



VALIDATION REPORT

LIUJIASHAN 10 MW SMALL HYDROPOWER PROJECT IN JIANGXI PROVINCE IN CHINA

REPORT No. 2007-0962

REVISION No. 02



VALIDATION REPORT

DET NORSKE VERITAS
CERTIFICATION AS

Climate Change Services
Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
<http://www.dnv.com>
Org. No: NO 945 748 931 MVA

Date of first issue: 2007-06-14	Project No.: 63602264
Approved by: Michael Lehmann	Organisational unit: Int. Climate Change Services
Client: Cleanergy Investment Service (Beijing) Co., Ltd.	Client ref.: Mr. WANG Xia

Project Name: Liujiashan 10 MW Small Hydropower Project in Jiangxi Province
Country: China
Methodology: AMS-I.D
Version: 10
GHG reducing Measure/Technology: Grid connected renewable electricity generation
ER estimate: 22 207 tCO₂e / year

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 DNV's opinion that the "Liujiashan 10 MW Small Hydropower Project in Jiangxi Province" in China, as described in the PDD version 4 of 28 November 2007, 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 10. DNV thus requests the registration of the project as a CDM project activity.

Report No.: 2007-0962	Date of this revision: 2007-12-20	Rev. No. 02
Report title: Liujiashan 10 MW Small Hydropower Project in Jiangxi Province in China		
Work carried out by: Sequoia A, Shuyong Sun, Michael Lehmann		
Work verified by: Mari Grooss Viddal		

Key words:

Climate Change
 Kyoto Protocol
 Validation
 Clean Development Mechanism

- ☒ No distribution without permission from the Client or responsible organisational unit
- ☐ Limited distribution
- ☐ Unrestricted distribution



VALIDATION REPORT

Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CCPG	Central China Power Grid
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EIA	Environmental Impact Assessment
EPB	Environmental Protection Bureau
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MP	Monitoring Plan
NCV	Net Calorific Value
NDRC	National Development and Reform Commission
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change
SCE	Standard coal equivalent



VALIDATION REPORT

TABLE OF CONTENTS

1	EXECUTIVE SUMMARY – VALIDATION OPINION	1
2	INTRODUCTION	2
2.1	Objective	2
2.2	Scope	2
3	METHODOLOGY	3
3.1	Desk Review of the Project Design Documentation	3
3.2	Follow-up Interviews with Project Stakeholders	4
3.3	Resolution of Outstanding Issues	5
3.4	Internal Quality Control	7
3.5	Validation Team	7
4	VALIDATION FINDINGS	8
4.1	Participation Requirements	8
4.2	Project Design	8
4.3	Baseline Determination	9
4.4	Additionality	10
4.5	Monitoring	11
4.6	Estimate of GHG Emissions	12
4.7	Environmental Impacts	13
4.8	Comments by Local Stakeholders	13
4.9	Comments by Parties, Stakeholders and NGOs	14

Appendix A: Validation Protocol

Appendix B: Certificates of Competence



VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the “Liujiashan 10 MW Small Hydropower Project in Jiangxi Province” in China. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

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

The host Party is China and the Annex I Party is Sweden. Both Parties fulfil the participation criteria and have approved the project and authorized the project participants. The DNA from China confirmed that the project assists in achieving sustainable development /2/.

The project correctly applies the simplified baseline and monitoring methodology AMS-I.D “Grid connected renewable electricity generation”, version 10 and the installed capacity is less than 15 MW.

By generating renewable energy from hydropower which will displace fossil fuel based grid electricity, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It has been 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 22 207 tCO₂e per year over the selected 7-year 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.

The monitoring methodology AMS-I.D has been correctly applied. The monitoring methodology will give opportunity for real measurements of achieved emission reductions. Adequate training and monitoring procedures have been implemented.

In summary, it is DNV’s opinion that the “Liujiashan 10 MW Small Hydropower Project in Jiangxi Province” in China, as described in the PDD (version 4 of 28 November 2007), meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the simplified baseline and monitoring methodology AMS-I.D, version 10. DNV thus requests the registration of the project as a CDM project activity.



VALIDATION REPORT

2 INTRODUCTION

Cleanergy Investment Service (Beijing) Co., Ltd. has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “Liujiashan 10 MW Small Hydropower Project in Jiangxi Province” in China (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the 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, the simplified modalities and procedures for small-scale CDM project activities 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, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved simplified baseline and monitoring methodology AMS-I.D version 10. 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.



