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VALIDATION REPORT

HUITONG COUNTY GAOYONGDONG HYDROPOWER DEVELOPMENT CO. LTD.

VALIDATION OF

CHINA HUNAN GAOYONGDONG SMALL HYDROPOWER PROJECT

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REPORT NO. 01 997 9105043949

REVISION NO. 04

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CDM Validation Report Template
Version 5.0, November 2006

VALIDATION REPORT

Date of first issue: 18th December 2007	Project No.: 01 997 9105043949	*TÜV Rheinland Japan Ltd.* *Shin Yokohama Daini Center Bldg., 3-19-5, Shin Yokohama Kohoku-ku, Yokohama 222-0033*
Approved by: Dr. Manfred Brinkmann	Organisational unit: Energy and Environment Technol. Industrial Services	
Client: Carbon Asset Management Sweden AB	Client ref.: C/o Mr. Christer Holmgren	Certificate Number 01 997 9105043949

Project Name: China Hunan Gaoyongdong Small Hydropower Project
Country: P.R. China
Methodology: AMS-I.D.
Version: 12
GHG reducing Measure/Technology: Hydropower
ER estimate: 30,178 tCO_2e/a

Size
☐ Large Scale
☒ Small Scale

Validation Phases:
☐ Desk Review
☐ Follow up interviews
☒ Resolution of outstanding issues

Validation Status
☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

In summary, it is TÜV Rheinland's opinion that the China Hunan Gaoyongdong Small Hydropower Project in P.R. China, as described in the revised PDD of 24th July 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AMS-I.D. (Version 12). TÜV Rheinland thus recommends for registration of the project as a CDM project activity with the UNFCCC.

Report No.:	Date of this revision:	Rev. No.
01 997 9105043949	30th December 2008	04

Report title:
China Hunan Gaoyongdong Small Hydropower Project

Work carried out by:
- Wai Kwok Wong
- Wilfred Chan
- Roy Fan

Work verified by:
- Dr. Manfred Brinkmann

Indexing terms

Climate Change
Kyoto Protocol
Validation
Clean Development Mechanism
Small-scale Hydropower Project

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Abbreviations

Explain any abbreviations that have been used in the report here.

BE	Baseline Emission
BM	Build Margin
CAM	Carbon Asset Management Sweden AB
CAR	Corrective Action Request
CCPG	Central China Power Grid
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CM	Combined Margin
CO_2	Carbon Dioxide
CPI	Consumer Price Index
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
DRC	Development and Reform Commission
EB	Executive Board
EIA	Environmental Impact Assessment
EPB	Environmental Protection Bureau
ER	Emission Reduction
ERPA	Emission Reduction Purchase Agreement
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse Gas
GWh	Giga Watt Hours
HCG	Huitong County Gaoyongdong Hydropower Development Co. Ltd.
HHHI	Hunan Huaihua Hydroelectric Investigation and Design Institute
HNCDM	Hunan CDM Project Service Center
I	Interview
IM	Interim Measures for Operation and Management of CDM projects
IETA	International Emissions Trading Organisation
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
kW	Kilo Watt
kWh	Kilo Watt Hours
L	Leakage
LoA	Letter of Approval
LoI	Letter of Intent
MoV	Means of Verification
MW	Mega Watt
MWh	Mega Watt Hours
NC4	National Coordination Committee on Climate Change
NDRC	National Development and Reform Commission
NGO	Non Government Organisation
NO_x	Nitrogen Oxides
O&M	Operation & Maintenance
ODA	Official Development Assistance
OM	Operating Margin
OSV	On Site Visit
PDD	Project Design Document
PDR	Preliminary Design Report
PE	Project Emission
RPI	Retail Price Index

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SA	Sensitivity Analysis
SItC	Supplier Information to Client
SO_2	Sulphur Dioxide
STHS	Stakeholder Survey
t	Tonne
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added Tax

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TABLE OF CONTENTS

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1 EXECUTIVE SUMMARY – VALIDATION OPINION

The audit team of TÜV Rheinland Japan Ltd., TÜV Rheinland Group (TÜV Rheinland) has performed a validation of the "China Hunan Gaoyongdong Small Hydropower Project" in P.R. China on the basis of UNFCCC criteria for small-scale Clean Development Mechanism (CDM) projects according to Article 12 of the Kyoto Protocol and subsequent decisions of the CDM Executive Board with regard to CDM modalities and procedures and the application of approved methodologies. The validation report and the validation protocol are summarizing the findings of the validation.

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The review of the project design documentation and the subsequent follow-up interviews have provided DOE with sufficient evidence to determine the fulfilment of stated criteria.

The validation was executed in the following steps so far:

- Public stakeholder comment process (21st October to 19th November 2007)
- Desk review of preliminary PDD (Version 1, 30th September 2007)
- On-site visit with stakeholder interviews (28th to 30th November 2007)
- Issue of checklist with corrective action requests (CARs) and clarification requests (CLs) and the draft validation report & protocol
- Desk review of revised PDD (Version 04, 24th July 2008)
- Review of proposed corrections and clarifications
- Issue of the final validation report & protocol

The host country is P.R. China. The Letter of Approval (LoA) of voluntary participation, including confirmation by China's DNA – National Development & Reform Commission (NDRC) (Document no.: 743), that the project assists them in achieving sustainable development, has been issued in December 2007.

The project activity is bilateral CDM-project, with Sweden identified as the Annex I party. The LoA from Sweden has also been issued on 15th January 2008.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards China. It is also reflected from the Sweden LoA that the Sweden DNA confirms that "*public funding is not used for the purchase of Certified Emission Reductions from the Project*".

The project correctly applies AMS-I.D./Version 12 – "Grid connected renewable electricity generation", in connection with ACM0002/Version 06 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

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This report summarizes the results of the document review, background investigation, follow-up interviews with local stakeholders and the staff at the project site during the visit to the project. This process enabled the team to conduct a risk-based review of material issues with impact on future claims of the emission reduction from the project activity. The concerns thereof, in the form of validation findings have been registered in the Validation Protocol.

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By generating renewable energy from clean hydro resource, which displace grid electricity, the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 30,178 tCO_2e per year over the selected 7-year renewable crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate monitoring procedures have been implemented according to the monitoring methodology AMS-I.D./Version 12. Training plan is available and the training programme was provided by the manufacturers and another currently operating hydropower station (i.e. Langjiang Power Station (24MW)) since September 2007.

The project proponent has resolved all Corrective Action Requests and Clarification Requests as stated in the first Validation Report and the Validation Protocol, which has resulted in a revision of the PDD. In the opinion of TÜV Rheinland the China Hunan Gaoyongdong Small Hydropower Project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AMS-I.D./Version 12. Therefore, TÜV Rheinland requests the registration of the "China Hunan Gaoyongdong Small Hydropower Project" as a CDM project activity.

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2 INTRODUCTION

Carbon Asset Management Sweden AB (CAM) has commissioned the audit team of TÜV Rheinland to perform a validation of the China Hunan Gaoyongdong Small Hydropower Project (hereafter called "the project"). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the small-scale 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.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology. The validation team has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

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3 METHODOLOGY

The validation consists of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation:

/1/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): Validation and Verification Manual.

http://www.ieta.org/ieta/www/pages/index.php?IdSitePage=200

/2/ UNFCCC, AMS-I.D./Version 12, "Grid connected renewable electricity generation", EB33

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/3/ UNFCCC, Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities, 28th November 2005

/4/ UNFCCC, ACM0002/Version 06, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", 19th May 2006

/5/ UNFCCC, "Simplified modalities and procedures for small-scale clean development mechanism project activities"

/6/ Project Design Document (PDD), version 1, 30th September 2007

/7/ Project Design Document (PDD), Version 04, 24th July 2008

/8/ The National Development and Reform Commission of The People's Republic of China (i.e. China DNA), Letter of Approval (Document no.: 743), December 2007

/9/ Swedish Energy Agency (i.e. Sweden DNA), Letter of Approval, 15th January 2008

/10/ Hunan Huaihua Hydroelectric Investigation and Design Institute, Preliminary Project Design Report (PDR), June 2005

/11/ Hunan Huaihua Hydroelectric Investigation and Design Institute, Document proof for Expansion of installed capacity of Gaoyongdong hydropower project, 10th September 2005

/12/ Huaihua Environmental Protection Science Research Institute, Environmental Impact Assessment (EIA) Report, October 2005

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/13/ Huaihua Municipal Water Resource Bureau, Approval of Preliminary Design Report (PDR) (Ref no.: HuaiShuiDianZi [2005] (87)), 21st July 2005

/14/ Huaihua Municipal Development and Reform Commission, Approval of FSR (Ref no.: HuaiFaGaiNeng [2005] (6)), 15th March 2005

/15/ Huaihua Municipal Environmental Protection Bureau, Approval of EIA Report (Ref no.: HuaiHuanHan [2005] (144)), 28th November 2005

/16/ Huaihua Municipal Ministry of Water Resources, Approval of water resources assessment (Ref no.: HuaiShuiZhengZi [2005] (98)), 8th August 2005

/17/ People's Government of Hunan Province, Approval of land acquisition (Ref no.: [2006] ZhengGuoTuZi (1529)), 20th December 2006

/18/ Huitong County Surveying and Mapping Bureau, Land Survey Report (Ref no.: 006-001), 25th December 2005

/19/ Huaihua Municipal Water Conservancy Administration, Approval licence of construction commencement (Ref no.: HuaiShuiDian [2005] ShiXu (039)), 28th September 2005

/20/ Hunan Huaihua Power Bureau, Grid connection agreement (Ref no.: HH2007011), 10th April 2007

/21/ Hunan Huaihua Power Bureau, Power Purchase Agreement (PPA), 10th April 2007

/22/ China Construction Bank (Huitong Branch), Bank loan approval contract, 24th January 2006

/23/ China Construction Bank (Huitong Branch), Written confirmation on consideration of CDM revenue during assessment of loan application, 5th December 2007

/24/ Jiangxi Dongyuan Electric Facility Co. Ltd., Installation contract of water turbines (model no.: HLA551-WJ-82) & generators (model no.: SFW3200-8/1730), 10th September 2005

/25/ Jiangxi Dongyuan Electric Facility Co. Ltd., Technical specification, operation & maintenance manual of water turbines (model no.: GD008-WZ-275), December 2005

/26/ Huitong County Shengheng Electrical Engineering Co. Ltd., Maintenance service contract, 6th July 2007

/27/ Hunan Shenneng Certified Public Accountants Co., Ltd., Financial Audit Report 2006 (Ref no.: XiangNengSuoShenZi [2007] (055)), 24th January 2007

/28/ Huitong County Gaoyongdong Hydropower Development Co. Ltd., Business registration licence (licence no.: 4300002007625), 10th January 2006

/29/ Huitong County Gaoyongdong Hydropower Development Co. Ltd., Organization chart

/30/ Hunan Huaihua Hydroelectric Investigation and Design Institute, Master project layout

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plan (Ref no.: GaoDian-ZongBu-01), October 2005

/31/ Hunan Donggang Construction Co. Ltd., Project construction contract (Contract no.: GYD-TJ/001), 28th September 2005

/32/ Huitong County Gaoyongdong Hydropower Development Co. Ltd., Approval of construction commencement, 3rd January 2006

/33/ Huitong County Gaoyongdong Hydropower Development Co. Ltd. and Sci. & Tech. Information Institute of Hunan, CDM development agreement, 17th September 2005

/34/ Huitong County Gaoyongdong Hydropower Development Co. Ltd. and Hunan CDM Project Service Center, CDM service contract, 16th November 2005

/35 Huitong County Gaoyongdong Hydropower Development Co. Ltd. & Carbon Asset Management Sweden AB, Purchase agreement of Certified Emission Reduction (CER), 30th September 2007

/36/ Huitong County Gaoyongdong Hydropower Development Co. Ltd. & Carbon Asset Management Sweden AB, Supplementary purchase agreement of Certified Emission Reduction (CER), 31st October 2007

/37/ Huitong County Gaoyongdong Hydropower Development Co. Ltd. & affected local residents, Land lease agreements (3 nos. of sample verified by audit team)

/38/ Huitong County Gaoyongdong Hydropower Development Co. Ltd. & Huitong County Land Acquisition & Resettlement Management Office, Agreement on land acquisition and compensation arrangement, 8th January 2007

/39/ Project financial calculation worksheet

/40/ Project GHG emission calculation worksheet

/41/ Office of National Coordination Committee on Climate Change, Baseline emission Factor Calculation Result of China Grids, 9th August 2007

http://cdm.ccchina.gov.cn/web/NewsInfo.asp?NewsId=1890

/42/ General Office of State Council, Notice on strictly prohibiting the installation of thermal power units with capacity of 135MW or below (Ref no.: GuoBanFaMingDian [2002] (6)), 15th April 2002

/43/ Ministry of Water Resources in P. R. China, Economic Evaluation Code for Small Hydropower Projects (Ref no.: SL16-95), 2nd June 1995

http://www.cws.net.cn/guifan/bz/sl16-95/

/44/ Ministry of Water Resources in P. R. China, Hydroenergy design code for small hydro power projects (Ref no.: GB50071-2002), 1st March 2003

/45/ Department of Industry and Transport Statistics, National Bureau of Statistics & Energy Bureau, National Development and Reform Commission, People's Republic of China, China Energy Statistical Yearbook 2004 to 2006

/46/ China Electric Power Yearbook Editorial Board, China Electric Power Yearbook 2001 to 2006

/47/ Hunan Provincial Price Bureau, Tariff document (Ref no.: XiangJiaZhong [2004] (114)), 4th August 2004

/48/ Ministry of Water Resources of China, Notice of Current Effective Technical Standards of Water Resources (Ref. no.: [2006] (5)), 9th September 2006

3.2 Follow-up Interviews with Project Stakeholders

Identify any personnel who have been interviewed and/or provided additional information to the presented documentation.

