




Validation report form for renewal of crediting period for CDM project activities

(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the validation report form for renewal of crediting period for CDM project activities" at the end of this form.

VALIDATION REPORT FOR RENEWAL OF CREDITING PERIOD (RCP)

Title of the project activity	Longyou 18 MW Hydropower Project in Zhejiang Province
Reference number of the project activity	2142
Number and duration of the next crediting period	2 nd , 7 years (12/08/2016 to 11/08/2023)
Version number of the validation report for RCP	02
Completion date of the validation report for RCP	12/04/2016
Version number of PDD to which this report applies	Version 08
Project participant(s)	Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd. China Carbon N.V.
Host Party	China
Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)	Sectoral scope -1: Energy industries (renewable/non-renewable sources) Methodology - ACM0002 Version 16.0.0, Grid-connected electricity generation from renewable sources
Estimated annual average GHG emission reductions or net anthropogenic GHG removals in the next crediting period	56,474 tCO ₂ e
Name of DOE	China Classification Society Certification Company (CCSC)
Name, position and signature of the approver of the validation report for RCP	Mr. TU Jianhua, Deputy General Manager 

SECTION A. Executive summary

>>

China Classification Society Certification Company (here after called CCSC) has performed an assessment of the request by Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd. to renew the crediting period of CDM project Longyou 18 MW Hydropower Project in Zhejiang Province, UNFCCC registration No. 2142, which has been registered as a CDM project on 19/05/2010. It is a hydro power project, located within Huzhen Town, Longyou County, Quzhou City, Zhejiang Province, P.R.China. As per the Accept Revised PDD for post registration changes within the 1st crediting period, the project involves installation of 4 units of hydropower turbine generators, which amount to a total installed capacity of 18MW. The project will transfer the electricity generated by the hydro power to East China Power Grid and thus replace the same amount of electricity generated by fossil fuel in the East China Power Grid /1//9/.

As per the requirements of PCP, the PP sent a notification email to the UNFCCC secretariat and announced the request of renewal of crediting period of the project 2142 and CCSC was chosen as the DOE on 01/02/2016 and the secretariat replied that the process of renewal of crediting period can be moved on.

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 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, 4 Corrective Action Requests (CARs), 1 Clarification Request (CL) and No Forward Action Request (FAR), were raised for the proposed CDM project activity (PDD

version 06.1, dated 26/05/2015) in relation to all relevant CDM requirements. Until issuance of this version of validation report, the raised CAR and CL were successfully closed.

Validation conclusion

The review of the PDD (both version 06.1 and version 08 inclusive) 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. CCSC hereby confirms that the project correctly applied the baseline and monitoring methodology ACM0002 Version 16.0.0 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 56,474 tCO₂e within the 2nd crediting period (7 years (12/08/2016 to 11/08/2023)).

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 review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	IR	LI	Xingtong	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	EI	TAN	Wenbin	CCSC Central Office
2.	Approver	IR	TU	Jianhua	CCSC Central Office

SECTION C. Means of validation

C.1. Desk review

>>

After receiving the updated PDD (Version 06.1, dated 26/05/2015) /6/, 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 Version 16.0.0 /16/. Therefore, CCSC has not conducted an on-site inspection for this validation of renewal of crediting period, which is in conformity with the paragraphs 72-76 of VVS, version 09.0 /18/.

Therefore, the follow-up actions through telephone and emails were held on 28/03/2016 by the validation team, which is focused on the issues identified during the document review. The response from the representatives of the PPs and the consultant were received on 29/03/2016.

Duration of on-site inspection: N/A				
No.	Activity performed on-site	Site location	Date	Team member
1.	N/A	N/A	N/A	N/A

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	XU	Songbiao	Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd.	28/03/2016	1. Status of the project and any modifications(including PPs) with respect to the Accept Revised PDD for post registration changes within the 1 st crediting period;	LI Xingtong
2	WANG	Yingying	Hanergy Carbon Asset Management (Beijing) Inc.		2. Applicability of selected methodology; 3. National policies and changes; 4. Baseline of the project and its updates; 5. Emission factors and their updates; 6. Monitoring plan and changes.	

