PDD of project that has opted for a renewal of the crediting period. The validation is an independent 3rd party assessment of the project's baseline, estimated GHG emission reductions or net anthropogenic GHG removals, the monitoring plan and the crediting period using the valid version of the approved baseline and monitoring methodology and, where applicable, the approved standardized baseline that is applicable to the project activity.

Scope of the validation

The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism. The scope of the validation is defined as an independent and objective review of the PDD, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against CDM Validation and Verification Standard, Kyoto Protocol Requirements, UNFCCC rules and associated interpretations.

The validation team has, based on the instructions in the VVS-PA employed a risk-based and step-wise approach when conducting the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

Validation process

The validation has been performed the identification whether the PPs have updated sections of the PDD relating to the baseline, estimated GHG emission reductions or net anthropogenic GHG removals, the monitoring plan and the crediting period using the valid version(s) of the approved baseline and monitoring methodology and, where applicable, the approved standardized baseline that is (are) applicable to the project activity.

Therefore, the validation report is based on the assessment of the project design document undertaken through stakeholder consultations, application of standard auditing techniques. The validation process consisted of the following three phases:

1. Desk review of the project design and baseline and monitoring plan;
2. Follow-up interview with project stakeholders;

3. Resolution of outstanding issues and the issuance of the final validation report and opinion.

In the course of the validation, 1 Corrective Action Request (CAR) and 1 Forward Action Request (FAR), no Clarification Request (CL), were raised for the CDM project activity (PDD Version 4.0, dated 15/01/2021) in relation to all relevant CDM requirements. Until issuance of this version of validation report, the raised CAR and FAR were successfully closed.

Validation conclusion

The review of the updated PDD (both version 4.0 and Version 4.1 inclusive /5/7/), the subsequent follow up interviews, together with the review of comments by Parties and Stakeholders, have provided CCSC with sufficient evidences to confirm that the project has satisfied the stated criteria.

The validation covered all project components and issues that need to be validated for the renewal of crediting period as a CDM project. CCSC hereby confirms that the project correctly applied the baseline and monitoring methodology ACM0002 Version 20.0 and meets the relevant UNFCCC requirements for the renewal of the crediting period /9/.

CCSC hereby requests the renewal of crediting period of the project. Provided that the project is implemented and maintained as designed, the project is expected to achieve annual average emission reduction of 123,721tCO₂e within the 2nd crediting period (7 years, 01/01/2021 to 31/12/2027).

SECTION B. Validation team, technical reviewer and approver**B.1. Validation team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	IR	MA	Zhiwei	CCSC Central Office	✓	✓	✓	✓
2.	Technical Expert	IR	WANG	Guan	CCSC Central Office	✓	✓	✓	

Note: IR: Internal Resources, EI: External Individuals

B.2. Technical reviewer and approver of the validation report for RCP

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	
1.	Technical reviewer	IR	LIU	Peitao	CCSC Office	Central
2	Technical reviewer	IR	XIE	Fengjun	CCSC Office	Central
3	Approver	IR	HUANG	Shiyuan	CCSC Office	Central

SECTION C. Means of validation**C.1. Desk/document review**

>>

After receiving the updated PDD (Version 4.0, dated 15/01/2021), a desk review of the PDD and additional background documents related to the project design was conducted by the validation team to verify the correctness, credibility and interpretation of presented data and information, and to cross check between information provided in the updated PDD and information from sources other than that used, if available. Review of the appropriateness of formulae and correctness of calculations was also carried out during this stage based on the approved methodology being applied. Documents reviewed and information sources used during desk review are listed in Appendix 3 to this report.

C.2. On-site inspection

The project description in the PDD for the renewable crediting period was verified from desk review. CCSC confirms the project design, construction, operation and monitoring plan were not changed. The baseline scenario information can also be confirmed as it was defined by the applied methodology – ACM0002 version20.0. CCSC conducted an on-site inspection for this validation of renewal of crediting period, which is in conformity with the paragraphs 28-32 of VVS-PA, version 02.0/10/.

Therefore, the on-site inspection was held on 07/04/2021 by the validation team, which is focused on the issues identified during the document review /11/. The response from the representatives of the PPs and the consultant were received on 07/04/2021.

Duration of on-site inspection: 07/04/2021				
No.	Activity performed on-site	Site location	Date	Team member
1.	On-site inspection and interview	Maqin County, Guoluo Zang Autonomous Prefecture, Qinghai Province, P.R. China	07/04/2021	Ms. Ma Zhiwei Mr. Wang Guan

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Lu	Wenjin	Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD	07/04/2021	<ul style="list-style-type: none"> – Status of the project and any modifications (including PPs) with respect to the registered PDD; – Applicability of selected methodology; – National policies and changes; – Baseline of the project and its updates; – Emission factors and their updates. – Monitoring plan and changes. 	Ms. Ma Zhiwei Mr. Wang Guan
2.	Zhu	Chengrong	Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD			
3	Zheng	Changjin	Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD			
4	Wu	Wenhui	Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD			
5	Liao	Wen	Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD			
6	Rao	Xiaoguang	Hangzhou Chaoteng Energy Technology Co.,Ltd			

C.4. Sampling approach

>>

Not applicable.

