

Project Title	Sichuan Muchuan County Huogu Hydropower Project
Project Reference	1746.V1
Client Name	Deutsche Bank AG, London branch
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Version Control	Date
Version 01	25 January 2010 (Draft Validation Report)
Version 02	25 February 2011 (Final Validation Report)
Version 03	15 August 2011 (Final Validation Report revised after 1 st incompleteness) ¹
Version 03.1	16 April 2012 (Final Validation Report revised after 2 nd incompleteness and change of Annex I party to UK) ²
Version 03.2	23 May 2012 (Final Validation Report revised after 3 rd incompleteness) ³
Version 03.3	24 July 2012 (Final Validation Report revised after 4 th incompleteness) ⁴

¹ Reference in China LoA to incorrect Annex I party

² Reference in China LoA to incorrect Annex I party (validator's justification not accepted)

³ After Reporting and Information Check (request to clarify validation of financial calculations)

⁴ After Reporting and Information Check (request to further validate use of benchmark for 'rural area')

Project Title:	Sichuan Muchuan County Huogu Hydropower Project		
Project Location	Lidian Town, Muchuan County, Leshan City, Sichuan Province		
Country:	People's Republic of China		
Project Parties	People's Republic of China; The United Kingdom		
Project Participants	Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd. Deutsche Bank AG, London branch		
Methodology used	ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"		
Methodology version number	12.3.0		
Estimated Annual Average Emission Reductions	141,158 tCO ₂ e		
Crediting Period Dates	01 June 2012 – 31 May 2019		
GSP PDD Version	Date: 09 December 2009	Final PDD Version	Date: 17 May 2012
	Version Number: 1		Version Number: 4.2
	Start date of GSP: 12 December 2009		

Summary:

ERM CVS was commissioned by Deutsche Bank AG, London branch to validate the Sichuan Muchuan County Huogu Hydropower Project on the basis of UNFCCC criteria for the Clean Development Mechanism (CDM), as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board, including the Validation and Verification Manual.

The validation consisted of the following three phases: i) a desk review of the project design documents, ii) site assessment and follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

Based on the work performed, it is ERM CVS's conclusion that the project as described in the Project Design Document (PDD), version 4.2, dated 17 May 2012, meets all necessary criteria and requirements of the CDM, correctly applies the methodology ACM0002 version 12.3.0 and is expected to result in real, measurable and long term emission reductions. The designated national authority (DNA) of the host Party has confirmed that the project assists in meeting sustainable development criteria.

ERM CVS therefore requests that the CDM Executive Board registers the project as a CDM project activity.

Client:	Deutsche Bank AG, London branch		
Client Representative:	Andrew Hallett		
Report approved by:		Signature 	
Name Melanie Eddis			
Date: 24 July 2012			

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Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CCPG	Central China Power Grid
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction
CL	Clarification Request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
COP	Conference of Parties
DNA	Designated National Authority
DOE	Designated Operational Entity
EIA	Environmental Impact Assessment
PDR	Preliminary Design Report
GHG	Greenhouse Gas
GSP	Global Stakeholder Process
FAR	Forward Action Request
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LoA	Letter of Approval
MOP	Meeting of Parties
MP	Monitoring Plan
NDRC	National Development and Reform Committee
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PP	Project Participant
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change
VVM	CDM Validation and Verification Manual

1. Introduction

1.1. Validation Objective

The purpose of a validation is to provide a thorough independent third party assessment of proposed CDM project activities to ensure that the proposed CDM project activity meets all the identified and applicable criteria for registration of projects under the Clean Development Mechanism. In particular, the project's baseline, additionality demonstration, applicability to an approved CDM methodology, monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Certified Emission Reductions (CERs). UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities and related decisions by the COP/MOP and the CDM Executive Board. The validation will result in a conclusion as to whether the project should be submitted to registration. The final decision on whether to register the project rests with the CDM Executive Board and the Parties involved.

1.2. Scope

The validation scope is defined as an independent and objective review of the PDD and associated documentation. The PDD and associated documentation is reviewed against the criteria and requirements stated in the CDM Validation and Verification Manual (VVM) (EB 44, updated at EB 55) and Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, as well as relevant decisions by the CDM Executive Board. The validation scope also included an assessment of completeness and accuracy of documentation, evaluation of evidences, information and assumptions made in the PDD and supporting documentation.

1.3. CDM Project Description

The Sichuan Muchuan County Huogu Hydropower Project (hereafter referred to as 'the project' or 'the project activity') is a 40 megawatt (MW) grid-connected hydroelectric project located in Lidian Town, Muchuan County, Leshan City, Sichuan Province, in the People's Republic of China. The project activity is developed and operated by Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd.

The project activity consists of two units of turbine-generator sets, each with a unit capacity of 20 MW. The project activity also includes a roller-compacted concrete arch dam, power house and substation facilities. The maximum dam height and crest length are designed to be 55.00m and 175.20m respectively. The submerged area of the reservoir at normal water level will be 891,000m², resulting in the power density of the project to be 44.89 W/m². The annual power generation of the proposed project activity is expected be 199,294.1 MWh, of which 165,513.9 MWh of net electricity will be delivered to the Central China Power Grid (CCPG).

The power output will be delivered to the grid via the Sichuan Power Grid, displacing same amount of power generated by the CCPG which is dominated by fossil fuel fired power plants. This will lead to the reduction of greenhouse gas (GHG) emissions by avoiding CO₂ emissions produced by fossil fuel combustion in power plants connected to the CCPG. The estimated annual average emission reduction over the first crediting period is 141,158 tCO₂e.

The baseline scenario, which is the situation existing prior to the development of the project activity, is that electricity would have otherwise been generated by power plants connected to CCPG and by the addition of new generation sources to the CCPG. This baseline is in accordance with the baseline scenario specified in the methodology ACM0002 v12.3.0

All project components were covered during the validation process. ERM CVS confirms that the project description provided in the final PDD is accurate and complete and complies with the CDM requirements.

1.4. Validation Personnel

Validation Team	Role	Coverage of sectoral scope	Coverage of technical area	Financial Expertise	Host country experience	Participated in site visit?
Wang Yan (Jessie)	Lead Validator	√	√		√	Yes
Liu Yang (Eddie)	Validator	√	√		√	Yes
Angus McEwin	Financial expert			√		No

Technical Review	Role	Coverage of sectoral scope	Coverage of technical area	Host country experience	Participated in site visit?
Bilal Anwar	Technical Reviewer	√	√		No

Wang Yan (Jessie) is an environmental engineer and lead GHG auditor based in Shanghai. Ms Wang has completed the ERM CVS training course on CDM validation and verification and has worked on over 15 CDM validations and verifications in China. Ms Wang has extensive knowledge of environmental regulation in China, and in depth experience of water and wastewater treatment, environmental impact assessment, water resources management, surface water/ground water modelling, environmental due diligence, and environmental compliance auditing. She has substantial professional experience in

government (China), research institutes (Germany), and consulting (USA). Ms Wang has undertaken and managed a wide variety of environmental projects nationally and internationally, including Greenhouse Gas Assurance, energy efficiency and climate change, carbon foot-printing assessments, green buildings, environmental site assessment, water/wastewater treatment and water resources.

Liu Yang (Eddie) is a lead GHG assessor with four years experience in CDM Validation & Verification. Mr. Liu is a Certified Energy Manager. He has completed the ERM CVS training course for CDM Validation & Verification, and IRCA registered ISO 9001:2008 / ISO 14001:2004 lead auditor training courses. He has worked on more than 100 GHG validation and verification projects in China, covering a wide range of technologies including hydro, wind, biomass, solar PV, waste energy recovery, HFC23 destruction, N₂O abatement, associated gas recovery and etc. He has received Certificate of Proficiency of Renewable Energy Projects and Certificate of Proficiency of Landfill Gas Projects from GHG Management Institute. Mr. Liu's experience in the renewable energy sector includes participation in more than 60 audits in scope 1 (energy industries), and assessment of hydroelectric projects against the criteria set by the World Commission on Dams.

Angus McEwin is a financial expert for ERM CVS and has over ten years experience of economic analysis and environmental auditing in the UK, Australia and Vietnam. In his previous work experience as an independent contractor, Angus worked in a range of roles in the financial services and investment banking sector in London, including carrying out analytical and operational roles for several large financial sector clients. Over the last six years Angus has worked as an environmental and socio-economist for ERM within the natural resources and environment sector in Southeast Asia, where his financial experience includes economic impact assessments in Australia and Singapore and numerous environmental assessments in Vietnam.

Bilal Anwar has ten years of professional experience in the area of International Climate Change Policy, Regulatory aspects of the Global Climate Regime, setting-up of the global accreditation system under the CDM and technical and methodological aspects relating to projects for reducing GHG emissions. This experience has been gained in the Secretariat for United Nations Framework Convention on Climate Change (UNFCCC) by supporting the CDM regulatory regime. In this role Bilal developed a profound understanding of all aspects of the project based mechanisms (CDM& JI) namely: regulatory, methodological, technical, legal and procedural. Bilal had been closely involved in the development of methodological and technical frameworks, including baseline and monitoring methodologies, standards for CDM projects, regulatory and technical requirements and associated procedural frameworks

2. Methodology

The validation was carried out in accordance with the CDM-VVM, version 1.2 updated at EB 55. The validation process employed standard auditing techniques and undertook necessary cross-checks and follow-up actions to ascertain the correctness of the information. The validation team included staff with experience in the relevant sectoral scopes and technical areas within the sectoral scope, and included local host country expertise, sectoral knowledge, and financial expertise. The validation report and associated documents have undergone a thorough technical review by ERM CVS before being submitted to the CDM Executive Board for registration. The validation consisted of the following key phases:

- I. Upload of the PDD for Global Stakeholder Process (GSP), receipt of any comments from stakeholders (GSP started on 12 December 2009)
- II. Desk review of documentation including PDD, methodology and key supporting documents and references
- III. A visit to the project site, including interviews with personnel responsible for developing the project (the site visit took place on 15 -16 December 2009)
- IV. Development of a draft validation report, identifying non-compliances including Corrective Action Requests (CARs) and Clarification Requests (CLs), taking into account findings of the GSP, desk review and site visit / interviews
- V. Resolution of outstanding issues (CARs and CLs) and development of a final validation report and validation opinion

2.1. Global Stakeholder Process Consultation

The PDD, version 1 dated 09 December 2009, was uploaded for the global stakeholder process (GSP) comments. The Global stakeholder period was 12 December 2009 to 10 January 2010. Relevant information can be found at <http://cdm.unfccc.int/Projects/Validation/DB/IG8JSU92TACJE6AWBY5VGLJLSBVWKN/view.html>

No comments have been received during the period.

2.2. PDD and Documentation Review

A detailed desk review of the PDD [PDD-1], methodology [ACM2] and all other associated documentation and references took place in advance of the site visit, and additional documents that were not available for the desk review were requested for review during the site visit.

The project information was also cross-checked through other sources in order to evaluate the authenticity and credibility of information and ascertaining the correctness of the information against the requirements and established criteria. The review of the PDD at the desk review stage raised a number of issues which were further reviewed and validated through supporting documentation and cross-checking from other sources and interviewing relevant personnel involved in the project activity during the site visit

A list of all documents reviewed or referred to in the course of this validation is included in Appendix A.

2.3. Site visit and interviews

Interviews took place on site, via telephone or via email and include relevant stakeholders in the host country, personnel responsible for project design and implementation, and other stakeholders as applicable.

The site visit took place on 15 -16 December 2009. ERM CVS staff attending the site visit included Jessie Wang (lead validator) and Eddie Liu (validator). The site visit included a tour of the physical project site, including the dam and power house. The site visit also included a visit to the main office of the project owner Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd.

Staff from the project owner and the CDM consultant were interviewed, and document review took place at the office of the project owner. A list of interviewees, and the main topics discussed with each can be found in Appendix A.

2.4. Reporting

A checklist ('validation protocol') of the key requirements for validation is included as Appendix B. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet.
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.
- It must also list project components/issues not covered in the validation engagement

The protocol describes the following:

Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
The requirements that the project should meet	The documents used to check the answer to the checklist question	This section is used to elaborate and discuss the conformance to the checklist question, and to explain the conclusion reached. It includes the means of validation, which explains how conformance with the checklist is justified. For example document review (DR) or interview (I). N/A means not applicable	This is either acceptable based on evidence provided (OK), or a <i>Corrective Action Request</i> (CAR) is required due to non-compliance with the checklist question. A request for <i>Clarification</i> (CL) is used when the validation team has identified a need for further clarification. A 'Minor Issue' may be recorded for typographical errors or similar minor errors that do not have an impact on the compliance of the project to the CDM rules but nevertheless should be corrected to improve clarity. A <i>Forward Action Request</i> (FAR) could be raised for issues to be addressed during first verification that do not form part of the registration requirements	Indicates whether the CAR or CL has been closed out (OK).

Remediation Form: Clarification Requests (CL), Corrective Action Requests (CAR) and Forward Action Requests (FAR), plus minor issues

CARs, CLs, and FARs are raised in the draft validation protocol and detailed in a separate form in Appendix C. In this form, note is made of actions taken by the Project Proponent to close outstanding CARs and respond to CLs and FARs:

Draft report corrective action, clarification, or forward action requests, or minor issues	Reference to CDM Validation Protocol Checklist	Summary of project participants' response	Final conclusion
List of CARs, CLs and FARs (and minor issues)	Reference to the validation protocol checklist question	Summary of response during the communication with the validation team	Summary of validation team responses and final conclusion.

Clarification Requests (CL): Where insufficient or unclear information is available and clarification or new information is required. A CL is raised specifying what additional information is required.

Corrective Action Requests (CAR): Where a non-conformance arises the Assessor shall raise a Corrective Action Request (CAR). A CAR is issued, where:

- Mistakes have been made that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The CDM requirements have not been met; or
- There is a risk that emission reductions cannot be monitored or calculated.

The validation process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

Forward Action Requests (FAR): FARs shall be raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

A '**Minor Issue**' may be recorded for typographical errors or similar minor errors that do not have an impact on the compliance of the project to the CDM rules but nevertheless should be corrected to improve clarity.

2.5. Internal Quality Control

The process of validation and decision of the validation team has been subject to an independent Technical Review. The scope of the Technical Review process is to independently assess that all procedures have been followed, necessary requirements have been met, and all conclusions are justified. The final validation decision is based on the findings and conclusions of the validation team, assessing the compliance of the project activity with the CDM requirements, and the technical evaluation of the independent technical reviewer. The final report is then approved and signed off by the qualified signatory / final decision maker within ERM CVS.

3. Validation findings

3.1. Main changes between the PDD version published for the global stakeholder comment period and the final version submitted for registration:

- Methodology version number updated from v10 to v12.3.0
- Baseline and project technology description revised to provide more details
- Project boundary description revised to include a flow diagram
- Geographical coordinates of the project corrected
- The timeline of project implementation and CDM actions elaborated
- Common practice analysis updated to define similar projects clearly and provide essential distinctions
- The latest version of the Tool to calculate the emission factor for an electricity system applied
- The formulae for baseline emission calculation corrected in accordance with ACM0002, v 12.3.0
- Corrections made to the list of parameters not monitored in section B.6.2
- EG_y has been replaced by $EG_{facility,y}$ in the monitoring plan in accordance with ACM0002, v 12.3.0
- Emission reduction calculation corrected
- Project start date revised to be compliant with the Glossary of CDM Terms
- Start date of crediting period revised
- Environmental impacts and mitigation measures more detailed explained in the PDD
- Local stakeholder consultation process explained in more detail
- Annex 1 country changed from the Netherlands to the United Kingdom

3.2. Approval and Participation Requirements

The project participants are Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd., authorised by P. R. China, and Deutsche Bank AG, London branch, authorised by United Kingdom. The host Party, P. R. China, and Annex I Party, United Kingdom, have both ratified the Kyoto Protocol. Both Parties have established their respective DNAs as per the participating requirements for CDM under the Kyoto Protocol.

The host country Letter of Approval (LoA) [HCA] was issued by the DNA of P. R. China in April 2008 (dated in English version). The LoA was received from the project participants and has been cross-checked against the list of approved projects on the web-site of the Chinese DNA. The letter confirms that:

- China ratified the Kyoto Protocol on 30 August 2002;
- Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd. is authorised as a project participant by the P. R. China to voluntarily participate in the project activity;
- The project complies with the permission requirements provided for in the Measures for Operation and Management of CDM projects in P. R. China, and assists P. R. China in achieving sustainable development;
- The LoA references the precise project title 'Sichuan Muchuan County Huogu Hydropower Project'. This is consistent with the project title in the PDD.

The Chinese LoA contains no additional specifications or conditions regarding the project activity, or references a specific version of the Validation Report or PDD.

The Annex I Party Letter of Approval (LoA) has been provided by the Environment Agency, which is the DNA of the United Kingdom, dated 22 February 2012 [LoA]. The approval of the project by the LoA from The United Kingdom has been checked and clearly confirmed:

- United Kingdom ratified the Kyoto Protocol on 31 May 2002;
- It participates in the CDM on a voluntary basis;
- Reference to the precise project title 'Sichuan Muchuan County Huogu Hydropower Project'. This is consistent with the project title in the PDD;
- Deutsche Bank AG, London branch is authorised as a project participant by the United Kingdom to voluntarily participate in the project activity;
- The LoA references the draft Validation Report, version 3, dated 27 July 2011 and the Project Design Document, version 4.0, dated 28 April 2011. Upon receipt of the UK LoA, the validation report has been amended to reflect:
 - the receipt and validation of the letter of approval;
 - to address the minor version update of ACM0002; and
 - the updating of the crediting period dates.

The PDD and validation report major version number has remained unchanged and the minor number has been increased to reflect the minor updates.

The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance funding towards P. R. China.

3.3. Project Design

Conformance of the PDD with EB guidelines

The PDD submitted for registration [PDD-2] has been checked against the latest 'Guidelines for developing the Project Design Document' (version 7) [GCP] and the latest template for the Project Design Document (version 3) [CPF] available on the CDM website. It is confirmed that the final PDD is in compliance with the template and guidelines.

Conformance of the project design in the PDD with source documents such as the PDR

The project design and technical description of the project activity has been cross-checked against the project construction contract [PCC] and equipment purchase contract [EPC]. Furthermore, a physical site inspection has been conducted by the validation team to confirm that the description in the PDD reflects the proposed CDM project activity.

The total installed capacity of the project is 40 MW, consisting of 2 units with a unit capacity of 20 MW. Annual utilisation hours are calculated as 4982 hours (56.8% equivalent in plant load factor) per year in the PDR. This is consistent with the Preliminary Design Report (PDR) which was developed by Engineering Design and Research Institute of Sichuan University in December 2006 [PDR], an independent third party qualified by the NDRC to perform PDRs. The PDR was approved by Development and Reform Commission of Sichuan Province – on 13 February 2007 [APDR]. As per the PDR, the expected annual power delivered to the grid is 165,513.9 MWh.