C.4. Clarification requests, corrective action requests and forward action requests raised

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	1	-
Application of baseline and monitoring methodology and standardized baseline	-	-	-
Validity of original baseline or its update	-	1	-
Estimated GHG emission reductions or net anthropogenic GHG removals	-	1	-

Validity of monitoring plan	1	1	-
Crediting period	-	-	-
Project participants	-	-	-
Others (please specify)	-	-	-
Total	1	4	-

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	According to Para.435 VVS version 09.0 /18/, CCSC validation team cross-checked and compared the revised PDD by employing the valid Project design document form listed in UNFCCC website /23/. Besides, the validation team compared the information transferred to the valid version of the PDD with that in the Accept Revised PDD for post registration changes within the 1 st crediting period.																												
Findings	<p><u>PDD Form</u></p> <ul style="list-style-type: none">● The PDD used the latest valid version of the applicable Project design document form (version 06.0) at UNFCCC website.● The PDD is complete and meet all relevant requirements of instructions for filling out the Project design document form(version 06.0) for CDM project activities and “Clean development mechanism project standard” (version 09.0) /17/ <p>However, CAR-1 was raised here as the information in the Section F, Appendix 2 and Appendix 3 is missing. In the PDD version 08, the information in the Section F, Appendix 2 and Appendix 3 is completed. Thus this CAR-1 was closed successfully.</p> <p><u>Description of project activity in updated PDD</u></p> <p>The proposed project is Longyou 18 MW Hydropower Project in Zhejiang Province (UNFCCC ref. 2142), which was registered as a CDM project on 19/05/2010. This is a hydro power project, located within Huzhen Town, Longyou County, Quzhou City, Zhejiang Province, P.R.China. The geographical coordinates of the Project are 119°15'E and 29°4'N. As per the Accept Revised PDD for post registration changes within the 1st crediting period and the revised monitoring plan, the project involves installation of 4 units of hydropower turbine generators, which amount to a total installed capacity of 18MW. The electricity generated will be transferred to East China Power Grid.</p> <p>The key technical specification of the project are listed in the following table:</p> <p style="text-align: center;">Key Technical Specification of the project</p> <table><tr><th colspan="2">Hydro Turbine</th><th colspan="2">Generator</th></tr><tr><td>Turbine Type</td><td>GZ1250a-WP-420</td><td>Generator Type</td><td>SFWG4500-60/4700</td></tr><tr><td>Rated head</td><td>4.65m</td><td>Rated Capacity</td><td>4500 kW/5000 kW</td></tr><tr><td>Rated power</td><td>4500 kW</td><td>Rated voltage</td><td>6300 V</td></tr><tr><td>Rated flow</td><td>112.17 m³/s</td><td>Rated current</td><td>458.2 A</td></tr><tr><td>Rated speed</td><td>93.8r/min</td><td>Rated power factor</td><td>0.9</td></tr><tr><td>Runaway speed</td><td>960r/min</td><td>Rated speed</td><td>93.8 r/min</td></tr></table>	Hydro Turbine		Generator		Turbine Type	GZ1250a-WP-420	Generator Type	SFWG4500-60/4700	Rated head	4.65m	Rated Capacity	4500 kW/5000 kW	Rated power	4500 kW	Rated voltage	6300 V	Rated flow	112.17 m³/s	Rated current	458.2 A	Rated speed	93.8r/min	Rated power factor	0.9	Runaway speed	960r/min	Rated speed	93.8 r/min
Hydro Turbine		Generator																											
Turbine Type	GZ1250a-WP-420	Generator Type	SFWG4500-60/4700																										
Rated head	4.65m	Rated Capacity	4500 kW/5000 kW																										
Rated power	4500 kW	Rated voltage	6300 V																										
Rated flow	112.17 m³/s	Rated current	458.2 A																										
Rated speed	93.8r/min	Rated power factor	0.9																										
Runaway speed	960r/min	Rated speed	93.8 r/min																										

	Declared working condition efficiency	92.09%	Rated efficiency	95.5%
	Best efficiency	95.49%	Flywheel moment GD	340 t·m ²
	Installation draught-height	-5.7 m	-	-
Conclusion	As per requirement of Para. 445(a)-(i) and (ii) of VVS Version 09.0 /18/, based on the findings above, CCSC validation team confirms that the PDD version 08 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 is materially the same as that in the Accept Revised PDD for post registration changes within the 1 st crediting period.			