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	0	0	0
Application and selection of methodologies and standardized baselines	0	0	0
Validity of original baseline or its update	0	0	0
Estimated emission reductions or net anthropogenic removals	0	1	0
Validity of monitoring plan	0	0	0
Crediting period	0	0	0
Project participants	0	0	0
Post-registration changes	0	0	0
Others (please specify): (i) apply any GWP values that may be adopted by the CMP for the period from 1 January 2021 in the monitoring reports for any emission reductions achieved by the project activity in that period; and (ii) update the project design document in accordance with any requirements of the CMP guidance."	0	0	1
Total	0	1	1

SECTION D. Validation findings**D.1. Compliance with PDD form**

Means validation	of	According to Para.412 VVS-PA version 02.0 /10/, CCSC validation team cross-checked and compared the updated PDD by employing the valid project design document form listed in UNFCCC website /12/. Besides, the validation team compared the information transferred to the valid version of the PDD form with that in the registered PDD (Version 3.0, 12/06/2012) within the 1 st crediting period.		
Findings		<u>PDD Form</u>		
		<ul style="list-style-type: none">– The PDD used the latest valid version of the applicable Project design document form (version 11.0) at UNFCCC website.– The updated PDD is complete and meets all relevant requirements of instructions for filling out the Project design document form (version 11.0) for CDM project activities and “CDM project standard for project activities” (version 02.0) /12//13/		
		<u>Description of project activity in updated PDD</u> <p>The project is Qinghai Maqin Gequ Level 2 hydropower Station (UNFCCC registration No.7507), which was registered as a CDM project on 03/10/2012. From 01/01/2014 to 30/09/2015, total CERs of 276,440 tCO₂e has been issued. This is a hydropower project with the dam on the river, located in Maqin County, Guoluo Zang Autonomous Prefecture of Qinghai Province, P.R.China. The straight-line distance from the location of the factory to Dawu town and Xining city, the provincial capital of Qinghai are respectively 53km and 493km. As per the updated PDD (Version 4.1, 09/06/2021), the project involves a total install capacity of 48MW (2*24MW) and a designed operation life of 20 years. The electricity generated will be transferred to NWPG. The estimated annual in-grid electricity output of the project is 223,525MWh. The construction of the project was started on 20/04/2011. The first hydro turbine started operation on 10/06/2014. All the hydro turbines started full operation on 21/06/2014. The Project Activity has been operating normally.</p>		
		The geographical	Latitude	Longitude

	coordinates of the project is below: nt		
	Dam	100°15'06"	34°46'50"
	Plant	100°13'32"	34°50'35"
	The key technical specification of the project is listed in the following table/20/:		
	Key technical specifications of Hydro turbines		
	Parameters Name	Unit	Data
	Model	/	CJA237-L-155/6*14
	Quantity	/	2
	Rated Output	MW	24
	Rated Rotation Speed	r/min	500
	Rated head	m	376.7
	Rated flow	m ³ /s	7.96
	Equipment life time	year	20
	Manufacture	/	Dongfeng Electric Machinery Co.,Ltd
	Key technical specifications of Generators		
	Parameters Name	Unit	Data
	Model	/	SF24-12/3300
	Quantity	/	2
	Installed capacity	MW	24
	Rated Voltage	kV	10.5
	Rated current	A	1649.6
	Rated frequency	Hz	50
	Rated Rotation Speed	r/min	500
	Rated Power Factor	%	80
	Equipment life time	year	20
	Manufacture	/	Dongfeng Electric Machinery Co.,Ltd
Conclusion	As per requirement of Para.412 (a)-(i) and (ii) of VVS-PA Version 02.0 /10/, based on the findings above, CCSC validation team confirms that the updated PDD was compliance with relevant valid version of project design document form and instructions therein for filling out PDD; the information transferred to the valid version of the PDD form is materially the same as that in the registered PDD (Version 3.0, 12/06/2012) within the 1 st crediting period.		

D.2. Application and selection of methodologies and standardized baselines

Means of validation	Through document review and on-site inspection, CCSC validation team re-assessed the applicability of baseline, monitoring methodology and standardized baseline in the methodology based on the knowledge of the project from the initial validation, subsequent verifications and the confirmation from the PPs.
Findings	<p>At the time of registration, the applied methodology of the project was ACM0002 – Consolidated methodology for grid-connected electricity generation from renewable sources, version 12.3.0.</p> <p>The updated PDD for the renewal of crediting period applied the valid version of the selected approved methodology ACM0002, Version 20.0, which is valid from 28/11/2019 onwards; hence it meets the condition that for renewal of the crediting period, the methodology shall not be changed.</p>

	<p>The application of the selected methodology is justified as below:</p> <ul style="list-style-type: none"> – The project is a newly built hydropower project with reservoir , not involved in capacity additions, retrofits, rehabilitations or replacements the existing plant/unit; – The project results in a new reservoir and the power density of the power plant is 195.2W/m², which is greater than 4 W/m²; – The project is not an integrated hydro power project. – The project does not involve an on-site switch from fossil fuels to a renewable source. <p>Therefore, the applied methodology ACM0002, Version 20.0 is applicable to the project activity.</p>
Conclusion	<p>As per requirement of Para. 412(a)-(iii) of VVS-PA Version 02.0/10/, based on the findings above, CCSC validation team confirms the project meets each of the applicability conditions of the methodology; it also meets all the other stipulations and limitations mentioned in the other sections of the methodology; the continued validity of the baseline is assessed and the emissions which would be resulted from the baseline scenario are updated at the start of the 2nd crediting period, as per the requirements of ACM0002, Version 20.0.</p>