	Name	Organization	Title
/i/	She Xuexi	Huitong County Development and Reform Commission	Deputy Director
/ii/	Ming Weide	Huitong County Environmental Protection Bureau	Deputy Director
/iii/	Gong Qunxin	Huitong County Land and Resource Bureau	Deputy Director
/iv/	Fan Shijian	Huitong County Water Resource Bureau	Director
/v/	Xie Qijiang	Huitong County Water Resource Bureau	Supervisor
/vi/	Li Yatao	Huitong County Power Supply Company	Deputy Director
/vii/	Wang Jie	China Construction Bank (Huitong Branch)	Deputy Director
/viii/	Liu Liangmei	Huitong County Taxation Bureau	Deputy Director
/ix/	Xiao Li	Huitong County Gaoyongdong Hydropower Development Co. Ltd.	General Manager
/x/	Chen Minggang	Huitong County Gaoyongdong Hydropower Development Co. Ltd.	Deputy General Manager
/xi/	Long Haihua	Huitong County Gaoyongdong Hydropower Development Co. Ltd.	Operation Supervisor
/xii/	Li Feng	Hunan CDM Project Service Center	Project Officer
/xiii/	Xiang Taijin	Huitong County, Gaoyong Village	Villager
/xiv/	Tian Zhongliang	Huitong County, Gaoyong Village	Villager

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Table 1 Interview topics

	Date	Organization	Topic
/1/	28th November 2007 to 30th November 2007	Huitong County Gaoyongdong Hydropower Development Co. Ltd. (HCG)	➢ Project design ➢ Project related legal issues ➢ Technical equipment ➢ Sustainable development issues ➢ Additionality ➢ Crediting period ➢ Monitoring plan ➢ Training history ➢ Management system ➢ Environmental impacts ➢ Stakeholder process ➢ Approval by the host country
/2/	28th November 2007 to 30th November 2007	Hunan CDM Project Service Center (HNCDM)	➢ Project design ➢ Technical equipment ➢ Sustainable development issues ➢ Baseline determination ➢ Additionality ➢ Crediting period ➢ Monitoring plan ➢ Management system ➢ Environmental impacts ➢ Stakeholder process ➢ Approval by the host country
/3/	29th November 2007 to 30th November 2007	Hunan / Huitong Municipality & Local Community	➢ Project design ➢ Project related legal issues ➢ Project status ➢ Sustainable development issues ➢ Environmental impacts ➢ Stakeholder process ➢ Issues affecting the local community ➢ Approval by the local governments

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to TÜV Rheinland's positive conclusion on the project design. In order to ensure transparency a validation protocol is customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. 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.

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The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the China Hunan Gaoyongdong Small Hydropower Project is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

i) mistakes have been made with a direct influence on project results;
ii) CDM and/or methodology specific requirements have not been met; or
iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

A revised version of the PDD, Version 04 of 24th July 2008, has been submitted to the audit team for final validation, which is revised based on the first validation report and the issued corrective action requests and clarification requests. The major changes include: project location more accurate; starting dates of project activity & crediting period amended; project history included; baseline discussion on Alternative 3; approach of conducting sensitivity analysis with annual operation hours and annual O&M cost included; monitoring plan revised; background information of stakeholder questionnaire, etc.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities		
Requirement	***Reference***	***Conclusion***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the small-scale PDD template, version 03 - in effect as of: 22 December 2006. Each section is then further sub-divided.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **corrective action request (CAR)** due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Validation conclusion***
If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Validation protocol tables

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3.4 Internal Quality Control

The validation report including the validation findings underwent a technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for CDM validation and verification.

3.5 Validation Team

Role/Qualification	Last Name	First Name	Affiliation of Team Members
Team Leader MSc, BEng	Wong	Wai Kwok	TÜV Rheinland Hong Kong Ltd.
CDM Auditor MSc, BSc	Chan	Wilfred	TÜV Rheinland Hong Kong Ltd.
CDM Auditor MSc, BSc	Fan	Roy	TÜV Rheinland Hong Kong Ltd.
Internal Reviewer PhD	Brinkmann	Manfred	TÜV Rheinland Japan Ltd.

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4 VALIDATION FINDINGS

The findings of the validation related to the revised PDD are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design shall be documented and described in the validation report, where the corresponding responses shall be reflected in the revised and resubmitted project design documentation.

4.1 Participation Requirements

The project participant is Huitong County Gaoyongdong Hydropower Development Co. Ltd. (HCG) from P.R. China, and Carbon Asset Management Sweden AB (CAM) from Sweden, where the host party and Annex I country meet all relevant participation requirements in CDM.

The Letter of Approval (LoA) /8/ (Document no.: 743) has been issued by the DNA of P.R. China – National Development & Reform Commission (NDRC) in December 2007 for authorizing HCG as project participant and confirming that the project contributes to China's sustainable development.

The proposed project is a bilateral CDM-project, with Sweden identified as the Annex I party. The LoA from Sweden /9/ has also been issued on 15th January 2008.

The project does not receive any public funding, according to Annex 2 of the PDD. The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China. It is also reflected from the Sweden LoA that the Sweden DNA confirms that "*public funding is not used for the purchase of Certified Emission Reductions from the Project*". The project funding is reported to be raised from internal accrual and loans from bank, i.e. China Construction Bank (Huitong Branch). Bank loan approval contract /22/ dated 24th January 2006 is available for audit team's inspection to be valid. The audit team also checks a written confirmation /23/ from China Construction Bank (Huitong Branch) dated 5th December 2007 and found that CDM revenue has been considered during the loan application assessment in September 2005. It is the bank's view that the proposed project has a high chance to be registered as CDM project and get the CDM revenue support for relieving the financial burden of the proposed project.

4.2 Project Design

The "China Hunan Gaoyongdong Small Hydropower Project" is a run-of-river type hydropower project involves the construction of a grid-connected hydropower plant with 8.8MW nominal generating capacity. The project owner is Huitong County Gaoyongdong Hydropower Development Co. Ltd. (HCG). The proposed project is located in Qushui River, which is a branch of Yuanshui River, Lianshan Town, Huitong County, Huaihua City, Hunan

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Province, P. R. China. The project-specific geographical coordinates is East Longitude 109°43'26" and North Latitude 26°49'07", which is checked by the audit team to be accurate.

The proposed project comprises 4 units of 2.2 MW rated output water turbines (model no. GD008-WZ-275) and 4 units of generator sets (model no. SFW2200-36/3250). All equipments of the project are supplied by domestic manufacturers with no foreign technology transferred from abroad. The total installed capacity is 8.8MW and the net power supply is 30,951 MWh per year (where the nominal power output is 32,580 MWh, i.e. 5% captive power consumption and transmission line loss). The annual utilization hour for power generation is 3,702 hours. The estimation of power generation is in accordance with the Preliminary Design Report (PDR) which follows the National Standard (Ref no.: GB50071-2002), namely 《*Hydroenergy design code for small hydro power projects*》 /44/. The electricity generated from the proposed project is expected to substitute the power from Central China Power Grid (CCPG) which is mainly composed of fossil fuel-fired power plants. The expected GHG emission reduction of the proposed project is 30,178 tCO_2e per annum over the next 7 years.

A "Grid connection agreement" /20/ for connection of local power grid with the power generation system of the proposed project has been signed with Hunan Huaihua Power Bureau on 10th April 2007 (Ref no.: HH2007011), and the Power Purchase Agreement (PPA) /21/ has also been signed by the aforesaid two parties in April 2007 for contractual arrangement of power purchase. Both documents are available for audit team's checking during on-site visit to be valid.

The CER buyer, i.e. Carbon Asset Management Sweden AB (CAM), has signed the agreements of CER purchase /35/ with the project owner on 30th September 2007. The assumed CER price is adopted by the project proponent in carrying out the financial analysis. The document is available for inspection by the audit team to be valid.

The proposed technology was approved as part of the Preliminary Design Report (PDR) in 2005 and the project design engineering reflects a current good practice in promoting the use of renewable energy, as well as contribution to sustainable development in China. The project is considered to be contributing to sustainable development in the host country (P.R. China), by on one hand utilizing the renewable hydro resources available in the project region for power generation, and on the other hand eliminating the environmental pollution caused by operation of fossil fuel-fired plant. In addition to CO_2 emission reductions, the project would mitigate other pollutants, such as SO_2, NO_x and particulates associated with power generation from fossil fuel. Several more benefits would be expected by implementation of the proposed project, which includes improvement in the local electricity generation, the local traffic, economy, overall social development and local employment condition. New employment opportunities are created during the project construction and operation phase. During on-site visit, the audit team has interviewed with the general manager of the proposed project (Mr. Xiao Li) and confirmed that a total of 15 numbers of new employment opportunities have been created according to the employment plan stipulated in the PDR (p.151, Section 14.2 – Project Management), which includes power plant management staff (4 nos.), operators (8 nos.) & servicing & security staff (3 nos.). They are mainly responsible for daily operation of the power station, data monitoring, regular system maintenance, emergency team and administrative works, etc. Besides, additional tax income induced from the sale of electricity

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shall be resulted to the local government. As confirmed by the local government officials from Huitong County Development & Reform Commission during on-site interview, sustainable development in social, environmental and economic aspects can be achieved by implementation of the proposed project.

During the site interview with HCG's management representative, it is understood that HCG, with assistance provided by the Hunan CDM Project Service Center (HNCDM), is responsible for organizing the necessary training for the operation, maintenance and monitoring of CDM implementation. Operational staffs with relevant professional qualification and education background are employed for the power plant operation. The project-specific training programme was provided by the manufacturers and another currently operating hydropower station (i.e. Langjiang Power Station (24MW)) since September 2007.

The Operation Manual and Maintenance Manual, which are prepared by HCG, are available during on-site audit for inspection.

Consideration of CDM income as important part of the project was demonstrated in the PDR (p.171, Section 17 – Project Economic Assessment) that the registration as CDM project could assist in building up the project revenue through selling of the CERs and turning the project to be financial viable. The PDR was prepared by the Hunan Huaihua Hydroelectric Investigation and Design Institute (HHHI) in June 2005, and was approved by the Huaihua Municipal Water Resources Bureau (Ref no.: HuaiShuiDianZi [2005] (87)) on 21st July 2005 /13/. HHHI attains the Class II consulting qualification granted by the State, and is a company under the NDRC specialized in new energy engineering consultation and industrial analysis.

The physical construction of the proposed project has been commenced in October 2005. As observed during on-site visit, the main project construction work and installation of main equipments, incl. water turbines and generator sets, have been substantially completed. The 4 nos. of power generation units has subsequently started for trial run since May 2007 and the full-scale power generation shall be expected in early-2008.

According to the PDD, a renewable crediting period of 7 years is selected. The starting date of project activity is 10th September 2005 (i.e. signing date of key equipment purchase agreement), while the starting date of crediting period is 1st October 2008, or the date of registration as CDM project activity (whichever later). The expected operational lifetime of the project activity is 30 years.