D.2. Application of baseline and monitoring methodology and standardized baseline

Means validation	of	Through document review and telephone interview, 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 Version 06 Consolidated methodology for grid-connected electricity generation from renewable sources</p> <p>The updated PDD for the renewal of crediting period applied the valid version of the selected approved methodology ACM0002 Version 16.0.0 /16/, which is valid from 28/11/2014 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 18MW grid-connected renewable energy (hydro power) power plant at the site where no renewable power plant was operated prior to the implementation of the project activity; ● The proposed project does not involve an on-site switch from fossil fuels to a renewable source. ● The power density of the new reservoir is 27.9 W/m², greater than 4 W/m² <p>Therefore, the applied methodology ACM0002 Version 16.0.0 is applicable to the project activity.</p>
Conclusion		As per requirement of Para. 445(a)-(iii) of VVS Version 09.0 /18/, 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 2 nd and 3 rd crediting period, as per the requirements of ACM0002 Version 16.0.0 /16/.

D.3. Validity of original baseline or its update

Means validation	of	According to Para.436 VVS version 09.0 /18/, CCSC validation team reviewed the updated PDD, and evaluated whether project participants
-------------------------	----	--

	<p>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 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 /22/.</p>
Findings	<p>The CAR-2 was raised here as the continued validity of the original baseline should be assessed for the second crediting period. The 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)” shall be adopted in the justification of the “Establishment and description of baseline scenario”.</p> <p>The CAR-2 was successfully closed after the PDD has been revised to adopt 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)” in the justification of the “Establishment and description of baseline scenario”.</p> <p>The following steps from the Methodological Tool “<i>Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period</i>” version 03.0.1 as per VVS version 09.0 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 (Version 09.0) 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 Accept Revised PDD for post registration changes 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 Accept Revised PDD for post registration changes within the 1st crediting period 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 plants still dominates the power supply (refer to China Electric Power Yearbook). 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 East China Power Grid provides the same electricity service as the proposed project and East China Power Grid is dominated by the coal fired power plants.</p> <p>The validation team confirmed that the current baseline identified in the originally Accept Revised PDD for post registration changes within the 1st crediting period is still valid for the second 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 hydro power 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 due.</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 16.0.0 and the methodological tool "Tool to calculate the emission factor for an electricity system" version 05.0.0, 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 16.0.0 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 05.0.0. In addition, the calculation refers to the latest version of 2014 Baseline Emission Factors for Regional Power Grids in China /11/ published by China's DNA (NDRC) on 11/05/2015, which is the latest valid available data at the time of requesting renewal of the crediting period and valid for calculation of baseline grid emission factor of the second crediting period. A 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 wind power 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 Accept Revised PDD for post registration changes 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 the Tool to calculate the emission factor for an electricity system"</i> according to methodology ACM0002 Version 16.0.0 /16/. According</p>

	to Para. 301 in PS(version 09.0) /17/, the demonstration of the validity of the original baseline or its update does not require a reassessment of the baseline scenario, but rather an assessment of the GHG emission reductions that would have resulted from that scenario.
--	--

D.4. Estimated GHG emission reductions or net anthropogenic GHG removals

Means validation	of <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 7.2.7 PS version 09.0, 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 16.0.0). Baseline emissions are the product of the grid emission factor ($EF_{grid, CM, y}$ in tCO_2/MWh) times the net electricity supplied by the proposed project to the grid (EG_y in MWh).</p> <p>In the updated PDD, the calculation of the grid emission factor is calculated based on the latest data which was available at the commencement of validation. The data used is quoted from “China Energy Statistical Yearbook” and “China Electric Power Yearbook”. The document “2014 Baseline Emission Factors for Regional Power Grids in China” 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.</p> <p>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 05.0.0) /21/.</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>

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.

The OM emission factor is calculated as the weighted average of the three years. The $EF_{grid, OM, y}$ is calculated to be 0.8095 tCO₂/MWh. The sources and calculation have been verified by CCSC.

Build Margin (BM). BM emission factor was calculated in updated PDD/1/ with Option 1 of “*Tool to calculate the emission factor for an electricity system*” (version 05.0.0) with *ex ante* approach. Because plant specific fuel consumption and 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 proposed 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 East China Power Grid 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 the DNA).