In accordance with the PDR, the gross electricity generation by the project activity is estimated as the theoretical annual power generation (199,294.1 MWh) multiplied by the effective coefficient factor of 0.85 and deducting 0.3% of self-consumption by the power plant and 2% of transmission line loss. The theoretical gross power generation is based on the value in the PDR and it is calculated from 47 years of hydrological data from hydrological monitoring stations. The coefficient factor, the self consumption rate and the transmission line loss are in line with the relevant national regulations and guidelines contained in the Economic Evaluation Code for Small Hydropower Projects (SL-16-95) [EEC-1]. The net electricity delivered to CCPG is therefore calculated as $199,294.1 \text{ MWh} \times 0.85 \times (1 - 0.3\%) \times (1 - 2\%) \approx 165,513.9 \text{ MWh}$. The effective net electricity has been checked by the validation team and is considered reasonable.

The project description has been validated against the PDR of the project activity. The project description was also cross-checked against the physical layout of the project during the site visit, which included a tour of the site area. The description was further cross-checked against the Environmental Impact Assessment Report (EIA) prepared by Environmental Protection Research Institute of Chengdu University of Science & Technology [EIA] and against the key contracts for construction of the project activity [EPA, PCA, PCC]. ERM CVS confirms that the description of the proposed CDM project activity, as contained in the PDD, sufficiently covers all relevant elements, is accurate, complete and provides the reader with a clear understanding of the nature of the proposed CDM project activity.

Timeline and operational status of the project

A site visit was conducted by ERM CVS as described above. At the time of the site visit, the main construction of the project including the dam and powerhouse were under construction. The project construction was indicated to be completed by mid 2011.

The start date of the project activity is validated in section 3.5 below. The project timeline has been verified by checking all relevant documents such as construction contracts and equipment purchase contracts.

The operational lifetime of the project activity is expected to be 20 years as stated in section C.1.2 of the PDD. This is consistent with the approved third party PDR and with the financial analysis, which is also in line with Economic Evaluation Code for Small Hydropower Project [EEC].

Permits and approvals:

ERM CVS has ensured that the project activity has all the relevant permits and approvals needed to be developed as a hydroelectric project in the host country by means of review of the government approval to the project [APDR], and interviews with a government representative [IV3].

Based on ERM CVS's local and sectoral knowledge, according to national procedures and regulations a project can only be approved when the necessary permits are in place. The following permits and approvals were checked by ERM CVS:

- Approval of Preliminary Design Report [APDR];
- Environmental Impact Assessment (EIA) Approval of the Project [AEIA];
- Business License of Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd. [BL].

Project location

As described in Section A.4.1 of the PDD, the project activity is located in Lidian Town, Muchuan County, Leshan City of Sichuan Province, P. R. China. The location described in the final PDD accurately reflects the location of the project, and the information is consistent with the PDR, and has been confirmed during the site visit.

3.4. Baseline

Applicability of selected methodology

The project activity applies approved baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 12.3.0, which is valid from 17 September 2010. The PDD originally applied methodology, ACM0002 version 10, but was updated during the course of the validation by the project participants. The methodology also refers to the “Tool for the demonstration and assessment of additionality” (Version 05.2.1) and the “Tool to calculate the emission factor for an electricity system” (Version 02.2.1). The methodology and tools are valid at the time of validation. The chosen methodology is considered appropriate for the project activity and is found to be correctly applied based on the following aspects:

Table 1: Applicability conditions of the applied methodology

Applicability conditions	Justification in the PDD	Ref.	Means of validation
The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	The proposed project is the installation of a new hydropower plant.	[PDR] [APDR] SV	The information has been verified by the DOE through on-site inspection, and checking the PDR and its approval by the government and other project documentation.
In the case of capacity additions, retrofits or replacements (except for capacity addition projects for which the electricity generation of the existing power plant(s) or unit(s) is not affected): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity addition or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	The proposed project is the installation of a new hydropower plant.	[PDR] SV	This has been confirmed by review of the PDR and site visit and other project documentation.
In case of hydro power plants, at least one of the following conditions must apply: - The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or - The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m² after the implementation of the project activity; or - The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m² after the implementation of the project activity.	The project activity is a hydro power plant with a new dam and a new single reservoir. The power density of the project activity is greater than 4 W/m ² .	[PDR]	Area of the project's new reservoir is estimated as 891,000 m ² in the approved PDR, and the power density is calculated as: 40,000,000W/ 89,1000m ² = 44.89 W/m ² . The area of the reservoir been verified by ERM CVS from the PDR and is found correct.
The methodology is not applicable to the following: - Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; - Biomass fired power plants; - A hydro power plant that results in the creation of a new reservoir or in the increase in an existing single reservoir where the power density of the reservoir is less than 4 W/m².	The proposed project does not involve switching from fossil fuels to renewable energy sources at the site of the project activity. The project is a hydropower plant with a new single reservoir and the power density greater than 4 W/m ² .	[PDR] SV	This has been confirmed by review of the PDR and site visit. Biomass is irrelevant to the project activity. Power density of the project activity is greater than 4 W/m ² as verified in above.
In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most plausible	Not applicable to the project activity since		NA

Applicability conditions	Justification in the PDD	Ref.	Means of validation
baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	retrofits, replacements, or capacity additions are not involved in the project.		

Applicability criteria related to multiple reservoirs are not relevant since the project has only a single reservoir.

Project boundary

According to the methodology ACM0002, v12.3.0, the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to, in this case the CCPG. The information is correctly described in the PDD section B.3.

The validation of the project boundary has been performed by ERM CVS, through assessing the documentation such as the PDR and its approval, and observations made during the site visit. The whole power plant of the project to generate hydro power and the connected regional grid are included in the project boundary. The DNA of the host country, NDRC of P. R. China, has published a delineation of the main electricity systems in China including the project electricity system of CCPG [GEF].

No emissions other than those allowed by the methodology are expected to result from the project, and no greenhouse gas emissions occur within the proposed CDM project activity boundary, as a result of the implementation of the proposed CDM project activity, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology.

Baseline

As per VVM paragraph 105, no baseline alternative analysis is required if the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario.

The methodology prescribes that if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

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". The calculation of baseline emissions is validated in detail in section 3.6.

The baseline of the project activity in the PDD correctly follows the methodology.

3.5. Monitoring Plan

As per the VVM paragraph 123, ERM CVS applied a two-step process to assess the compliance with requirements of the monitoring plan, and confirms the following:

- (a) the monitoring plan is fully in compliance with the requirements of the methodology ACM0002;
- (b) the monitoring arrangements described in the monitoring plan are feasible within the project design;
- (c) the project participants are able to implement the monitoring plan.

The assessment conducted by ERM CVS is by means of review of the documented procedures, interviews with relevant personnel, project plans and physical inspections of the proposed CDM project activity site. Further detail is given below.

As a newly constructed hydro power project, the required monitoring parameters are the net electricity supplied by the project activity to the grid ($EG_{Facility, y}$), area of the reservoir (A_{PJ}) and installed capacity of the project (Cap_{PJ}) described in section B.7.1 of the PDD:

Table 2: Data and parameters monitored

Parameter	Requirements of the methodology	Description in the PDD	Conclusion
$EG_{Facility, y}$	- Continuous measurement and at least monthly recording - Cross check measurement results with records for sold electricity	- Continuous electricity meter measurement at the project site - Hourly recorded and monthly aggregated - Cross check with sale records	OK
Cap_{PJ}	- Monitored yearly - Based on recognized standards	- Annual confirmation with installed equipments - Cross check with specification manual	OK
A_{PJ}	- Monitored yearly - Measured from topographical surveys, satellite pictures, etc	Annually measured from topographical surveys by third qualified organization	OK

The other parameters from the methodology are not relevant and do not need to be monitored for this type of project.

Equipment:

Measurement of net electricity delivered to the grid will be carried out by two meters (M1 & M2). M1 meter will be installed at the project site, whereas, M2 a bi-directional meter, will be installed at the substation. Accuracy of both meters will be 0.2S which is in compliance with the host country industrial standard *Technical Administrative Code of Electric Energy Metering* (DL/T448-2000) [CEM]. M1 will be owned and maintained by the project owner, and M2 will be owned and maintained by Sichuan Power Grid which belongs to CCPG. Net electricity supplied to the grid by the project activity ($EG_{\text{Facility}, y}$) will be the difference between the values of electricity import and export. In case of any mal-functioning of the meter M2, net electricity data should be calculated data from M1 minus line losses and internal consumption of the project activity.

This equipment setup is considered sufficient to carry out the monitoring requirements of the methodology, and the appropriate national standards have been followed. This has been cross checked against the standard DL/T448-2000.

Data:

The project developer will implement a data management system. Data for $EG_{\text{Facility}, y}$ will be measured continuously and recorded monthly. Readings will be taken by the Project Entity and the local Power Grid Company and will be cross-checked with the invoices of electricity sales. Data will be archived electronically and monthly, and will be kept for 2 years after the end of the crediting period, or the last issuance of CERs, whichever occurs later. The data management procedures are considered appropriate to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified.

Organisation:

The PDD contains a diagram illustrating the organisational structure to be implemented by the project developer in order to implement the project activity. A manager in charge of CDM will be in overall charge of the monitoring system and there will be separate roles for data collector, meter maintainer (calibration/maintenance and QA/QC) and data auditor, in order to carry out the monitoring plan. The organisational structure is considered sufficient to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified

Quality Assurance and Quality Control:

The PDD describes calibration and trouble-shooting procedures in the monitoring plan. The meters will be calibrated annually. And reading from the M1 meter will be applied if the main meter is malfunctioned.

The PDD contains sufficient description on how quality will be controlled and assured in the monitoring of emission reductions.

Feasibility of the monitoring plan:

Based on ERM CVS's local and sectoral knowledge, the measurement methods, recording procedures, meter maintenance and trouble-shooting procedures described in the monitoring plan are also required by the grid company when dealing with invoicing, and this will be specified in the PPA once signed. Therefore the procedures are considered standard and feasible in China and can fully meet the requirements of the CDM methodology. No difficulties are anticipated in implementing the operational and management structure or the monitoring plan as a whole.

3.6. Additionality

Start date

The start date of the project activity is 06 June 2007 which is the date of the equipment purchase contract (water turbine and generator) [EPC], since this is the earliest contract signed by the project owner among the equipment purchase contracts [EPC] and main construction contracts [ECC]. The construction started on the project activity on 8 October 2007 [int4]. All the documents have been checked and verified by ERM CVS and represent reliable, third party documentation.

Table 3: Assessment of project start date determination

Activity	Date	Document / Evidence	Reference	Assessment
Equipment purchase contract signed by the project developer (starting date of the project activity)	06/06/2007	Water turbine generator sets purchase contract	[EPC]	The signed contract has been checked, date and signatures are confirmed.
Engineering and Construction Contract signed by the project developer	08/10/2007	Engineering and Construction Contract	[ECC]	The signed contract has been checked, date and signatures are confirmed.
Construction of the project started	08/10/2007	News reported on internet.	[int4]	The news with photographs available on website has been checked, the date is confirmed.

The start date and the timeline of project implementation described in section B.5 of the PDD was also confirmed during the on site interviews with the project developer and local government officials. The determination of date of purchase contract of water turbine sets as the start date of the project is considered reasonable since water turbine generator sets are the key equipment for a new hydro-power project and its purchase indicates commitment of project participants with the implementation of the project activity, and this is also therefore the earliest date of any real action in the project.

ERM CVS confirms that the start date of the project activity, reported in the PDD, is in accordance with the "Glossary of CDM terms".

Prior consideration of the CDM and timeline of real and continuing actions to secure CDM status

The project activity is an **existing** project with a starting date of 6 June 2007 which is before 2 August 2008, and the start date is prior to the date of publication of the PDD for global stakeholder consultation.

The PDD contains a timeline of real actions to secure CDM status in section B.5 of the PDD, based on which ERM CVS has validated that the CDM was seriously considered in the decision to implement the project activity according to the 'Guidelines on the demonstration and assessment of prior consideration of the CDM' [EB49a22]. Assessment of the timeline and details of activities is summarized in below table:

Table 4: Assessment of continuing CDM actions in parallel with project implementation

Activity	Date	Document / Evidence	Reference	Assessment
The board determined to introduce CDM into the project development on becoming aware of financial viability of the project activity	22/11/2006	Initial Board Meeting resolution to consider CDM	[BMM-1]	Board meeting minutes have been checked, and the date and signatures of shareholders are confirmed.
The board made investment decision with CDM consideration	02/03/2007	Final Board Meeting resolution to apply for CDM	[BMM-2]	Board meeting minutes have been checked, and the date and signatures of shareholders are confirmed.
CDM Development Agreement signed with CDM Consultancy	04/04/2007	CDM Development Agreement, signed with Hangzhou Carbon Trade Environment Engineering Co., Ltd	[CDA]	The agreement has been checked, and the date and signatures are confirmed.
The host company signed a Term Sheet of possible business of Emission Reduction Purchase Agreement	31/01/2008	Term sheet signed with ORBEO	[CTS]	The document has been checked, and the date and signatures are confirmed.
Letter of Approval issued by China DNA	11/06/2008	China LOA No. 1164	[HCA-1]	The LOA has been checked, and the date is confirmed.
ORBEO terminated cooperation with the host company	08/10/2008	Term sheet terminated with ORBEO	[TST]	The document has been checked, and the date and signatures are confirmed.
Emissions reductions Purchase Agreement signed with Deutsche Bank AG	03/04/2009	Emissions reductions Purchase Agreement	[ERPA]	The agreement has been checked, and the date and signatures are confirmed.
PDD of the project published on UNFCCC website	12/12/2009	CDM website		

Above assessed real and continuing actions to secure CDM status demonstrate that:

(a) The project participants were aware of CDM prior to the project activity start date, and considering the financial returns of the project not being attractive, benefits of the CDM were a decisive factor in the decision to proceed with the project. Evidence to support this includes meeting related to the consideration of the decision by the Board of Directors [BMM].

(b) Continuing and real actions were taken to secure CDM status for the project in parallel with its implementation. Evidences to support this include, contracts with consultants for CDM services [CDA], documentation related to the sale of the potential CERs [CTS] [TST], Emission Reduction Purchase Agreements [ERPA], LoA application from host country DNA [HCA-1].

Assessment of real and continuing actions has been validated by ERM CVS, and authenticity of the documented evidences as indicated in table 3 is assessed as reliable, there is no time gap more than 2 years between the documented evidences.

Therefore in accordance with the *Guidelines on the demonstration and assessment of prior consideration of the CDM* [EB49a22], ERM CVS has validated that serious consideration of CDM was taken before the project start date, and that real and continuing actions were taken to secure CDM status for the project activity.

Identification of alternatives:

According to the applied methodology ACM0002, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

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"*.

As per paragraph 105 of the VVM, no analysis of baseline alternatives is required if the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario.

The project activity is a hydropower project that provides electricity to the local grid network which is dominated by fossil fuel fired power plants, and the methodology prescribes the baseline emissions as the product of the electrical energy baseline, expressed in kWh of electricity produced by the renewable generating unit multiplied by an emission factor.

No assessment of alternative baseline scenarios is therefore to be conducted in the PDD.

Additionality determination:

According to the applied methodology ACM0002, the additionality of the project activity shall be demonstrated and assessed using the *"Tool for the demonstration and assessment of additionality"*.

Benchmark analysis is applied by the project, as per Step 2b of the *"Tool for the demonstration and assessment of additionality"*.

The financial analysis was assessed by the validation team, including assessment of the spreadsheet and evidences relating to the input values to the financial analysis. The analysis was also assessed by referring to the 'Guidelines on the assessment of investment analysis' by a financial expert assigned by ERM CVS, who has specific expertise in the assessment of financial analysis for CDM projects.

Investment analysis:

Determine appropriate analysis method

The PDD adopts the benchmark analysis (option III), which is appropriate, because there are other economic benefits associated with the project activity in addition to CER revenues (i.e. from selling electricity), hence option I is not applicable. Option II is also not applicable as the status-quo scenario of the project activity, continuation of electricity supply by the grid, does not represent a comparable investment opportunity to the proposed project. The alternative to the project is to 'do nothing' i.e. the project developer would make no investment. Therefore investment comparison analysis cannot be carried out.

Apply Benchmark Analysis

The financial indicator is the internal rate of return (IRR) which is the most suitable for the project type and decision context is chosen, and the project IRR used is considered appropriate and in line with common practice in the host country and based on ERM CVS's local and financial expertise because the industrial benchmark regulated in the host country is also based on project IRR, this is also in line with the benchmark selected.

Determination of the benchmark

According to the Economic Evaluation Code for Small Hydropower Projects (SL 16-95) [EEC], the benchmark IRR of small hydro projects (installed capacity less than 50 MW in rural areas) in China is regulated as 10% of the total investment (for post-tax project IRR). Based on review of the PDR [PDR] and its government approval [APDR], as well as site visit by ERM CVS, it is confirmed that the proposed project activity is a **40 MW** hydropower plant located in a **rural area** near Lidian town in Muchuan county, Sichuan Province.

According to The Economic Evaluation Code for Small Hydropower Projects (SL 16-95) [EEC] issued by The Ministry of Water Resources of the P. R. China on 02 June 1995, the financial benchmark rate of return of 10% project-IRR after tax is applicable to medium hydropower stations located in a rural area with installed capacity below 50,000 kW (50 MW).

ERM CVS has validated that the industrial benchmark is applicable to the project activity for the following reasons:

- The benchmark value is sourced from PDR for the project [PDR] which cites the reference Economic Evaluation Code for Small Hydropower Projects SL16-95 [EEC].
- The PDR [PDR] was prepared by a qualified third party, the Engineering Design and Research Institute of Sichuan University and was approved by the appropriate authority, the Development and Reform Commission of Sichuan Province [APDR].
- The Economic Evaluation Code for Small Hydropower Projects has been updated from SL16-95 to SL16-2010 [EEC10] on 22 October 2010, effective as of 22 January 2011, issued by The Ministry of Water Resources of the P. R. China, the new version was published after the PDR was completed in December 2006 [PDR] and approved on 13 February 2007 [APDR]. In addition, the start date of the project activity was 06 June 2007.

To conclude, The Economic Evaluation Code for Small Hydropower Projects (SL 16-95) [EEC] is applicable to the financial analysis of the project activity as the source of the industrial benchmark.

ERM has also validated that the project activity is located in a rural area because the term 'rural area' can be understood to refer to an area of land that is not urbanized and has a low density of population that is engaged primarily in rural-type activities (e.g. farming):

- According to the PDR [PDR] and its approval [APDR], the main infrastructure of the project is located approximately 3km upstream of Lidian Town, Muchuan County.
- According to the EIA [EIA], the nearest communities to the project are Lidian Town in Muchuan County and Rongding Town and Shiliang Town in Mabian Yi Autonomous County. In 2004 the total population of all three towns was 31,520, of which the agricultural population accounted for approximately 84% of the total population. The land along the watershed in Lidian, Rongding and Shiliang Towns comprised 34.4% forest, 42.75% farmland, 12.7% grassland and 10.15% unused land. According to the EIA, the number of the people affected by land acquisition for the project was 63 people.
- ERM CVS visited the site on 15 December 2009 and observed the surroundings of the project activity, which can be described as a mountainous area covered by forest and grass as evidenced by a photo taken during the site visit (see below photo). ERM CVS observed that the only visible land use in the vicinity of the project activity was agricultural.