D.3. Validity of original baseline or its update

Means of validation	<p>According to Para.404 VVS-PA version 02.0, CCSC validation team reviewed the updated PDD, and evaluated whether project participants assess and incorporate the impact of national and/or sectoral policies and circumstances existing at the time of requesting renewal of the crediting period on the current baseline GHG emissions, without reassessing the baseline scenario. Where data and parameters used for determining the original baseline that was determined ex ante (and not monitored during the crediting period) are no longer valid, CCSC validation team identified whether PPs update such data and parameters in accordance with the Methodological Tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” version 03.0.1 /14/.</p>
Findings	<p>The following steps from the Methodological Tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” version 03.0.1 /14/ as per VVS-PA version 02.0/10/ were applied to assess the continued validity of the baseline and/or to update the baseline at the renewal of a crediting period:</p> <p>Step 1- Assess the validity of the current baseline for the next crediting period</p> <p>The CDM PS-PA (version 02.0 /13/) requires assessing and incorporating the impact of new relevant national and/or sectoral policies and circumstances existing at the time of requesting renewal of the crediting period on the current baseline GHG emissions, without reassessing the baseline scenario. The validity of the current baseline is assessed using the following Sub-steps:</p> <p>Step 1.1- Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies</p> <p>The current baseline remains the same as it was in the registered PDD (Version 3.0, 12/06/2012) within the 1st crediting period. The validation team has confirmed that no relevant mandatory national and/or sectoral policies applicable to the project activity came into effect since the date of earlier registered PDD till now. Although national policies encourage the development of renewable energy, but the renewable energy resources are not mandatory. Electricity generated by fossil fuel-based power plants still dominates the power supply (refer to China Electric Power Yearbook /17/). Thus, it can be concluded that the current baseline still complies with all the relevant policies.</p> <p>Step 1.2- Assess the impact of circumstances</p> <p>The existing scenario is that NWPG provides the same electricity service as the project and NWPG is dominated by the coal fired power plants.</p>

	<p>The validation team confirmed that the current baseline identified in the originally registered PDD (Version 3.0, 12/06/2012) within the 1st crediting period is still valid for the 2nd crediting period.</p> <p>In conclusion, as per the requirement of the sub-step, it has been assessed that there were no impact of circumstances existing at the time of requesting of the crediting period on the current baseline scenarios.</p> <p>Step 1.3- Assess whether the continuation of the use of current baseline equipment(s) is most likely scenario for the crediting period for which renewal is requested</p> <p>In the absence of the project activity, the project owner would not have constructed the hydropower plant and electricity would have been generated by other power plants connected to the grid, which is also the identified baseline scenario.</p> <p>This sub-step is not applicable for this project as the baseline scenario is electricity provided by the grid and the project proponent or 3rd-party (ies) would not undertake an investment later.</p> <p>Also, it is clear that the grid equipment as a system has longer life time and will exceed in the next 7-yr crediting period.</p> <p>Step 1.4- Assessment of the validity of the data and parameters</p> <p>The emission factor that was determined only at the start of the previous crediting period is no more valid on account of change in the grid configuration. As per the requirement of ACM0002, Version 20.0 and the methodological tool "Tool to calculate the emission factor for an electricity system" version 07.0, new data available should be used to revise the baseline scenario and emissions for updating the baseline at the start of the 2nd crediting period. Hence, the emission factor needs to be updated accordingly.</p> <p>Step 2- Update the current baseline and the data and parameters</p> <p>Step 2.1- Update the current baseline</p> <p>As per the requirement of the sub-step, the update for baseline emissions of the 2nd crediting period should be based on the latest approved version of the methodology ACM0002 Version 20.0 applicable to the project activity taking into account the sectoral policies and circumstances that are applicable at the time of request for renewal of the crediting period. A detailed calculation process of update of the baseline emissions is indicated in D.4 Findings of this report.</p> <p>Step 2.2- Update the data and parameters</p> <p>The baseline emission from the project has been calculated as per the Tool to calculate the emission factor for an electricity system, version 07.0. The calculation of the grid emission factor is based on the latest data which was available at the commencement of the validation. The data used is quoted from "China Energy Statistical Yearbook (2016-2018)" /18/ and "China Electric Power Yearbook (2014-2018)" /17/. The document "2019 Baseline Emission Factors for Regional Power Grids in China" published by China's DNA on 29/12/2020 is also referred to, as this document provides guidance on the calculation of baseline emission factors for project electricity system and connected electricity systems in China. The detailed calculation process of the update of the emission factor is indicated in D.4 Findings of this report.</p>
Conclusion	<p>According to the findings, CCSC validation team confirms that there have been no changes in the relevant national and/or sectoral regulations on building a hydropower project for exporting electricity to power grid since the previous crediting period. On the other hand, the baseline scenario for the project remains the same as that in the registered PDD Version 3.0 within the 1st crediting period as <i>"Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in "TOOL07: Tool to calculate the emission factor for an electricity system (Version 07.0)" according to methodology. According to Para. 283 in PS-PA (version 02.0), the demonstration of the validity of the original baseline or its update</i></p>

	does not require a reassessment of the baseline scenario, but rather an assessment of the GHG emission reductions or net anthropogenic GHG removals that would have resulted from that scenario.
--	--