Finally, based on data in the *China Electric Power Yearbook 2011-2013*, $EF_{grid, BM, y}$ is calculated to be 0.6861 tCO₂/MWh, which is in line with the 2014 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 05.0.0) /21/. The weighting is set to be 0.25 and 0.75 for OM and BM emission factors respectively. For this project, the combined baseline emission factor will remain fixed during the second crediting period, via $EF_{grid, CM, y} = EF_{grid, OM, y} \times \omega_{OM} + EF_{grid, BM, y} \times \omega_{BM}$ = 0.8095 × 0.25 + 0.6861 × 0.75 = 0.71695 tCO₂/MWh.

However, **CAR-3** was raised here as the ω_{OM} and ω_{BM} are incorrect in the PDD.

The PDD has been revised to correct the ω_{OM} and ω_{BM} , and information used in the Section B.6 and Appendix 4 has been updated as per the latest published “Notification on 2015 Baseline Emission Factors for Regional Power Grids in China” by China DNA. Then the **CAR-3** was closed.

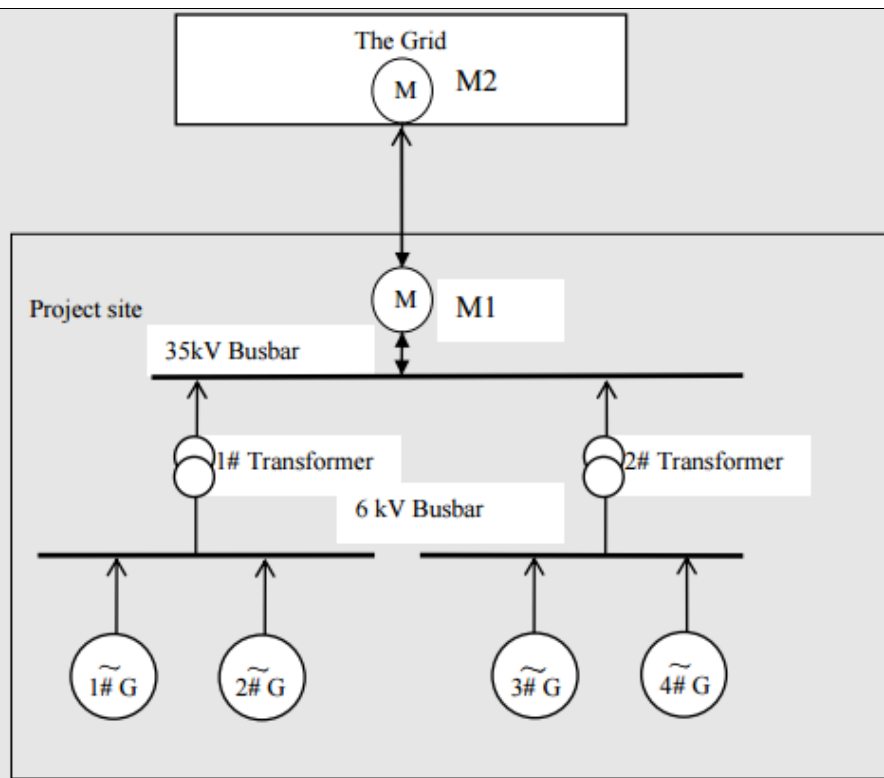
As validated above, the CM emission factor of the project is 0.71695 tCO₂/MWh. The estimated annual electricity supplied to the East China Power Grid by the project is 78,770 MWh. Thus, according to ACM0002 Version 16.0.0, the annual baseline emissions in the second crediting period are calculated as:

	<p>$BE_y = EF_{gird, CM, y} \times EG_y = 0.71695 \times 78,770 = 56,474 \text{ tCO}_2\text{e}$.</p> <p>The adoption of <i>impart</i> in CER calculation spreadsheet results in the emission reduction of 56,474 tCO₂e above, which is conservative.</p> <p><u>Project Emissions</u></p> <p>Since the power density is greater than 10W/m², the project emission is zero. Based on document review, the validation team regards this consideration is correct, and in line with methodology ACM0002 Version 16.0.0.</p> <p><u>Leakage</u></p> <p>The project does not need to consider leakage. The validation team regards this consideration is correct and in line with methodology ACM0002 Version 16.0.0.</p> <p><u>Emission Reductions</u></p> <p>According to ACM0002 Version 16.0.0, emission reductions are calculated as follows:</p> $ER_y = BE_y - PE_y$ <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 average annual emission reductions of 56,474tCO₂e, resulting in estimated amount of GHG emission reductions (ER_y) is 395,318tCO₂e during the 2nd crediting period 7 years (12/08/2016 to 11/08/2023).</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 PDD; • All values used in the PDD are considered reasonable in the context of the proposed CDM project activity; • The baseline methodology, any applicable tool(s) and, where applicable, the standardized baseline have been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions; <p>All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.</p>