VALIDATION REPORT

3 METHODOLOGY

The validation consisted 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/ Cleanergy Investment Service (Beijing) Co., Ltd., Project Design Document for Liujiashan 10 MW Small Hydropower Project in Jiangxi Province, Version 01 dated 4 January 2007 and version 04 dated 28 November 2007
- /2/ Letter of Approval issued by DNA of China on 2 July 2007.
- /3/ Letter of Approval issued by DNA of Sweden on 13 November 2007.
- /4/ *“Appendix B of the “Simplified modalities and procedures for small-scale CDM project activities” - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities: AMS-I.D – “Grid connected renewable electricity generation” for Type I – Renewable Energy Projects. Version 10 of 23 December 2006.*
- /5/ 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?IdSiteTree=1146>
- /6/ Hydro Power Reconnaissance & Design Institute of Fuzhou City, Feasibility Study of the project on December 2002 and the approval letter by local Development and Reform Commission on 26 December 2003.
- /7/ Jiangxi Academy of Environmental Sciences, Environmental Impact Assessment of the project, January 2005 and the approval letter by local Environmental Protection Bureau on 14 January 2005.
- /8/ CDM Executive Board, ACM0002 “Consolidated methodology for grid-connected electricity generation from renewable sources” version 06 of 19 May 2006.
- /9/ China NDRC, The emission factor calculation for each power grid of China, published on 15 December 2006, NDRC official website: <http://cdm.ccchina.gov.cn/web/NewsInfo.asp?NewsId=1235>
- /10/ Chinese DNA’s guidance for the determination of grid boundaries and emission factors, <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1053.pdf>
- /11/ China Electric Power Yearbook 2001, 2002, 2003, 2004, 2005 and 2006
- /12/ China Energy Statistical Yearbook 2004, 2005 and 2006



VALIDATION REPORT

- /13/ 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- /14/ CDM Executive Board, Guidance for request for deviation titled “Application of AM0005 and AMS-I.D in China” (<http://cdm.unfccc.int/Projects/Deviations>)
- /15/ China NDRC, The statistics by State Electricity Regulatory Commission (SERC) on newly built thermal plants in 10th "Five-Year Plan" period 2000-2005, and NDRC official website
<http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/2006/20061215144747182.pdf>
- /16/ Ministry of Water Resources, Economic evaluation code for small hydropower projects. (SL 16-95)
- /17/ Zixi Sanjiang Hydropower Co., Ltd., CDM Management and Monitoring Manual for Liujiashan Hydropower Plant, July 2007
- /18/ The written order to commence construction approved by Zixi County Hydro and Power Bureau on 20 December 2004
- /19/ Memo of Board Meeting of Zixi Sanjiang Hydropower Co., Ltd., on 23 August 2004
- /20/ Letter of Loan Intent issued by the Zixi County Sub-branch of China Agriculture Bank on 15 September 2004
- /21/ Resettlement plan and Resettlement plan approval by Zixi County government, on 18 December 2004
- /22/ Jiangxi Province Development and Reform Commission, the Electricity tariff policy of Jiangxi Province, 19 July 2004

The main changes between the version of the PDD published for the 30 days stakeholder commenting period and the final version submitted for registration:

- *Changes related to the CARs and CLs identified in the DNV's draft validation report.*
- *The IPCC default values used for OM & BM calculation have been changed from IPCC 1996 to IPCC 2006.*
- *Project emission has been considered additionally and the reservoir's area at full level will be monitored.*
- *Annex I Party has been changed from UK to Sweden*

3.2 Follow-up Interviews with Project Stakeholders

	Date	Name	Organization	Topic
/23/	2007-05-14	DING Liquan	Zixi Sanjiang Hydropower Co., Ltd.	<ul style="list-style-type: none"> – Project background information – Project technology, operation, maintenance and monitoring capability – Project additionality



VALIDATION REPORT

				<ul style="list-style-type: none"> – Project financial structure – Project monitoring and management plan – Project approval status – Stakeholder consultation process
/24/	2007-05-14	SONG Wei	Cleanergy	– Project design document
	2007-11-02		Investment Service (Beijing) Co., Ltd. (as consultant company)	<ul style="list-style-type: none"> – Baseline determination – Emission reductions calculation – Project additionality

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was 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.

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 "Liujiashan 10 MW Small Hydropower Project in Jiangxi Province" 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:

- mistakes have been made with a direct influence on project results;
- CDM and/or methodology specific requirements have not been met; or
- 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.