As indicated during the on-site interview with the management representative, HCG has taken into account the financial analysis in the PDR for considering CDM incentive and began to focus on the CDM development and studied the possibility in applying for CDM support since Year 2005. The audit team is able to check the supporting documents as below:-

Date	Evidence document
June 2005	PDR /10/

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17th September 2005	CDM development agreement signed with Sci. & Tech. Information Institute of Hunan /33/
16th November 2005	CDM service contract signed with HNCDM /34/
5th December 2007	Written confirmation on consideration of CDM revenue during assessment of loan application (in September 2005) signed by China Construction Bank (Huitong Branch) /23/

By checking the above listed documents, it can be verified by the audit team that the incentive from the CDM was seriously considered in the decision to proceed with the project activity. It is clearly demonstrated that the CDM has been seriously considered since June 2005, which is prior to the project starting date on 10th September 2005.

4.3 Baseline Determination

The project applies the approved simplified baseline methodology for small-scale CDM project activities AMS-I.D./ Version 12 titled "Grid connected renewable electricity generation", which is available to be applied since EB33. The use of this methodology is considered appropriate as the project activity involves electricity generation for a grid through hydro sources where the output is below the threshold of 15MW. The baseline is the emission reduction occurring due to electricity generation through a fuel-fired power plant connected to the grid, i.e. CCPG.

The project boundary is clearly defined as the physical, geographical site of the renewable generation source, which comprise the project site and the grid electricity system boundary which is defined as the CCPG including the Henan, Hubei, Hunan, Jiangxi, Sichuan provincial grids & Chongqing municipal grid, on the basis of information announced by NDRC /41/ on 9th August 2007. There are no significant transmission constraints between the power plants of the CCPG.

Applicability criteria for the baseline methodology are assessed by the audit team by means of document review and interview. It is agreed in the audit team's opinion that the proposed project fully met the criteria as described below:-

- The proposed project is a run-of-river type hydropower project which generates electricity by utilizing the renewable hydro resource, which supplies electricity to and displaces electricity from the connected grid, i.e. CCPG. CCPG mainly comprises fossil fuel-fired power plants which bears lot more than one fossil fuel-fired generating unit;
- The total installed capacity of the proposed project is 8.8MW, which is below the threshold of 15MW for small-scale CDM project;

There is no registered small-scale project activity under the CDM or an application to register another CDM small-scale project activity under the CDM by the project proponent within the previous two years with the same project category and technology within 1 km of the project boundary of the proposed project. This is confirmed by the audit team during on-site

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interview with the relevant government officials (namely Mr. Fan Shijian (local Water Resource Bureau) /i/, Mr. She Xuexi (local Development & Reform Commission) /iv/, & Mr. Li Yatao (local power supply company) /vi/), who all indicated that the proposed project is the 1st hydropower project being developed by the project proponent and the nearest hydropower plant is located at least 5 km away from the proposed project power plant. In addition, the audit team is able to check up with the UNFCCC website and identify no other hydropower project being developed by the project proponent. Therefore, the proposed project is confirmed not deemed to be a de-bundled component of a large project activity.

It is illustrated in the PDD that the baseline scenario is selected from evaluation of alternatives. A numbers of plausible alternatives to the project activity have been identified as follows:-

Alternative 1 – The project activity not undertaken as CDM project activity;

Alternative 2 – Construct a fossil fuel-fired power plant with equivalent annual electricity generation;

Alternative 3 – Construct a renewable power plant with equivalent annual electricity generation; &

Alternative 4 – Get equivalent electricity supply from the CCPG annually.

These alternatives are described in a transparent manner in the PDD and only Alternative 4 was considered feasible and could be realistic. The audit team has verified the justification for the barriers faced by the alternatives and is described as follows:-

Alternative 1 – The audit team has checked up with the IRR calculation and observed in the spreadsheet that a project IRR of 7.61% shall be resulted from the proposed project without CDM income. While the benchmark IRR for construction material industry is 10.0%, according to the authoritative financial analysis reference – "Economic Evaluation Code for Small Hydropower Projects" (Ref no.: SL16-95), the project could not demonstrate its financial attractiveness to potential investor. Please refer to Section 4.4 for details.

Alternative 1 is therefore not feasible.

Alternative 2 – For construction of fossil fuel-fired power plants, it is prohibited by the <Notice on strictly prohibiting the installation of thermal power units with capacity of 135MW or below> released by State Council on 15th April 2002 (Ref. No.: GuoBanFaMingDian [2002] (6)) and <Temporary rules on construction management of small-scale thermal power units> released by State Council in August 1997 for strictly controlling the construction of thermal power plants with capacity under 100MW.

It is also confirmed by the local government officials from Huitong County Development and Reform Commission during stakeholder interview and is concurred by the audit team that construction of a fossil fuel-fired power plant with equivalent annual electricity generation, i.e. 8.8MW, is legally not feasible in P. R. China.

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Alternative 2 is therefore also not feasible.

Alternative 3 – By referring to the information references provided by the project proponent sourced from <Energy Dictionary> p.392 (i.e. China solar energy distribution)[1] & p.413 (i.e. China wind energy distribution)[2], it is agreed by the audit team that the project location is lack of solar and wind resource for power generation in a similar project scale. Where there is also no utilizable geothermal resource available locally according to the information source from Energy Management Net [3], such power generation development is also not feasible.

The audit team can also confirm by referring to the document[4] released by the Ministry of Agriculture of P.R. China dated May 2007, that the biomass power generation technology is still relatively immature in China and the development cost is rather high. In addition, there is no reasonably effective encouragement policy from the State for promoting long-term biomass power generation development in the aspects of project finance, marketing or even the relevant legal system. All in all, the biomass energy development is not readily feasible unless special financial aid is present.

Besides, the audit team has also confirmed with the Deputy Director of Huitong County DRC, i.e. Mr She Xuexi /i/, during on-site interview that the development cost in Hunan Province in solar PV power generation is high and not attractive in view of business development. And due to the inadequate wind and biomass resource for power generation, wind and biomass power plant could not provide comparable output as the proposed project does. Based on the abovementioned, it is therefore concurred by the audit team that the development of other sources of renewable energy is not feasible.

Alternative 3 is therefore also not feasible.

Alternative 4 – There is no barrier in legal, financial, technical or any other aspects.

The most likely baseline scenario then remains to import electricity from the grid, i.e. Alternative 4, in which the power output equivalent to the proposed project generates would be supplied by CCPG where the proposed project is connected to. This alternative does not face any prohibitive barrier and be accepted as the baseline scenario.

This is reflected in the combined margin (CM), i.e. the weighted average of the operating margin (OM) emission factor and the build margin (BM) emission factor. According to AMS-I.D./ Version 12, a grid emission coefficient has been developed in the PDD for the power generation baseline scenario in accordance with ACM0002/ Version 06 as a combined margin emission coefficient. According to ACM0002/ Version 06, the default weights for the proposed project of 50% OM and 50% BM have been selected. The calculation of baseline emission factors of CCPG is based on the publication of the Office of National Coordination Committee on Climate Change (NC4), which is the subordinate of NDRC. Details will be further discussed in Section 4.6 – Calculation of GHG Emission.

[1] Energy Dictionary, Page 392 - China solar energy distribution
[2] Energy Dictionary, Page 413 - China wind energy distribution
[3] Energy Management Net, Current development of geothermal energy in China, http://www.wesharer.com/html/xuejie/20070905/1059.html
[4] Ministry of Agriculture of P.R. China, Development Plan of Agricultural Biomass Power Generation (2007-2015), May 2007, http://www.agri.gov.cn/xxlb/P020070705456007024820.doc

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The CCPG is dominated by coal-fired power plants, and it is considered likely that coal-fired power plants will continue to dominate the power sector due to the local availability of low-cost coal. It is expected that renewable capacity additions will not have significant effects on the mix of the CCPG during the crediting period.

The baseline determination is transparent and reasonable.

The system boundary is justified transparently and is presented as below:

	GHGs involved	Description
Baseline emissions	CO_2	Major emission source
Project emissions	--	No use of supplementary fossil fuel is noted during on-site visit. Project power density is 368.7W/m^2, i.e. larger than 10W/m^2, and project emission is thus considered as zero.
Leakage	--	Considered negligible as per AMS-I.D.

4.4 Additionality

As per AMS-I.D./ Version 12, the project proponent has provided an explanation to show that the project activity would not have occurred anyway due to the following barrier:

Investment barrier

It is noted in the revised PDD that, the application of simple cost analysis & investment comparison analysis are excluded by the project proponent from the analysis. The selection of "benchmark analysis" for project financial assessment is justified in considering that, other than CDM revenue, the proposed project would generate revenue stream through sale of electricity to the provincial grid.

The audit team is also able to check up with the applied economic analysis reference, i.e. Economic Evaluation Code for Small Hydropower Projects (SL16-95), and in which it states that "the project is financially feasible only when the IRR is above or equal to benchmark IRR. The benchmark IRR for small-scale hydropower projects (<25MW) is 10% (after tax)".

The project's PDR also refers to that same document for the application of the financial rules for IRR calculations. The PDR was prepared by the Hunan Huaihua Hydroelectric Investigation and Design Institute (HHHI), a class-II accredited entity in China for developing FSR by the Chinese Government. The PDR, being approved by the Huaihua Municipal Water Resource Bureau in July 2005, could also support that the applied assessment methodology is considerably valid. Besides, in viewing the popularity of adoption of this benchmark evaluation method in China's small hydropower industry, the application of benchmark analysis and the selected benchmark IRR is deemed appropriate for the proposed project.

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The suitability of the 10% benchmark specifically the appropriateness of a 1995 benchmark when assessing investment decisions made in 2005 has been justified by the validation team, details as below:-

The project proponent has adopted a benchmark of 10% for conducting the investment analysis. The validation team confirms that this selected benchmark is in accordance with the authoritative financial analysis reference – "Economic Evaluation Code for Small Hydropower Projects" (Ref no.: SL16-95) issued by the Ministry of Water Resources (MWR) of China (http://www.cws.net.cn/guifan/bz/sl16-95/) on 2nd June 1995 (effective as of 1st July 1995). This document stipulates a 10% benchmark for small-scale hydropower projects with

i) an installed capacity below 25MW, or
ii) an installed capacity below 50MW in rural regions.

The validation team has studied the applicability and validity of the concerned benchmark reference document, and has confirmed that with an installed capacity of 8.8MW, the proposed project falls within the range of applicability of said reference document. It was also confirmed that since the release of this benchmark reference document in 1995, no other new documents (or revised version of that reference document) were ever released for replacement. It is thus relevant and applicable as being the only existing source reference which clearly defines the expected minimum rate of returns of small hydropower projects until today.

The continued validity of the benchmark for the proposed project is supported by the fact that the reference document SL16-95 is contained in the list of existing regulations and technical standards for hydropower plants in China as stipulated in the "Notice of Current Effective Technical Standards of Water Resources (Ref. no.: [2006] (5))" (/48/), released by the MWR of China on 9th September 2006 and publicly available under http://www.mwr.gov.cn/tzgg/qt/20060926000000479251.aspx, http://www.mwr.gov.cn/tzgg/qt/images/20060926170832NVNTYU.xls (see also the Chinese Hydraulic Engineering Society (CHES): http://www.ches.org.cn/jishubiaozhun/001.asp)
Considering that the investment decision of the proposed project was made on 10th September 2005 (i.e., the project starting date when the key equipment purchase agreement was signed), it is clearly demonstrated that the reference document and thus the benchmark were indeed valid at the time of decision making.

The validation team also observed that in the Preliminary Design Report (PDR) of the proposed project, the financial analysis has also been compared against the same benchmark of 10% in accordance with the SL16-95 reference document (referable to PDR p.171, Chapter 17 – Project Financial Analysis). The PDR was approved by the Hunan Huaihua Municipal Water Resource Bureau on 21st July 2005, which adds to the fact that the benchmark of 10% is considered appropriate by the Authority in China. This benchmark is a decisive factor in China for project approval.

It may further be noted that design institutes, investors, government authorities, project owners, consultants, etc so far commonly apply this benchmark of 10% for assessing the financial viability of small hydropower projects in China. This is also reflected in the financial analysis of other similar small-scale hydropower projects in China recently registered as CDM project activities, some recent indicative examples being summarized in Table 1 below. All of these projects refer to the same benchmark reference document (Ref no.: SL16-95) and apply the 10% benchmark.

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Based on the above, the validation team confirms the continued validity of the reference document stipulating the benchmark of 10%, and thus the suitability and appropriateness of applying this benchmark in the financial analysis when making the investment decisions in the year 2005.