D.5. Validity of monitoring plan

Means validation of	The validation team reviewed the updated PDD, checked whether the PDD update the monitoring plan section in accordance with all relevant applicable requirements in the PS; 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.
Findings	<p>The project applies the approved consolidated monitoring methodology ACM0002 Version 16.0.0 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 power.</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 project emission or leakage is zero, and not required to be monitored either.</p> <p>For the proposed project, the following parameters will be monitored in accordance with the methodology:</p> <p>The parameters monitored ex-post include:</p> <ul style="list-style-type: none"> – $EG_{\text{facility},y}$ Quantity of net electricity generation supplied by the project plant/unit to the grid in year y. This parameter should be calculated as difference between (a) the quantity of electricity supplied by the project plant/unit to the grid (EG_{export}); and (b) the quantity of electricity the project plant/unit from the grid (EG_{import}): $EG_{\text{facility},y} = EG_{\text{export}} - EG_{\text{import}}$ – Cap_{PJ} Installed capacity of the hydro power plant after the implementation of the project activity – A_{PJ} Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full <p>CAR-4 was raised since the parameters Cap_{PJ} and A_{PJ} are not included in the monitoring plan as per the methodology.</p> <p>The PDD has been revised to include the parameters Cap_{PJ} and A_{PJ} as per the requirements in the methodology. Hence the CAR-4 was closed.</p> <p><u>Monitoring Arrangement</u></p> <p>The generated electricity is transmitted to the East China Power Grid through 35kV line. The EG_{export} and EG_{import} will be continuously monitored through bi-directional meters installed at the Project site. The line diagram showing meter location is as follows:</p>



The parameters Cap_{PJ} and A_{PJ} are monitored Once at the beginning of each crediting period.

Data Management and Quality Control

Authorities and responsibilities regarding monitoring plan have been described in section B.7.3 of the updated PDD.

The data should be cross-checked against relevant electricity sales receipts and/or records from the grid for quality control. The Power Purchase Agreement between the Project owner and the grid company can be used as guidance on data collection and documentation.

Calibration of Meters & Metering should be implemented according to national standards and rules (such as DL/T448-2000 the Technical Management Rules for Electric Power Measuring Installations), and all the records should be documented and maintained by the Project owner for DOE's verification.

However, **CL-1** was raised here as the accuracy of the meters involved in the monitoring plan is not described.

In the PDD version 08, the accuracy of the meters involved in the monitoring plan is included. Thus, this **CL-1** was closed successfully. The accuracy of the meters included in the updated PDD is not less than 0.5S, not less than the required accuracy in the PDD and the monitoring reports of the 1st crediting period.

Emergency procedures

Problem occurred in monitoring and measurement process will be recorded and reported to company administrator or supervisor. Consequently, the corrective resolution will be adopted to deal with that problem and to avoid it occur again in future.

Conclusion

In conclusion, based on document review, and stakeholder interview,

	<p>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. <p>The PP's ability to implement the monitoring plan can be guaranteed.</p>
--	--

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, use of official sources and interviews with relevant personnel by phone.
Findings	The 1 st 7-yr renewable crediting period was from 12/08/2009 to 11/08/2016; the PPs are applying for a 2 nd renewable crediting period, which is 7 years (12/08/2016 to 11/08/2023). The project participant notified the EB Secretariat on 01/02/2016 regarding the renewal of the crediting period and selected DOE, which is within 270 to 180 days prior to the date of expiration of the current crediting period.
Conclusion	As per the requirement of Para. 445(a)(v) VVS version 09.0, based on the findings above, the validation team confirmed that the notification regarding to the request for renewal of crediting period of the project meets the requirements of PCP and 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.438 of VVS version 09.0 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 on the UNFCCC website.
Findings	The project participants in updated PDD are Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd. and China Carbon N.V., which are checked against the UNFCCC website and found consistent.
Conclusion	Therefore, CCSC concluded that the name of project participant in the updated PDD is the consistent with the actual situation.