In support of its conclusion that the 10% benchmark is applicable to the project, ERM CVS also notes that:

- The Economic Evaluation Code for Small Hydropower Projects SL16-95 [EEC] does not contain a definition of "rural area" or provide clarification about how the term should be interpreted in the application of Code.
- Nonetheless, the benchmark of 10% has been commonly used in China for assessing the financial viability of hydro projects under 50MW, as listed in Table 5: Assessment of input values used in financial analysis.
- In the Economic Evaluation Code for Small Hydropower Projects SL 16-2010 [EEC10] which was updated on 22 October 2010, the financial benchmark rate of return of 10% benchmark is applicable to ALL hydropower stations less than 50,000 kW, i.e. the reference to "rural area" was removed.

Therefore the benchmark is assessed as applicable to the project activity since the project fully meet the applicability criteria of the Economic Evaluation Code for Small Hydropower Projects (SL 16-95) [EEC].

This benchmark is considered appropriate as it is the common practice in the hydro power industry in the host country, based on ERM CVS's local and financial expertise. This is also in line with the financial indicator (post-tax project IRR) selected.

As per the VVM paragraph 112, ERM CVS has:

- Determined that the type of benchmark applied (post-tax project IRR) is suitable for the type of financial indicator presented in the PDD: A post-tax project IRR is calculated which is consistent with the benchmark
- Ensured that any risk premiums applied in determining the benchmark reflect the risks associated with the project type: considering the benchmark is regulated for power sector by the government and no additional risk premiums have been added to the benchmark, this is considered appropriate;
- Determined that it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark: given the benchmark is determined by the government taking into consideration circumstances in the country and sector, it is reasonable to conclude that the investment would not be made at a rate of return lower than the benchmark. This benchmark is widely applied in China according to the local and sectoral knowledge of the validation team.

Based on ERM CVS's local, sectoral and financial expertise, the DOE confirms the suitability of the benchmark applied in the investment analysis.

Calculation and comparison of financial indicators

The PDD presents the key input parameters and results of the IRR of the project, and ERM CVS has assessed the correctness of computations carried out by the project participants by reproducing the results using the IRR calculation spreadsheet [IRR].

The validation team confirms that the calculations are correct, traceable, and consistent with the results of the PDR.

All input values used in the spreadsheet are consistent with the PDD and the PDR, and the calculation is in line with the *Guidelines on the Assessment of Investment Analysis* [GAIA], and is considered reasonable on the basis of ERM CVS's local and sectoral expertise and financial knowledge.

By means of reproducing the calculations in the IRR spreadsheet [IRR] and cross check against the PDR [PDR], ERM CVS confirms that the IRR calculation is fully consistent with the PDR, including all the input values, investment schedule, depreciation calculations, VAT and income tax calculation, and the results.

Depreciation which has been deducted in estimating gross profits on which tax is calculated, has been added back to net profits for the purpose of calculating the IRR. This is in compliance with the *Guidelines on the Assessment of Investment Analysis* [GAIA].

Residual value of depreciation has been added back to the cash inflow in the final year, and even if the VAT is calculated based on electricity sales only rather than cash inflow, the impact on the IRR is only 0.01% which will not change the result of investment analysis.

The project IRR calculated in the PDD and the spreadsheet is in line with the results of the PDR. The IRR of the project without CDM income is 6.93%, which is well below the benchmark of 10%, and the IRR will reach 10.37% with CDM income, hence it can be concluded that the CDM project is additional.

Use of values from Feasibility Study Reports

As per VVM paragraph 113, the project participants rely on values from a Preliminary Design Report (PDR) that is approved by the appropriate national authorities for proposed CDM project activities, and ERM CVS has ensured that:

- The PDR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the PDR (Dec. 2006) and the investment decision (March 2007) [BMM] is sufficiently short for ERM CVS to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed;
- The values used in the PDD and associated annexes are fully consistent with the PDR;
- On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values are valid and applicable at the time of the investment decision. Further details on the cross checks carried out on the input parameters are given in below section.

Assessment of parameters and assumptions

Table 5: Assessment of input values used in financial analysis

Parameter	Reference	Assessment of parameters and validity at the time of investment decision
Fixed asset investment	[PDR] [CPL] [int5]	The value (26.35 million RMB) is sourced from the third party approved PDR, and the unit cost of the proposed project is calculated as 6587 RMB/kW. According to the CDM pipeline [CPL] published by the UNEP Risoe Centre, the unit cost of other hydro power projects registered as CDM projects in the same region (Sichuan province) and with similar scale (15MW-50MW) varies from 4544 RMB/kW (Ref.1589) to 10363 RMB/kW (Ref. 3600). The average level of unit cost is 6719 RMB/kW. The total investment cost of the proposed project is within the range of similar projects in the region, and it is lower than the average level. Therefore the estimated value in the PDR is assessed to be reasonable and conservative. Please refer to Table 6 in below for details of projects used for comparison. During the site visit the project was still under construction, it was estimated that the project would be completed mid of 2011. According to local government [int5], the total investment of the project activity was estimated to exceed 300 million RMB which is 10% higher than the estimation of PDR.
Annual power generation	[PDR] [APDR] [CPL] [EB48a11] [EEC]	The annual utilization hours of the proposed project are calculated as 4982 hours (56.8% equivalent in plant load factor) per year in the PDR. According to the CDM pipeline [CPL] published by the UNEP Risoe Centre, the full load operation hours of other hydropower projects registered as CDM projects in the same region (Sichuan province) and with similar scale (15MW-50MW) vary between 3238 hours (Ref. 1222) and 5526 hours (Ref. 2085), and the average level is 4337 hours. Please refer to Table 6 in below for details of projects used for comparison. The plant load factor in terms of full-load operation hours of the proposed project is above average level of similar projects. Therefore the annual power output estimation is considered as reasonable and conservative. According to the Economic Evaluation Code for Small Hydropower Project (SL-16-95) [EEC] which is applicable to small hydro projects (installed capacity less than 50 MW in

Parameter	Reference	Assessment of parameters and validity at the time of investment decision																					
		rural areas) in China, effective coefficient of hydropower plants are set as following: <table border="1"> <thead> <tr> <th></th><th>Type of hydropower plant</th><th>Effective coefficient</th></tr> </thead> <tbody> <tr> <td>1</td><td>Grid-connected plant with yearly regulation or over-year regulation capability</td><td>0.95~1</td></tr> <tr> <td>2</td><td>Grid-connected plant with seasonally regulation capability</td><td>0.90~0.95</td></tr> <tr> <td>3</td><td>Grid-connected plant with monthly regulation, or weekly regulation, or daily regulation capability, or with no regulation capability – 2 types:</td><td></td></tr> <tr> <td></td><td>On the condition that the connected grid absorb all power generated during wet season and night times</td><td>0.80~0.90</td></tr> <tr> <td></td><td>On the condition that the connected grid has limits to absorb all power generated during wet season and nighttimes</td><td>0.70~0.80</td></tr> <tr> <td>4</td><td>Off-grid plant with daily regulation capability or has no regulation capability</td><td>0.60~0.70</td></tr> </tbody> </table> As a grid connected hydropower plant with daily regulation capability, the project activity belongs to the 3rd type of hydropower plant in above table, and the PDR assumed that all power generated by the proposed project activity during wet season and nighttimes will be sold to the grid, therefore the range of effective coefficient is selected as 0.80~0.90 which is deemed appropriate. Based on local and sectoral knowledge of ERM CVS, the effective coefficient is positively correlated to regulation capability of hydropower plants, which means the bigger regulation capability a hydropower plant has, the better it can schedule its power generation to make full use of water resources in the river, and therefore a higher effective coefficient can be expected. According to the PDR, the proposed project activity only has daily regulation capability, this is less than monthly regulation or weekly regulation capability which are also categorized in the 3rd type of hydropower plant as per the Economic Evaluation Code for Small Hydropower Project (SL-16-95) [EEC], and the effective coefficient of the project activity was determined in the PDR as 0.85 which is the mean value of the indicated range, therefore it is validated as reasonable. Even if effective coefficient of 1 (100%) is applied in the financial analysis, the project IRR is still well below the benchmark. Line loss and auxiliary power consumption rate are estimated in the PDR as 2% and 0.3% of the effective power generated by the project activity. The net power supply to the grid estimated by the PDR is validated as reasonable. According to <i>Guideline for the reporting and validation of plant load factors</i> [EB48a11], the plant load factor defined ex-ante in the CDM-PDD has been verified by ERM CVS based on the following criteria: (a) The plant load factor was determined by a third party design institute (Engineering Design and Research Institute of Sichuan University) which was contracted by the project participants, and the engineering estimation is based on over 40 years of meteorological data in the area. [PDR]; (b) The plant load factor was provided to the government while applying the project activity for implementation approval [APDR]. In summary, it is confirmed by ERM CVS that the plant load factor is valid and applicable at the time of investment analysis.		Type of hydropower plant	Effective coefficient	1	Grid-connected plant with yearly regulation or over-year regulation capability	0.95~1	2	Grid-connected plant with seasonally regulation capability	0.90~0.95	3	Grid-connected plant with monthly regulation, or weekly regulation, or daily regulation capability, or with no regulation capability – 2 types:			On the condition that the connected grid absorb all power generated during wet season and night times	0.80~0.90		On the condition that the connected grid has limits to absorb all power generated during wet season and nighttimes	0.70~0.80	4	Off-grid plant with daily regulation capability or has no regulation capability	0.60~0.70
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4	Off-grid plant with daily regulation capability or has no regulation capability	0.60~0.70																					
Electricity tariff	[PDR] [BTR]	The tariff used in the investment analysis is estimated by the independent third party PDR design institute in accordance with the bus-bar tariff in the province which is valid since 2005. According to a regulation published by the Price Bureau of Sichuan Province in April 2005 [BTR-1], the bus-bar tariff for hydro power project was regulated as 0.288 RMB/kWh, which is consistent with the PDR. In 2008 and 2009, Price Bureau of Sichuan Province published two tariff regulations [BTR-2, 3] which both confirmed the bus-bar tariff of 0.288 RMB/kWh for hydropower project connected to Sichuan grid. Furthermore, the highest tariff for the Sichuan Province published by the CDM Executive Board is also 0.288 RMB/kWh. In conclusion, the applied electricity tariff is valid and applicable at the time of investment decision and is the highest applied tariff in the province for such projects.																					
Annual O&M cost	[PDR]	The O&M cost mainly consists of repair costs, payroll & employee welfare, material																					

Parameter	Reference	Assessment of parameters and validity at the time of investment decision																					
	[CPL]	costs, insurance fee and other costs. A detailed calculation is broken down in the IRR spreadsheet. The annual O&M cost is 3.09% of total static investment of the project. According to the CDM pipeline [CPL] published by the UNEP Risoe Centre, the O&M cost of other hydropower projects registered as CDM projects in the same region (Sichuan Province) vary between 1.48% (Ref. 1984) and 7.14% (Ref. 1589). Please refer to Table 6 in below for details of projects used for comparison. The annual O&M cost of the proposed project is within the range of similar projects, therefore it is considered as reasonable. Therefore the validation team assessed that the O&M cost estimated in the PDR is reasonable and valid at the time of investment decision.																					
Assessment period	[PDR] [GAIA]	The assessment period contains 4 years of construction and 20 years of operation of the project, which is consistent with the PDD and the PDR. The project lifetime is in line with the relevant host country guidelines – the Economic Evaluation Code for Small Hydropower Project (SL-16-95) [EEC] as well as the Guidelines on the Assessment of Investment Analysis [GAIA] and therefore is determined to be reasonable.																					
Income tax rate	[PDR] [TRC-1] [TRC-2] [TRC-8]	The value of tax rate (33%) is derived from the <i>Provisional Regulations of the People's Republic of China On Enterprises Income Tax</i> (promulgated in the Document Order of the State Council of the People's Republic of China (No. 137) on 13 Dec. 1993) [TRC-1] which is effective from 1st Jan. 1994 to 1st Jan. 2008. On 16 March 2007, the <i>Enterprise Income Tax Law of the People's Republic of China</i> [TRC-2] was promulgated to replace the <i>Provisional Regulations of the People's Republic of China On Enterprises Income Tax</i>. In the new tax law, enterprise income tax is regulated as 25% which is lower than 33% in the provisional regulations. The PDR of the proposed project was finalized in December 2006 and the investment decision was made on 02 March 2007. The <i>Enterprise Income Tax Law of the People's Republic of China</i> [TRC-2] was promulgated after the investment decision. Therefore the tax rate 33% is applicable at the time of the PDR preparation and the investment decision. Please see the timeline table in below: <table border="1"> <thead> <tr> <th>Date</th><th>Event</th><th>Reference</th></tr> </thead> <tbody> <tr> <td>13 Dec. 1993</td><td>Provisional Regulations of the People's Republic of China On Enterprises Income Tax (income tax rate of 33%)</td><td>[TRC-1]</td></tr> <tr> <td>Dec. 2006</td><td>PDR</td><td>[PDR]</td></tr> <tr> <td>13 Feb. 2007</td><td>PDR approved by local government</td><td>[APDR]</td></tr> <tr> <td>02 Mar. 2007</td><td>Investment decision of the project activity with CDM development</td><td>[BMM-2]</td></tr> <tr> <td>16 Mar. 2007</td><td>Enterprise Income Tax Law of the People's Republic of China promulgated (income tax rate of 25%)</td><td>[TRC-3]</td></tr> <tr> <td>01 Jan. 2008</td><td>Enterprise Income Tax Law of the People's Republic of China became effective</td><td>[TRC-3]</td></tr> </tbody> </table> By screening tax policies published prior to the investment decision of the project activity (March 2007), it is confirmed that there is no preferential tax policy or regulation applicable to the project activity. The widely referenced preferential tax policy 'two-year tax exemption, three-year half tax exemption' is sourced from the Notice of Preferential Tax Policies on West Development [TRC-8] which was promulgated in 2001 and effective for 10 years (i.e. 2001 to 2010 inclusive.) Although the proposed project activity is located in western China, the construction period of the project is four years according to the PDR and the project was anticipated be completed in 2011 after the policy expires as estimated by the PDR. Therefore, this preferential tax policy was not considered in the investment analysis.	Date	Event	Reference	13 Dec. 1993	Provisional Regulations of the People's Republic of China On Enterprises Income Tax (income tax rate of 33%)	[TRC-1]	Dec. 2006	PDR	[PDR]	13 Feb. 2007	PDR approved by local government	[APDR]	02 Mar. 2007	Investment decision of the project activity with CDM development	[BMM-2]	16 Mar. 2007	Enterprise Income Tax Law of the People's Republic of China promulgated (income tax rate of 25%)	[TRC-3]	01 Jan. 2008	Enterprise Income Tax Law of the People's Republic of China became effective	[TRC-3]
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Value added tax (VAT) rate	[PDR] [TRC-4] [TRC-7] [TRC-9] [IGES] [EEC]	The value of the value added tax (VAT) (17%) is derived from the national policy <i>Interim Regulation of the People's Republic of China on Value Added Tax</i> issued by the State Council on 13 December 1993 and revised in Nov. 2008 [TRC-4]. The VAT rate is standard in China. When the State Council revised the national policy in November 2008 it introduced certain deductions for VAT paid on project inputs. This revision is only applicable for projects contracting purchase of equipment after 1 Jan. 2009. Since the equipment contract for the proposed project was signed in 2007, no VAT deductions on project inputs are applicable to the project activity. According to the IGES CDM Investment Analysis Database [IGES], there are 108 hydropower projects in Sichuan Province registered as CDM projects, 64 of them are large scale projects (applying CDM methodology ACM0002). Among the 64 registered projects, 28 of them are classified as small hydropower projects (installed capacity less																					