Table 1: Recently registered Small Hydropower Projects in China applying the 10% benchmark based on SL 16-95

Project Ref. No.	Title	Registration date	Link
2145	Hunan Yangmingshan Three Level Hydropower Project	23rd November 2008	http://cdm.unfccc.int/Projects/DB/DNV-CUK1218619447.13/view
1994	Yunnan Lincang Zhenai Hydropower Project	8th November 2008	http://cdm.unfccc.int/Projects/DB/TUEV-SUED1217947630.46/view
1831	Fujian Wuyishan Wenlin River 2nd and 3rd Level Hydropower Station	4th November 2008	http://cdm.unfccc.int/Projects/DB/RWTUV1209367988.5/view
1879	Lijiang Xinzhuhe Second Level Hydropower Project	27th October 2008	http://cdm.unfccc.int/Projects/DB/TUEV-SUED1213945335.67/view
1772	China Tuanjie Small Rundle Hydropower Project	4th December 2008	http://cdm.unfccc.int/Projects/DB/RWTUV1207557851.8/view

The selected financial parameters (input values) for IRR calculation were checked by the audit team against the source reference documents to be valid. The calculation procedure in IRR spreadsheet is also verified by the audit team, which is calculated in accordance with the PDR, against the "Economic Evaluation Code for Small Hydropower Projects (SL16-95)", and is confirmed sound and reasonable. It is reflected from the benchmark analysis that, without the revenue from CDM (i.e. Alternative 1), the project IRR would be 7.61%, which is below the benchmark of 10.0% in China for small hydropower industry, as defined within the "Economic Evaluation Code for Small Hydropower Projects (SL16-95)". Hence, the audit team concurred that the project cannot be considered as financially viable in the absence of CDM benefits, and Alternative 1 is not deemed a likely baseline scenario.

The IRR of the total investment of the proposed project would be improved in consideration of CERs revenue, where IRR of 12.29% shall be expected.

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The following is an excerpt extracted from the PDR and presents the guideline documents referenced in the investment analysis which demonstrates that the inputs values adopted for the investment analysis are in accordance with appropriate guidelines and best available market information:

1. *《Economic assessment method and parameter of construction projects》;*
2. *《Economic Evaluation Code for Small Hydropower Projects (SL16-95)》;*
3. *《Economic Evaluation Code for Hydroenergy Projects (SL72-94)》;*
4. *《Hydroenergy Design Code for Small Hydropower Projects (GB50071-2002)》;*
5. *《Budget Estimation for Hydroenergy Design & Construction in Hunan Province》;*
6. *《Budget Estimation for Hydroenergy Equipments Installation for Small & Medium-Sized Hydropower Projects》;*
7. *《Engineering Cost in Huaihua City》; & etc…*

According to EB38 meeting, the audit team considers that the period of time between the finalization of the PDR (i.e. June 2005) and the investment decision (10th September 2005) is sufficiently short that it is unlikely in the context of the underlying project activity that the input values would have materially changed. Details on how key financial input values and the IRR calculation being independently checked by the audit team are presented below:

Item	Data & Source	Remarks on Validation of Parameters
Installed capacity:	8.8MW (PDR /10/ – Chapter 17, & Document proof for installed capacity expansion /11/)	4 units of 2.2MW rated output water turbines (model no.: G008-WZ-275) Total power = 2.2MW x 4 = 8.8MW Confirmed by site inspection, i.e. checking on equipments' identity plates and equipment supply contracts
Estimated annual grid-electricity:	30,951 MWh (PDR /10/ – Chapter 17, & Document proof for installed capacity expansion /11/)	Net annual electricity supply based on 5% captive power consumption and transmission line loss to the nominal power output of 32,580MWh (PDR); The audit team is able to check up with the PDR, where it states the captive power consumption and transmission line loss is 5%. As the PDR is produced by an accredited design institute (HHHI), the value is therefore deemed credible. This adoption is further checked against SL16-95 that the proposed project, as being a run-of-river project, is eligible to adopt 0.60 to 0.70 as the effective coefficient. Therefore, the adoption of this 0.95 (i.e. 5%), a

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		commonly used value in China's hydropower industry, is considered acceptable as to demonstrate the conservative approach in the IRR calculation.
Operation hour	3,702 hr/a (PDR /10/ – Chapter 17, & Document proof for installed capacity expansion /11/)	The 3,702 hr/a of operating hours is considered reasonable as referring to the China Eletric Power Yearbook 2007 that that operating hours of Hydropower plants is 3,313hr in Hunan Province & 3,393hr in the whole State in Year 2006. The gap is considered acceptable with reasonable allowance provided for the potential shutdowns of the power plants due to lack of operating experience, and for plant maintenance.
Project lifetime applied in financial analysis:	22 years (PDR /10/ – Chapter 17; & SL16-95)	This consists of 2 year of construction phase and 20 years of operation phase. The audit team has checked with the applied financial benchmark reference, i.e. SL16-95, where it allows the application of 20 years as project lifetime in the small-scale hydropower projects' economic analysis with the benchmark being set as 10%.
Total investment:	RMB 58.26 million Yuan (PDR /10/ – Chapter 17, & Document proof for installed capacity expansion /11/)	The audit team is able to checked with the supplementary PDR that an addition investment amount of RMB 0.19 million shall be added for modifying the original 8.0MW design into the current 8.8MW design. While the original total investment is RMB 58.07 million Yuan, as indicated in the PDR, the current total investment is therefore confirmed to be RMB 58.26 million Yuan as applied in the financial analysis (i.e. 58.07 + 0.19 = 58.26). Besides, it is noted by interview with the top management of project owner during on-site visit that the overall investment would even go beyond the stated amount due to the ever-increasing labour costs.
Prospective pool purchase price:	RMB 0.30 Yuan/kWh (incl. VAT) (Tariff document from Hunan Provincial Price	Based on the official tariff document released by the Hunan Provincial Price Bureau (Ref no.: XiangJiaZhong [2004] (114)), the audit team can confirm that the

	Bureau /47/ Ref no.: XiangJiaZhong [2004] (114)	feed-in tariff is RMB 0.30 Yuan/kWh for those newly built hydropower plants with installed capacity ranged from 6MW to 15MW in Hunan Province, which is application to the proposed project with its total installed capacity of 8.8MW.
Tax:	Income tax (33%); Value added tax (17%); Construction surtax (5% of VAT); Education surtax (3% of VAT). (PDR /10/ – Chapter 17, & Relevant tax documents)	The applied tax rates are in line with the existing tax laws in China, which are checked by the audit team against the credible public information as below:-. Income tax rate – 33% (see Remark 1 below) http://opinion.people.com.cn/GB/8213/55724/55731/3881426.html Value added tax (VAT) rate – 17% http://www.gov.cn/banshi/2005-08/19/content_24733.htm Construction surtax rate – 5% of VAT http://www.gov.cn/banshi/2005-08/19/content_24817.htm Education surtax – 3% of VAT http://www.gov.cn/gongbao/content/2005/content_91662.htm [Remark 1: The known income tax rate is 33% during the time of finalization of PDR (June 2005) and decision making (10th September 2005), and the value of 33% has been applied in the IRR calculation. The audit team is able to confirm that the announcement of new income tax rate of 25% is made on 16th March 2007 and comes effective on 1st January 2008.]
Annual operational cost:	1.29 million RMB/year (PDR /10/ – Chapter 17)	The annual operational cost is calculated based on labour costs (salary & welfare), maintenance and repair expenses, etc, which does not include the initial investment costs, in accordance with the above PDR mentioned principles. All parameters were checked against the PDR (details in IRR table) and confirmed to be applied correctly. The operational cost was further reviewed during site interview with the project owner,

		where it is reported that the operational cost would be even higher than those predicted in the PDR due to the ever-increasing labour costs.

It is noted in the revised PDD that the discussion of sensitivity analysis has been carried out in the approach where it covers the justification on how unrealistic would the project IRR go beyond the benchmark under variation of four financial parameters, namely total investment, tariff, annual operation hour & annual O&M cost. From the IRR spreadsheet, the audit team notes that there shall need a fairly strong variation in those four parameters for resulting the project IRR to reach the benchmark. Respectively, variation of –16.4%, +20.5%, +20.5% & –85.5% for the mentioned four parameters shall result in the project IRR to reach the benchmark as 10.0%.

To pinpoint, the audit team has studied the ex-factory price index from the National Bureau of Statistics of China (*http://www.stats.gov.cn/tjsj/ndsj/2006/html/I0913e.HTM*) and learnt that there is an overall increase of 9.38% in the total industry products' price since 1998 to 2005. This increasing trend is considered likely to be continuing in developing country like China, and there is no sign to appear such a drastic drop to make a reduction of 16.4% in the total investment likely to happen.

For variation of tariff, it is noted that the project tariff is being determined according to the official approval by the Provincial Price Bureau. According to the tariff reform guideline document released by NDRC on 28th March 2005 (Ref no.: FaGaiJiaGe [2005] (514)) (*http://www.ndrc.gov.cn/zcfb/zcfbtz/zcfbtz2005/t20050613_6670.htm*), the tariff determination shall take into account with the consideration from the government authority and market competition information, and shall be kept moderately stable. Besides, it is also noted from a recent announcement made by NDRC that the central government came to a decision to proactively get involved into control and stabilize the national price level (including tariff) in a steady and reasonable range by means of administrative measures, e.g. pricing strategy. According to a latest control measures announced by the State Council on 14th January 2008 regarding monitoring of the price control and management (*http://www.gov.cn/ldhd/2008-01/14/content_857704.htm*), the Vice-Premier (Mr. Zeng Peiyan) proclaimed to freeze the charges of public affairs which include the tariff. Since the tariff is such a sensitive issue which is always strictly monitored and controlled by the central and local government, the audit team agrees with the argument that the tariff is considered not likely to reach +20.5% in the near future.

For variation of annual operation hour, it is mentioned in the PDD that an increase of annual operation hour would be attributed to the increased water resource brought by the rainfall precipitation. However, it is reasonable not to expect an increase in such degree throughout the project lifetime. Besides, the audit team is able to check against the China Electric Power Yearbooks (2004 to 2007) and observes that the average annual utilization hour of hydropower projects in China is 3,393hrs (3,313hrs in Hunan Province) in Year 2006; 3,664hrs (3,190hrs in Hunan Province) in Year 2005; 3,462 hrs (3,620hrs in Hunan Province) in Year 2004; and 3,239hrs in Year 2003. Considering the fairly stable utilization hours of hydropower projects, it is reasonable to believe that an increase of 20.5% (resulting [3,702hrs x (1+20.5%)] = 4,461hrs) shall not likely to be occurred.

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For variation of annual O&M cost, it can be referred to the Consumer Price Index (CPI) and Retail Price Index (RPI) released by the National Bureau of Statistics of China (*http://www.stats.gov.cn/tjsj/ndsj/2006/html/I0905e.htm*) that the annual variation of CPI & RPI are observed to be ranging from –1.4% to 24.1% and –3.0% to 21.7% respectively since 1994 to 2005. In considering also the pricing strategy recently announced by the State Council as mention above, the audit team agrees that the annual O&M cost is not likely to decrease more than 85.5%.

The above arguments have been studied by the audit team that it is concurred to be unlikely for the project IRR to reach the benchmark under variation of those four selected financial parameters. Noticeable financial barrier is therefore observed in view of the absence of CDM revenue during the project implementation and cannot still reach the benchmark.

All in all, the investment analysis and sensitivity analysis have demonstrated that the project activity is unlikely to be the most financially attractive option.

In summary, all of the above described steps are convincingly followed and demonstrated within the documentation and the interviews. The proposed project activity is proven additional through investment analysis and is not likely the baseline scenario, and has illustrated the project's necessity for CDM in order to proceed further.

4.5 Monitoring

The project activity correctly applies the approved monitoring methodology AMS-I.D./ Version 12 titled "Grid connected renewable electricity generation" for the project activity. Applicability criteria of the monitoring methodology to the project activity are met as noted in Section 4.3.

Regarding the calculation of project emissions, since the project activity utilizes hydropower for electricity generation, no auxiliary fuels will be used and it is verified by the audit team during the on-site inspection. The project emission could therefore be regarded as zero.

All power generating equipments involved in the project is newly purchased, where purchasing contracts for those equipments are checked by the audit team to be showing that the equipments are bought from the equipment suppliers. There is no transfer of equipment from another activity and the project owner did not transfer any equipment to another activity because it is a new facility. According to the AMS-I.D/Version 12, no leakage is considered and is therefore assumed as zero.

The project activity will not generate any project emission nor leakage, monitoring of project emission and leakage is not required.

The monitoring will involve metering the electricity generated by individual turbines and the emission rates of the CCPG. The combined margin emission factor is determined *ex-ante* based on the most recent information available. Monitoring of GHG emission reduction is based on measuring the net quantity of electricity supplied to the CCPG, i.e. difference

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between imported and exported electricity, which is transparently presented in the PDD. The data will be counter-verified against the selling receipt from the grid. The PDD has made provisions in B.7 for full details in monitoring the GHG emissions reduction due to the project activity.