VALIDATION REPORT

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities				
Requirement	Reference	Conclusion		
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>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.</i>		

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>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 large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>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.</i>	<i>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.</i>	<i>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.</i>

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
<i>If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the CAR or CL is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1 Validation protocol tables



VALIDATION REPORT

3.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation Team

Role/Qualification	Last Name	First Name	Country
Team Leader/ GHG Auditor	A	Sequoia (Qingxing)	China
CDM Validator	Sun	Shuyong	China
Technical Reviewer	Viddal	Mari Grooss	Norway
Sector Expert	Lehmann	Michael	Norway

The qualification of each individual validation team member is detailed in Appendix B to this report.



VALIDATION REPORT

4 VALIDATION FINDINGS

The findings of the validation 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 as documented and described in the revised and resubmitted project design documentation (version 04 of 28 November 2007).

4.1 Participation Requirements

The host Party China and the Annex I Party Sweden meet all relevant participation requirements.

The DNA of China has issued a Letter of Approval (LoA) /2/ on 2 July 2007, authorizing Zixi Sanjiang Hydropower Co., Ltd. as a project participant and also confirming that the project assists in achieving sustainable development.

The DNA of Sweden has issued a LoA /3/ on 13 November 2007, authorizing EcoSecurities Group PLC as a project participant.

The validation did not reveal any information indicating that the project can be seen as a diversion of official development assistance (ODA) funding towards China.

4.2 Project Design

The Liujiashan 10 MW Small Hydropower Project in Jiangxi Province is a new-reservoir hydropower plant with a total installed capacity of 10 MW, two units of 5000 kW each, with the power density of 9.3 W/m² (the reservoir area at full level is 1.07 km² according to the Feasibility Study /6/). The proposed project is to utilize water resources of the Baita River to generate zero carbon emission electricity for the Central China Power Grid (CCPG).

The project proponent has not registered any small scale CDM projects in the last 2 years and the project is not within 1 km radius of any other proposed small scale CDM project. Hence, the project activity is not a debundled component of a larger project activity according to the rules for “determining the occurrence of debundling” as outlined in Appendix C of the Simplified Modalities and procedures for Small-Scale CDM activities.

The proposed technology is similar to the technology used in existing hydropower projects and represents current good practice.

The project is in line with host-country specific CDM requirements and sustainable development priorities. The confirmation thereof by the DNA of China was issued on 2 July 2007.

The project activity was permitted for construction on 20 October 2004 /18/ and the length of the first renewable crediting period is seven years, starting on 1 March 2008. For Chinese projects, it is not possible to make investments until the developer has got the construction permission letter. The construction approval date is therefore deemed the earliest date of implementation, construction and real action for Chinese projects. The designed operation life of the project is 20 years. Over the first crediting period (7 years), the annual power output of the project is expected to be 25.09 GWh /1/. The project’s power generation will displace part of the electricity generation by the existing power plants and likely capacity additions in the Central China Power Grid (CCPG), which is dominated by fossil fuel based power plants and



VALIDATION REPORT

thereby reduce greenhouse gas emissions. The estimated emission reductions from the project are 22 207 tCO₂e annually.

4.3 Baseline Determination

The project is a renewable electricity generation for a grid project activity (Category I.D) as per appendix B of the simplified modalities and procedures for small-scale CDM project activities. The project correctly applies the simplified baseline methodologies proposed for this project activity category, i.e. AMS I.D (version 10). Its applicability has been justified due to that i) the project is a new-reservoir hydropower plant with the power density of 9.3 W/m² and ii) is connected to a regional electricity grid (CCPG) and iii) the installed capacity is less than 15 MW.

The baseline scenario is that the electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

The baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO₂e/kWh) calculated in a transparent and conservative manner as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the approved methodology ACM0002 /8/.

The ex-ante estimation method was selected for the OM and BM emission factor based on the most recent information available for the years 2001-2005, which was the most recent data available at the time of PDD submission. The baseline is the MWh produced by the project power plant multiplied by an emission coefficient (in tonnes CO₂e/MWh), calculated based on the weighted average emissions of the current CCPG generation mix.

The Central China Power Grid is dominated by coal-fired power plants. It is deemed 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 grid during the crediting period.

The project boundary includes the project activity. The grid system boundary includes all the power plants connecting to the CCPG, which geographical range includes the Henan Province, Jiangxi Province, Hubei Province, Sichuan Province, Chongqing City, and Hunan Province.

The application of the baseline methodology is transparent and conservative.