D.4. Estimated emission reductions or net anthropogenic removals

Means of validation	<p>CCSC validation team checked the whole calculation process of GHG emission reductions including the calculations of baseline emissions, project emissions and leakage and emission reductions in the updated PDD against referenced sources and applied methodology and tools. The parameters and equations presented in the updated PDD and further documentation have been compared with the information and requirements presented in applied methodology and respective tools.</p> <p>CCSC assessed whether the baseline, the estimated GHG emission reductions in the updated PDD comply with the applicable requirements in the section 7.5.5 PS-PA version 02.0, and the valid version of the methodology and, where applicable, the standardized baseline that is(are) applicable to the registered CDM project activity.</p>
Findings	<p><u>Baseline Emissions</u></p> <p>The calculation of the baseline emissions followed the procedures described in the methodology ACM0002 (Version 20.0). Baseline emissions are the product of the grid emission factor ($EF_{grid, CM, y}$ in tCO₂/MWh) times Quantity of net electricity generation supplied by the project plant to the grid ($EG_{facility, y}$ in MWh).</p> <p>According to the analysis in section D.3 of this report, in updated PDD Version 4.1, the latest valid available data at the time of requesting renewal of the crediting period were adopted for the calculation of baseline grid emission factor. The grid emission factor is determined as Combined Margin (CM), combination of the Operating Margin (OM) and Build Margin (BM), which is for the second 7-year crediting period following the “<i>Tool to calculate the emission factor for an electricity system</i>”.</p> <p>Operating Margin (OM). Ex-ante option was selected. Simple OM method was chosen and this is justified since the low cost/must run resources constitute less than 50% of total grid generation in the average of the five recent years. The Simple OM emission factor is “<i>calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (tCO₂/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units</i>”, as per “<i>Tool to calculate the emission factor for an electricity system</i>” (version 07.0) /15/.</p> <p>Because (1) the net electricity generation and a CO₂ emission factor of each power unit are not available in China, and (2) the nuclear and renewable power generations are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known in China, at the same time, (3) off-grid power plants are not included in the calculation. The “<i>Option B - Calculation based on total fuel consumption and electricity generation of the system</i>” is adopted for Simple OM calculation, which is “<i>based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system</i>”.</p> <p>Net calorific values of each fuel type were obtained from the China Energy Statistical Yearbook. IPCC 2006 default values were used for the CO₂ emission factors of each type of fossil fuel. The values used and the calculation of the simple OM is considered to be reasonable, and is in line with official data published by the Government of China.</p> <p>Based on data in the “China Electric Power Yearbook (2014-2018)” and “China Energy Statistical Yearbook (2016-2018)”, the OM emission factor is calculated as the weighted average of the three years. The $EF_{grid, OM, y}$ is calculated to be 0.8922 tCO₂/MWh. The sources and calculation have been verified by CCSC.</p> <p>Build Margin (BM). BM emission factor was calculated in updated PDD with Option 1 of “<i>Tool to calculate the emission factor for an electricity system</i>” (version 07.0) with <i>ex ante</i> approach. Because plant specific fuel consumption and</p>

electricity generation data are not publicly available in China, the guidance given by the CDM Executive Board for a deviation from methodology AM0005 has been applied for calculation of the BM emission factor for the project, which suggests to “use the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption to estimate the build margin (BM)”.

In accordance with this guidance, the build margin consists of the set of power capacity additions in the electricity system that comprises 20% of the generation capacity (in MW) of the system, that have been built most recently, based on the aggregate incrementally installed capacity of all generation sources in year y. The emissions factor of fossil fuel fired power generation in NWPG is calculated using the proportions of GHG emissions from solid, liquid and gaseous fuels in the total GHG emissions related to power generation as the weights, and the emission factors of the most advanced commercial generation technologies available in the host country (as published by Chinese DNA).

Finally, based on data in the “China Electric Power Yearbook (2016-2018)” and “China Energy Statistical Yearbook (2016-2018)”, $EF_{grid, BM, y}$ is calculated to be 0.4407 tCO₂/MWh, which is in line with the 2019 Baseline Emission Factors for Regional Power Grids in China. The sources and calculation have been verified by CCSC.

Combined Margin (CM). CM emission factor is calculated following “weighted average CM method (option A)” of “Tool to calculate the emission factor for an electricity system” (version 07.0) /15/. The hydropower project shall use $\omega_{OM}=0.5$ and $\omega_{BM}=0.5$ for the first crediting period, and $\omega_{OM}=0.25$ and $\omega_{BM}=0.75$ for the second and third crediting period, unless otherwise specified in the approved methodology which refers to this tool. For this project, the combined baseline emission factor will remain fixed during the 2nd crediting period, via $EF_{grid, CM, y} = EF_{grid, OM, y} \times \omega_{OM} + EF_{grid, BM, y} \times \omega_{BM} = 0.8922 \times 0.25 + 0.4407 \times 0.75 = 0.5535$ tCO₂/MWh.