Monitoring of sustainable development indicators is not required by the China DNA. The environmental impacts are considered minor and will be monitored by the local environmental authority during the project lifetime. The project proponent has developed a project-specific "Handbook of Monitoring and Management for Huitong County Gaoyongdong Hydropower Project", and is checked by the audit team to be valid. The monitoring plan of the proposed project includes the followings:-

- Identification of monitoring subjects;
- Establishment of operational and management structure;
- Monitoring apparatus and installment;
- Data monitoring;
- Quality Control;
- Disposing process of urgency and abnormity;
- Training programme

Detailed procedures have been developed and the implementation of these will enable subsequent verification of the project's emission reductions. The management team for monitoring of the project is identified in the PDD. Appropriate training has been provided to the management team and operation team for ensuring they are suitable and competent for carrying out the work.

4.6 Estimate of GHG Emissions

The GHG emissions calculations are transparently documented and appropriate assumptions regarding expected amount of electricity generated have been used to forecast emission reductions.

According to the selected methodology AMS-I.D./ Version 12, the emission reduction (ER_y) by the project activity during the crediting period is the difference between the baseline emissions (BE_y), project emissions (PE_y) and emissions arising from leakage (L_y), with reference to ACM0002/ Version 06.

Regarding the calculation of project emissions, since the project activity utilizes renewable hydro source for electricity generation, where no auxiliary fuels shall be used and it is verified by the audit team during on-site audit. The power density of project is 368.7W/m^2, i.e. greater than 10W/m^2, the project emission could therefore be regarded as zero.

It is noted during on-site visit that all energy generating equipments involved in the project is newly purchased, where purchasing contracts for those equipments are checked by the audit team to be showing that the equipments are bought from the equipment suppliers. There is no transfer of equipment from another activity and the project owner did not transfer any

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equipment to another activity because it is a new facility. According to the AMS-I.D./ Version 12, no leakage is considered and is therefore assumed as zero.

While the project emission & leakage are zero, the baseline emission are equal to the emission reductions due to the project activity and have been estimated to be 30,178 tCO_2e per year in the PDD, based on an *ex-ante* fixed baseline emission factor of 0.97504 tCO_2e/MWh.

The baseline emission factor for the project, using the combined margin (CM) approach, is fixed *ex-ante* during the crediting period. The default weights for the proposed project of 50% OM and 50% BM have been selected according to ACM0002/Version 06. For the calculation of OM emission factor, simple OM emission factor calculation method is chosen because low cost must run projects constitute less than 50% of the total grid generation and data is not available for applying the dispatch data analysis. The average emission factor for the grid for each fuel type is calculated *ex-ante* based on a 5-year full generation-weighted average of the most recent statistics available (data available from 2000 to 2004 derived from China Electric Power Yearbook and China Energy Statistical Yearbook at the time of PDD submission). Because plant specific fuel consumption and electricity generation data is not publicly available in China, a deviation of the baseline methodology of AM0005 (later replaced by ACM0002) approved by the EB (as detailed in the PDD) is adopted for using relevant emission data recently published by the DNA of P.R. China on 9th August 2007. The simple OM emission factor is calculated as 1.29086 tCO_2e/MWh and the BM emission factor as 0.65923 tCO_2e/MWh, resulting the CM be 0.97504 tCO_2e/MWh. Preciseness of the data was verified by the audit team during the on-site interview.

The *ex-ante* estimation of emission reductions is based on the estimated net electricity generation and the relevant baseline emissions and project emissions of the project, which is reasonably and transparently carried out.

4.7 Environmental Impacts

The environmental impacts of the project have been reported in the PDD, Section D. It is reported that the project activity is not expected to cause any significant environmental impacts. The environmental impacts of the project were sufficiently assessed by means of an Environmental Impact Assessment (EIA) study according to the China laws & regulations. The EIA Report, which is prepared by the Huaihua Environmental Protection Science Research Institute in October 2005, has been approved by the Huaihua Municipal Environmental Protection Bureau (EPB) on 28th November 2005 (Ref no.: HuaiHuanHan [2005] (144)) and is inspected by the audit team to be valid.

No significant environmental impact is identified during the on-site assessment since relevant mitigation measures were properly implemented as stated in the EIA Study. The environmental protection measure is satisfied as confirmed by the interview with representative of local EPB and local villagers, i.e. Gaoyong Village. No environmental complaint on the proposed project is received.

Consensus on compensation arrangement for land acquisition and land lease has been reached between the project proponent and the local communities in early-2007. Compensation agreements were signed with the various affected local parties (incl. individual affected local

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residents & Huitong County Land Acquisition & Resettlement Management Office). The signed agreements and land acquisition summary have been checked by the audit team to be valid. In addition, it is confirmed by the local residents & village committee representative during the stakeholder interview that the compensation arrangement is satisfied and the compensation payment has been released as scheduled.

4.8 Comments by Local Stakeholders

Although it is not a formal requirement by the current legislation of the host country to carry out a public consultation process, 50 nos. of local stakeholders were consulted through questionnaire survey in August 2005. The local residents were notified about the project development by the means of posting public notice and official announcement through local village committees since October 2005. A public meeting was then held to invite the local stakeholders for expressing their comments on the project implementation in November 2005. Most of the comments from stakeholders considered that the project would bring positive impacts to the local economy and livelihoods of local people with increased job opportunities and more stable power supply. The majority of them expressed their full support to the implementation of the project activity. All the comments were summarized and recorded in the PDD, Section E.

All 50 nos. of the returned public questionnaires were received from the project owner for audit team's inspection. The audit team has read through the questionnaires and concurs the summary in Section E of PDD to be comprehensive. The stakeholder survey itself is also deemed appropriate as it reasonably covered the most affected people in the community, incl. residents from various villages, town government, county commission, environmental protection bureau, water resources bureau, etc. Moreover, groups from different background (e.g. gender, age, vocation and education level) were invited for giving comments. In particular, the surrounding of construction site and submerged area was identified as the highlighted spot for investigation.

The results of the questionnaire survey can be counter-confirmed with the general voices noticed from the on-site visit. Representatives from the local community were interviewed. In general, the interviewees show adequate understanding of the nature of the project and are satisfactory with the resettlement and compensation arrangement. As confirmed by the government official from Huitong County Development and Reform Commission during on-site audit, the citizens consider that the project would benefit the improvement in local social, economic and environmental development. The response is overall supportive to the project implementation. The questionnaires results are hence deemed representative.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 30th September 2007 was made publicly available on UNFCCC CDM website (*http://cdm.unfccc.int/Projects/Validation/DB/3TD33G5WFBY38DHCO3ZISAOMODMBVQ/view.html*) and parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 21st October 2007 to 19th November 2007, where no comment was received.

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APPENDIX A

SMALL-SCALE CDM VALIDATION PROTOCOL

* MoV = Means of Verification, DR= Document Review, I= Interview

SMALL-SCALE CDM VALIDATION PROTOCOL

INTRODUCTION

This document contains a generic Validation Protocol for small-scale CDM projects, which must be seen in conjunction with the Validation and Verification Guidelines and the Validation Report Template.

This validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a project is expected to meet; and
- It ensures a transparent validation process by inducing the validator to document how a particular requirement has been validated and which conclusions have been reached;

This protocol contains two tables with generic requirements for validation projects. Table 1 shows the requirements that the GHG emission reduction project will be validated against. Table 2 consists of a checklist with validation questions related to one or more of the requirements in Table 1. The checklist questions may not be applicable for all investors, and should not be viewed as mandatory for all projects. Where a finding is issued, a corrective action request or clarification request are stated. The resolution and final conclusions of these requests should be described in Table 3 of this protocol.

Before this generic validation protocol can be applied to validate a specific project, the validator must review and adjust/amend the protocol to make it applicable to individual project characteristics and circumstances as well as individual investor criteria. The application of the validator's professional judgement and technical expertise should ensure that checklist amendments cover all necessary specific project requirements that have impact on project performance and acceptance of the project. Given the above, the checklist part of the protocol is neither exhaustive nor prescriptive.

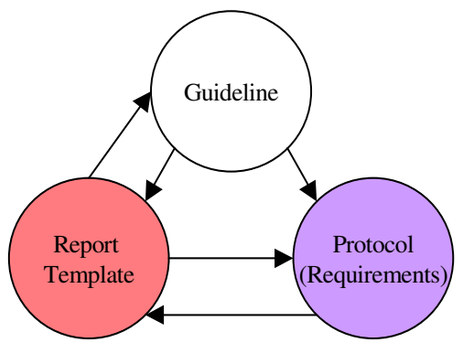

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Table 1 Mandatory Requirements for Small Scale Clean Development Mechanism (CDM) Project Activities

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference/ Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art. 12.2	~~**CAR02**~~ OK (Refer to Table 3)	Table 2, Section E.4.1 Annex I Party is Sweden. Reference: www.unfccc.net **CAR02** The name of Annex I Party involved is not correctly indicated in A.3 of PDD. Please revise accordingly.
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	~~**CAR01**~~ OK (Refer to Table 3)	Table 2, Section A.3 **CAR01** The LoAs from DNA of P.R. China & Sweden are not yet available for inspection. Please accordingly obtain and submit to the audit team for verification.
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art. 12.2.	OK	Table 2, Section E.4.1
4. The project shall have written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	~~**CAR01**~~ OK (Refer to Table 3)	Approval of voluntary participation from the China DNA & Sweden DNA is not received.

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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference/ Comment
5. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E.1 to E.4
6. Reduction in GHG emissions must be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	OK	Table 2, Section B.2.1
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Marrakech Accords (Decision 17/CP.7)	OK	The review of documents and the interviews during the on-site assessment showed that no ODA is used for the project financing or the proposed project.
8. Parties participating in the CDM shall designate a national authority for the CDM	Marrakesh Accords (CDM modalities§ 29)	OK	China DNA – National Development and Reform Commission (NDRC); Sweden DNA –Swedish Energy Agency, Department of Energy system Analysis and Climate Change.
9. The host country shall be a Party to the Kyoto Protocol	Marrakesh Accords (CDM modalities§ 30)	OK	China Ratified the Kyoto Protocol on 30th August 2002; Sweden ratified the Kyoto Protocol on 31st May 2002.

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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference/ Comment
10. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, Section A.1 There is no other hydro power project within 1 km of the project.
11. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	
12. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, Section A.1.3 and B.1 The project category is Type I.D. – Grid connected renewable electricity generation.
13. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Table 2, Section G Stakeholders' questionnaire survey was carried out in August 2005; Public notification was made in October 2005.
14. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2, Section F EIA Report was prepared by the Huaihua Environmental Protection Science Research Institute in October 2005.

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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference/ Comment
15. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	PDD was published for invitation of comments at UNFCCC CDM website for a 30-days period from 21st October 2007 to 19th November 2007. No comment was received.