	<i>GHGs involved</i>	<i>Description</i>
<i>Baseline emissions</i>	CO ₂	The baseline emission factor for the project is determined ex-ante as a combined margin, consisting of the weighted average of the operating margin (OM) and build margin (BM) emission factors. The combined margin 0.97517 tCO ₂ /MW is fixed <i>ex-ante</i> for the first crediting period.
<i>Project emissions</i>	CH ₄	According to AMS ID, being a



VALIDATION REPORT

		hydropower project with a power density less than 10W/m ² , project emissions need to be accounted for. The project emissions are calculated to be 2 258 tCO ₂ e per year.
<i>Leakage</i>	Zero	According to AMS ID, being a hydropower renewable energy project, no leakage is accounted for.

4.4 Additionality

The additionality of the project is demonstrated by applying the attachment A to the Appendix B of *the Simplified Modalities and Procedures for Small-scale CDM Project Activities*.

An investment barrier has been used to demonstrate that the project activity is not financially attractive without CDM revenues.

An IRR of 10% has been selected as the benchmark rate, which is deemed to be reasonable for small hydropower projects in China. /16/ The IRR of the project has been confirmed to be 7.08% without the CERs revenues, which shows that the proposed project is not considered financially attractive, compared to the benchmark, and the project faces an investment barrier. However, if the project is registered as a CDM project, the IRR is expected to reach 10.98%.

Moreover, a sensitivity analysis has been assessed with regards to the total investment, annual operational costs and grid tariff. The sensitivity analysis shows that without the income from CERs sales the IRR of the proposed project is still lower than the benchmark even when the possible variations of 10% of the main parameters are considered.

The main parameters used for the IRR calculations are derived from the Feasibility Study of the project /6/, and the electricity tariff is from “the Electricity tariff policy of Jiangxi Province” /22/. Both documents have been assessed by DNV. A feasibility study report in China is required to be developed by a third party which is accredited for this task directly by the government. An approval letter of the feasibility study report (FSR) is issued by the government only after it passes the public assessment of the sector experts designated by the government. A feasibility study report can in the opinion of DNV thus be regarded as an accurate and trustworthy report coming from a recognized entity.

The Feasibility Study was approved 26 December 2003 and the electricity tariff of the project was issued by Jiangxi government on 19 July 2004 /22/. The electricity tariff made the proposed project financially unviable. On 23 August 2004, the Board Meeting of Zixi Sanjiang Hydropower Co., Ltd. decided to develop the proposed project as a CDM project to overcome the financial barrier /19/. Moreover, the Letter of Loan Intent was issued by Zixi County Sub-branch of China Agriculture Bank on 15 September 2004 after consideration about CDM. /20/. The project activity was then permitted for construction on 20 October 2004 /18/. The documents above were all provided and have been verified by DNV.

In conclusion, the assessment of the arguments presented above is deemed to sufficiently demonstrate that the project activity itself is not a likely baseline scenario and that emission reductions resulting from the project are additional.



VALIDATION REPORT

4.5 Monitoring

The project applies the approved monitoring methodology, AMS-I.D “Grid connected renewable electricity generation” version 10. The selected monitoring methodology is in line with the monitoring methodologies provided for the relevant project category as listed in Appendix B of the Simplified Modalities and Procedures for Small Scale CDM project activities.

The monitoring methodology will give opportunity for real measurements of achieved emission reductions.

Leakage has not been considered for the project due to that the renewable energy technology equipment is not transferred from another activity or to another activity.

Monitoring of sustainable development indicators is not required by the Chinese DNA. The environmental impacts are considered minor and will be monitored by the local environmental authority during the project lifetime.

It has been verified that the electricity generation exported to the CCPG grid will be monitored continually and recorded on monthly basis by the project owner. In addition, the electricity sales receipts will be provided for data quality control and cross check.

Details of the data to be collected, frequency of data recording, certainty level and format and the project management responsibilities are clearly defined.

The baseline emissions are calculated as the product of the electricity supplied to the grid and the grid emission factor of CCPG, which is determined ex-ante.

4.5.1 Parameters determined ex-ante

The methodology requires monitoring of the following for grid-connected hydropower projects:

- Data needed to calculate the operating margin emission factor, based on the choice of the method to determine the operating margin (OM), consistent with “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (ACM0002);
- Data needed to recalculate the build margin emission factor consistent with “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (ACM0002);

The parameters determined ex-ante for calculating the emission factor are listed in the PDD and were verified by DNV.