Parameter	Reference	Assessment of parameters and validity at the time of investment decision																																																																																							
		than 50 MW) and selected IRR benchmark of 10% sourced from the Economic Evaluation Code for Small Hydropower Project (SL-16-95) [EEC], it can therefore be inferred that these 28 registered hydropower plants have installed capacity between 15MW and 50MW. The VAT rate selected for these projects is detailed in the following table: <table> <tr> <th>CDM Ref.</th><th>Project title</th><th>VAT rate</th></tr> <tr> <td>3687</td><td>Sichuan Shuanghekou 18MW Hydropower Project</td><td>17%</td></tr> <tr> <td>4008</td><td>Sichuan Liangtan Hydropower Station Second Phase Project</td><td>17%</td></tr> <tr> <td>4548</td><td>Hekou 23MW Hydropower Project</td><td>17%</td></tr> <tr> <td>4499</td><td>Sichuan Province Songpan County Muguadun Hydroelectric Project</td><td>17%</td></tr> <tr> <td>4403</td><td>Sichuan Fangdaping Hydropower Project</td><td>17%</td></tr> <tr> <td>4434</td><td>Sichuan Li County Jiujiapeng Hydropower Project</td><td>6%</td></tr> <tr> <td>3097</td><td>Sichuan Songxin 20MW Hydropower Project</td><td>17%</td></tr> <tr> <td>3778</td><td>Sichuan Pingwu County Sancha Hydropower Station Project</td><td>17%</td></tr> <tr> <td>2862</td><td>Sichuan Luding Moxi 20MW Hydropower Project</td><td>17%</td></tr> <tr> <td>3403</td><td>Sichuan Neijiang Tiangongtang Hydropower Project</td><td>17%</td></tr> <tr> <td>2808</td><td>Sichuan Heishui Changde 20MW Hydropower Project</td><td>17%</td></tr> <tr> <td>3651</td><td>Sichuan Longdong 30MW Hydropower Project of China</td><td>17%</td></tr> <tr> <td>2961</td><td>Sichuan Fengyanbao 44MW Hydropower Project</td><td>6%</td></tr> <tr> <td>2988</td><td>Sichuan Pendaikou 18.9MW Hydropower Project</td><td>17%</td></tr> <tr> <td>2868</td><td>Sichuan Lushan Dachuan River Cascade Hydropower Bundle Project</td><td>17%</td></tr> <tr> <td>2737</td><td>Sichuan Shimian County Ximagu Hydropower Project</td><td>17%</td></tr> <tr> <td>2991</td><td>Sichuan Baixi 24MW Hydropower Project</td><td>6%</td></tr> <tr> <td>2990</td><td>Sichuan Xiaohe 48MW Hydropower Project</td><td>6%</td></tr> <tr> <td>2806</td><td>Sichuan Mabian Yi-Autonomous County Bajiaoxi Hydro Power Station</td><td>17%</td></tr> <tr> <td>2575</td><td>Sichuan Yetang 24MW Hydro Power Project</td><td>6%</td></tr> <tr> <td>1848</td><td>Sichuan Kangding Simaqiao 24MW Hydroelectric Project</td><td>17%</td></tr> <tr> <td>2456</td><td>Jiema Hydro Power Project</td><td>6%</td></tr> <tr> <td>2085</td><td>Sichuan Guohe 20MW Hydropower Project</td><td>8%</td></tr> <tr> <td>1897</td><td>Sichuan Pingshan Pingbian&Guanyintuo Hydropower Station</td><td>17%</td></tr> <tr> <td>1984</td><td>Sichuan Wanyuan Baiyangxi Hydropower Station</td><td>17%</td></tr> <tr> <td>2172</td><td>Daofu County Mengtuo Hydro Project</td><td>6%</td></tr> <tr> <td>1589</td><td>Sichuan Chenjiaheba 20MW Hydropower Project</td><td>17%</td></tr> <tr> <td>1431</td><td>Sichuan Zhaojiashan 20MW Hydropower Project</td><td>17%</td></tr> </table> It can be seen from above table that 20 projects (over than 70% of the total 28 projects) applied 17% of VAT rate in the IRR analysis, which means the standard 17% of VAT rate is commonly applied in CDM projects using IRR benchmark of 10%. The 6% of VAT rate used in some of the projects listed above is sourced from the <i>Notice of the Ministry of Finance and the State Administration of Taxation on Issuing the Explanatory Notes on the Scope of Agricultural Products and Some Items Subject to Taxation</i> [TRC-7] which provided small hydropower projects an option to choose the 'simple approach' to pay VAT using the rate of 6% whilst losing the right to offset input VAT. The regulation originally came into force on 01 May 1994 and was substituted by a successive regulation [TRC-9] in which small hydropower projects (installed capacity ≤50MW) still have the option to apply 6% of VAT. Choosing the 'simple approach' is optional, and based on review of the regulations it is reasonable for hydro plants to choose to adopt the normal VAT rate of 17% if they prefer. To conclude, selection of standard VAT rate as 17% is in compliance with host country financial regulations, and the rate was valid and reasonable at the time of PDR preparation and investment decision.	CDM Ref.	Project title	VAT rate	3687	Sichuan Shuanghekou 18MW Hydropower Project	17%	4008	Sichuan Liangtan Hydropower Station Second Phase Project	17%	4548	Hekou 23MW Hydropower Project	17%	4499	Sichuan Province Songpan County Muguadun Hydroelectric Project	17%	4403	Sichuan Fangdaping Hydropower Project	17%	4434	Sichuan Li County Jiujiapeng Hydropower Project	6%	3097	Sichuan Songxin 20MW Hydropower Project	17%	3778	Sichuan Pingwu County Sancha Hydropower Station Project	17%	2862	Sichuan Luding Moxi 20MW Hydropower Project	17%	3403	Sichuan Neijiang Tiangongtang Hydropower Project	17%	2808	Sichuan Heishui Changde 20MW Hydropower Project	17%	3651	Sichuan Longdong 30MW Hydropower Project of China	17%	2961	Sichuan Fengyanbao 44MW Hydropower Project	6%	2988	Sichuan Pendaikou 18.9MW Hydropower Project	17%	2868	Sichuan Lushan Dachuan River Cascade Hydropower Bundle Project	17%	2737	Sichuan Shimian County Ximagu Hydropower Project	17%	2991	Sichuan Baixi 24MW Hydropower Project	6%	2990	Sichuan Xiaohe 48MW Hydropower Project	6%	2806	Sichuan Mabian Yi-Autonomous County Bajiaoxi Hydro Power Station	17%	2575	Sichuan Yetang 24MW Hydro Power Project	6%	1848	Sichuan Kangding Simaqiao 24MW Hydroelectric Project	17%	2456	Jiema Hydro Power Project	6%	2085	Sichuan Guohe 20MW Hydropower Project	8%	1897	Sichuan Pingshan Pingbian&Guanyintuo Hydropower Station	17%	1984	Sichuan Wanyuan Baiyangxi Hydropower Station	17%	2172	Daofu County Mengtuo Hydro Project	6%	1589	Sichuan Chenjiaheba 20MW Hydropower Project	17%	1431	Sichuan Zhaojiashan 20MW Hydropower Project	17%
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Parameter	Reference	Assessment of parameters and validity at the time of investment decision
City maintenance & construction tax	[PDR] [TRC-5]	The value (5% of VAT) is derived from the <i>Interim Regulations on City Maintenance and Construction Tax of the People's Republic of China</i> (promulgated in Document [1985] No. 19 of the State Council on Feb. 8, 1985). The tax rate is mandatory in China and applicable since 1985.
Educational surtax	[PDR] [TRC-6]	The value (3% of VAT) is derived from the document <i>Decision of the State Council on Amending the Interim Provisions on the Collection of Educational Surcharges</i> (promulgated in the Document Order of the State Council No. 448 on August 20, 2005) which is effective since 2005. The tax rate is mandatory in China and applicable since 2005
Depreciation rate	[PDR] [EEC]	The value (4.8 %) is derived from the PDR, it is in line with the <i>Economic Evaluation Code for Small Hydropower Project</i> (SL-16-95) [EEC], which was published by Ministry of Water Resources of China in June 1995.
Residual value	[PDR] [EEC]	The residual value of the project activity assets is determined as 4%. This is in line with the <i>Economic Evaluation Code for Small Hydropower Project</i> (SL-16-95) [EEC], in which the reasonable range of residue value is regulated as 3% to 5%.
Interest	[PDR] [pbc]	The interest rate is derived from the PDR which was the benchmark interest rate regulated by the central bank of China (The People's Bank of China) from August 2006 to 18 March 2007, it is applicable at the time of investment decision.

Based on above assessments, ERM CVS confirms that the underlying assumptions of financial analysis are appropriate and the financial calculations of the project activity are correct.

Sensitivity Analysis

A sensitivity analysis has been carried out to demonstrate the impact on the IRR by variations in the key input values to the financial analysis in accordance with the *Guidelines on the assessment of investment analysis*. All costs and revenues greater than or equal to 20% of total costs / revenues have been included in the analysis. The variation in each parameter needed in order for the IRR to reach the benchmark, and the likelihood of such variations taking place, are explained. The analysis is assessed as appropriate.

ERM CVS has reviewed the calculations for the sensitivity analysis which are presented in the IRR Spreadsheet [IRR], and the computations are reproduced as correct and consistent with the information presented in the PDD. The sensitivity analysis was assessed with respect to the likelihood of the variations of each parameter involved.

Total static investment:

Statistic data of price indices from China Statistical Yearbook 2005-2009 [csy] are provided in the table below:

(preceding year=100)

Indices	2004	2005	2006	2007	2008
Price Indices for Fixed Assets Investment in Sichuan Province	106.8	103.9	102.9	104.7	112.5
National average Price Indices for Fixed Assets Investment	105.6	101.6	101.5	103.9	108.9
National price index of raw material, fuel and power	111.4	108.3	106.0	104.4	110.5
National average Wage Indices	114.1	114.6	114.4	118.7	117.2

According to the official statistics from China Statistical Yearbook 2005-2009 published by National Bureau of Statistics of China, it can be clearly seen that price indices for Investment in Fixed Assets in Sichuan Province and the whole country has kept increasing in the past five years, and price trends of raw materials, fuel, power and labour are consistent with the Fixed Assets Investment.

Based on local knowledge and sectoral expertise of ERM CVS and considering the fact that labour costs and material costs in the host country have been steadily increasing in recent years. The sensitivity analysis shows that fixed asset investments shall have to reduce by over 55 % in order for the IRR to cross the benchmark. Taking into consideration the sustained increase in price indices, it is concluded that total investment is not likely to reduce significantly so that the project IRR can cross the industrial benchmark.

Electricity Tariff:

The electricity tariff in the PDD and financial analysis is derived from the PDR which was approved by local government in February 2007 [APDR], the tariff for the project was estimated as 0.288 RMB/kWh in the PDR according to local tariff regulations. The power tariff for the project is considered to be appropriate and applicable at the time of investment decision.

According to regulations published by Price Bureau of Sichuan Province [BTA], on-grid tariff for hydropower plants in Sichuan Province are summarized in the table below:

Year	Tariff (RMB/kWh)	Regulations	Cross check	Ref
2005	0.288	Tariff regulation issued by Price Bureau of Sichuan Province (Document No. Chuan Jia Fa [2005] 91#), dated 30 April 2005	Tariff approval for Nanjinyi hydropower plant (Document No. Chuan Jia Han [2005] 280#), dated 07 Nov. 2005	[BTR-1] [BTA-1]
2006	0.288		Tariff approval for Songlinhe Cascade 1 hydropower plant (Document No. Chuan Jia Han [2006] 117#), dated 24 May 2006	[BTA-2]
2007	0.288		Tariff approval for Shuangtan hydropower plant (Document No. Chuan Jia Han [2007] 117#), dated 11 April 2007	[BTA-3]
2008	0.288	Tariff regulation issued by Price Bureau of Sichuan Province (Document No. Chuan Jia Fa [2008] 127#), dated 02 July 2008	Tariff approval for Longtoushi hydropower plant (Document No. Chuan Jia Han [2008] 174#), dated 09 Sep. 2008	[BTR-2] [BTA-4]
2009	0.288	Tariff regulation issued by Price Bureau of Sichuan Province (Document No. Chuan Jia Dian Fa [2009] 59#), dated 19 Nov. 2009	Tariff approval for Baoxing hydropower plant (Document No. Chuan Jia Han [2009] 238#), dated 19 Nov. 2009	[BTR-3] [BTA-5]
2010	0.288		Tariff approval for Beituo hydropower plant (Document No. Chuan Jia Han [2010] 728#), dated 22 July 2010	[BTA-6]

It can be clearly seen that the bus-bar on-grid tariff for hydropower plants in Sichuan Province has been 0.288 RMB/kWh since 2005, there's no policy change in tariff of hydropower projects in Sichuan province.

Based on the local and sectoral knowledge of the validation team and the past trend analysis as stated above, the tariff is not likely to increase significantly under the policy framework because electricity tariffs are tightly regulated by the government and subject to price controls.

According to the *Information note on the highest tariffs applied by the EB in its decisions on registration of projects in the People's Republic of China* [HTC] published by the CDM Executive Board, the highest applicable tariff for large scale hydro projects with reservoir in Sichuan province is also 0.288 RMB/kWh. This indicates that the tariff used in financial analysis is valid and conservative.

In conclusion, the applied electricity tariff is considered to be valid and applicable at the time of investment decision, and it is not likely to be a factor that would lead the IRR to cross the benchmark.

Therefore ERM CVS has concluded that the electricity tariff has been substantiated.

O&M costs

The annual O&M cost is only 3.09% of total static investment, therefore it has a very small impact on the IRR. Even if the O&M cost is reduced to zero, the IRR is still lower than the benchmark.

It is not likely for variations in the O&M costs to lead to the IRR crossing the benchmark.

Power output (Plant load factor)

Average power generation would need to increase by over 30% for the whole lifetime of the project activity in order for the IRR to exceed the benchmark.

It is confirmed by the DOE that this is highly unlikely to happen considering that the technology is mature and that the operating hours are determined by an independent third party design institute based on a long time-series (over 40 years) of meteorological data.

The plant load factor is determined by a third party design institute (Engineering Design and Research Institute of Sichuan University) which was contracted by the project participants, and the engineering estimation is based on over 40 years of hydrological data, and the plant load factor has been provided to the government while applying for implementation approval for the project activity [APDR].

In summary, it is confirmed by the DOE that the plant load factor is valid and applicable at the time of investment analysis.

Table 6: Registered 15-50MW Hydropower Projects in Sichuan Province

CDM Reference Number	Project Title	Installed Capacity (MW)	Full load operation hours	Unit investment cost (RMB/kW)	Unit O&M cost (RMB/kWh)
1223	Wahei Hydroelectric Project	40.0	3858	18.3	4.30%
1222	Xiangziyan Hydroelectric Project	20.0	4386	11.9	7.14%

1897	Sichuan Pingshan Pingbian&Guanyintuo Hydropower Station	24.0	4390	20.3	2.39%
1589	Sichuan Chenjiaheba 20MW Hydropower Project	20.0	4730	15.4	2.08%
1848	Sichuan Kangding Simaqiao 24MW Hydroelectric Project	20.0	5526	18.9	1.84%
1431	Sichuan Zhaojiashan 20MW Hydropower Project	30.0	4816	27.0	1.81%
2085	Sichuan Guohe 20MW Hydropower Project	24.0	3978	24.3	2.66%
1961	Sichuan Miaopu Hydropower Project	22.5	3698	19.8	2.91%
2192	Tianquan Xiacun Hydro Power Project	21.0	3697	19.7	2.75%
2189	Tianquan Qieshan Hydro Power Project	32.0	4351	31.5	1.48%
2195	Tianquan Shiyang Hydro Power Project	18.9	4909	18.9	5.11%
1984	Sichuan Wanyuan Baiyangxi Hydropower Station	18.0	3458	12.7	2.15%
2172	Daofu County Mengtuo Hydro Project	36.0	5091	36.3	2.45%
2737	Sichuan Shimian County Ximagu Hydropower Project	24.0	4347	29.2	1.58%
2806	Sichuan Mabian Yi-Autonomous County Bajiaoxi Hydro Power Station	24.0	4362	20.7	2.01%
2991	Sichuan Baixi 24MW Hydropower Project	42.0	4495	31.6	3.68%
2575	Sichuan Yetang 24MW Hydro Power Project	20.0	5437	27.2	1.59%
2945	Sichuan Baoxing Dongfeng Hydropower Project	32.0	4219	25.8	2.59%
3600	Xiaojin County Zhongmachang Hydropower Project	20.0	4600	13.7	4.65%
2756	Miyi Wantan Hydroelectric Project	48.0	4284	42.8	2.26%
2456	Jiema Hydro Power Project	44.0	4241	31.6	2.40%
2990	Sichuan Xiaohe 48MW Hydropower Project	18.9	3517	15.3	2.68%
2961	Sichuan Fengyanbao 44MW Hydropower Project	18.0	4681	19.7	2.21%
2988	Sichuan Pendaikou 18.9MW Hydropower Project	42.0	4257	45.0	2.30%
3403	Sichuan Neijiang Tiangongtang Hydropower Project	40.0	3858	18.3	4.30%
3778	Sichuan Pingwu County Sancha Hydropower Station Project	20.0	4386	11.9	7.14%

* Data source: CDM pipeline published by UNEP Risoe Centre [CPL]

Common Practice Analysis

A common practice analysis has been carried out in accordance with the *Tool for the demonstration and assessment of additionality*. Projects are defined as similar to the project activity if they are hydro projects in Sichuan province and with an installed capacity between 15MW-50MW. Those are considered justified based on the following considerations:

- Provinces in China are very large in terms of both geographical area and population size. Tariffs and regulatory environment vary significantly between provinces in China;
- Only projects built after 2002 were considered in the common practice analysis. This is considered reasonable given that the power industry was significantly reformed in 2002 [ERP]. Under the set of reforms enacted in 2002, the China power industry started to create a market-driven structure by separate power generation from transmission and distribution (the grid);
- 15MW is less than 50% of the project scale and therefore is considered as conservative, hydropower project larger than 50MW is categorized as middle type and cannot apply the benchmark of 10% given by *Economic Evaluation Code for Small Hydropower Project* [EEC], in other words, hydro projects larger than 50MW has different requirement of financial return. Therefore the range of projects selected for comparison (15MW-50MW) is considered reasonable.

Based on the official statistics provided by China Water Resources Yearbooks [CWRY] which is the official and publicly available source of information of operational hydropower projects in China, and with reference to the CDM project documentation available on the UNFCCC website [unfccc], it is confirmed there are only three projects identified as similar to the project activity and has not applied CDM. Detailed assessments to the three similar projects are provided in the table below:

Project	Installed Capacity	Essential distinction from the proposed project activity	Reference	Assessment
Niujiaowan Cascade-3 hydropower project	25 MW	The project's operational hours are much higher than the proposed project activity, while its investment per kilowatt is much lower.	[int6] [int7]	The information available from press news shows that the full load operational hours of Niujiaowan Cascade-3 project is 6782 [int6] which is 36% higher than the proposed project activity, and its total investment [int7] is 3320 RMB/kW which is only 50% of the proposed project activity. This distinction is assessed as essential to the explanation why the similar activities enjoyed certain benefits that rendered it financially attractive. The references are available from public and checked as reliable.
Tongkouhe hydropower project	45 MW	The project enjoys high project IRR of 18%.	[int8]	The information available from press news shows that the project IRR of Tongkouhe hydropower project is 18% which is higher than the benchmark of 10%. The references are available from public and checked as reliable.
Shazui hydropower project	38 MW	The project's operational hours are much higher than the proposed project activity.	[int9]	The information available from public source shows that the full load operational hours of Shazui project is 6373 [int6] which is 28% higher than the proposed project activity. This distinction is assessed as essential to the explanation why the similar activities enjoyed certain benefits that rendered it financially attractive. The references are available from public and checked as reliable.

In summary, similar project activities are observed, but essential distinctions between the project activity and similar projects are reasonably explained in the PDD, therefore the proposed project activity is considered additional.

Additionality summary

ERM CVS has assessed and verified the reliability and credibility of all data, rationales, assumptions, justifications and documentation provided by project participants to support the demonstration of additionality using its local knowledge and sectoral and financial expertise. ERM CVS can therefore conclude that the additionality of the proposed project activity has been demonstrated.

3.7. Calculation of GHG Emissions

ERM CVS has confirmed that the equations and parameters in the PDD have been correctly applied by comparing them to those in the selected approved methodology [ACM2]. The GHG emission reductions of the project activity are calculated in accordance with the applied methodology: the baseline emissions are the product of the electrical energy baseline $EG_{Facility,y}$, expressed in kWh of electricity produced by the renewable generating unit multiplied by an emission factor. Project emissions are considered following the procedure described in the methodology ACM0002 [ACM2] in which project emissions from water reservoirs of hydropower plants are not to be considered if the power density of the project activity (PD) is greater than 10 W/m^2 . Leakage is not to be considered if the energy generating equipment is not transferred from another activity.

Baseline emissions:

Grid emissions factor:

According to the requirement of ACM0002, the proposed project applied the steps of the *Tool to calculate the emission factor for an electricity system* [TEF] to calculate the grid emission factor. The grid emission factor is calculated as a combined margin (CM) which is made up of the combination of operating margin (OM) and build margin (BM).

The DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations are used in the PDD as required by the *Tool to calculate the emission factor for an electricity system*. The description in the PDD has been checked against the delineation published by China DNA [GEF] as correct.

The emission factor of the grid is determined ex-ante for the 7 year crediting period following the *tool to calculate the emission factor for an electricity system*. In accordance with the tool the weights of the operating margin and the build margin are 0.5:0.5.

The PDD was published on 12 December 2009, and the calculation of the grid emission factor is calculated based on the latest data available at the time of validation. The most recent three years of data at the time of PDD submission (2005-2007) are used based on the China Electric Power Yearbook and the China Energy Statistical Yearbook and applied in the NDRC guidelines [GEF].

Operating Margin (OM): Method (a) (Simple OM) is used. This is appropriate since low-cost/must run resources constitute less than 50% of total grid generation in the average of the five most recent years (2003-2007). The Simple OM emission factor is calculated as the generation-weighted average emissions per electricity unit (tCO₂/MWh) of all generating sources serving the system, excluding low operating cost and must-run power plants. The data on fuel consumption and net electricity generation of each power plant /unit in the grid is not publicly available, therefore the simple OM is calculated based on data 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 (option B). Aggregated generation and fuel consumption data are used as more disaggregated data are not available. Low-cost/must run power resources in the grid include only renewable power generation, and the quantity of electricity supplied to the grid by these sources is known. Off-grid power plants are not included in the calculation. Therefore, Option B is appropriate for calculating the Simple OM emission factor. Net calorific values of each fuel type were obtained from the China Energy Statistical Yearbook, and IPCC 2006 default values [IPCC] were used for the oxidation factor and emission factor 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 [GEF].