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Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. Project Description The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	PDD	DR	Yes. The Gaoyongdong Project is a small hydroelectric project, where the installed capacity is 8.8 MW with expected net output of 30,951 MWh per year to the CCPG.	OK	OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	PDD	DR, I	As confirmed and reported during the on-site visit, this project is not a de-bundled component of a larger project activity.	OK	OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	PDD	DR	Yes. This project is a grid-connected renewable power generation project activity which meets all the application criteria stated in the methodology AMS-I.D.. Therefore, the project confirms to SSC category I.D – Grid connected renewable electricity generation.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	PDD	DR	Yes. The project spatial boundaries have been defined and are described in A.4 of PDD. **CAR03** The demarcation of the proposed project in A.4.1.4. of PDD is not detail enough to clearly identify the project location. Please revise the demarcation with site-specific coordinates for clear identification of project location.	~~**CAR03**~~	OK (Refer to Table 3)
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	PDD	DR, I	Yes. The project' system boundaries are clearly defined. The project boundary is limited to project site, and the grid electricity system boundary is defined as the CCPG which includes the Henan, Hubei, Hunan, Jiangxi, Sichuan provincial grids & Chongqing municipal grid.	OK	OK
A.2.3. Does the project design engineering reflect current good practices?	PDD PDR FSR	DR, I	The technical specifications have been provided to the audit team for inspection. The PDR was prepared by the Hunan Huaihua Hydroelectric Investigation and Design Institute (HHHI). The technology used for the project reflects current good practices where renewable hydro resource would be utilized for clean power generation.	~~**CL02**~~ ~~**CL03**~~	OK (Refer to Table 3)

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			CL02 It is illustrated in the PDD that the proposed project is a "…daily regulated diversion and run-of-river power plant with low water head…". However as observed during on-site visit, the project is solely a run-of-river type hydropower project with no diversion tunnel being deployed for diverting water into the power generation units. Please clarify and accordingly revise the incorrect parts of the PDD. In addition, please further revise the Table 1 of PDD to include those much related key technical parameters, e.g. dam width, etc. **CL03** Please substantiate with supporting information for the claim of 5% for captive power consumption and transmission line loss in determining the net electricity supply to the local power grid.		
A.2.4. Will the project result in technology transfer to the host country?	PDD	DR, I	No technology is transferred from other countries to this project activity.	OK	OK
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	PDD	DR, I	Yes. The whole training program contains the CDM knowledge, the operational regulations, the quality control (QC) standard flows, the data recording requirements and the management rules.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	PDD	DR, I	Several more benefits would be expected, which includes improvement in the local electricity generation, local traffic, economy, overall social development and local employment condition. In addition, the project proponent has responded to the request of the local residents and provided, on his own cost, a footbridge of 2.5m width over the top of water dam, so as to make good of the intercoastal transportation. Moreover, 7 units of automatic electric water pump houses are re-constructed to facilitate the irrigation need for the neighbor farmers. **CL05** Please provide details in PDD with supporting documents for the claims of creating new employment opportunities in project construction & implementation phases. In addition, it is noted from the PDR that the project was originally designed also for river-route navigation purpose, though it is not observed during on-site visit. Please clarify for the influence to the current project development, as well as the overall project finance.	~~CL05~~	OK (Refer to Table 3)
A.3.2. Will the project create any adverse environmental or social effects?	PDD FSR	DR, I	After on-site audit and review of EIA Report, minimal impact to the environment was observed, where specific control measures is adopted by the project	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	EIA		owner as suggested in the EIA Report.		
A.3.3. Is the project in line with sustainable development policies of the host country?	PDD LoA	DR, I	**CAR01** The LoA from DNA of P.R. China is not yet available for confirming the achievement of sustainable development. Please accordingly obtain and submit to the audit team for verification.	~~**CAR01**~~	OK (Refer to Table 3)
A.3.4. Is the project in line with relevant legislation and plans in the host country?	PDD EIA	DR, I	Yes. An EIA was conducted according to China's environmental regulations, and was approved by the Huaihua Municipal EPB on 28th November 2004. (Ref no.: HuaiHuanHan [2005] (144)).	OK	OK
B. **Project Baseline** The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	PDD	DR, I	The approved methodology AMS-I.D./Version 12 – "Grid connected renewable electricity generation" has been considered in accordance with simplified baseline and monitoring methodologies for selected CDM projects - Appendix B.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.1.2. Is the baseline methodology applicable to the project being considered?	PDD	DR, I	Yes. The adopted methodology AMS-I.D./ Version 12 is applicable to a hydropower plant, i.e. a renewable energy source, with an installed capacity under the threshold of 15MW.	OK	OK
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?	PDD	DR, I	**CL06** The determination of alternatives for baseline scenario is considered not comprehensive enough. Project proponent is requested to review and revise the justification, so as to take into account of the consideration of legal requirements, financial barrier, other natural renewable resource availability, etc. **CL07** It is understood that the China government has already announced that the revenue tax shall be decreased from 33% to 25% starting Year 2008, please clarify for the influence to the overall project finance. In addition, it is noted from the PDR that the project IRR is 9.84%, which is inconsistent with the IRR reported from the PDD, i.e. 8.13%. Please clarify. **CL08**	~~CL06~~ ~~CL07~~ ~~CL08~~ ~~CL09~~ ~~CL10~~ ~~CL11~~ ~~CL12~~	OK (Refer to Table 3)

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			It is noted from the PDD that “Benchmark Analysis” has been chosen for project financial assessment. However, no justification of applicability of the analysis option is duly provided. Please clarify. In addition, it is required by the “Economic Evaluation Code for Small Hydropower Projects (SL16-95)” that the financial analysis should be carried out based on 20 years, where the project proponent adopted 30 years in the analysis. Please clarify. **CL09** Please provide the primary source reference for verification of financial indicators listed in Table 5 of B.5 in PDD. In addition, please provide explanation for the selection of those chosen parameters. **CL10** Please provide justification on the selection of parameters and fluctuation range in the Sensitivity Analysis. The analysis is considered not comprehensive enough to reasonably cover those parameters which are anticipated to probably be fluctuating throughout the project period, e.g. O&M cost, operating hours, etc. **CL11** Please provide evidence documents for demonstrating the claims of refusal on loan application by the bank.		

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			CL12 It is noted during on-site audit that the project proponent responded to the request of the local residents for provision of a 2.5m-wide footbridge and re-construction of 7 nos. of water pump stations. Although the claim is considered not a prohibitive financial barrier, the project proponent should provide supporting evidences to substantiate the amount mentioned for the audit team's consideration.		
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	PDD	DR, I	The average of the OM and BM is selected as baseline in a transparent and conservative manner.	OK	OK
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	PDD	DR, I	**CL01** It is reported in A.4.1.4 of PDD that the proposed project is "…one of step development hydropower stations on Qushui River…". Please clarify, in such case, if the government involves in any part of the project, incl. project design, construction, operation, etc. Please also demonstrate if the project proponent were voluntary in the project development and does the proposed project fall in any local energy development policy that the project development would proceed anyway.	~~**CL01**~~	OK (Refer to Table 3)

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2.4. Is the baseline selection compatible with the available data?	PDD	DR, I	Yes. Calculation of OM and BM is compatible with the data available from China Electric Power Yearbook 2001 – 2006.	OK	OK
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	PDD	DR, I	**CL06** The determination of alternatives for baseline scenario is considered not comprehensive enough. Project proponent is requested to review and revise the justification, so as to take into account of the consideration of legal requirements, financial barrier, other natural renewable resource availability, etc.	~~**CL06**~~	OK (Refer to Table 3)
C. **Duration of the Project / Crediting Period** It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	PDD	DR, I	Yes. The starting date of the project activity is 10th September 2005. The expected operational lifetime of the project activity is 30 years. **CL04** Please demonstrate in the PDD the project history since the consideration of CDM implementation by the project developer until the latest project status with supporting documents. Also, please clearly clarify for the starting date of project activity reported in C.1.1 of PDD, as the starting date of project activity should be the earliest of the dates at which the implementation or construction or real action of	~~**CL04**~~	OK (Refer to Table 3)

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			the project activity began.		
C.1.2. Is the crediting period clearly defined (seven years with two possible renewals or 10 years with no renewal)?	PDD	DR, I	Yes, the starting date of crediting period is 1st October 2008 with 7 years. **CL04** In addition, the starting date of crediting period is stated as 1st January 2008, which is deemed not realistic in temporal consideration. Please revise.	~~CL04~~	OK (Refer to Table 3)
D. **Monitoring Plan** The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
D.1. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies provided for the relevant project category?	PDD	DR, I	Yes, same as the choice of baseline methodology in B.1.1. & B.1.2. The monitoring methodology is – "metering the electricity generated by the renewable technology" as indicated in Appendix B of simplified modalities and procedures for small-scale projects.	OK	OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	PDD	DR, I	Idem	OK	OK
D.1.3. Is the application of the monitoring methodology	PDD	DR, I	Yes. Direct metering to be applied for monitoring of	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
transparent?			electricity generated by the project activity is considered transparent.		
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	PDD	DR, I	Yes. Real measurements can be acquired by keeping the selling and purchasing receipts and preparing a monitoring report at the end of each year, which includes the on-grid electricity quantity monitoring files, the verification files, the emission reduction evaluation files and the records on monitoring apparatus' repairs and tests.	OK	OK
D.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Are the choices of project emission indicators reasonable?	PDD	DR	**CL15** Please provide the calculation of power density of the proposed project, including reference source of submerged area information, for verification of project emission.	~~**CL15**~~	OK (Refer to Table 3)
D.2.2. Will it be possible to monitor / measure the specified project emission indicators?	PDD	DR	Not applicable	OK	OK
D.2.3. Do the measuring technique and frequency comply with good monitoring practices?	PDD	DR	Not applicable	OK	OK
D.2.4. Are the provisions made for archiving project emission data sufficient to enable later	PDD	DR	Not applicable	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
verification?					
D.3. Monitoring of Leakage It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. If applicable, are the choices of leakage indicators reasonable?	PDD	DR	With reference to Para. 8, Appendix B, small-scale CDM project activity modalities, leakage calculation is only required if the renewable energy technology equipment is transferred from another activity. The equipment of Gaoyongdong project is not transferred from another activity and therefore no leakage calculation is required. **CL16** Please clarify for the justification of leakage consideration in the emission reduction estimation, in accordance with the AMS-I.D./ Version 12 but not ACM0002 as stated in B.6.1. of PDD.	~~CL16~~	OK (Refer to Table 3)
D.3.2. If applicable, will it be possible to monitor / measure the specified leakage indicators?	PDD	DR	Not applicable	OK	OK
D.3.3. If applicable, do the measuring technique and frequency comply with good monitoring practices?	PDD	DR	Not applicable	OK	OK
D.3.4. If applicable, are the provisions made for archiving leakage data sufficient to enable later verification?	PDD	DR	Not applicable	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	PDD	DR	**CL13** Some sections of the content in the "Handbook of Monitoring and Management for Huitong County Gaoyongdong Hydropower Project" are found inconsistent with the practical condition as revealed on-site, e.g. management and usage of monitoring logsheet, metering flow diagram, etc. Please accordingly revise the handbook to reflect the exact operation and submit to the audit team for verification.	~~CL13~~	OK (Refer to Table 3)
D.4.2. Will it be possible to monitor / measure the specified baseline emission indicators?	PDD	DR, I	Yes. In addition to the continuous metering, the project owner shall keep the selling and purchasing receipts and prepare a monitoring report at the end of each year, which including the on-grid electricity quantity monitoring files, the verification files, the emission reduction evaluation files and the records on monitoring apparatus' repairs and tests. **CL14** There is no auxiliary electricity meter installed at the project location for back-up monitoring purpose, which is inconsistent with the information reflected in the PDD. Please clarify if the provision of auxiliary	~~CL14~~	OK (Refer to Table 3)

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			electricity meter is mandatorily required. If so, please accordingly demonstrate to the audit team in the aid of flow diagram for the concerned installation with supporting evidence. Or, if not, revise the relevant sections of PDD to reflect the practical setup of on-site monitoring system.		
D.4.3. Do the measuring technique and frequency comply with good monitoring practices?	PDD	DR, I	Yes.	OK	OK
D.4.4. Are the provisions made for archiving baseline emission data sufficient to enable later verification?	PDD	DR, I	Yes. The monitoring data shall be kept for 9 years, i.e. first crediting period + 2 years.	OK	OK
D.5. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	PDD	DR, I	Yes. The project proponent Huitong County Gaoyongdong Hydropower Development Co. Ltd. (HCG) is responsible for the project operation, maintenance, monitoring and reporting.	OK	OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	PDD	DR, I	The monitoring organization chart in PDD B.7.2 clearly provides a description of the single responsibility of the relevant party.	OK	OK
D.5.3. Are procedures identified for training of monitoring personnel?	PDD	DR, I	Yes, as reported during on-site audit, the training of monitoring personnel was provided by the	OK	OK