As validated above, the CM emission factor of the project is 0.5535 tCO₂/MWh. The estimated annual electricity supplied to the NWPG by the project is 223,525 MWh. Thus, according to latest version of ACM0002, the annual baseline emissions in the 2nd crediting period are calculated as:

$$BE_y = EF_{grid, CM, y} \times EG_{facility, y} = 0.5535 \text{ tCO}_2/\text{MWh} \times 223,525 \text{ MWh/yr} = 123,721 \text{ tCO}_2\text{e}.$$

The adoption of impact in CER calculation spreadsheet results in the emission reduction of 123,721 tCO₂e above, which is conservative /6/.

The CAR-1 was raised since the values for w_{OM} and w_{BM} in the PDD Version 4.0 do not comply with the “Tool to calculate the emission factor for an electricity system” version 07.0.

The project participant has revised the PDD and ER Spreadsheet, in the updated PDD Version 4.1 and ER Spreadsheet Version 02; validation team confirms the values for w_{OM} and w_{BM} of the updated PDD as per Tool to calculate the emission factor for an electricity system version 07.0 and the updated emission reductions are calculated accurately. Thus, **CAR-1** was closed successfully.

Project Emissions

The power density (PD) of the project activity is calculated based on equation (2) in the PDD. The calculation result of the PDD is 195.2 W/m², larger than the threshold 10 W/m² according to ACM0002 Version 20.0. As a result, the PDD defines that the project emissions of the project activity are zero.

Leakage

The project does not need to consider leakage. The validation team regards this consideration is correct and in line with methodology ACM0002, Version 20.0.

Emission Reductions

According to ACM0002, Version 20.0, emission reductions are calculated as follows:

	$ER_y = BE_y - PE_y$ <p>Where:</p> <p>ER_y = Emission reductions in year y (tCO₂e/yr)</p> <p>BE_y = Baseline emissions in year y (tCO₂e/yr)</p> <p>PE_y = Project emissions in year y (tCO₂e/yr)</p> <p>Hence for this project, the estimated amount of GHG emission reductions (ER_y) is 866,047 tCO₂e during the 2nd crediting period (7 years) from 01/01/2021 to 31/12/2027, resulting in estimated average annual emission reductions of 123,721tCO₂e.</p>
Conclusion	<p>In conclusion, based on the information reviewed, it can be confirmed that in the PDD, the sources used are correctly quoted and interpreted, the calculation processes are complete and replicable, and the calculation outcomes are reasonable and accurate. CCSC also confirms that:</p> <ul style="list-style-type: none"> - All assumptions and data used by the project participants are listed in the PDD, including their references and sources; - All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the updated PDD; - All values used in the updated PDD including GWPs are considered reasonable in the context of the CDM project activity; - The methodologies and, where applicable, the standardized baselines and the other methodological regulatory documents have been applied correctly to calculate baseline, project and leakage GHG emissions, as well as GHG emission reductions; - All estimates of the baseline GHG emissions can be replicated using the data and parameter values provided in the updated PDD.

D.5. Validity of monitoring plan

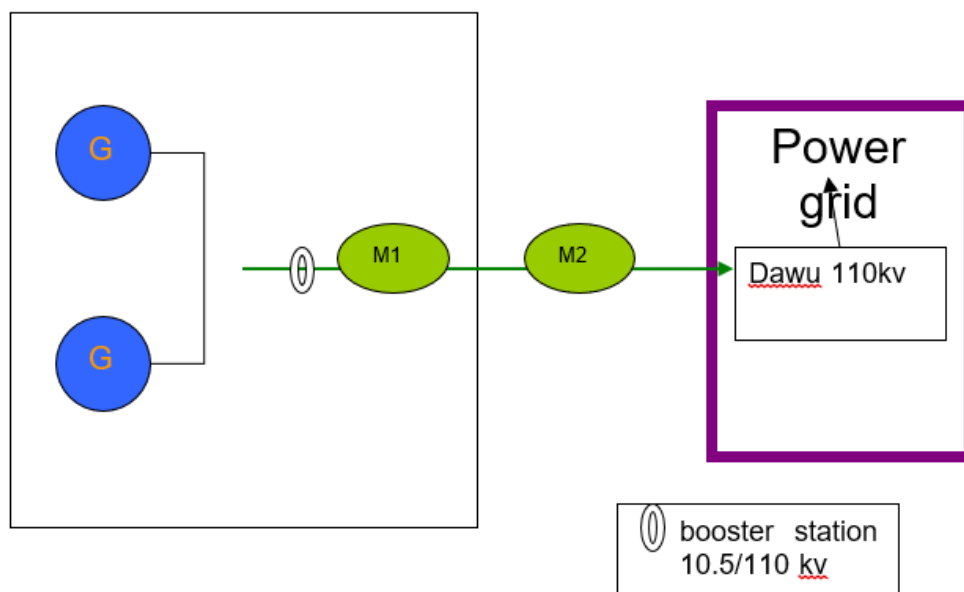
Means of validation	<p>The validation team reviewed the updated PDD and approved monitoring plan, checked whether the PDD update the monitoring plan section in accordance with all relevant applicable requirements in the PS-PA; whether the PDD list all data and parameters to be monitored, as required by the applied methodology and whether the monitoring plan explained the operational and management structure, responsibilities and institutional arrangement for data collection/archiving, QA/QC procedures.</p>
Findings	<p>The project applies the approved consolidated monitoring methodology ACM0002, Version 20.0 for grid-connected electricity generation from renewable sources. As validated, the selected monitoring methodology is applicable for the project activity as it involves grid-connected renewable power generation using hydro energy.</p> <p><u>Monitoring Parameters</u></p> <p>According to the applied methodology, the combined margin emission factor is determined ex-ante based on the most recent information available at the start of the validation, and need not to be monitored. The leakage is zero, and not required to be monitored either.</p> <p>The project has a total installed capacity of 48MW (2*24MW).</p> <p>For the project, the following parameter will be monitored ex-post in accordance with ACM0002:</p> <p>$EG_{facility,y}$: Quantity of net electricity generation supplied to grid in year y by the project plant;</p> <p>$Cap_{P,j}$: Installed capacity of the hydro power plant after the implementation of the project activity</p> <p>$A_{P,j}$: Area of the reservoir measured in the surface of the water, after the implementation of the Project activity, when the reservoir is full.</p>