Build Margin (BM): 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 build margin (BM) emission factor for this project [BMD]. 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, and the aggregate incrementally installed capacity of all generation sources in year y-n, where n represents the number of years of historical data that need to be considered in order for the sample group to comprise 20% of the total system generation capacity (in MW). The emissions factor of fossil fuel fired power generation in the 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 NDRC). Finally, the BM emission factor is calculated as the product of this emission factor of fossil fuel fired power generation and the proportion of fossil fuel fired power plants in the newly installed 20% capacity, based on data for years 2005-2007, contained in the power yearbooks 2006-2008.

OM	BM	Weights	CM
1.1255	0.5802	0.5:0.5	0.85285

The OM and BM of the connected regional grid system (CCPG) are calculated based on public and official data from the China Energy Statistical Yearbooks 2006-2008 editions and the China Electric Power Yearbooks 2006-2008 editions. The weights ω_{OM} and ω_{BM} are selected as 0.5 and 0.5 respectively for hydro projects according to the *Tool to calculate the emission factor for an electricity system*. The combined margin is fixed ex-ante for the entire first crediting period.

The results are consistent with the data published by the DNA of China in the China Regional Grid Baseline Emission Factor published in 2009 [GEF].

Project emissions:

Project emissions are considered following the procedure described in ACM0002 [ACM2] in which project emissions from water reservoirs of hydropower plants are not to be considered if the power density of the project activity (PD) is greater than 10 W/m². With respect to the project activity, the power density is calculated based on the surface area of the reservoir which was estimated by the third party design institute in the EIA [EIA], which is 0.891 km², and the installed capacity of 40MW, and therefore the power density of the project is calculated as 44.89 W/m² which is much greater than 10 W/m². The installed capacity of the hydropower plant before the implementation of the project activity is zero since the project is a new hydropower plant.

The area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m²), was also validated to be zero, since the reservoir is new. This information was validated based on the approved third party PDR and also based on the site visit.

Therefore, project emissions are not considered in the ex-ante estimation of emission reductions.

Leakage:

According to the applied methodology, leakage is not to be considered because the energy generating equipment is newly manufactured [EPC] and is not transferred from another activity.

Conclusion:

As per the VVM paragraph 92, based on the information reviewed and calculations reproduced by the validation team, ERM CVS confirms the following:

- 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 the sources of data are 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 has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

Parameters determined ex-ante

By reviewing the data and parameters used in the equations in accordance with the applied methodology ACM0002 and the *Tool to calculate the emission factor for an electricity system*, ERM CVS assessed that all data sources and assumptions of the data and parameters that will not be monitored and will remain fixed throughout the crediting period are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions.

For the data and parameters that will be monitored, ERM CVS confirmed that the estimates provided in the PDD for these data and parameters are reasonable including the value of data and references used.

Please refer to the following tables for each parameter determined ex-ante:

$FC_{i,y}$	<i>Amount of fossil fuel type I (in a mass or volume unit) consumed in the project electricity system in year y</i>
<i>Title in line with Methodology?</i>	Yes
<i>Data unit correctly expressed?</i>	Yes
<i>Appropriate description?</i>	Yes
<i>Source clearly referenced? (appropriate?)</i>	<i>The source is China Energy Statistical Yearbooks (2006,2007,2008)</i>
<i>Correct value provided?</i>	Yes
<i>Has this value been verified?</i>	<i>Yes. The values have been verified against the official data published by China DNA [GEF].</i>
<i>Choice of data correctly justified?</i>	Yes
<i>Measurement method correctly described?</i>	<i>Not applicable</i>

$NCV_{i,y}$	<i>Net calorific value (energy content) of fossil fuel type i in year y</i>
<i>Title in line with Methodology?</i>	Yes
<i>Data unit correctly expressed?</i>	Yes
<i>Appropriate description?</i>	Yes
<i>Source clearly referenced? (appropriate?)</i>	<i>The source is China Energy Statistical Yearbook (2008)</i>
<i>Correct value provided?</i>	Yes
<i>Has this value been verified?</i>	<i>Yes. The values have been verified against the official data published by China DNA [GEF].</i>
<i>Choice of data correctly justified?</i>	Yes
<i>Measurement method correctly described?</i>	<i>Not applicable</i>

$EF_{CO_2,i,y}$	CO2 emission factor of fossil fuel type <i>i</i> in year <i>y</i>
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, the source is Table 1-3 and Table 1-4 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories [IPCC]
Correct value provided?	Yes
Has this value been verified?	Yes. The values have been verified against the IPCC GHG Inventories.
Choice of data correctly justified?	Yes
Measurement method correctly described?	Not applicable

EG_y	Net electricity generated and delivered to the grid by power plant/unit in year <i>y</i>
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	The source is China Electric Power Yearbooks (2006,2007,2008)
Correct value provided?	Yes
Has this value been verified?	Yes. The values have been verified against the official data published by China DNA [GEF].
Choice of data correctly justified?	Yes
Measurement method correctly described?	Not applicable

$EF_{i,adv,y}$	Emission Factor of the best available commercial power plants for fuel <i>i</i> power Plants in year <i>y</i> , <i>i</i> = coal, oil and gas.
Title in line with Methodology?	The parameter is specific to grid emissions factor calculations in China
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	The source is official data published by China DNA
Correct value provided?	Yes
Has this value been verified?	Yes. The values have been verified against the official data published by China DNA [GEF].
Choice of data correctly justified?	Yes
Measurement method correctly described?	Not applicable

$CAP_{Thermal,y}$	Fossil-fuel fired installed capacity in the newly added 20% capacity in year <i>y</i>
Title in line with Methodology?	The parameter is specific to grid emissions factor calculations in China
Data unit correctly expressed?	Yes
Appropriate description?	Yes

Source clearly referenced? (appropriate?)	The source is China Electric Power Yearbooks 2006-2008
Correct value provided?	Yes
Has this value been verified?	Yes. The values have been verified against the official data published by China DNA [GEF].
Choice of data correctly justified?	Yes
Measurement method correctly described?	Not applicable

$CAP_{Total,y}$	Total newly added 20% installation capacity in year y
Title in line with Methodology?	The parameter is specific to grid emissions factor calculations in China
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	The source is China Electric Power Yearbooks 2006-2008
Correct value provided?	Yes
Has this value been verified?	Yes. The values have been verified against the official data published by China DNA [GEF].
Choice of data correctly justified?	Yes
Measurement method correctly described?	Not applicable

Cap_{BL}	Installed capacity of the hydro power plant before the implementation of the project activity
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes
Has this value been verified?	Yes. The values have been verified against ACM0002.
Choice of data correctly justified?	Yes
Measurement method correctly described?	Not applicable

A_{BL}	Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2).
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes
Has this value been verified?	Yes. The values have been verified against ACM0002.
Choice of data correctly justified?	Yes
Measurement method	Not applicable

correctly described?	
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3.8. Environmental and Sustainable Development Impacts

An Environmental Impact Assessment (EIA) Report has been performed according to Chinese regulations [EIA]. The EIA was conducted by Environmental Protection Research Institute of Chengdu University of Science & Technology in December 2006, and the document has been reviewed by ERM CVS. The EIA was approved, as per Chinese regulations, by the Sichuan Province Environmental Protection Bureau on 07 February 2007 [AEIA]. The EIA report concludes that no significant environmental impacts are expected from the project. Impacts that are identified are subject to mitigation measures, and these are accurately described in the final PDD.

The letter of approval by the DNA of China [HCA] confirms the contribution of the proposed CDM project activity to the sustainable development of the host Party.

3.9. Comments by Local Stakeholders

As per VVM paragraph 129, by means of document review including the Stakeholder Consultation Questionnaires [LSC], the validation team confirm that:

- (a) Comments have been invited from local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, through a questionnaire survey;
- (b) The summary of the comments received as provided in the PDD is complete;
- (c) The stakeholders are all supportive to the project activity, no due account of any comments received should be undertaken.

To conclude, the local stakeholder consultation is adequate in the DOE's opinion.

3.10. Additional Findings

None

4. Conclusion and Validation Opinion

Name of Project	Sichuan Muchuan County Huogu Hydropower Project
Basis of validation	ERM CVS based its validation work on: • CDM approved monitoring methodology ACM0002 v12.3.0 • Project Design Document Version 1 dated 09 December 2009 and the revised PDD Version 4.2 dated 17 May 2012 • CDM Validation and Verification Manual v 1.2 (EB 55) • ERM CVS's internal CDM validation methodologies and protocols • CDM decisions and guidance issued by the CDM Executive Board • UNFCCC criteria for the Clean Development Mechanism • Host Country criteria for the Clean Development Mechanism
Responsibilities of ERM CVS	ERM CVS is responsible to provide a thorough independent third party assessment of the proposed CDM project activity to ensure that the proposed CDM project activity meets all the identified and applicable criteria for registration of projects under the CDM.
Responsibilities of Project Participants	Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd. is responsible for preparing the PDD, supporting documentation and providing all necessary evidences to support the information included in the PDD.
Activities performed	ERM CVS conducted its activities in accordance with the CDM Validation and Verification Manual, approved v 1.2 (EB 55). The validation consisted of a review of project documentation, a site visit, interviews with relevant personnel, cross checking and ascertaining information through other reliable sources and on its sectoral, regional and local expertise and resolution of CLs and CARs pertaining to the project activity.
ERM CVS Conclusion	ERM Certification and Verification Services (ERM CVS) has performed the validation of the 'Sichuan Muchuan County Huogu Hydropower Project' against the criteria for the Clean Development Mechanism as set out by the Conference of the Parties and the UNFCCC CDM Executive Board, and host country criteria. The validation employed standard auditing techniques, and a validation protocol checklist was used to carry out the validation. The project is a grid connected hydropower project in Sichuan Province, People's Republic of China. The Party fulfils the criteria for participation in the CDM. The LoA of the host Party, P. R. China, confirms the contribution of the project towards sustainable development. The validation has provided sufficient evidence to demonstrate that the emission reductions would be additional to what would have taken place in the absence of the CDM project activity. The project meets the applicability criteria and correctly applies the approved methodology, and is therefore expected to result in real, measurable and long term reductions in greenhouse gas emissions. The monitoring plan provides for the collection and archiving of data sufficient to ensure that emission reductions can be verified. Nothing came to our attention to suggest that the project, if implemented as described, would not result in emission reductions of 141,158 tCO₂e per year on average over the first 7 year crediting period. In summary, it is the opinion of ERM CVS that the Project as described in the PDD Version 4.2 of 17 May 2012, meets all stated criteria of the CDM, correctly applies the methodology ACM0002 version 12.3.0, and is expected to result in real, measurable and long term emission reductions, and the DNA of the host Party has confirmed that the project assists in meeting sustainable development criteria. ERM CVS therefore requests registration of the project activity.
Signed on behalf of ERM CVS	
Name:	Melanie Eddis
Date:	24 July 2012

Appendix A: DOCUMENTS & INTERVIEWEES

DOCUMENT LIST

1. Documents provided by the project participants

Reference	Date	Document Title
[AEIA]	07/02/2007	Environmental Impact Assessment (EIA) Approval, Sichuan Province Environmental Protection Bureau
[APDR]	13/02/2007	Approval of Preliminary Design Report issued by Development and Reform Commission of Sichuan Province
[BMM]	22/11/2006 02/03/2007	Board Meeting Minute 1. Initial consideration of CDM by the board, dated 22/11/2006 2. Investment decision of the project activity with CDM development, dated 02/03/2007
[CDA]	04/04/2007	CDM Development Agreement signed with Hangzhou Carbon Trade Environment Engineering Co., Ltd
[CSR]	08/10/2007	Construction Start Report
[CTS]	31/01/2008	CER Term Sheet signed with ORBEO
[ECC]	08/10/2007	Engineering and Construction Contract
[EIA]	Dec. 2006	Environment Impact Assessment Report prepared by Environmental Protection Research Institute of Chengdu University of Science & Technology
[EPC]	06/06/2007	Equipment Purchase Contracts Water turbine generator sets purchase contract signed with Sichuan Dongfeng Electric Machinery Works Co., Ltd, date: 06/06/2007
[ERC]		Emission Reduction Calculation spreadsheet
[ERPA]	03/04/2009	Emission Reduction Purchasing Agreement signed with Deutsche Bank AG
[HCA]	11/06/2008 Mar. 2010	Host Country Letter of Approval issued by The National Development and Reform Commission 1. The LOA mention ORBEO as CER buyer, No. 1164 dated 11/06/2008 2. Approval Note on Change of Project Participants of the project by China DNA, No. 030 dated March 2010
[IRR]		IRR Calculation Spreadsheet
[LOA]	22/02/2012	Letter of Approval issued by The United Kingdom
[LSC]	10/07/2007 20/07/2007 29/08/2007	Local Stakeholder Consultation documents\ 1. Public invitation, dated 10/07/2007 2. Questionnaires, dated 20/07/2007 3. Meeting minute and survey summary, dated 29/08/2007
[PDD]	09/12/2009 28/04/2011 06/03/2012	Project Design Document 1. version 01 dated 09/12/2009, published for global stakeholder consultation during 12/12/2009— 10/01/2010 2. version 4.0 dated 28/04/2011 submitted for registration 3. version 4.1 dated 04/04/2012 submitted for registration after change of Annex I party to UK. 4. version 4.2 dated 17/05/2012 submitted for registration after incompleteness
[PDR]	Dec. 2006	Preliminary Design Report prepared by Engineering Design and Research Institute of Sichuan University
[TST]	08/10/2008	Term Sheet Termination issued by ORBEO
[MOC]	28/03/2012	Modalities of Communication Form signed by the PPs

2.

3. Background investigation and documents used for assessment

Reference	Date	Document Title
[ACM2]		Consolidated baseline methodology for grid connected electricity generation from renewable sources (version 12.3.0)
[BMD]		The guidance for deviation in use of methodology AM0005 by several project activities in China by EB. http://cdm.unfccc.int/Projects/Deviations
[BTA]	07/11/2005 24/05/2006 11/04/2007 09/09/2008 19/11/2009 22/07/2010	Bus-bar Tariff Approvals 1. Tariff approval for Nanjinyi hydropower plant (Document No. Chuan Jia Han [2005] 280#), dated 07 Nov. 2005 2. Tariff approval for Songlinhe Cascade 1 hydropower plant (Document No. Chuan Jia Han [2006] 117#), dated 24May 2006 3. Tariff approval for Shuangtan hydropower plant (Document No. Chuan Jia Han [2007] 117#), dated 11 April 2007 4. Tariff approval for Longtoushi hydropower plant (Document No. Chuan Jia Han [2008] 174#), dated 09 Sep. 2008 5. Tariff approval for Baoxing hydropower plant (Document No. Chuan Jia Han [2009] 238#), dated 19 Nov. 2009 6. Tariff approval for Beituo hydropower plant (Document No. Chuan Jia Han [2010] 728#), dated 22 July 2010
[BTR]	30/04/2005 02/07/2008 19/11/2009	Bus-bar Tariff Regulation 1. Tariff regulation issued by Price Bureau of Sichuan Province (Document No. Chuan Jia Fa [2005] 91#), dated 30 April 2005; 2. Tariff regulation issued by Price Bureau of Sichuan Province (Document No. Chuan Jia Fa [2008] 127#), dated 02 July 2008; 3. Tariff regulation issued by Price Bureau of Sichuan Province (Document No. Chuan Jia Dian Fa [2009] 59#), dated 19 Nov. 2009;
[CEM]		Technical Administrative Code of Electric Energy Metering (DL/T448-2000)
[CEPY]		China Electric Power Yearbook (Editions 2006, 2007 and 2008)
[CESY]		China Energy Statistical Yearbook (Edition 2006, 2007 and 2008)
[CPF]		UNFCCC CDM PDD Form (CDM PDD), Version 03
[CPL]	01/08/2010	CDM pipeline published by UNEP Risoe Centre
[CWRY]		China Water Resource Yearbook (Edition 2006, 2007 and 2008)
[EB48a11]	17/07/2009	EB 48 Report Annex 11, Guideline for the reporting and validation of plant load factors (Version 01)
[EB49a22]	11/09/2009	EB 49 Report Annex 22, Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM
[EEC]	02/06/1995	Economic Evaluation Code for Small Hydropower Project (SL 16-95), published by Ministry of Water Resources of China on 2 June 1995
[EEC10]	22/10/2010	Economic Evaluation Code for Small Hydropower Project (SL 16-2010), published by Ministry of Water Resources of China on 22 October 2010, effective as of 22 January 2012
[ERP]	10/02/2002	Electric Power System Reform Program, No. 5 [2002] of the State Council of P. R. China
[GAIA]	15/07/2011	EB 62, Annex 5, Guidelines on the Assessment of Investment Analysis, Version 5
[GCP]		Guidelines for Completing the CDM-PDD and the CDM- NM (version 07)
[GEF]	02/07/2009	2009 China Regional Grid Baseline Emission Factor published by China DNA
[GLS]		Glossary of CDM terms (Version 04)
[HTC]		Information note on the highest tariffs applied by the EB in its decisions on registration of projects in the People's Republic of China (Version 01) Publication, reflecting the report of EB 54, Paragraph 53
[IGES]	02/04/2012	IGES CDM Investment Analysis Database (2 Apr. 2012 Updated)
[IPCC]		2006 IPCC Guidelines for National Greenhouse Gas Inventories
[TA]		Tool for the demonstration and assessment of additionality (Version 05.2.1)

Reference	Date	Document Title
[TEF]		Tool to calculate the emission factor for an electricity system (Version 2.2.1)
[TRC]	13/12/1993 06/12/2007 16/03/2007 13/12/1993 08/02/1985 20/08/2005 29/03/1994 27/07/2011 19/01/2009	Tax Regulations in China - Provisional Regulations of the People's Republic of China On Enterprises Income Tax (promulgated in the Document Order of the State Council of the People's Republic of China (No. 137) on 13 Dec. 1993) which is effective from 1st Jan. 1994 to 1st Jan. 2008. - Implementation Regulations of the People's Republic of China Enterprise Income Tax Law (promulgated on Document Order of the State Council of the People's Republic of China (No. 512) on 6 Dec. 2007) - Enterprise Income Tax Law of the People's Republic of China (promulgated on Document Order of the President of the People's Republic of China (No. 63) on March 16, 2007) which is effective since Jan. 1, 2008. - Interim Regulation of the People's Republic of China on Value Added Tax issued by the State Council on 13 Dec. 1993, revised on 10 November 2008. - Interim Regulations on City Maintenance and Construction Tax of the People's Republic of China (promulgated on Document [1985] No. 19 of the State Council on Feb. 8, 1985), in effect since 1985. - Decision of the State Council on Amending the Interim Provisions on the Collection of Educational Surcharges (promulgated on Document Order of the State Council No. 448 on August 20, 2005), in effect since 1 October 2005. - Notice of the Ministry of Finance and the State Administration of Taxation on Issuing the Explanatory Notes on the Scope of Agricultural Products and Some Items Subject to Taxation, promulgated on 29 March 1994, in effect from 01 May 1994 to 01 Jan. 2009 - Notice of Preferential Tax Policies on West Development, the Ministry of Finance, the General Administration of Customs and the State Administration of Taxation (Promulgated on July 27, 2011 by the Ministry of Finance, the General Administration of Customs and the State Administration of Taxation, in effective from 01 January 2001 to 31 Dec. 2010) - Notice of the Ministry of Finance and the State Administration of Taxation on the Application of Low Value Added Tax Rates and Policies on Collecting Value Added Tax by the Simple Approach to Some Goods (Promulgated on 19 Jan. 2009 by the Ministry of Finance, State Administration of Taxation, in effect from 01 Jan. 2009)
[VVM]		CDM Validation and Verification Manual (Version 1.2, EB 55)