4.5.2 Parameters monitored ex-post

The main data that needs to be monitored ex-post is the amount of the electricity delivered to the grid, which will be continuously monitored through metering equipments installed at the project site. Designated staff will collect the measured electricity data every month and complete the report. Receipts from electricity sales will also be obtained for double checking. The data will be kept for 2 years following the end of the crediting period.

Another parameter, area of the reservoir at full level, will also be monitored at the start of the project activity.



VALIDATION REPORT

4.5.3 Management system and quality assurance

The project developer will establish a CDM team as described below:

The Project owner will take the responsibility of the monitoring plan implementation.

The staff from operational and financial departments will undertake the monitoring tasks including reading metering equipments daily, collecting electricity data and completing records, checking and analyzing the data, archiving relevant records, reporting to company administrator or supervisor.

The staff concerned will receive training in monitoring to ensure the implementation of this monitoring plan before project operation. Problems that occur in the monitoring and measurement process will be recorded and reported to the company administrator or supervisor. Consequently, a corrective action will be adopted to deal with that problem and to avoid it occur again in future.

CDM Management and Monitoring Manual for Liujiashan Hydropower Plant /17/ has set out the procedures for tracking information. All paper-based information will be stored by the project owner.

4.6 Estimate of GHG Emissions

The emission reductions ER_y by the project activity during the crediting period is the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (Ly), as follows:

- 1) Baseline emissions: Baseline emissions (BE_y in tCO_2) are the product of the ex-ante baseline emission factor (EF_y in tCO_2/MWh) times the electricity supplied by the project activity to the grid (EG_y in MWh).
- 2) Project emissions: The proposed project is a new-reservoir type with the power density of $9.3 W/m^2/6/$, so that the project emissions should be considered.
- 3) Leakage: No leakage has to be considered for the proposed project activity.
- 4) Emission reduction: $ER_y = BE_y - PE_y - Ly = BE_y - PE_y$.

For the calculation of the OM emission factor, the simple OM emission factor calculation method is selected 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 aggregated generation and fuel consumption data are used as more disaggregated data are not available in the CCPG. Country specific data for the net calorific value (NCV_i) of each type of fossil fuel, which can be obtained from the China Energy Statistical Yearbook /12/, the IPCC 2006 default values /13/ for the oxidation factor of each type of fossil fuel and the total electricity delivered to the CCPG selected are deemed reasonable. Vintage data for the years 2003, 2004 and 2005 are used for the OM emission factor calculation. This is the most recent data available. The OM is calculated to be $1.2909 tCO_2/MW$ as a generation-weighted average for the three years.

Because plant specific fuel consumption and electricity generation data is not publicly available in China, the EB guidance on the request for deviation titled "Application of AM0005 and AMS-I.D in China" /14/ has been applied as follows:

- Use of capacity additions for estimating the build margin emission factor for grid electricity.



VALIDATION REPORT

- Use of weights estimated using installed capacity in place of annual electricity generation.
- Use the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption to estimate the build margin (BM).

Following the EB's guidance the build margin is calculated with the following parameters:

- The capacity additions from the years 2002 to 2005 is chosen and reach 24.6% of total installed capacity /11/
- The weight of installed capacity additions for thermal power plant is accounted for 69.52% of total installed capacity additions. /11/
- The standard coal consumption of 343.33gSCE/kWh is used to determine the BM emission factor, which is deemed conservative. The coal consumption efficiency of 343.33g SCE/kWh is defined as the best technology commercially available in China by the DNA of China /15/.
- The local net calorie value of each kind of fuel, the local carbon content of each kind of fuel and the IPCC 2006 default value of carbon oxidization factor are used to calculate the BM. /13/
- The BM is calculated as 0.6592 tCO₂/MW

The weights ω_{OM} and ω_{BM} are selected as 0.5 and 0.5, respectively, as stipulated for hydropower project by ACM0002, version 06. The combined margin 0.97517 tCO₂/MW is fixed *ex-ante* for the first crediting period.

The most recent data at the time of PDD is used to calculate the OM emission factor. The OM emission factor is derived from the China Energy Statistical Yearbooks 2004, 2005, and 2006 /12/; the BM calculation is derived from the China Power Electric Power Yearbooks 2004, 2005, and 2006 /11/.

The default emission factor for emissions from reservoir, as per EB23, is 90 KgCO₂e/MWh during the calculation of project emissions. The project emissions are estimated to be 2 258 tCO₂e per year.

Finally, the total estimated emission reductions over the first crediting period are 22 207 tCO₂e per year. The GHG calculations are complete and transparent, and their accuracy has been verified.