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, monitoring methodology or standardized baseline	N	N/A	N/A
Corrections	N	N/A	N/A
Inclusion of a monitoring plan to a registered project activity	N	N/A	N/A
Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline	N	N/A	N/A
Changes to the project design of a registered project activity	N	N/A	N/A
Types of 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 Longyou 18 MW Hydropower Project in Zhejiang Province in P.R.China, as described in the PDD version 08 meets all relevant UNFCCC criteria for the Clean Development Mechanism, Clean Development Mechanism Validation and Verification Standard (VVS, Version 09.0) 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, 1 Clarification Request (CL), 4 Corrective Action Requests (CARs) and no Forward Action Request (FAR), were raised for the proposed CDM project activity (PDD version 06.1, dated 26/05/2015) in relation to all relevant CDM requirements. Until issuance of this version of validation report, the raised CAR and CL were successfully closed.

The review of the PDD (version 06.1 and version 08) 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 16.0.0 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 56,474tCO₂e within the 2nd crediting period.

For and on behalf of CCSC



Authorized Signature

Name: TU Jianhua

Date: 12/04/2016

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
MP	Monitoring Plan
NDRC	National Development and Reform Committee
NGO	Non-governmental Organization
ODA	Official Development Assistance
OM	Operating Margin
PCP	Project Cycle Procedure
PDD	Project Design Document
PP	Project Participant
PPA	Power Purchase Agreement
PS	Project Standard
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

CCS 认证公司

Appendix 8

CERTIFICATE OF COMPETENCE

Date of issue: 16/10/2015

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
- CDM verifier for Technical Area(s): TA1.1/TA1.2/TA3.1/TA9.2
- ☐ Technical expert for Technical Area(s): _____



Huang ShiYuan
CCSC General Manager

CCS 认证公司

Appendix 9

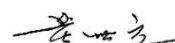
CERTIFICATE OF COMPETENCE

Date of issue: 16/10/2015

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

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd.	Registered PDD (Accept Revised PDD for post registration changes within the 1st crediting period), Version 07	25/07/2008	Others
2	DNV	Validation report of the project activity, Version 03	12/05/2009	Others
3	BVCH	Validation opinion for assessment of changes in the PDD of the Project for the 1st crediting period, Version 01	/	Others
4	Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd. and Verification DOE	Monitoring reports and corresponding verification reports for the monitoring periods of the 1st crediting period	http://cdm.unfccc.int/Projects/D B/DNV-CUK121861834 9.9/view	PP Others
5	Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd.	Notification email to UNFCCC secretariat of the renewal of crediting period and the corresponding reply from the secretariat	01/02/2016	PP
6	Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd.	Updated PDD sent to the secretariat for notification, Version 06.1	26/05/2015	PP
7	Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd.	Updated PDD to request a renewal of crediting period of the project, Version 08	16/03/2016	PP
8	Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd.	Emission Factor Calculation Spreadsheet	/	PP
9	Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd.	Power Purchase Agreement and Grid Connection Agreement	March, 2015	PP
10	Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd.	Grid connection diagram	/	PP
11	Zhejiang Longyou Xiaoxitan Hydro Complex Development Co., Ltd.	Mails records for PP's interview and the relevant responses	/	PP
12	NDRC	2014 Baseline Emission Factors for Regional Power Grids in China	http://cdm.ccchina.gov.cn/Detail.aspx?newsId=51651&TId=3	Others
14	China Power Yearbook Editing Committee	China Electric Power Yearbook 2009,2010,2011,2012 and 2013	N/A	Others