4. Internet websites

Reference	Link	Organization
[cdna]	http://cdm.ccchina.gov.cn/english/index.asp	Chinese DNA: National Development and Reform Commission (NDRC)
[csy]	http://www.stats.gov.cn/tjsj/ndsj/	China Statistical Yearbook 2005-2009
[pbc]	http://www.pbc.gov.cn/publish/zhengcehuobisi/631/1269/12693/12693_3_.html	Historical benchmark interest rate published by The People's Bank of China
[sseg]	http://www.007star.com/Index.php	SevenStar Energy Group of China
[unfccc]	http://cdm.unfccc.int/	UNFCCC
[int1]	http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2413.pdf	China DNA (regional grid delineation)
[int2]	http://cdm.ccchina.gov.cn/web/main.asp?ColumnId=25	China DNA approved project database
[int3]	http://cn.chinagate.cn/economics/2007-04/27/content_2374275.htm http://cn.chinagate.cn/economics/2008-03/24/content_13459752.htm http://cn.chinagate.cn/reports/2009-03/19/content_17470581.htm	Statistical Announcement of National Economy and Social Development of Sichuan Province in 2006~2008
[int4]	http://www.007star.com/Read_Document.php?DocumentID=1075&ItemID=	Huogu project construction start date
[int5]	http://www.sc.xinhuanet.com/content/2010-03/04/content_19158838.htm	Local government reporting
[int6]	http://www.chinapower.com.cn/article/1004/art1004225.asp	Press news of Niujaowan Cascade-3 hydropower project

[int7]	http://finance.sina.com.cn/qsgg/20040409/sh600505-3.html	Niujiaowan Cascade-3 hydropower project total investment
[int8]	http://www.chinaqw.com/node2/node116/node120/node334/node336/userobject6ai4672.html	Tongkouhe hydropower project
[int9]	http://baike.baidu.com/view/3065598.htm	Shazui hydropower project

4. List of Interviewees

Reference	Name	Title	Organization
[IV1]	Mr. WEI Mingxing	Mechatronics Engineer	Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd.
[IV1]	Mr. JIANG Ming	Vice Manager	Engineering Dept. of Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd.
[IV1]	Mr. Ma Kepeng	Secretary	Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd.
[IV1]	Mr. SU Shaojun	Chairman of the Board	Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd.
[IV1]	Mr. YIN Liansong	Vice General Manager	Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd.
[IV2]	Ms. WANG Minna	CDM Project Manager	Hangzhou Carbon Trade Environment Engineering Co., Ltd
[IV2]	Ms. XIE Yuehong	CDM Project Specialist	Hangzhou Carbon Trade Environment Engineering Co., Ltd
[IV3]	Mr. MU Jianchun	Director	Investment Dept. of Development and Reform Bureau of Muchuan County
[IV3]	Mr. WU Ke	Vice Chief Secretary	People's Government of Muchuan County
[IV3]	Mr. HE Ping	Director	Environmental Protection Bureau of Muchuan County
[IV3]	Mr. LI Shiyin	Vice Director	Land and Resources Bureau of Muchuan County
[IV3]	Mr. XIANG Chuanjin	Villager	Zhuxi village, Lidian town, Leshan city
[IV3]	Mr. LI Youquan	Villager	Zhuxi village, Lidian town, Leshan city
[IV3]	Mr. GU Yucai	Villager	Zhuxi village, Lidian town, Leshan city
[IV3]	Mr. XU Jun	Village Head	Zhuxi village, Lidian town, Leshan city

Appendix B: CDM Validation Protocol Checklist

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
1.	mat (CDM VVM EB 55 para. 55 and 57)			OK/CAR/CL	OK/ NOT OK
1.1	Is the PDD prepared in accordance with the latest template and guidance by the CDM EB? http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html	[CPF]	Yes, the PDD is prepared in accordance with the latest template, Version 03 - in effect as of 28 July 2006. Specific non conformities with the Guidelines for completing the Project Design Document are identified in the CARs and CLs below.	OK	OK
1.2	Does the language make sense and is it clear?		Yes.	OK	OK
2.	Project Title	PDD A.1			
2.1	Does the project title enable the identification of the unique CDM project activity?		Yes.	OK	OK
2.2	Is the version number and date of the PDD clearly indicated? Is this consistent with the project's timeline?		Yes, the PDD submitted for validation is version 01, dated 09/12/2009, which is consistent with the project timeline.	OK	OK
3.	Project Description (CDM VVM 55 para. 58-64)	PDD A.2			
3.1	Does the PDD contain a clear description of the project activity, with regard to its nature and technical implementation? Does Section A2 include: a. A brief summary of A4, particularly A4.3, b. A summary of B.3, sources and gases c. The PP's opinion regarding the contribution of the project to sustainable development	[GCP]	According to PDD Guideline, the purpose of the project activity with a description of three scenarios should be included in A.2 of the PDD, however the PDD of the proposed project doesn't explain the baseline situation and thereby how the proposed project activity reduces greenhouse gas emissions.	GL-1	OK
3.2	Does the description deliver a transparent overview of the project activity and does it cover all relevant elements?		Yes.	OK	OK
3.3	Has a physical site inspection been undertaken to confirm that the description in the PDD reflects the proposed CDM project activity?		Yes, A site inspection was undertaken from 15 to 16 December 2009. The description in the PDD reflects the proposed CDM project activity.	OK	OK
3.4	Does section A.2 also indicate the baseline situation, and the historical situation at the facility, if this is different to the baseline? If the proposed CDM activity involves the alteration of an existing installation or process, does the description clearly state the differences to the pre-project situation?	[GCP]	According to PDD Guideline, the purpose of the project activity with a description of three scenarios should be included in A.2 of the PDD, however the PDD of the proposed project doesn't explain how the proposed project activity reduces greenhouse gas emissions. Please refer to CL 1.	Not yet OK	OK
3.5	Is all information provided in the project description consistent with information provided in later sections of the PDD?		Yes.	OK	OK

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4.	Technical Description	PDD A.4			
	Location of Project	PDD A.4.1			
4.1	Does the information provided on the location of the project activity allow for a clear identification of the site(s)? How was the site location confirmed? (e.g. site visit, planning documents)	[PDR]	The project location provided by the PDD contradicts with information given by the PDR, and the coordinates are incorrect.	CL-2	OK
	Category/ Sectoral Scope	PDD A.4.2			
4.2	Is the category (sectoral scope) of the project activity indicated and correct?	[PDR] [PDD]	Yes.	OK	OK
	Technology to be Employed by the Project Activity	PDD A.4.3			
4.3	Is there a clear description of the baseline scenario, as identified in section B.4? This should include: a. An indicative list of the equipment(s) and systems that would have been in place in the absence of the project activity (if any) b. Information about the age and average lifetime of the baseline facility based on manufacturer's specifications and industry standards (if applicable) c. Installed capacities, load factors and efficiencies of the baseline facility (if applicable) d. An explanation of how the same types and levels of services provided by the project activity would have been provided in the baseline scenario.	[GCP]	How the proposed project activity reduces greenhouse gas emissions making reference to the scenarios, emission sources and gases, and equipment lifetime are not explained in section A.4.3 of the PDD following the requirements of the latest version of PDD Guideline.	CL-3	OK
4.4	If the scenario existing prior to the start of the implementation of the project activity is different from the selected baseline scenario, is there a clear description of the pre-existing scenario, with a list of the equipment(s) and systems in operation at that time?	[ACM2]	Not applicable.	OK	OK
4.5	Is the technology to be employed by the project activity clearly described and is it consistent with information provided elsewhere in the PDD? The description should include: a. List of main technologies involved b. List of main equipment and installations c. The lifetime of the project equipment d. Capacities, load factors and efficiencies (where relevant) e. The emissions sources and the greenhouse gases involved in the project activity f. Existing and forecast energy and mass flows and balances g. Interaction with processes/equipment outside the project boundary, if any, is stated.	[PDR] [GCP]	a. The main technology involved in the project is hydro power technology. b. Main equipments are described in accordance with the equipment purchase agreement. c. Lifetime of the project equipments is not included. Please refer to CL 3. d. Necessary information is included in the PDD. e. Not applicable since the project is a hydropower project with a power density greater than 10W/m2 and therefore is emission free. f. Not applicable since the project is a hydropower project and applies ACM0002 which doesn't include energy balance.	Not yet OK	OK

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			g. Not applicable since the project boundary includes the connected regional power grid.		
4.6	Does the description of the technology to be applied provide sufficient and transparent input/ information to evaluate its impact on the greenhouse gas balance?		Please refer to CL 3.	Not yet OK	OK
4.7	Does the implementation of the project activity require any technology transfer from annex-I countries to the host country(ies)?	[EPC]	No, main equipments will be produced domestically. This has been verified against the equipment purchase agreement.	OK	OK
4.8	Does the project use state of the art technology and / or does the technology result in a significantly better performance than any commonly used technologies in the host country? Is the technology implemented by the project activity environmentally safe?	[PDR] [EPC] [AEIA]	No, the project employs commonly used technology in the host country and has been approved by local environmental protection bureau and therefore can be regarded as environmentally safe.	OK	OK
4.9	Is the project technology likely to be substituted by other or more efficient technologies within the project period?	[EPC]	No, small hydropower technology is very mature and commonly applied in the host country. It is not likely to be substituted by other or more efficient technologies within the project period.	OK	OK
4.10	Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period? Is information available on the demand and requirements for training and maintenance?	IV	The project developer is a group company which is experienced in developing and operating hydropower projects including another CDM project. Training and maintenance demand will be met by the project developer and equipment supplier.	OK	OK
4.11	Is a schedule available for the implementation of the project and are there any risks for delays?		The project is under construction, and expects to be completed in 2011. No foreseeable delays were noted during the site visit.	OK	OK
	Public Funding from Annex I country	PDD A.4.5			
4.12	Is the information provided on public funding provided in compliance with the actual or planned situation, based on the available evidence?	[PDR] IV	No public funding from Parties included in Annex 1 has been identified to be involved in the project activity. This is confirmed by the PDR and project developer.	OK	OK
4.13	If the project involves public funding from an Annex 1 country, have the annex 1 parties involved provided an affirmation that such funding does not result in a diversion of official development assistance?		Not applicable.	NA	NA
5.	Approval and Participation (CDM VVM EB 55 para.44 – 50 and para. 51 - 54)	PDD A.3			
5.1	Are project participants listed in tabular form in section A.3 of the PDD? Is this information consistent with the contact details provided in Annex 1 of the PDD and other project documentation (Letters of Approval and Modalities of Communication)?	[LOA]	Yes, the project participants are listed in A.3 and Annex 1 of the PDD. However, name of participant of Annex 1 country is not consistent throughout the PDD.	CL 4	OK
5.2	Has the Host Party provided a Letter of Approval (LoA) with	[HCA]	Yes. A Letter of Approval has been provided by the China	OK	OK

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	clear referencing and supporting documentation? Does the LoA confirm: a. Ratification of the Kyoto Protocol b. Voluntary Participation c. Contribution to Sustainable Development d. Reference to the precise project title in the PDD		National Development and Reform Commission (NDRC), which is the DNA of China, in April 2008. The letter confirms that: a. China ratified the Kyoto Protocol on 30th Aug 2002; b. Sichuan Muchuan County Qixing Huogu Hydropower Development Co., Ltd. is authorized as a project participant by China to voluntarily participate in the project activity; c. The project complies with the permission requirements provided for in the Measures for Operation and Management of CDM projects in China, and assists China in achieving sustainable development; d. The LoA references the precise project title 'Sichuan Muchuan County Huogu Hydropower Project'. This is consistent with the project title in the PDD.		
5.3	Was the LoA received directly from the DNA or from the project participants? Has the Host Party LoA been issued by the respective DNA? How has this been confirmed?	[HCA]	The LoA was received from the project participant. The authenticity of the LoA is not doubted as the project can be found on the website of the China DNA as approved.	OK	OK
5.4	Has the Annex I Party provided a Letter of Approval (LoA) with clear referencing and supporting documentation? Does the LoA confirm: a. Ratification of the Kyoto Protocol b. Voluntary Participation c. Contribution to Sustainable Development d. Reference to the precise project title in the PDD		LoA of Annex I country is pending.	CAR 1	OK
5.5	Was the LoA received directly from the DNA or from the project participants? Has the Annex I Party LoA been issued by the respective DNA? How has this been confirmed?		Please refer to CAR 1.	CAR 1	OK
5.6	If either LoA contains additional specification or conditions of the project activity, then has the request for registration been based on the documents specified in the LoA?	[HCA]	The host country LoA is unconditional. Refer to CAR 1.	CAR 1	OK
5.7	If the LoA references a specific version of the Validation Report or PDD and this version cannot be submitted, then has either of the following been submitted? a) a statement indicating final LoA has not been received, or b) an updated Validation Report/ PDD	[HCA]	The host country LoA is unconditional. Refer to CAR 1.	CAR 1	OK
6.	Baseline and Monitoring Methodology (CDM VVM EB 55 (para. 65-92))	PDD B			
	Title and reference of the approved baseline and monitoring methodology?	PDD B.1			
6.1	Are the number, version and title of the methodology clearly	[ACM2]	Yes. The project adopts the methodology ACM0002, version	OK	OK

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	and correctly stated? Is the version of the methodology valid at the time of validation submission?		10, which is the latest version and valid from 11 Jun 09 onwards. The PDD has subsequently been updated to version 12.3.0 which is valid at the time of submission for registration		
6.2	Are the Tools applicable to the methodology correctly referenced, including the correct version number(s) valid at the time of registration submission?	[ACM2] [TA] [TEF]	Yes. The PDD refers to <i>Tool for the demonstration and assessment of additionality</i> , version 05.2, which is the latest version. However, version 01.1 of <i>Tool to calculate the emission factor for an electricity system</i> has expired since 26 Oct. 2009, which is before the GSP on 12 Dec. 2009. The latest version of emission factor tool should be referred to and applied.	CAR-2	OK
	Justification for the choice of methodology and why it is applicable	PDD B.2			
6.3	Have any sources of greenhouse gas emissions been identified by the DOE ,within the project boundary following project implementation, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, and which are not addressed by the applied methodology?	[ACM2]	No. The project is a hydropower project with a power density greater than 10W/m2, and there are no significant emission sources identified, consistent with the applied methodology.	OK	OK
6.4	Is the methodology fully applicable to the proposed project? For each of the applicability criteria: (a) Is the criterion discussed in the PDD? (b) Is compliance provable? (c) Is evidence provided in the PDD to prove applicability? (d) Has compliance with the criterion been verified (by checking evidence provided, sector/ local knowledge etc)?	[ACM2]	Yes. The applicability criterion of the applied methodology are justified in the PDD, and it can be confirmed by the DOE that all the criterion are met since the project is a new dam hydropower project with a power density greater than 4W/m2.	OK	OK
6.5	Was there a request for clarification, revision or deviation made for the adopted methodology in relation to the proposed project activity? If so, were the correct procedures provided by the CDM EB followed?		Not applicable	NA	NA
	Description of sources and gases included in the project boundary	PDD B.3			
6.6	Does the PDD correctly describe the project boundary, including the physical delineation of the proposed CDM project activity, in compliance with the requirements of the selected baseline methodology, and is this consistent with site observations and other documentation provided?	[ACM2] [TEF]	Yes. The project boundary is described in accordance with ACM0002. The spatial extent of the project boundary includes the project site and all power plants connected physically to the CCPG. This has been verified using the definition of the grid boundary provided by the China DNA.	OK	OK
6.7	Baseline emissions: Have all sources and GHGs required by the methodology been included within the project boundary? For each potential source:	[ACM2]	Yes. The sources and GHGs required by the methodology ACM0002 are included in the project boundary.	OK	OK

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	- Are source(s) and gases discussed by the PDD? - Is inclusion / exclusion justified? - Is explanation/ justification sufficient? - Is the inclusion/ exclusion consistent with the monitoring plan?				
6.8	Project emissions: Have all sources and GHGs required by the methodology been included within the project boundary? For each potential source: - Are source(s) and gases discussed by the PDD? - Is inclusion / exclusion justified? - Is explanation/ justification sufficient? - Is the inclusion/ exclusion consistent with the monitoring plan?	[ACM2] [PDR]	For hydro power plants, emissions of CH ₄ from the reservoir have been excluded from the project boundary because the power density of the project is calculated as greater than 10W/m ² .	OK	OK
6.9	For large scale projects, is a diagram given to illustrate the project boundary, including all the key equipment, systems and flows of mass and energy, as well as the emissions sources and gases included in the project boundary?	[GCP]	A flow diagram of the project boundary which physically delineating the project activity should be presented in the PDD, including all the equipments, systems and flow of mass and energy, the emissions sources and gases included in the project boundary and the monitoring variables.	GAR-3	OK
	Description of how the baseline scenario is identified and description of the identified baseline scenario	PDD B.4			
6.10	Does the PDD clearly identify the baseline, a scenario that represents the anthropogenic emissions by sources of GHG that would occur in the absence of the proposed CDM project activity?	[ACM2]	The baseline scenario for a new grid-connected renewable power plant is prescribed in ACM0002; a scenario approach is unnecessary and should be removed from the PDD.	GAR-4	OK
6.11	- Have the procedures/ steps to identify the most reasonable baseline scenario, as required by the methodology and applicable tools, been documented clearly in the PDD? Are all feasible and credible alternatives identified, including but not limited to all the potential scenarios listed in the methodology? - Are all considered alternatives assessed for consistency with (enforced) mandatory laws and regulations? - Does the list of alternatives include the project activity undertaken without being registered as a CDM project? - If alternatives are excluded: - Is sufficient evidence/ justification provided to support every exclusion of alternatives? Is it reasonable? - Is it shown that at least one credible and feasible alternative does not face a barrier? Is this reasonable? - If Investment Analysis is used to exclude baseline	[ACM2]	ACM0002 does not require the assessment of alternative baseline scenarios.	NA	NA

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	alternatives, has it been correctly applied? Are assumptions and input values reasonable and sufficiently justified?				
6.12	Have all relevant national and/or sectoral policies and circumstances been taken into account? Are they listed in the PDD?	[ACM2]	Not applicable since the baseline scenario for a new grid-connected renewable power plant is prescribed by ACM0002.	NA	NA
	Does the PDD provide a verifiable description of the baseline scenario, including a description of the technology/ activities that would have been employed in the absence of the CDM project?	[ACM2]	Not applicable since the baseline scenario for a new grid-connected renewable power plant is prescribed by ACM0002.	NA	NA
6.13	Does the identified baseline scenario reasonably represent what would occur in the absence of the proposed project activity?	[ACM2]	Not applicable since the baseline scenario for a new grid-connected renewable power plant is prescribed by ACM0002.	NA	NA
7.	Additionality (CDM VVM EB 55 (para.94-121))	PDD B.5			
	a) Prior consideration of the CDM	PDD C.1.1			
7.1	Is the start date defined in accordance with the "Glossary of CDM terms"? What evidence is provided to verify that this was the official start date? Is this considered reliable and reasonable?	[GLC] [EPC] [PCC] [GCP]	The project start date is defined in the PDD as 06 June 2007, which is the date of signing the main equipment purchase contract. It is in line with the Glossary of CDM Terms as the earliest contract and before real construction start date in Oct. 2007. This has been verified by checking the original contracts, and deemed as reliable and reasonable. According to the PDD Guideline, the CDM-PDD should contain the date in form of DD/MM/YYYY. Please provide a description of how this start date has been determined, and a description of the evidence available to support this start date.	GL-5	OK
7.2	Is it a new project activity (start date on or after August 2008) or an existing project?		It is not a new project with start date after 2 August 2008 and is an existing one.	OK	OK
7.3	For a new project which does not require a new methodology and has not published its PDD for stakeholder comments prior to the start date, then: a. Have the project proponents informed the DNA and/or UNFCCC secretariat in writing? How has this notification been verified? (i.e. confirmation from the DNA or UNFCCC) b. Was the notification made within 6 months of the project activity start date? c. Does the letter/ notification indicate the precise geographic location and provide a brief description of the proposed project? d. Have the project proponents informed the DNA and/ or		Not applicable.	NA	NA