Monitoring Arrangement

The main meter M2 (accuracy level $\geq 0.5S$) is a bidirectional power meter that is installed at the Grid Company, which monitors the quantity of net electricity generation supplied by the Project to the grid ($EG_{\text{facility},y}$) ie. The electricity exported to the grid by the project subtracts the electricity imported to the project from the grid. M2 is owned and maintained by Qinghai Power Grid which belongs to NWPG. The backup meter M1 is installed at the project site and monitors the electricity coming out from the plant to grid and the electricity received by the plant from the grid, M1 is owned and maintained by the project owner. The difference between M2 and M1 is the line loss. The project owner read M1 on site hourly and record the data every day. The power grid read M2 monthly and recorded. The data will be cross-checked by the electricity sales invoices or receipts. The metering equipment will be properly configured and checked annually according to the requirement from Technical administrative code of electric energy metering (DL/T448-2016). If the error of the main meter is out of the permissible limits, the data of the backup meter will be used to determine the electricity amount; the calculation of line loss can be determined by maximum historical records between M1 and M2. If both the main meter and the backup meter fail, the project owner and Grid Company shall jointly prepare a reasonable and conservative estimate of the correct reading. If the grid company and project owner can not determine a reasonable and accurate way to confirm the electricity generation during the meter failure period, then the electricity generated during this period will be neglected for conservative approach.

The surface area of the reservoir at full reservoir level will be measured by competent Authority yearly and the installed capacity of the project will be monitored in accordance with the nameplate of the generators. The data will be recorded and archived in electronic form annually.

The location of all the meters described above are showed in the figure below.



CCSC validation team confirms that the monitoring plan contains all necessary parameters which have been clearly described in PDD and that the means of monitoring described in the monitoring plan complies with the requirements of the methodology.

Data Management and Quality Control

A Management Structure of the CDM Monitoring Team is provided in the updated PDD. The functions such as data collection, aggregation, verification, calculation, archiving, as well as the maintenance of equipment etc. have been defined. Quality assurance and quality control procedures for recording, maintaining and data archiving etc. will be ensured according to CDM EB rules. The monitoring system equipment will be implementation properly upon the agreement of the project

	company and the grid company. The monitoring data would be cross checked by the electricity sales invoices or receipts of the project for the purpose of quality control. The project owner will record the readings of the meter monthly. The calibration of the meters will be implemented as per relevant national standards. An emergency treatment process has been defined in the updated PDD when the meter is in malfunction. Data management and quality control system are quoted in the updated PDD. The monitoring staffs will be trained based on the training program described in the updated PDD.
Conclusion	<p>In conclusion, based on document review, on-site inspection and stakeholder interview, together based on CCSC's local and sectoral expertise, CCSC confirms that:</p> <ul style="list-style-type: none"> – The monitoring plan is in compliance with the requirements of the methodology. – Monitoring arrangements described in the monitoring plan are feasible within the project design. – The PP's ability to implement the monitoring plan can be guaranteed.

D.6. Crediting period

Means of validation	CCSC validation team checked whether the updated PDD indicated that the next crediting period commences on the day immediately after the expiration of the current crediting period by means of a document review and on-site inspection.
Findings	The 1 st 7-yr renewable crediting period was from 01/01/2014 to 31/12/2020; the PPs are applying for a 2 nd 7-yr renewable crediting period, which starts from 01/01/2021 to 31/12/2027.
Conclusion	As per the requirement of Para. 412(a) (v) VVS-PA version 02.0, based on the findings above, the validation team confirmed that the next crediting period of the registered CDM project activity commences on the day immediately after the expiration of the current crediting period.

D.7. Project participants

Means of validation	As per Para.412 of VVS-PA version 02.0 required, CCSC validation team checked whether the names of the project participants included in the updated PDD are consistent with the names of the project participants in the latest version of the MoC statement by means of desk review and on-site inspection.
Findings	The project participants in the latest version of the MoC statement (valid as of 25/08/2016) /8/ are Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD, Carbon 350 Ltd., Climate Wedge Ltd Oy and Carbon & Energy Capital Co. LTD.
Conclusion	As per the requirement of Para. 412(a)(vi) VVS-PA version 02.0, based on the findings above, the validation team confirmed that the names of the project participants in the updated PDD are consistent with the names of the project participants in the latest version of the MoC statement.