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			manufacturers and another currently operating hydropower station (i.e. Langjiang Power Station (24MW)) since September 2007.		
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	PDD	DR, I	Reference – "Handbook of Monitoring and Management for Huitong County Gaoyongdong Hydropower Project".	OK	OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	PDD	DR, I	Idem	OK	OK
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	PDD	DR, I	Idem	OK	OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	PDD	DR, I	Idem	OK	OK
D.5.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	PDD	DR, I	Idem	OK	OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	PDD	DR, I	Idem	OK	OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	PDD	DR, I	Idem	OK	OK
D.5.11. Are procedures identified for project performance reviews?	PDD	DR, I	Idem	OK	OK
D.5.12. Are procedures identified for corrective	PDD	DR, I	Idem	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
actions?					
E. **Calculation of GHG emission** It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.					
E.1. Project GHG Emissions The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	PDD	DR, I	**CL15** Please provide the calculation of power density of the proposed project, including reference source of submerged area information, for verification of project emission.	~~CL15~~	OK (Refer to Table 3)
E.1.2. Have all relevant greenhouse gases and sources been evaluated?	PDD	DR	Not applicable	OK	OK
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?	PDD	DR	Not applicable	OK	OK
E.1.4. Are the calculations documented in a complete and transparent manner?	PDD	DR	Not applicable	OK	OK
E.1.5. Have conservative assumptions been used?	PDD	DR	Not applicable	OK	OK
E.1.6. Are uncertainties in the project emissions	PDD	DR	Not applicable	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
estimates properly addressed?					
E.2. Leakage It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	PDD	DR	With reference to Para. 8, Appendix B, small-scale CDM project activity modalities, leakage calculation is only required if the renewable energy technology equipment is transferred from another activity. The equipment of Gaoyongdong project is not transferred from another activity and therefore no leakage calculation is required. **CL16** Please clarify for the justification of leakage consideration in the emission reduction estimation, in accordance with the AMS-I.D./ Version 12 but not ACM0002 as stated in B.6.1. of PDD.	~~CL16~~	OK (Refer to Table 3)
E.2.2. Are potential leakage effects properly accounted for in the calculations (if applicable)?	PDD	DR	Not applicable	OK	OK
E.2.3. Do the methodologies for calculating leakage comply with existing good practice (if applicable)?	PDD	DR	Not applicable	OK	OK
E.2.4. Are the calculations documented in a complete and transparent manner and (if applicable)?	PDD	DR	Not applicable	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.2.5. Have conservative assumptions been used (if applicable)?	PDD	DR	Not applicable	OK	OK
E.2.6. Are uncertainties in the leakage estimates properly addressed (if applicable)?	PDD	DR	Not applicable	OK	OK
E.3. Baseline GHG Emissions The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?	PDD	DR, I	Yes. The hydropower plant and the CCPG were defined as the system boundary. All the power plants under the CCPG are covered.	OK	OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	PDD	DR, I	All the direct baseline emissions were captured.	OK	OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	PDD	DR, I	Yes.	OK	OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	PDD	DR, I	Yes. The methodology complies with the SSC category I.D. project activities.	OK	OK
E.3.5. Are the calculations documented in a complete and transparent manner?	PDD	DR, I	Yes. The calculation is done in a transparent manner.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.3.6. Have conservative assumptions been used?	PDD	DR, I	Yes. The justification for selecting the average plant efficiency is reasonable.	OK	OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	PDD	DR, I	Yes.	OK	OK
E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	PDD	DR	Yes. The estimated emission reduction is 30,178 tCO_2e per annum over the first 7-years crediting period from October 2008 to September 2015. **CL17** It is noted that the starting date of crediting period is selected as 1st January 2008, which is however deemed to be not realistic in temporal consideration. Please therefore review for the adjustment of estimated emission reduction during the crediting period, i.e. A.4.3. & B.6.4. of PDD. Also, please substantiate for the stated hours of operation and efficiency of water turbines & generators in the influence to the whole electricity generation setup.	~~CL17~~	OK (Refer to Table 3)

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
F. **Environmental Impacts** It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	PDD	DR, I	An EIA was conducted as required by the China's Law and Regulations. The summary was revealed in Section D of the PDD.	OK	OK
F.1.2. Does the project comply with environmental legislation in the host country?	PDD	DR, I	Yes. The EIA Report has been approved by the local EPB in Huaihua County (Ref no.: HuaiHuanHan [2005] (144)) on 28th November 2005.	OK	OK
F.1.3. Will the project create any adverse environmental effects?	PDD	DR, I	With reference to the approval letter from the Huaihua Municipal EPB, the project is unlikely to have significant environmental impacts.	OK	OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	PDD	DR, I	Yes. Refer to Section D of PDD.	OK	OK
G. **Comments by Local Stakeholder** Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	PDD	DR, I	The project proponent has performed a formal consultation process with local stakeholders through local public notification, public meeting and questionnaire survey. **CL18** Please provide all of the returned stakeholder	~~**CL18**~~ ~~**CL19**~~	OK (Refer to Table 3)

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			questionnaires & public meeting minutes or other records to the audit team for checking and verification. **CL19** Please clarify and reflect in the PDD for the background of stakeholders consulted and how were they being identified for carrying out the questionnaire survey.		
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	PDD	DR, I	Idem.	~~CL18~~ ~~CL19~~	OK (Refer to Table 3)
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	PDD	DR, I	Not required.	OK	OK
G.1.4. Is a summary of the comments received provided?	PDD	DR, I	Yes. A summary was prepared and was reviewed by the audit team.	OK	OK
G.1.5. Has due account been taken of any comments received?	PDD	DR, I	There were no major negative comments received in general and the local community gave strong positive comments on the project.	OK	OK

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Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR01 The LoAs from DNA of P.R. China & Sweden are not yet available for inspection. Please accordingly obtain and submit to the audit team for verification.	Table 1 A.3.3.	Both HCA and LoA are obtained and are available for finishing validation report.	OK LoAs from China DNA (NDRC) & Sweden DNA (Swedish Energy Agency) are received on 18th January 2008 & December 2007 respectively. OK. CAR is therefore resolved and closed.
CAR02 The name of Annex I Party involved is not correctly indicated in A.3 of PDD. Please revise accordingly.	Table 1	The name of Annex I party's name is corrected.	OK The name of Annex 1 Party involved, i.e. Sweden, is correctly revised in A.3 of PDD. The CAR is therefore resolved and closed.
CAR03 The demarcation of the proposed project in A.4.1.4. of PDD is not detail enough to clearly identify the project location. Please revise the demarcation with site-specific coordinates for clear identification of project location.	A.2.1.	The coordinates of project location are clearly identified in the revised PDD.	OK The proposed project has been clearly indicated in PDD with a project-specific geographic coordinates, i.e. East Longitude 109°43'26" and North Latitude 26°49'07", which has been checked by the audit team to be

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			accurate. The CAR is therefore resolved and closed.
CL01 It is reported in A.4.1.4 of PDD that the proposed project is "…one of step development hydropower stations on Qushui River…". Please clarify, in such case, if the government involves in any part of the project, incl. project design, construction, operation, etc. Please also demonstrate if the project proponent were voluntary in the project development and does the proposed project fall in any local energy development policy that the project development would proceed anyway.	B.2.3.	The river hydropower development plan report was compiled by water resource administration of government. The aim of compiling the report is to determine the appropriate site for potential hydropower station scientifically. However, the government doesn't involve in the actual project activity, like project design, investment, or construction etc.. The project owner is voluntary in project development, and no policy force the project owner must implement the proposed project, and that is not allowed by law or regulations.	OK It is understood that the stated development plan is merely a development framework released by the local government, which does not conclusively incur any mandatory involvement of the government in any project development. The project participant's voluntary on project development is confirmed with the project participant & government officials during on-site visit and there be no government policy mandatorily require the project implementation. The CL is therefore resolved and closed.
CL02 It is illustrated in the PDD that the proposed project is a "…daily regulated diversion and	A.2.3.	From the on-site validation, it is found that there is no diversion tunnel and there is no facilities are used to	OK It is confirmed from the project participant that the proposed project

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
run-of-river power plant with low water head…". However as observed during on-site visit, the project is solely a run-of-river type hydropower project with no diversion tunnel being deployed for diverting water into the power generation units. Please clarify and accordingly revise the incorrect parts of the PDD. In addition, please further revise the Table 1 of PDD to include those much related key technical parameters, e.g. dam width, etc.		diverting water from other place, and thus it is PDD writer's fault to describe the project as diversion type. Therefore, the incorrect parts of PDD are revised in the latest document of version 04. The key technical parameters, such as dam width and average river flux, are included in the latest document of version 04.	involves no water diversion for the hydropower generation, which is in line with the on-site observation. The concerned statement has been accordingly revised in PDD to reflect the factual project engineering design, i.e. run-of-river type hydropower project. The CL is therefore resolved and closed.
CL03 Please substantiate with supporting information for the claim of 5% for captive power consumption and transmission line loss in determining the net electricity supply to the local power grid.	A.2.3.	The 5% power loss brought by captive power consumption and transmission line loss is an estimated data stated in project's PDR. The data is set by design institute who compile the PDR. According to the table 3.4 in Economic Evaluation Code for Small Hydropower Projects(SL16-95), the effective coefficiency of 0.95 can only be used to estimate the hydropower project with reservoir of annual/ seasonal storage capacity, while for project with little storage capacity or run-of-river type, the coefficiency should be ranged between 0.60～0.70. The project is of run-of-	OK The audit team is able to check up with the PDR, where it states the captive power consumption and transmission line loss is 5%. As the PDR is produced by an accredited design institute, the value is therefore deemed credible. This adoption is further checked against the reference document for economic evaluation (SL16-95) that the proposed project, as a run-of-river project, is eligible to adopt 0.60 to 0.70 as the effective coefficient. Therefore, the adoption of this 0.95, a commonly used value in China's hydropower industry,

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		river type, however, the employed effective coefficiency of 0.95 in PDR is conservative when evaluating the IRR of project.	is considered acceptable as to demonstrate the conservative approach in the IRR calculation. The CL is therefore resolved and closed.
CL04 Please demonstrate in the PDD the project history since the consideration of CDM implementation by the project developer until the latest project status with supporting documents. Also, please clearly clarify for the starting date of project activity reported in C.1.1 of PDD, as the starting date of project activity should be the earliest of the dates at which the implementation or construction or real action of the project activity began. In addition, the starting date of crediting period is stated as 1st January 2008, which is deemed not realistic in temporal consideration. Please revise.	C.1.1. C.1.2.	The brief history of the project is given in A.2 part of latest version 04 PDD. The project's official approved starting date is 19th Oct 2005, which is in project construction approval issued by Huaihua Municipal Water Conservancy Administration. While the signature date of main equipment purchase agreement is 10th Sep 2005. However, the project supervisor record the actual starting date is 3rd Jan 2006. The earliest one among those, i.e. 10th Sep 2005, is selected in the C1.1 of PDD. The starting date of crediting period is revised to be a more realistic one.	OK A project history has been incorporated in the revised PDD to cover all key milestone dates, e.g. project approval, signing of purchase contract of key equipments, project construction, etc. The starting date of project activity is indicated as 10th September 2005 in the revised PDD, which is the signing date of equipment purchase contract. The audit team considers the date be the earliest *at which the implementation or construction or real action of the project activity began*. The starting date of crediting period is revised as 1st October 2008, which is deemed to be much realistic in temporal

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			consideration. The CL is therefore resolved and closed.
CL05 Please provide details in PDD with supporting documents for the claims of creating new employment opportunities in project construction & implementation phases. In addition, it is noted from the PDR that the project was originally designed also for river-route navigation purpose, though it is not observed during on-site visit. Please clarify for the influence to the current project development, as well as the overall project finance.	A.3.1.	The details and supporting documents for claims of creating new employment opportunities are given in latest version 04 PDD. In Jan. 2007, the project owner used to apply for postponing building the river-route navigation facility to the Huaihua Municipal Navigation Administration, and the application was approved by the administration. For no river traffic demands is found or raised, the project owner still hasn't built the facility. Meanwhile in Chapter 16 of PDR, it can be found that the navigation facility cost is not included in the project budget.	OK It is noted from the revised PDD that there were 82,848 man-day employed in the project construction phases, and have brought about 150 short-term employment opportunities at peak. Besides, 15 permanent positions shall be created in the project operation phase. The stated amount of newly-created employment opportunities has been checked by the audit team against the PDR (p.151), which includes power plant management staff (4 nos.), operators (8 nos.) & servicing & security staff (3 nos.), i.e. 15 nos. of permanent employment. The social benefit induced by the project implementation is verified to be valid. It is noted that the building of navigation facility has been called off in January 2007 owing to the low traffic

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			demand (which was approved by the Huaihua Municipal Navigation Administration). The audit team is able to check with the financial analysis in PDR and found that no cost is planned for building of the navigation facility in the IRR calculation. No influence to the project finance shall therefore be resulted from calling off this building activity. The CL is therefore resolved and closed.
CL06 The determination of alternatives for baseline scenario is considered not comprehensive enough. Project proponent is requested to review and revise the justification, so as to take into account of the consideration of legal requirements, financial barrier, other natural renewable resource availability, etc.	B.2.1. B.2.5.	The determination procedure and justification for baseline scenarios is revised to be more comprehensive in latest version 04 PDD.	OK Discussion on the alternative scenario of construction of renewable power plant is provided in the revised PDD. By referring to the information references provided by the project proponent sourced from <Energy Dictionary> p.392 (i.e. China solar energy distribution) & p.413 (i.e. China wind energy distribution), it is agreed by the audit team that the project location is lack of solar and wind

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			resource for power generation in a similar project scale. Where there is also no utilizable geothermal resource available locally according to the information source from Energy Management Net, such power generation development is also not feasible. The audit team can also confirm by referring to the document released by the Ministry of Agriculture of P.R. China dated May 2007, that the biomass power generation technology is still relatively immature in China and the development cost is rather high. In addition, there is no reasonably effective encouragement policy from the State for promoting long-term biomass power generation development in the aspects of project finance, marketing or even the relevant legal system. All in all, the biomass energy development is not readily feasible unless special financial aid is present. Besides, the audit team has also confirmed with the Deputy Director of Huitong County DRC, i.e. Mr She Xuexi /i/, during on-site interview that