CDM-RCP-FORM

15	China Energy Yearbook Editing Committee	China Energy Statistical Yearbook 2011, 2012 and 2013	N/A	Others
16	CDM-EB	Methodology ACM0002 Version 16.0.0	28/11/2014	Others
17	CDM-EB	Clean development mechanism project standard, Version 09.0	20/02/2015	Others
18	CDM-EB	Clean development mechanism validation and verification standard, Version 09.0,	20/02/2015	Others
19	CDM-EB	Clean development mechanism project cycle procedure version, Version 09.0	20/02/2015	Others
20	CDM-EB	Glossary of CDM terms, Version 08.0	/	Others
21	CDM-EB	Tool to calculate the emission factor for an electricity system, Version 05.0.0	27/11/2015	Others
22	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
23	CDM-EB	Project design document for CDM project activities, Version 06.0	09/03/2015	Others
24	UNFCCC	Kyoto Protocol	/	Others

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

Table 1. CL from this validation

CL ID	CL-1	Section no.	D.5	Date: 28/03/2016
Description of CL				
The accuracy of the meters involved in the monitoring plan is not described.				
Project participant response				Date: 29/03/2016
The accuracy of the meters is not less than 0.5S, which has been included in the updated PDD.				
Documentation provided by project participant				
PDD version 08.				
DOE assessment				Date: 30/03/2016
In the PDD version 08, the accuracy of the meters involved in the monitoring plan is included. The accuracy of the meters included in the updated PDD is not less than the required accuracy in the PDD and the monitoring reports of the 1st crediting period. The CL-1 was closed.				

Table 2. CAR from this validation

CAR ID	CAR-1	Section no.	D.1	Date: 28/03/2016
Description of CAR				
Information in the Section F, Appendix 2 and Appendix 3 is missing.				
Project participant response				Date: 29/03/2016
The PDD has been revised and information of the Section F, Appendix 2 and Appendix 3 is included.				
Documentation provided by project participant				
PDD version 08.				
DOE assessment				Date: 30/03/2016
The verification team has checked the revised PDD and can confirm that the information of the Section F, Appendix 2 and Appendix 3 is included. The CAR-1 was closed.				

CAR ID	CAR-2	Section no.	D.3	Date: 28/03/2016
Description of CAR				
For the second crediting period, the continued validity of the original baseline should be assessed. The 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)" shall be adopted in the justification of the "Establishment and description of baseline scenario".				
Project participant response				Date: 29/03/2016
PDD has been revised to adopt 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)" in the justification of the "Establishment and description of baseline scenario".				
Documentation provided by project participant				
PDD version 08.				
DOE assessment				Date: 30/03/2016

The verification team has checked the revised PDD and can confirm that the 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)” has been adopted in the justification of the “Establishment and description of baseline scenario”. The **CAR-2** was closed.

CAR ID	CAR-3	Section no.	D.4	Date: 28/03/2016
Description of CAR				
ER calculation spreadsheet shall be provided. Values of w_{OM} and the weight w_{BM} are wrong. Information used in the Section B.6 and Appendix 4 shall be updated as per the latest published “Notification on 2015 Baseline Emission Factors for Regional Power Grids in China” by China DNA.				
Project participant response				Date: 29/03/2016
Values of w_{OM} and the weight w_{BM} have been revised to be 0.25 and 0.75. Information used in the Section B.6 and Appendix 4 has been updated as per the latest published “Notification on 2015 Baseline Emission Factors for Regional Power Grids in China” by China DNA.				
Documentation provided by project participant				
PDD version 08.				
DOE assessment				Date: 30/03/2016
The verification team has checked the revised PDD and can confirm that the the values of w_{OM} and the weight w_{BM} have been corrected as per the Tool to calculate the emission factor for an electricity system, and the information used in the Section B.6 and Appendix 4 has been updated as per the latest published “Notification on 2015 Baseline Emission Factors for Regional Power Grids in China” by China DNA. The CAR-3 was closed.				

CAR ID	CAR-4	Section no.	D.5	Date: 28/03/2016
Description of CAR				
The parameters Cap_{PJ} and A_{PJ} are not included in the monitoring plan as per the methodology				
Project participant response				Date: 29/03/2016
The PDD has been revised and the parameters Cap_{PJ} and A_{PJ} are included as per the requirements in the methodology.				
Documentation provided by project participant				
PDD version 08.				
DOE assessment				Date: 30/03/2016
The verification team has checked the revised PDD and can confirm that the parameters Cap_{PJ} and A_{PJ} are included as per the requirements in the methodology. The CAR-4 was closed.				

Table 3. FAR from this validation

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

N/A

- - - - -

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
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		