D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents ¹	N	N/A	N/A
Corrections	N	N/A	N/A
Change to the start date of the crediting period	N	N/A	N/A
Inclusion of a monitoring plan	N	N/A	N/A
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied	N	N/A	N/A

¹ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied (selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

methodologies, standardized baselines, or other methodological regulatory documents			
Changes to the project design	N	N/A	N/A
Changes specific to afforestation and reforestation project activities	N	N/A	N/A

SECTION E. Internal quality control

>>

CCSC has taken the following quality control measures within the validation team and of the validation process according to relevant CCSC's internal procedures:

- The contract review of the validation was conducted and concluded that CCSC has the accredited scope and competence to validate the project with impartiality as well;
- The validation team was selected with due considerations given in terms of the competence and impartiality;
- The validation team carried out the validation work and compiled a validation report strictly following CCSC's Procedures for Implementation of Validation.

The validation report submitted by the validation team was subjected to a technical review and decision-making process, the technical reviewers and decision-makers are qualified and independent from the validation team. If any issue is raised during technical review and/or decision-making the same is to be discussed between the issue-raiser and the team leader as well as the PP. All issues must be satisfactorily addressed before the submission of the report for final approval. The persons who conducted the technical review and decision-making for the project are shown on Section B of this report and their Certificates of Competence can be found in Appendix 2 of this report.

The report approved by the authorized official of CCSC as the final report together with relevant documents are submitted to CDM EB through the UNFCCC dedicated web-platform for registration (only if an unconditioned positive validation opinion is concluded).

SECTION F. Validation opinion

>>

The validation team assigned by China Classification Society Certification Company (CCSC) concludes that Qinghai Maqin Gequ Level 2 hydropower Station, as described in the updated PDD Version 4.1 (dated 09/06/2021) meets all relevant UNFCCC criteria for the Clean Development Mechanism, CDM Validation and Verification Standard for Project Activities (VVS-PA, Version 02.0) and host country criteria. Hence CCSC requests the project for renewal of crediting period by the CDM Executive Board.

The validation was executed by taking the following methods and in the following steps:

1. Desk review of the project design and baseline and monitoring plan;
2. Follow-up interview with project stakeholders;
3. Resolution of outstanding issues and the issuance of the final validation report and opinion.

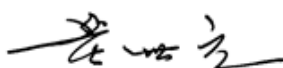
In the course of the validation, 0 Clarification Request (CL), 1 Corrective Action Request (CAR) and 1 Forward Action Request (FAR) were raised for the CDM project activity (PDD Version 4.0, dated 15/01/2021) in relation to all relevant CDM requirements. Until issuance of this version of validation report, the raised CL were successfully closed.

The review of the PDD (Version 4.0 and 4.1) and additional background documents, the subsequent follow up interviews, together with the review of comments by Parties and Stakeholders, have provided CCSC with sufficient evidence to confirm that the project has satisfied the stated criteria.

The validation covered all project components and issues that need to be validated for the renewal of crediting period as a CDM project. In our opinion, CCSC hereby confirms that the project correctly applied the baseline and monitoring methodology ACM0002, Version 20.0 and meets the relevant UNFCCC requirements for the renewal of the crediting period.

CCSC hereby requests the renewal of crediting period of the project. Provided that the project is implemented and maintained as designed, the project is expected to achieve annual average emission reduction of 123,721tCO₂e within the 2nd crediting period.

For and on behalf of CCSC



Authorized Signature

Name: Huang Shiyuan

Date: 10/07/2021

Appendix 1. Abbreviations

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CCSC	China Classification Society Certification Company
CDM	Clean Development Mechanism
CME	Coordinating/managing entity
CER	Certified Emission Reduction
CM	Combined Margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
EB	Executive Board
EIA	Environmental Impact Assessment
ERPA	Emission Reduction Purchase Agreement
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
GSP	Global Stakeholder Consultation Process
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
LoA	Letter of Approval
MoC	Modalities of Communication
MP	Monitoring Plan
NWPG	Northwest China Power Grid
NGO	Non-governmental Organization
ODA	Official Development Assistance
OM	Operating Margin
PCP-PA	CDM Project Cycle Procedure for Project Activities
PDD	Project Design Document
PP	Project Participant
PPA	Power Purchase Agreement
PS-PA	CDM Project Standard for Project Activities
UNFCCC	United Nations Framework Convention on Climate Change
VVS-PA	CDM Validation and Verification Standard for Project Activities