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	UNFCCC secretariat of the progress of the project activity every subsequent two years after the initial notification?				
7.4	For an existing project which has a start date prior to the publication of the PDD for global stakeholder comments, has the project proponent provided the following: a. Evidence of awareness of the CDM prior to the project activity start date and that the benefits of the CDM were a decisive factor in the decision to proceed with the project? (e.g. Board minutes, notes etc) Is this sufficient? b. Reliable evidence that demonstrates real actions were taken to secure CDM status in parallel with the project's implementation? (e.g. contracts with consultants for CDM/PDD/methodology services, ERPAs, correspondence with CER buyers, DOEs, DNAs or the UNFCCC). Is this sufficient?	[EB49a22] [CPC] [CDA] [CTS] [ERPA] [TST]	a. Since the project developer has developed another hydropower project as a CDM project which indicates his awareness of the CDM. Similarly in the case of this project, it has been validated that the CDM is a key factor in the decision with the project as shown by the board decision in March 2007. As per Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM [EB49a22], documented evidences are reviewed. b. Since the board decided to implement the project as a CDM project in March 2007, a series of CDM actions such as signing CDM consulting agreement and ERPA, applying for the LOA from the host country DNA have been taken to secure the CDM process.	OK	OK
	b) Identification of alternatives (Additionality Tool)	PDD B.5			
7.5	Is the assessment of alternatives in compliance with the requirements of the methodology and the relevant tool(s) (e.g. the Tool for the demonstration and assessment of additionality)? Is the assessment consistent with section B.4?	[VVM] [ACM2]	The methodology does not require an assessment of alternatives. According to clause 103 of the VVM, "The PDD shall identify credible alternatives to the project activity in order to determine the most realistic baseline scenario, unless the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required (e.g., methodology ACM0002).	OK	OK
	c) Investment Analysis				
7.6	Has an investment analysis been used to demonstrate additionality?	[TA] [PDD]	Yes	OK	OK
7.7	Has the appropriate analysis Option been chosen?	[TA]	The selection of option III (benchmark analysis) is appropriate because the project generates economic benefits other than CDM and the baseline scenario is not an investment project.	OK	OK
7.8	If Option I is chosen (simple cost analysis), is it demonstrated that the activity produces no economic benefits other than CDM income?		Not applicable.	NA	NA
7.9	If Option II is chosen: Is the most suitable financial indicator clearly identified (Project IRR, Equity IRR, NPV, cost benefit ratio, or (levelised) unit cost)?		Not applicable.	NA	NA
7.10	Benchmarks - If Option III is chosen: a. Does the proposed baseline scenario leave the project participant no other choice than to make an investment to	[EEC]	a. No, the PP has the option not to invest in the project. b. Yes, the most suitable financial indicator, the project IRR, is identified in accordance with the Economic	GL-6	OK

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	supply the same (or substitute) products or services? b. Is the most suitable financial indicator clearly identified (Project IRR, Equity IRR, NPV, cost benefit ratio, or (levelized) unit cost)? Is the suitability of the selection reasonable and adequately justified? c. Is an appropriate benchmark chosen that is relevant for the project activity (sector, investment, investor, country, risk of project, time of investment decision)? d. Is the choice of benchmark appropriate to the type of IRR calculated? (e.g. a Project IRR benchmark is appropriated for a WACC or Project IRR analysis; an Equity IRR benchmark is appropriate for an Equity IRR analysis) e. Is the chosen benchmark appropriate in comparison with other publicly available comparable benchmarks? f. Is the chosen benchmark appropriate and in line with other benchmarks used in current or previous projects by the same investor? g. Is the choice of benchmark justified with supporting evidence for its appropriateness?		Evaluation Code for Small Hydropower Project SL16-95 issued by Ministry of Water Resources of China. c. Why the benchmark is applicable to the proposed project is not addressed in the PDD. (CL 6). d. Yes. The project IRR benchmark matches project IRR calculation. e. According to the Economic Evaluation Code for Small Hydropower Project, the benchmark is for small hydro projects (below 50MW) in China. Thus, the chosen benchmark is appropriate. f. The benchmark is commonly applied in small hydro power generation industry in China. g. Yes, the chosen benchmark is backed with supporting evidence for its appropriateness.		
7.11	If the project can be developed by an entity other than the project participant, is the benchmark based on publicly available data sources? Have these data sources been validated?	[EEC]	Yes, the benchmark is based on publicly available data source which is widely used in the host country.	OK	OK
7.12	If an internal company benchmark has been used: a. Is the project participant the only possible investor in the project? b. Is it sufficiently demonstrated that the internal benchmark has been used for similar projects with similar risk or would have been used for similar projects in the same sector and country/region? c. How has this been validated?		Not applicable.	NA	NA
7.13	If risk premiums are applied in the development of the benchmark, are they reasonable and justified?		Not applicable since a government benchmark is adopted and no additional risk premiums are applied.	NA	NA
7.14	If internal company benchmark is applied: Has a lower benchmark been used in previous investment decisions by the project participant? If so, are there verifiable circumstances that have led to a change in the benchmark?		Not applicable.	NA	NA
7.15	Overall, is the choice of benchmark reasonable? Is it reasonable to assume that no investment would be made at a rate of return lower than the benchmark?	[EEC]	Yes. The selection of the benchmark is in accordance with the regulations in China and reasonable.	OK	

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	Calculations				
7.16	Is the period of assessment appropriate?	[PDR] [GAIA]	Yes. The operation period adapted for the IRR calculation is 20 years (excluding four year of construction period). This has been verified against the PDR, and it is in line with <i>Guidelines on the Assessment of Investment Analysis, version 3</i> . However, the project lifetime stated in TableB-3 and C.1.2. of the PDD is 24 years, please revise the PDD to keep consistency.	GL-7	OK
7.17	Is any residual value of the project activity assets included in the analysis? Are residual value calculations reasonable and justified and consistent with local accounting rules or international best practice?	[PDR] [GAIA]	4% of fixed assets is set as residual value of the project when calculating depreciation, and it is included as a cash inflow in the final year. It is reasonable and consistent with local accounting rules.	OK	OK
7.18	Are the depreciation and major maintenance costs consistent with the assessment period and the residual values?	[PDR]	Yes, depreciation and operation cost are both included through out the assessment period of 20 years.	OK	OK
7.19	Are depreciation and other non-cash items related to the project activity deducted from net profits used for calculating the financial indicator (e.g. IRR, NPV)?	[PDR] [GAIA]	No, depreciation is only taken into account when calculating income tax.	OK	OK
7.20	Is the treatment of taxation consistent with the chosen benchmark? (i.e. taxation should only be treated as an expense in the IRR/NPV calculation if the chosen benchmark is intended for post-tax calculations?)	[PDR]	Taxation is only included as an expense in the IRR calculation since the benchmark is intended for post-tax comparisons. Corporate tax rate (income tax) is stated as stepwise in the PDD as following: zero for the first 3 years, 16.5% for the 4th and 5th year, and 33% for the rest of years. However, no relevant information confirming these tax rates can be found in the PDR and the IRR calculation. Clarification is requested.	GL-8	OK
7.21	Recommended project: If the implementation of the project ceased and then recommenced due to consideration of the CDM, then: a. Are input values valid and applicable at the time of making the decision to recommence the project? b. Are capital costs incurred prior to the revised project activity start date input as the recoverable value of the assets (limited to the potential reuse/ resale of tangible assets)? c. How has the fair market value of the capital expenditures been calculated and validated? (e.g. by chartered specialists). Is this fair market value reasonable and justified?		Not applicable.	NA	NA
7.22	Has the project participant supplied unprotected and traceable spreadsheet versions of all investment analysis?	[IRR]	Yes.	OK	OK

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7.23	From the investment analysis provided, is it possible to reproduce the results?	[IRR]	Yes.	OK	OK
7.24	If a Project IRR has been used, are the costs of financing expenditures (i.e. loan repayments and interest) included in the calculation of project IRR?	[IRR]	The cost of financing expenditures (i.e. loan repayments and interest) is not included in the cash outflow of calculation of project IRR. Actual interest payable is only taken into account in the calculation of income tax.	OK	OK
7.25	If an Equity IRR has been used, is the debt portion of the investment cost included as a cash outflow? (i.e. as well as interest costs and principle repayments – double counting)	[IRR]	Not applicable.	NA	NA
7.26	Sensitivity analysis: - Are all variable and critical costs and revenues in the analysis included in the sensitivity analysis? - Is the assessed range of variations reasonable in light of the reliability of the estimated input values and the likely range? - If some variations create scenarios that change the conclusion/ result of the analysis, how likely/ probable is such a scenario (in the opinion of the DOE)? - Is the sensitivity analysis possible to reproduce?	[IRR] [GAIA]	- Yes. Sensitivity analysis included variables of fixed assets investment, annual operational and maintenances costs, annual electricity generation, and electricity tariff. There are no other variables that represent more than 20% of costs or revenues that should be included, therefore the selection of variables is considered reasonable. - The sensitivity analysis used a range of variation from -10% to +10%. This is in line with <i>Guidelines on the Assessment of Investment Analysis, version 3</i>. (Paragraph 18). - Amongst all of the chosen range of variations, the Project IRR remains below the benchmark after the variation. - Yes. The sensitivity analysis can be reproduced.	OK	OK
7.27	Are input values used in all the investment analysis valid and applicable at the time of the investment decision taken by the project participant?	[PDR] [IRR] [VVM]	According to VVM clause 111, the PDR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the PDR (Dec. 2006) and the investment decision (02/03/2007) is sufficiently short, and it is unlikely in the context of the underlying project activity that the input values would have materially changed.	OK	OK
7.28	Have the listed input values been consistently applied in all calculations?	[PDR]	The Annual Net Output in the PDD is 184,986.2MWh, however, the parameter is 165,513.9 MWh according to the PDR. Please explain how the net electricity output is calculated. (CL 9) All other values used in the PDD and IRR calculation are fully consistent with the PDR except the income tax rate, please refer to CL 8.	CL 9	OK
7.29	Are all references made in the investment analysis correctly referenced/ sourced? Have these sources been verified?	[PDR] [IRR]	Reference of Corporate tax rate is not consistent with the PDR, please refer to CL 8.	Not yet OK	OK
7.30	Have financial calculations been verified by: assessing all parameters and assumptions against the available evidence and expertise; cross-checking the parameters against 3 rd party or publicly available sources; reviewing feasibility reports, public	[PDR] [EEC] [IRR]	Yes, the financial analysis has been verified by the DOE by cross checking data sources with the PDR and the regulation, and reproducing the IRR using the spreadsheet submitted by the PP.	OK	OK

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	announcements and annual financial reports; assessing the correctness of computations and the sensitivity analysis?				
7.31	Have values from a feasibility study report (FSR) approved by national authorities been used? If so: a. Has the FSR been the basis of the decision to proceed with the investment in the project? How has this been verified? b. Are the values used in the PDD and associated annexes valid and consistent with the FSR? c. At the time of the investment decision, are the input values from the FSR valid and applicable (based on specific local and sectoral expertise and knowledge)?	[PDR] [VVM] [IRR]	a. Yes, the PDR is adopted as the basis of the decision to proceed with the investment in the project since the PDR must be completed and approved before the project is permitted to be built in accordance with Chinese regulations. b. Please refer to CL 8 and CL 9. c. The period of time between the finalization of the PDR (Dec. 2006) and the investment decision (02/03/2007) is sufficiently short, the input values from the PDR are valid at the time of investment decision.	Not yet OK	OK
	d) Barrier Analysis (VVM EB 55 para. 115 – 118)	<i>PDD Step 3</i>			
7.32	Has a barrier analysis been used?		Not applicable	NA	NA
7.33	Is a complete list of barriers that prevent the relevant alternatives and the proposed CDM project activity from occurring identified?		Not applicable	NA	NA
7.34	Do any such identified barriers have a clear and direct impact on the financial returns of the project activity? (these are not barriers and should be assessed in the investment analysis)		Not applicable	NA	NA
7.35	Are the identified barriers real and substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics?		Not applicable	NA	NA
7.36	Does an identified barrier or set of barriers prevent the implementation of the proposed CDM project activity? How has this been validated?		Not applicable	NA	NA
7.37	Do the identified barriers not equally prevent at least one of the possible alternatives (i.e. the baseline scenario)? How has this been validated?		Not applicable	NA	NA
7.38	Is it clearly explained how the approval of the project in the CDM would enable the proposed project activity to surmount the barrier? Is the rationale reasonable and justified with evidence?		Not applicable	NA	NA
7.39	Overall, is the Barrier Analysis presented credible and compliant with the applicable Tools?		Not applicable	NA	NA
	e) Common Practice Analysis (VVM EB 55 para. 119 – 121)	<i>PDD Step 4</i>			
7.40	Is the proposed project activity a 'first of its kind'? Has sufficient evidence been provided to validate this claim?		No, the PDD does not claim that the project is the first of its kind.	OK	OK
7.41	Has common practice analysis been undertaken?		Yes.	OK	OK
7.42	Is the geographical scope of the common practice analysis	[TA]	How other activities similar to the proposed project activity	GAR-5	OK

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	appropriate for the assessment, considering the project activity's technology or industry type?		are defined is not included in the common practice analysis of the PDD. Please clearly explain how similar project activities are identified in the PDD.		
7.43	Have all comparable projects been included in the common practice analysis? How was this assessed (by the DOE)? If some projects have been excluded as non-comparable, is the exclusion reasonable and justified?		Please refer to CAR 5.	CAR 5	OK
7.44	Have similar and operational projects, other than CDM project activities, been undertaken in the region?		Please refer to CAR 5.	CAR 5	OK
7.45	Are these widely observed and commonly carried out? If so: a. How have the essential distinctions with the proposed CDM project activity been assessed? b. Are such distinctions justified with sufficient evidence? c. If inaccessibility of data is the reason why some projects have not been included in the analysis, is justification of this claim provided?	[TA]	Please refer to CAR 5. According to the requirement of additionality tool, it is necessary to compare the proposed project activity with other similar activities, and to point out and explain essential distinctions between them, such as the similar activities enjoyed certain benefits that made them financially/economically attractive (e.g., subsidies or other financial flows), which are not for the proposed project activity or the similar project activities did not face the barriers to which the proposed project activity is subject. The explanation provided in the PDD is insufficient with lack of evidence.	CAR 5 CAR 6	OK
7.46	Overall, is the proposed CDM project activity considered common practice?		Please refer to CAR 5 and CAR 6.	Not yet OK	OK
8.	Emissions Reductions (CDM VVM EB 55 para. 89-93)	PDD B.6			
	Explanation of methodological choices				
8.1	Is it explained how the procedures provided in the Methodology and applicable Tools are applied by the proposed project activity? (i.e. Are the required steps clearly followed?)	[TEF]	The latest version of <i>Tool to Calculate Emission Factor for an Electricity System</i> version 02 should be applied. Please refer to CAR 2.	Not yet OK	OK
	<i>Project emissions:</i>				OK
8.2	Is every choice of options for calculating project emissions offered by the methodology correctly justified? Is this justification in line with the situation as evidenced by site visits, local knowledge and supporting documentation?	[PDR] [ACM2]	Yes. According to ACM0002 the only project emissions of hydro power plants are from water reservoirs, and the power density of the project activity (PD) is greater than 10 W/m ² , therefore project emission is zero. The area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full is evidenced by the PDR.	OK	OK
8.3	Are the formulae and parameters required for the determination of project emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?		The calculation of project emissions contains a mistake. The value of A _{PJ} is 0.891 km ² rather than 891 km ² .	CAR 7	OK
	<i>Baseline emissions:</i>				OK
8.4	Is every choice of options for calculating baseline emissions	[ACM2]	Yes. This has been verified by cross-checking the	OK	OK

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	offered by the methodology correctly justified? Is this justification in line with the baseline scenario?	[TEF]	methodology and the <i>Tool to Calculate Emission Factor for an Electricity System</i> version 02.		
8.5	Are the formulae and parameters required for the determination of baseline emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?	[ACM2]	The formulae and parameters required by ACM0002 for baseline emissions are not correctly applied in the PDD. Corrections are requested.	CAR 7	OK
8.6	Are the applicable Tools and methods to calculate parameters correctly applied?	[TEF]	The latest version of <i>Tool to Calculate Emission Factor for an Electricity System</i> version 02 should be applied. Please refer to CAR 2.	Not yet OK	OK
	<i>Leakage:</i>				OK
8.7	Are all potential sources of leakage correctly identified in accordance with the applied Methodology?	[ACM2]	Not applicable. According to the methodology ACM0002, leakage does not need to be considered.	NA	OK
8.8	Are the formulae and parameters required for the determination of leakage emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?	[ACM2]	Not applicable	NA	OK
8.9	Are the applicable Tools and methods for calculating leakage correctly applied?	[ACM2]	Not applicable	NA	OK
	<i>Emissions Reductions:</i>				OK
8.10	Are the parameters and equations used to calculate emission reductions correct?	[ACM2]	Please refer to CAR 7 and CAR 2.	Not yet OK	OK
	Data and Parameters	PDD B.6.2			
8.11	Is the list of parameters presented in chapter B.6.2 of the PDD considered to be complete with regard to the requirements of the applied methodology and any applicable tools?	[ACM2] [TEF]	Data that is calculated such as OM, BM and CM should not be included in B.6.2 of the PDD, and those required by ACM0002 and emission factor tool should be included, e.g. Cap _{BL} and A _{BL} .	CAR 8	OK
8.12	For each parameter: a. Title in line with Methodology? b. Data unit correctly expressed? c. Appropriate description? d. Source clearly referenced? (and appropriate?) e. Correct value provided? f. Has this value been verified? g. Choice of data correctly justified? h. Measurement method correctly described?	[ACM2] [TEF]	CAR 2 and CAR 8 have to be closed first. Please update the parameters to be in line with ACM0002, and <i>Tool to calculate Emission factor for an Electricity System</i> , version 2.	Not yet OK	OK
8.13	Will the data and parameters result in a conservative estimate of emissions reductions?	[ACM2] [TEF] [GEF]	By cross checking documents like the applied methodology and the official grid emission factor published by Chinese DNA, the DOE confirmed that all data and parameters used for emission reduction calculation that are not monitored are in line with the methodology and referred tool, and the data sources are from public available and appropriate.	OK	OK