4.7 Environmental Impacts

An environmental impact assessment (EIA) has been conducted according to Chinese laws and regulations. The potential environmental impacts have been sufficiently identified. No significant environmental impacts are expected from the project activity. The local Environmental Protection Bureau (EPB) approved the project activity on 14 January 2005 /7/.

4.8 Comments by Local Stakeholders

A survey of local residents was carried out to invite comments from local stakeholders in November 2006. Totally 65 questionnaires were distributed to local stakeholders, and a 95.4% feedback (62 copies) was received. All the respondents supported the project construction. No negative comments have been received.

DNV has checked all the questionnaires received. The survey shows that the proposed project



VALIDATION REPORT

receives strong support from the local people and the comments received have been taken into consideration during construction and operation to achieve environmental and social benefits.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD (version 01 of 4 January 2007) was made publicly available on DNV's climate change website (<http://www.dnv.com/certification/climatechange/>) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 3 March 2007 to 1 April 2007.

No comments were received.

APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion
About Parties		
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	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	CAR-1 OK
4. 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, CDM Modalities and Procedures §40a	CAR-1 OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK

Requirement	Reference	Conclusion
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the 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. 12.5c, CDM Modalities and Procedures §43	CL1 CL2 OK
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
About small-scale project activities		
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech 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
13. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK
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
About stakeholder involvement		
15. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		

Requirement	Reference	Conclusion
17. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
18. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
19. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
20. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
21. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

Table 2 Requirements Checklist

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity <i>The project design is assessed.</i>						
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>						
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?		/1/	DR	Yes. The Project is located in Liujiashan Village of Luyang Town, Zixi County, Fuzhou City, Jiangxi Province, P.R.China. The Project's dam site is located in the Baita river canyon 1.2 km downstream from Liujiashan Village and about 6 km from Zixi County. The geographical coordinates of the Project site are 27°49' N-117°07' E.		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?		/1/	DR	Yes. The project's system boundaries are clearly defined and encompass the physical, geographical site of the hydropower generation sources. The power generated will be exported to the Central China Power Grid (CCPG), which is defined as the project system boundary.		OK
A.2. Participation Requirements <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project</i>						