Appendix 2. Competence of team members and technical reviewers



Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 20/01/2021

Ms. Ma Zhiwei

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

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

■ Technical expert for Technical Area(s): TA4.1

Huang ShiYuan
CCSC General Manager



Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 25/02/2021

Mr. Wang Guan

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

□ CDM validator for Technical Area(s): _____

□ CDM verifier for Technical Area(s): _____

■ Technical expert for Technical Area(s): TA1.2

Huang ShiYuan
CCSC General Manager



Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 20/01/2021

Mr. Liu Peitao

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

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

□ Technical expert for Technical Area(s): _____

Huang ShiYuan
CCSC General Manager



Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 20/01/2021

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 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	Hangzhou Carbon Trade Environment Engineering Co., Ltd	Registered PDD of Qinghai Maqin Gequ Level 2 hydropower Station for the 1 st crediting period (Version 3.0)	12/06/2012	Others
2.	Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD	Power Purchase Agreement	10/12/2020	PP
3.	CEPREI Certification Body	Validation report of Qinghai Maqin Gequ Level 2 hydropower Station for the 1 st crediting period (version 2.1).	23/09/2012	Others
4.	Hangzhou Chaoteng Energy Technology Co.,Ltd	Emission Reductions Calculation Spreadsheet (version 01)	15/01/2021	Others
5.	Hangzhou Chaoteng Energy Technology Co.,Ltd	The updated PDD for 2 nd crediting period of Qinghai Maqin Gequ Level 2 hydropower Station (Version 4.0)	15/01/2021	Others
6.	Hangzhou Chaoteng Energy Technology Co.,Ltd	Emission Reductions Calculation Spreadsheet (version 02)	09/06/2021	Others
7.	Hangzhou Chaoteng Energy Technology Co.,Ltd	The updated PDD for 2 nd crediting period of Qinghai Maqin Gequ Level 2 hydropower Station (Version 4.1)	09/06/2021	Others
8.	Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD	The latest version of the MoC statement	25/08/2016	Others
9.	CDM-EB	Methodology ACM0002 Version 20.0	28/11/2019	Others
10.	CDM-EB	CDM validation and verification standard for project activities (VVS-PA), Version 02.0	29/11/2018	Others
11.	Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD	Interview record	07/04/2021	PP
12.	CDM-EB	Project design document form, Version 11	31/05/2019	Others
13.	CDM-EB	CDM project standard for project activities (PS-PA), Version 02.0	29/11/2018	Others
14.	CDM-EB	Assessment of the validity of the current original baseline and update of the baseline at the renewal of the crediting period, Version 03.0.1	02/03/2012	Others
15.	CDM-EB	Tool to calculate the emission factor for an electricity system, Version 07.0	31/08/2018	Others

16.	China's DNA	2019 Baseline Emission Factors for Regional Power Grids in China	http://www.mee.gov.cn/ywgz/ydqhbh/wsqtz/202012/t20201229_815386.shtml	Others
17.	China Yearbook Power Editing Committee	China Electric Power Yearbook 2014, 2015, 2016, 2017 and 2018	N/A	Others
18.	China Yearbook Energy Editing Committee	China Energy Statistical Yearbook 2016, 2017 and 2018	N/A	Others
19.	CDM-EB	CDM project cycle procedure for project activities (PCP-PA), Version 02.0	29/11/2018	Others
20.	Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD	Nameplate of hydro turbine set	N/A	PP
21.	CDM-EB	Glossary of CDM terms, Version 09.1	01/09/2017	Others
22.	UNFCCC	Kyoto Protocol	N/A	Others
23.	Qinghai Maqin Gequ River Cascade Hydropower Development Co., LTD	Risk acknowledgement and acceptance form	23/01/2021	PP

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CL from this validation

CL ID	N/A	Section no.	N/A	Date: N/A
Description of CL				
N/A				
Project participant response				Date: N/A
N/A				
Documentation provided by project participant				
N/A				
DOE assessment				Date: N/A
N/A				

Table 2. CAR from this validation

CAR ID	CAR-1	Section no.	D.4	Date: 07/04/2021
Description of CAR				
For the PDD and ER Spreadsheet, the values for w_{OM} and w_{BM} in the PDD Version 4.0 do not comply with the "Tool to calculate the emission factor for an electricity system" version 07.0.				
Project participant response				Date: 09/06/2021
The values for w_{OM} and w_{BM} are corrected according to the "Tool to calculate the emission factor for an electricity system".				
Documentation provided by project participant				
PDD Version 4.1 dated 09/06/2021 and ER Spreadsheet Version 02 dated 09/06/2021				

DOE assessment	Date: 10/07/2021
The project participant has revised the PDD and ER Spreadsheet, in the updated PDD Version 4.1 and ER Spreadsheet Version 02; validation team confirms the values for w_{OM} and w_{BM} of the updated PDD as per Tool to calculate the emission factor for an electricity system version 07.0 and the updated emission reductions are calculated accurately. Thus, CAR-1 was closed successfully.	

Table 3. FAR from this validation

FAR ID	FAR-1	Section no.	N/A	Date: 07/04/2021
Description of FAR				
PP requires to: (i) apply any GWP values that may be adopted by the CMP for the period from 1 January 2021 in its monitoring reports for any emission reductions achieved by the project activity in that period; and (ii) update its project design document in accordance with any requirements of the CMP guidance.				
Project participant response				Date: 09/06/2021
PP accepts the FAR and will (i) apply any GWP values that may be adopted by the CMP for the period from 1 January 2021 in the monitoring reports for any emission reductions achieved by the project activity in that period; and (ii) update the project design document in accordance with any requirements of the CMP guidance." Documentation provided by project participant CDM-RAA-FORM dated 23/01/2021.				
Documentation provided by project participant				
CDM-RAA-FORM dated 23/01/2021				
DOE assessment				Date: 10/07/2021
It is confirmed that PP accepts the FAR and its implementation will be assessed in the next monitoring period.				

- - - - -

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none">• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN) and version 02.0 of the “CDM project cycle procedure for project activities” (CDM-EB93-A06-PROC);• Make editorial improvements.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Renewal of crediting period Keywords: crediting period, project activities, validation report		