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			the development cost in Hunan Province in solar PV power generation is high and not attractive in view of business development. And due to the inadequate wind and biomass resource for power generation, wind and biomass power plant could not provide comparable output as the proposed project does. Based on the abovementioned, it is therefore concurred by the audit team that the development of other sources of renewable energy is not feasible. The CL is therefore resolved and closed.
CL07 It is understood that the China government has already announced that the revenue tax shall be decreased from 33% to 25% starting Year 2008, please clarify for the influence to the overall project finance. In addition, it is noted from the PDR that the project IRR is 9.84%, which is inconsistent with the IRR reported from the PDD, i.e. 8.13%. Please clarify.	B.2.1.	The new law on revenue tax was published at 16th March 2007, and was executed from 1st Jan 2008. The tax rate for domestic enterprises is decreased from 33% to 25%. The tax rate change will cause the FIRR of project increase from 7.61% to 8.00%, still below the benchmark IRR. However, all the implementation decisions were made earlier than the	OK It is clarified by the project participant that an income tax rate of 33%, but not 25%, was put into the financial analysis because 33% was the official income tax rate at the time of project financial assessment and project decision. The new income tax law was announced on 16th March 2007, while the project was started on 10th September 2005. The

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		new revenue tax law is announced. Therefore, the factor of law's changing is not considered in assessing the additionality of proposed project. According to the SL16-95, the economical evaluation for small scale hydropower project should apply 20 years to the project life cycle in operational status. The IRR calculation excel table provided employs the same parameters as financial assessment part of PDR, except the parameter of "life cycle", and conclude the result of 7.61%.	subsequent change of the tax rate to 25% does not prohibit or affect the overall project development and implementation. Furthermore, the project participant has demonstrated that the new tax rate shall result the FIRR to 8.00%, which is still below the benchmark IRR. The discrepancy of IRR resulted in PDR & PDD is claimed because of the different input for the project lifetime in the calculations, 30yrs & 20yrs respectively. The audit team is able to check with the applied benchmark reference, i.e. SL16-95, where it allows the application of 20 years in the hydro projects' economic analysis with the benchmark being set as 10%. The resulted IRR is 7.61% and the IRR spreadsheet has been checked by the audit team to be valid. The CL is therefore resolved and closed.
CL08	B.2.1.	The scanned and translated pages with	OK

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
It is noted from the PDD that "Benchmark Analysis" has been chosen for project financial assessment. However, no justification of applicability of the analysis option is duly provided. Please clarify. In addition, it is required by the "Economic Evaluation Code for Small Hydropower Projects (SL16-95)" that the financial analysis should be carried out based on 20 years, where the project proponent adopted 30 years in the analysis. Please clarify.		relevant content have been prepared, and will be provided to DOE as justification. The pages are selected from SL16-95, which provides the benchmark FIRR of 10% for small scale hydropower project. The SL16-95 requires project designer carrying out financial analysis base on 20 years; therefore, the project developer revises the IRR calculation process accordingly, and gets the result of 7.61% in stead.	It is noted in the revised PDD that, simple cost analysis & investment comparison analysis are excluded from the analysis. Justification on selection of "benchmark analysis" for project financial assessment is provided thereby. The audit team is able to check up with the applied economic analysis reference, i.e. SL16-95, and in which it states that "the project is financially feasible only when the FIRR is above or equal to benchmark FIRR. The benchmark FIRR for small-scale hydropower projects (<25MW) is 10%". In viewing the popularity of adoption of this benchmark evaluation method in China's small hydropower industry, the benchmark analysis is deemed appropriate for the proposed project. The financial analysis has been revised to put the project lifetime as 20 years according to the requirements set out in SL16-95. The resulted IRR is 7.61%. The CL is therefore resolved and closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CL09 Please provide the primary source reference for verification of financial indicators listed in Table 5 of B.5 in PDD. In addition, please provide explanation for the selection of those chosen parameters.	B.2.1.	The chosen parameters are sourced from PDR and other official documents. The PDR is compiled by Huaihua Institute of Hydroelectric Investigation & Design, which is a neutural and professional institution, meanwhile, the PDR is the most important materials for investors and bankers to consider project investment. The data cited from design report is creditable.	OK Indication of primary source reference has been added in the revised PDD (revised as Table 3) and is checked by the audit team to be valid. According to EB38 meeting, the audit team considers that the period of time between the finalization of the PDR (i.e. June 2005) and the investment decision (10th September 2005) is sufficiently short that it is unlikely in the context of the underlying project activity that the input values would have materially changed. Details on how key financial input values and the IRR calculation being independently checked by the audit team are presented in the VR, section 4.4 (Additionality). The CL is therefore resolved and closed.
CL10 Please provide justification on the selection of parameters and fluctuation range in the Sensitivity Analysis. The analysis is	B.2.1.	The sensitive analysis is revised to apply another justification approach, which is analyzed to proof that it is unrealistic for the variation of	OK It is noted in the revised PDD that the discussion of sensitivity analysis has been carried out in another approach,

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
considered not comprehensive enough to reasonably cover those parameters which are anticipated to probably be fluctuating throughout the project period, e.g. O&M cost, operating hours, etc.		parameters to cause the FIRR overcoming the benchmark, and the parameters selected are most significant to the financial assessment result.	where it covers the justification on how unrealistic would the FIRR go beyond the benchmark under variation of 4 parameters, incl. total investment, tariff, annual operation hour & annual O&M cost. The arguments are agreed by the audit team that it would be unlikely for the FIRR to reach the benchmark FIRR under variation of those parameters. Explanation on the selection of the sensitivity test parameters is given, which is focused mainly on those parameters which are more likely to be varying along the project implementation and more significant to the financial assessment result. It is noted that the sensitivity analysis is revised to cover also those fluctuating parameters which includes annual operating hours and annual O&M cost. The CL is therefore resolved and closed.
CL11	B.2.1.	From on-site investigation, it is found	OK

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
Please provide evidence documents for demonstrating the claims of refusal on loan application by the bank.		that the claim on loans refusal from bank is inadequate, and the claim is deleted in updated PDD; however, there is evidence of proofing the bank considered CDM's positive impacts to the project loans, which is provided to DOE for inspection.	Written explanation from China Construction Bank (Huitong Branch) dated 5th December 2007 has been received from the project participant, where it is confirmed that the CDM revenue has been considered during the loan application assessment in September 2005. It is the bank's view that the proposed project has a high chance to be registered as CDM project and getting the CDM revenue support, and this is why the bank approved the loan release. The CL is therefore resolved and closed.
CL12 It is noted during on-site audit that the project proponent responded to the request of the local residents for provision of a 2.5m-wide footbridge and re-construction of 7 nos. of water pump stations. Although the claim is considered not a prohibitive financial barrier, the project proponent should provide supporting evidences to substantiate the amount mentioned for the audit team's	B.2.1.	The cost of constructing footbridge and re-constructing water pump stations is not too much compare to the project investment, which can be viewed as difficulties in project implementation, but can not be a key barrier to prohibit the project implementation. Therefore, the claim of budget rise is deleted in updated PDD. The core financial barrier is the	OK The project participant considered the cost of construction the footbridge and re-constructing water pump stations is not significant in the total project investment, and could not provide relevant supporting information on the amount stated. The audit team cannot therefore quantitatively justify the claim. Nevertheless, the justification

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
consideration.		unfeasible results of project financial assessment in PDR, which caused investment barrier to project implementation.	does not influence the project finance as the cost of such footbridge construction has not been included in the project financial analysis and thus not affecting the project IRR. The CL is therefore resolved and closed.
CL13 Some sections of the content in the "Handbook of Monitoring and Management for Huitong County Gaoyongdong Hydropower Project" are found inconsistent with the practical condition as revealed on-site, e.g. management and usage of monitoring logsheet, metering flow diagram, etc. Please accordingly revise the handbook to reflect the exact operation and submit to the audit team for verification.	D.4.1.	The revised handbook has been provided to DOE, which is consistent with practical conditions.	OK The project-specific monitoring handbook has been received from the project participant. It is checked by the audit team that the practical condition has been correctly revealed in the handbook. The CL is therefore resolved and closed.
CL14 There is no auxiliary electricity meter installed at the project location for back-up monitoring purpose, which is inconsistent with the information reflected in the PDD. Please clarify if the provision of auxiliary	D.4.2.	The auxiliary electricity meter is not employed in the project, and thus the part B.7 of PDD has been revised accordingly.	OK The section "Monitoring apparatus & instalment" is noted amended in the revised PDD to reflect the factual arrangement. The audit team is able to check with the statutory requirements,

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
electricity meter is mandatorily required. If so, please accordingly demonstrate to the audit team in the aid of flow diagram for the concerned installation with supporting evidence. Or, if not, revise the relevant sections of PDD to reflect the practical setup of on-site monitoring system.			namely DL/T 448-2000 <Technical administrative code of electricity energy metering>, released by the State Economy & Trade Commission on 3rd November 2000, that in p.9 it reads "auxiliary electricity meter shall be installed for power generator with installed capacity of 100MW or above". Where the installed capacity of the proposed project is 8.8MW, it is not mandatorily required to install auxiliary electricity meter. The CL is therefore resolved and closed.
CL15 Please provide the calculation of power density of the proposed project, including reference source of submerged area information, for verification of project emission.	D.2.1. E.1.1.	The project power density is calculated and provided in latest version 04 PDD. The data source of submerged area is provided in Table 1, as footnote No.4.	OK The power density of the proposed project is calculated as follow:- Installed capacity (W)/ submerged area (m^2) = 8.8MW / 23,866.4m^2 = 368.7 W/m^2 i.e. > 10 W/m^2 The project emission can therefore be considered as zero as per the selected

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			methodology. The CL is therefore resolved and closed.
CL16 Please clarify for the justification of leakage consideration in the emission reduction estimation, in accordance with the AMS-I.D./ Version 12 but not ACM0002 as stated in B.6.1. of PDD.	D.3.1. E.2.1.	The justification of leakage has been revised according to the AMS-I.D.	OK The justification of leakage consideration is revised in PDD to demonstrate that, according to AMS-I.D., there shall be no leakage since there is neither energy generating equipment transfer from another activity nor existing equipment transfer to another activity exists in the project. The CL is therefore resolved and closed.
CL17 It is noted that the starting date of crediting period is selected as 1st January 2008, which is however deemed to be not realistic in temporal consideration. Please therefore review for the adjustment of estimated emission reduction during the crediting period, i.e. A.4.3. & B.6.4. of PDD. Also,	E.4.1.	The starting date of crediting period is revised to be 1st October 2008, which is realistic under temporal conditions. And the relevant parts have been revised accordingly. The technical parameters are provided in Table 1 in part A.4.2. The operation hour is determined according to the	OK A much realistic starting date of crediting period has been identified, as 1st October 2008. Relevant sections regarding the adjustment on estimated ER have been accordingly revised. The audit team is able to check with the

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
please substantiate for the stated hours of operation and efficiency of water turbines & generators in the influence to the whole electricity generation setup.		dozens of years' water records, while the efficiency of turbines & generators is setup by manufacturer. The operation hour is estimated by the professional Design institute, which is a third party who is responsible for technical assessment job of project.	specification of supplementary PDR that the project has been modified from 8.0MW to 8.8MW with the total power generation increased from 32,260MWh to 32,580MWh. The utilization hour is therefore calculated to be 3,702 hr/a, as shown in Table 1 in PDD p.7. The calculation breakdown (i.e. conversion) of which has been provided as footnote 5 in the same page. The CL is therefore resolved and closed.
CL18 Please provide all of the returned stakeholder questionnaires & public meeting minutes or other records to the audit team for checking and verification.	G.1.1. G.1.2.	All the questionnaires are scanned and provided to DOE for checking.	OK All 50 nos. of filled questionnaires were received from the project participant. It is checked by the audit team that there is no negative opinion received. The CL is therefore resolved and closed.
CL19 Please clarify and reflect in the PDD for the background of stakeholders consulted and	G.1.1. G.1.2.	The background and procedure of stakeholders' consultant have been clarified in latest PDD (version 04).	OK Background information of the consulted stakeholders is briefly

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
how were they being identified for carrying out the questionnaire survey.			introduced in the PDD, where most of them are actually affected by the project implementation. It is also acknowledged that the selected interviewees are mainly focused on those who set around the project location. The CL is therefore resolved and closed.

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