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>Participant.</i>					
A.2.1. Which Parties and project participants are participating in the project?	/1/ /3/	DR	The host party involved in the project is China and the Annex-1 participating country is Sweden. Zixi Sanjiang Hydropower Co., Ltd. is the project participant from the Host Party (China). EcoSecurities Group PLC is the other project participant.		OK
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/ /2/ /3/	DR	No. The LoA from the DNA of China has not been obtained. The same with the Annex I Party.	CAR-1	OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/	DR	Yes. China ratified the Kyoto Protocol on 30 August 2002. Sweden ratified the Kyoto Protocol on 31 May 2002. DNA of China is National Development and Reform Commission. DNA of Sweden is Swedish Energy Agency. Both Parties are voluntary participating in the project.		OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR	The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			(ODA) funding towards China.		
A.3. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.3.1. Does the project design engineering reflect current good practices?	/1/ /6/	DR	Yes. The project design engineering reflects current good practice in China.		OK
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/ /6/	DR	The Project, a diversion hydropower station, will install two sets of 5 MW hydro turbines (HLD74-LJ-120) and associated generators (SF4000-14/2600). The technology employed is a commonly used technology in China.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/ /17/	DR	Yes. The project made provisions for training and maintenance.		OK
A.4. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/ /2/	DR I	Not yet. The LoA from the DNA of China has not been issued.	CAR-1	OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes. The project activity will create job opportunities for the local people at the time		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
		I	of the construction of the project. The project implementation is also likely to contribute to the development of the local communities.		
A.5. Small scale project activity <i>It is assessed whether the project qualifies as small-scale CDM project activity</i>					
A.5.1. 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?	/1/	DR	The installed capacity of the project is 10 MW, lower than 15 MW, the project qualifies as Type I, small-scale project activity. The project applies the approved baseline methodology AMS I.D. - “Grid Connected Renewable Energy Generation”.		OK
A.5.2. Is the small scale project activity not a debundled component of a larger project activity?	/1/	DR I	The proposed project is not a debundled component of a larger project activity.		OK
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1/ /4/	DR	Yes. The project applies the methodology AMS-I.D. version 10.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /4/	DR	The project is a hydroelectric power plant with installed capacity below the 15 MW threshold, and it supplies electricity to a regional electricity grid (CCPG).		OK
B.2. Baseline Scenario Determination <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
B.2.1. What is the baseline scenario?	/1/ /4/	DR	“Provision of equivalent amount of annual power output by the grid (CCPG) where the proposed project is connected into” is the baseline scenario.		OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /4/	DR	No other alternatives have been identified and this is in line with the applied methodology AMS I.D.		OK
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/ /4/	DR	Yes		OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /4/	DR	Yes		OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR I	Yes. The renewable energy law, sectoral policy and development trends in CCPG have been taken into account.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Yes.		OK
B.2.7. Have the major risks to the baseline been identified?	/1/	DR	There are no significant risks to the baseline except the enforcement of the Chinese renewable law. However, this law does not need to be taken into account as it is being implemented only now i.e. after the entry into force of decision 17.CP 7.		OK
B.3. Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					
B.3.1. Is the project additionality assessed according to the methodology?	/1/	DR	Additionality of the Project is demonstrated based on the requirement of Attachment A to Appendix B of the <i>Simplified Modalities and Procedures for Small-scale CDM Project Activities</i> .		OK
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/ /6/ /22/	DR	No. The whole process of calculation of IRR, including necessary parameters, assumptions and their data sources are not available in the PDD. The excel file for calculating IRR and the relevant evidences should be provided.	CL	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Ditto	CL 1	OK
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/ /18/ /19/ /20/	DR	The evidence needs to be provided to prove that the incentive from the CDM was seriously considered in the decision to proceed with the project activity.	CL 2	OK
B.4. Calculation of GHG Emission Reductions – Project emissions <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /6/ /7/ /8/	DR I	The power density is 9.3 W/m ² , according to the Feasibility Study. The default emission factor for emissions from reservoir is selected 90 KgCO ₂ e/MWh, as per EB23.		OK
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/ /6/ /7/ /8/	DR I	Ditto		OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/ /6/ /7/	DR I	Ditto		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/8/				
B.5. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /4/ /8/	DR	The most recent data of year 2005 and IPCC 2006 default values should be used during the calculation of the OM/BM and the CM.	CAR-2	OK
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	Ditto	CAR-2	OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Ditto	CAR-2	OK
B.6. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /4/	DR	No leakage is considered in the Project and this is deemed appropriate and in line with the applied methodology.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.7. Emission Reductions <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>						
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.		/1/	DR	Yes, The project is forecasted to reduce CO ₂ emissions 22 207 tCO ₂ e / year average over the crediting period. The emission reductions are real, measurable, and give long-term benefits related to the mitigation of climate change comparing to baseline scenario.		OK
B.8. Monitoring Methodology <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>						
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?		/1/ /4/	DR	According to the methodology AMS-I.D, monitoring shall consist of metering the electricity generated by the renewable technology. Here, the monitoring plan is according to the AMS-I.D.		OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?		/1/	DR	Yes. The relevant data records will be kept for 2 years following the end of the crediting period.		OK
B.9. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for</i>						