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	Ex-ante calculation of emission reductions	PDD B.6.3			
8.14	Is the projection based on the same procedures as used for future monitoring?		Yes. The projection is based on the same procedures as used for future monitoring. This has been verified against the monitoring plan.	OK	OK
8.15	Are the GHG calculations documented in a complete and transparent manner?		CAR 2 and CAR 7 should be closed out first.	Not yet OK	OK
8.16	Are detailed calculations provided in a traceable spreadsheet showing relevant information?	[ERC]	Yes	OK	OK
8.17	Can the calculation of baseline emissions be replicated using the data and parameters supplied in the PDD?		The emission reduction calculation in B.6.3 of the PDD is incorrect because wrong data value of parameters is used. Please revise the PDD.	CAR-9	OK
8.18	Is the data provided in this section consistent with data as presented in other chapters of the PDD?		CAR 4 should be closed first.	Not yet OK	OK
	Summary of ex-ante estimation of emission reductions	PDD B.6.4			
8.19	Is the form/ table required for the indication of projected emission reductions correctly applied? And is the data provided in this section consistent with data as presented in other chapters of the PDD?		CAR 2, CAR 7 and CAR 8 should be closed first.	Not yet OK	OK
8.20	Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?		The PDD states that the crediting period is expected to start on 01/10/2010, please reconsider it to accommodate with the most likely date that the project start to generate GHG emission reductions.	CL-14	OK
9.	Monitoring Plan (CDM VVM EB 55 (para.122-124))	PDD B.7			
	<i>(a) Compliance of the MP with the methodology</i>				
9.1	Are all necessary parameters required for the type of project by the methodology and applicable tools contained in the monitoring plan?	[ACM2]	Parameters such as $EG_{facility,y}$ and Cap_{PJ} that are required by ACM0002 are not included in the PDD. Please revise the PDD to include necessary monitored parameters in accordance with the methodology.	CAR-10	OK
9.2	For each parameter, is the: a. Title in line with methodology? b. Data unit correctly expressed? c. Parameter appropriately described? d. Source clearly referenced? e. Correct value provided for the purpose of PDD estimations? f. Measurement methods correctly described and in line with the methodology/tools? g. Correct reference to standards (i.e. for calibration and maintenance)? h. Indication of accuracy provided?	[ACM2]	CAR 10 has to be closed out first.	Not yet OK	OK

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	i. QA/QC procedures described? j. QA/QC procedures appropriate?				
	(b) Implementation of the MP				OK
9.3	Are the arrangements described in the plan feasible and practical within the project design? How has this been verified (review procedures, interviews, project plans, and physical inspection)?	[PDD] IV	The monitoring plan described in B.7.2 of the PDD is unclear in meter system and troubleshooting procedure, "two back-up meters" are mentioned in the PDD but not included in the metering diagram. Besides, please specify meter calibration interval.	GL-11	OK
9.4	Is the operational and management structure clearly described and in compliance with the envisioned situation? Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	[PDD]	Yes. An organizational chart is clearly presented in the PDD, which individual's roles/ responsibilities clearly identified.	OK	OK
9.5	Is necessary monitoring equipment in place or readily available?	[PDD]	Electricity meters will be installed before the project start to generate emission reductions according to the description of the MP.	OK	OK
9.6	Are the management systems described in the monitoring plan adequate to ensure accurate data?		The management system described in section 2 (Monitoring Organization) in B.7.2 of the PDD is adequate to satisfy needs of CDM monitoring.	OK	OK
9.7	Are the means of implementation of the monitoring plan, including data management and QA/ QC procedures, sufficient to ensure that the emission reductions achieved can be reported ex-post and verified?	[PDD]	Please refer to CL 11.	Not yet OK	OK
10.	Sustainable Development (CDM VVM EB 55 (para.125-127))				
10.1	Does the Letter of Approval from the Host Party confirm that the project activity contributes to the sustainable development of that country?	[HCA]	Yes. The LOA provided by the China DNA (NDRC) confirms that the project complies with the permission requirements provided in the Measures for Operation and Management of CDM projects in China, and assists China in achieving sustainable development.	OK	OK
11.	Environmental Impacts (CDM VVM EB 55 (para.131-133))	PDD D.			
11.1	Has an analysis of the environmental impacts of the project activity been undertaken? Does the analysis conclude that the project will create any unacceptable adverse environmental impacts?	[EIA] [AEIA]	Yes. An Environmental Impact Assessment Report for the project was prepared by Environmental Protection Research Institute of Chengdu University of Science & Technology in Dec. 2006, and a subsequent approval was issued by Environmental Protection Bureau of Sichuan Province on 07/02/2007. The EIA concluded that the project would not create any significant negative impact to environment.	OK	OK
11.2	In accordance with the laws and regulations in the Host	[EIA]	Yes. As stated in 11.1, an EIA for the project was conducted,	OK	OK

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	Country, does this project require an EIA? If so, has a valid EIA been conducted? Has this EIA been approved?	[AEIA]	and approved by the local authority.		
11.3	Does the environmental analysis undertaken and presented for the project activity include an analysis of trans-boundary impacts?	[EIA]	Not applicable. The project does not involve transboundary impacts.	NA	NA
11.4	Is the analysis in the PDD fully consistent with the findings of the EIA? Are all significant impacts and mitigation measures identified in the EIA mentioned in the PDD?	[EIA]	The impacts on ecology and resettled people and corresponding mitigation measures should be described in more detail according to the EIA.	CL-12	OK
12.	Local Stakeholder Consultation (CDM VVM EB 55 (para.128-130))	PDD E.			
12.1	Have comments from relevant stakeholders been invited prior to the publication of the PDD on the UNFCCC website?	[LSC]	Yes. A stakeholder consultation has been conducted for the CDM project in July 2007.	OK	OK
12.2	a. Have local stakeholders that can reasonably be considered relevant been included in the stakeholder consultation? b. Have appropriate media been used to invite comments by local stakeholders?	[LSC]	a. Local residents especially those who are directly affected by the project, and a few government officials have been consulted by the project developer, and this has been confirmed by interview relevant people during the site visit. b. On 10/07/2007, the project developer published an notice on its corporate website to invite potential stakeholders to attend the stakeholder meeting which was held on 20/07/2007 and received 50 questionnaires from the attendants, and public comments can be submitted till the date 20/08/2007 which is one month later than the meeting. However, how the stakeholders were invited for consultation is not clearly described in the PDD. And the date of the stakeholder consultation meeting given in the PDD is wrong. Please clarify the stakeholder consultation in more detail.	CL-15	OK
12.3	Is the summary of comments received as provided in the PDD complete?	[LSC]	Yes. The PDD includes a summary of the public consultation. The information has been reviewed against the questionnaires and their summary.	OK	OK
12.4	Has due account been taken of any stakeholder comments received and is this adequately and clearly described in the PDD?	[LSC]	Yes. According to the survey questionnaire, all surveyed stakeholders were reflected in the summary described in the PDD.	OK	OK

Appendix C: REMEDIATION FORM

Corrective Action Requests (CARs), Clarification Requests (CLs), Forward Action Requests (FARs) and Minor Issues

Corrective action requests	Reference to checklist question	Summary of project participants' response	Final conclusion
CAR 1: LoA of Annex I country is pending.	5.4	The LoA of Annex I country the United Kingdom has been provided.	The LoA of Annex I country dated 22 February 2012 has been received from the PPs. The project title and the name of entity "Deutsche Bank AG, London Branch" shown in the LoA is consistent with the MOC and the PDD. CAR 1 is closed.
CAR 2: Version 01.1 of the Tool to calculate the emission factor for an electricity system has expired since 26 Oct. 2009 which is before the GSP. The latest version of emission factor tool should be referred to and applied.	6.2	Tool to calculate the emission factor for an electricity system, version 02 has been referred to in the revised PDD.	In the revised PDD, the applied latest version of the emission factor tool is referred to in B.1 of the PDD, and <i>Step 2: Choose whether to include off-grid power plants in the project electricity system</i> has been added in B.6 of the PDD. CAR 2 is closed.
CAR 3: A flow diagram of the project boundary which physically delineates the project activity, including all the equipments, systems and flows of mass and energy, the emissions sources and gases included in the project boundary and the monitoring variables has not been presented.	6.9	A diagram which was added into the PDD illustrated all the equipments and systems, emissions sources and the monitoring variables, and connected power grid in the project boundary as shown in Figure B-1 of B.3. Section.	The flow diagram added to indicate the project boundary is in line with the requirements of the VVM. CAR 3 is closed
CAR 4: The baseline scenario for a new grid-connected renewable power plant is prescribed by ACM0002, a scenario approach is unnecessary and should be removed from the PDD.	6.10	A scenario approach has been removed from the PDD according to ACM0002.	The baseline scenario is revised to be in line with ACM0002. CAR 4 is closed.
CAR 5: How other activities similar to the proposed project activity are defined is not included in the common practice analysis of the PDD.	7.42	The common practice analysis is revised in accordance with "tool for the demonstration and assessment of additionality". How to define the similar projects is explained in the revised PDD. i.e. same region- Sichuan province, the projects operated after 2002, and the project's capacity of 15MW-50MW. Similar projects are identified from Yearbooks of China Water Resources.	How to define the similar projects has been explained in the revised PDD. The identification is assessed as reasonable and sufficient. Please see detailed assessment in section 3.5 of this report. CAR 5 is closed.
CAR 6: According to the requirement of additiorality tool, it is necessary to compare the proposed project activity to other similar activities, pointing out and explaining essential distinctions between them. Explain why the similar activities enjoyed certain benefits that rendered them financially/economically attractive (e.g., subsidies or other financial flows) which the proposed project activity	7.45	Three similar projects are identified based on the definition and official database from Yearbooks of China Water Resources. Essential distinctions between the Project and other similar projects are explained in the revised PDD.	The justification in common practice analysis in the revised PDD has been verified by cross checking the database provided in Yearbooks of China Water Resources, it is confirmed that there are only 3 projects can be identified as similar to the project activity. Essential distinctions are assessed as

cannot use, or barriers to which the proposed project activity is subject which similar activities did not face. The explanation provided in the PDD is insufficient and lacks sufficient evidence.			sufficient. Please see detailed assessment in section 3.5 of this report. CAR 6 is closed.
CAR 7: The formulae and parameters required by ACM0002 Version 10 for baseline emissions are not correctly applied in the PDD. Corrections are requested. In addition, the reservoir surface area in Sections A4.2, B6.1 and B7.1 are not consistent (0.81km ² , 891 km ² , 0.891 km ²).	8.5	The formulae and parameters are updated according to ACM002: 1. $EG_{PJ,y} = EG_{facility,y}$ is added in B.6.1 of the PDD. 2. The power density calculation is corrected to use 0.891 km ² . The reservoir surface area in the whole PDD is revised to keep consistence.	The formulae and parameters have been revised to be in line with the methodology. The correct value of reservoir surface area from the PDR is applied in the whole PDD. CAR 7 is closed.
CAR 8: Data that is calculated such as OM, BM and CM should not be included in B.6.2 of the PDD, and those required by ACM0002 and emission factor tool should be included, e.g. Cap _{BL} and A _{BL} .	8.11	Section B.6.2 is updated according to ACM0002 and the tool to calculate emission factor. The parameters such as $FC_{i,y}$, $NCV_{i,y}$, $EFCO_{2,i,y}$, EG_y are included in the PDD.	Parameters required by ACM0002 and the emission factor tool have been included in the PDD. Please see details in section 3.6 of this report. CAR 8 is closed.
CAR 9: The emission reduction calculation in B.6.3 of the PDD is incorrect because wrong data value of parameters is used.	8.17	The emission reductions are corrected in the revised PDD using correct data value.	Correct data value of net electricity out and grid emission factor are applied in the revised PDD, the calculation result has been reproduced as correct. CAR 9 is closed.
CAR 10: Parameters such as $EG_{facility,y}$ and Cap _{PJ} that are required by ACM0002 are not included in the PDD. Please revise the PDD to include necessary monitored parameters in accordance with the methodology.	9.1	The parameters listed in B.7.1 of the PDD are revised to be in line with ACM0002.	The parameters to be monitored have been included in the B.7.1, which are in line with ACM0002. CAR 10 is closed.

Clarification requests	Reference to checklist question	Summary of project participants' response	Final conclusion
CL 1: According to PDD Guideline, the purpose of the project activity with a description of three scenarios should be included in A.2 of the PDD, however the PDD of the proposed project doesn't explain how the proposed project activity reduces greenhouse gas emissions	3.1	Prior to the implementation of the Project, equal amounts of electricity are supplied through coal-fired power plants which will emit carbon dioxide to the atmosphere. This is the scenario existing before the implementation of the project and also it is the baseline scenario. The purpose of the project activity with a description of three scenarios is included in A.2 of the PDD. The project reduces greenhouse emissions through generating electricity without emitting greenhouse gas to atmosphere which is elaborately explained in the PDD.	The revised PDD provides a concise description regarding the baseline situation and how emission reductions are achieved. CL 1 is closed.
CL 2: The project location provided by the PDD contradicts with information given by the PDR, and the coordinates are incorrect.	4.1	The coordinates for the project are revised to be consistent with the PDR.	The project location has been clearly indicated in the PDD according to the PDR. CL 2 is closed.
CL 3: How the proposed project activity reduces greenhouse gas emissions	4.3	Before the Project, an equal amount of electricity is imported from CCPG dominated by fossil-fired power plants, which is also the baseline scenario.	Technological details of the project including the reservoir and power connection to the grid have been clearly

making reference to the scenarios, emission sources and gases, and equipment lifetime should be explained in section A.4.3 of the PDD accordance to the requirements of the latest version of PDD Guideline.		Furthermore, more details on dam, reservoir, turbine and generators and how the generated power will be connected to the CCPG system have been provided in Section A.4.3 of the revised PDD.	explained in the revised PDD, equipment lifetime and emission sources have also been added. All provided information has been cross checked against the PDR as correct. CL 3 is closed.
CL 4: Name of participant of Annex 1 country is not consistent throughout the PDD.	5.1	The name of participant of Annex 1 country is updated as Deutsche Bank AG, London branch to in accord with LoA from The United Kingdom.	The names for the PPs have been corrected to be consistent in all documents, i.e. LoAs, MOC, PDD CL 4 is closed.
CL 5: According to the PDD Guideline, the CDM-PDD should contain the date in form of DD/MM/YYYY. Please provide a description of how this start date has been determined, and a description of the evidence available to support this start date.	7.1	The date is updated to a form of DD/MM/YYYY. The start date is 06/06/2007 which is the signed date of the main equipment purchase contract, and is the earliest date at which either the implementation or construction or real action of a project activity begins. Therefore, according to Glossary of CDM terms, 6 June 2007 is considered as the start date of the project. The description of the start date is included in the PDD.	The date format has been changed to be in line with the PDD guideline and a brief description of the starting date 06/06/2007 as the signed date of the main equipment purchase contract after the date in Section C.1.1. CL 11 is closed.
CL 6: The PDD does not address the reasons why the benchmark is applicable to the proposed project. Clarification is requested.	7.10	The project adopts <i>Economic Evaluation Code for Small Hydropower Project (SL16-95)</i> which indicates a benchmark of 10% as a reference. The project is located in a rural area and its capacity is under 50MW, which meets SL16-95's requirements. Therefore, the project applied a benchmark of 10%.	The regulation <i>Economic Evaluation Code for Small Hydropower Project (SL16-95)</i> has been included in the revised PDD, which indicates the benchmark of 10% is correctly selected. CL 6 is closed.
CL 7: The operation period adapted for the IRR calculation is 20 years (excluding four year of construction period). However, the project lifetime stated in TableB-3 and C.1.2. of the PDD is 24 years, please revise the PDD to keep consistency.	7.16	The operational lifetime which is 20 years is corrected in the PDD according to the PDR.	The operational life time of 20 years has been revised to be consistent with the PDR. CL 7 is closed.
CL 8: Corporate tax rate (income tax) is stated as stepwise in the PDD as following: zero for the first 3 years, 16.5% for the 4 th and 5 th year, and 33% for the rest of years. However, no relevant information can be found in the PDR and the IRR calculation. Clarification is requested.	7.20	Corporate tax rate was wrongly indicated in the PDD. Actual corporate tax rate which is 33% (see Page 13-4 of the PDR) is added into PDD.	A 33% income tax rate has been included in the revised PDD, which is checked as correct and consistent with the PDR. CL 8 is closed.
CL 9: The Annual Net Output in the PDD is 184,986.2MWh, however, the parameter is 165,513.9 MWh according to the PDR. Please explain how the net electricity output is calculated.	7.28	The PDD has been corrected to be consistent with the PDR. It has been described in A.4.3 that the Project will generate an annual electricity output of 199,294.1MWh, of which 165,513.9MWh will be delivered to power grid. 85% of effective coefficient is explained in Table B-3. According to SL16-95, effective power production rate for a daily regulation ability hydropower connected to power grid is ranged from 0.80 to 0.90, thus 0.85 chosen by the design institute is reasonable. Please see PDD page 11, footnote 5.	Electricity gross output and net electricity supplied to the grid have been revised to be consistent in the PDD. The explanation on the selection of 85% effective coefficient has been included in the PDD. 85% is selected in the PDR which has been prepared by an independent third party Design Institute. Please see detailed assessment in section 3.5 of this report. CL 9 is closed.

CL 10: The PDD states that the crediting period is expected to start on 01/10/2010, please reconsider it to accommodate with the most likely date that the project start to generate GHG emission reductions.	8.20	The crediting period is revised and is stated as 01/04/2011 to 31/03/2018.	The crediting period has been revised to be realistic. CL 10 is closed.
CL 11: The monitoring plan described in B.7.2 of the PDD is unclear in meter system and troubleshooting procedure, "two back-up meters" are mentioned in the PDD but not included in the metering diagram. Besides, please specify meter calibration interval.	9.3	The monitoring plan in the PDD has been updated to clearly describe the meter system, M2 will act as the main meter and M1 will be its back-up. Both meters will be calibrated annually..	The monitoring plan is revised to clarify the metering system and calibration interval. This is assessed feasible in the project design and sufficient to ensure that the emission reductions can be accurately monitored and verified. CL 11 is closed.
CL 12: The impacts on ecology and resettled people and corresponding mitigation measures should be described in more detail according to the EIA.	11.4	The conclusion of the EIA has been updated according to the EIA. Impacts on ecology and resettled people are described thoroughly. Mitigation measures for environmental impacts and resettlements are also included.	The conclusion of the EIA has been more clearly presented in the PDD according to the EIA, and no significant impact was identified. CL 12 is closed.
CL 13: However, how the stakeholders were invited for consultation is not clearly described in the PDD. And the date of the stakeholder consultation meeting given in the PDD is wrong. Please clarify the stakeholder consultation in more detail.	12.2	The stakeholder consultation process is described in more detail in the revised PDD. And the date of stakeholder consultation meeting has been corrected.	Information of stakeholder consultation process has been checked against the documented evidences as consistent, local stakeholders have been actively invited for consultation. CL 13 closed.

Forward Action Requests	Reference to checklist question	Summary of project participants' response	Final conclusion
No forward actions are raised			

Minor Issues	Reference to checklist question	Summary of project participants' response	Final conclusion
No minor issues are raised			