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>reliable and complete project emission data over time.</i>					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	Surface area at full reservoir level will be monitored at the start of the project.		OK
B.10. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/ /4/	DR I	The electricity delivered to the grid will be continuously monitored. The measurement data will be collected and recorded monthly, and will be stored during the crediting period and two years after that. The measurements will be cross checked with the electricity sales receipts.		OK
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/ /4/	DR	The choice of baseline indicators is in line with the methodology AMS-I.D.		OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR	Yes.		OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR	Yes. The electricity delivered to and drawn from CCPG by the Project will be		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				continuously monitored through Gateway meters.		
B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/ /17/	DR		The measurement accuracy and the procedures in place on how to deal with erroneous measurements are not addressed in the PDD. They are required further.	CL3	OK
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR		The measured data will be collected and recorded monthly. This is in line with the monitoring methodology.		OK
B.10.7. Is the registration, <i>monitoring</i> , <i>measurement</i> and <i>reporting</i> procedure defined?	/1/	DR		The procedures for records handling are identified in the monitoring plan.		OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR		Calibration of meters will be implemented according to national standards and rules, the frequency will be at least annually.		OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR		The procedures for record handling are identified in the monitoring plan in the PDD.		OK
B.11. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>						
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data	/1/ /4/	DR		No leakage emissions are expected to occur from the project activity.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
necessary for determining leakage?						
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>						
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?		/1/ /7/	DR I	Monitoring of sustainable development indicators is not required by the Chinese DNA. The environmental impacts are identified in the EIA that was approved on 14 January 2005.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?		/1/	DR	The Chinese DNA, NDRC, does not require collection and archiving of data related to environmental, social and economic impacts. The environmental impacts will be monitored by local environmental authority.		OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?		/1/	DR	Ditto		OK
B.13. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>						
B.13.1. Is the authority and responsibility of overall		/1/	DR	Yes. The authority and responsibility of		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
project management clearly described?			project management is described in the PDD.		
B.13.2. Are procedures identified for training of monitoring personnel?	/1/ /17/	DR	No such information is identified in the PDD.	CL4	OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	According to the actual status of the hydropower project, no emergency situation which can cause unintended emissions is expected from the project.		OK
B.13.4. Are procedures identified for review of reported results/data?	/1/ /17/	DR	No such information is identified in the PDD.	CL4	OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/ /17/	DR	No such information is identified in the PDD.	CL4	OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/ /6/ /18/	DR I	The evidence of the project's starting date needs to be provided.	CL5	OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	The expected start date of the crediting period is 1 July 2007, which needs to be delayed after the registration.	CAR-3	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>						
D.1. For Small-scale projects						
D.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?		/1/ /7/	DR	Yes. An EIA is required. The EIA of the project has been approved by the local Environment Protection Bureau on 14 January 2005.		OK
D.1.2. Does the project comply with environmental legislation in the host country?		/1/ /7/	DR	Yes		OK
D.1.3. Will the project create any adverse environmental effects?		/1/ /7/	DR	There is no significant adverse environmental effect.		OK
D.1.4. Have environmental impacts been identified and addressed in the PDD?		/1/ /7/	DR	Yes. The impacts are properly described in the PDD.		OK
E. Stakeholder Comments <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>						
E.1.1. Have relevant stakeholders been consulted?		/1/	DR I	In November 2006, staff from the project owner carried out a survey of local residents in the area where the project is sited to collect public comments and attitudes towards the		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				project.		
E.1.2. Have appropriate media been used to invite comments by local stakeholders?		/1/	DR	It needs to be clarified as to what medium has been used to invite comments from local stakeholders. How was the project information provided to all possible stakeholders for the project?	CL-6	OK
E.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?		/1/	DR	Yes. The stakeholder consultation process is in accordance with Chinese EIA regulations.		OK
E.1.4. Is a summary of the stakeholder comments received provided?		/1/	DR	Yes. The summary of the stakeholder comments received is described in the PDD.		OK
E.1.5. Has due account been taken of any stakeholder comments received?		/1/	DR	Yes.		OK

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
CAR 1 The LoA from the DNA of China has not been obtained. The same with the Annex I Party.	A.2.2 A.4.1	The LoA from the DNA of China has been provided, and the LoA from DNA of Sweden instead of United Kingdom has also been submitted. Sweden is an Annex I Party as well as a Party to the Kyoto Protocol.	OK. Letter of Approval was issued by the DNA of China on 2 July 2007, which confirms that the project assists in achieving sustainable development. Letter of Approval was issued by the DNA of Sweden on 13 November 2007.
CAR 2 The most recent data of year 2005 and IPCC 2006 default values should be used during the calculation of the OM/BM and the CM.	B.5.1 B.5.2 B.5.3	The calculation of OM/BM has been revised according to the data and calculation method issued by China DNA on Aug. 9 th , 2007. Please see Section B.6 and Annex 3 of the PDD.	OK.
CAR 3 The expected start date of the crediting period is 1 July 2007, which needs to be delayed after the registration.	C.1.2	The start date of crediting period has been revised as 01/03/2008. Please see Section C of the PDD.	OK
CL 1 The whole process of calculation of IRR, including necessary parameters, assumptions and their data sources are not available in the PDD. The excel file for calculating IRR and the relevant evidences should be provided.	B.3.2 B.3.3	The data sources of IRR calculation has been clarified in the PDD. The spreadsheet of IRR calculation has been provided to the auditor.	OK. The excel file has been provided. The main parameters come from the Feasibility Study of the project and have been verified.
CL 2 The evidence that the incentive from the	B.3.4	In the phase of FSR approved by the local government on Dec. 2003, the	OK. This Letter of Loan Intent was signed

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
CDM was seriously considered in the decision to proceed with the project activity need to be provided.		Project is likely to be economically attractive for the total investment's IRR is 13.04% based on a electricity tariff of 0.38 RMB/kWh which is rated by the summation of costs, tax and profits. However, on Jul. 19 th , 2004, the Development and Reform Commission of Jiangxi Province issued a policy document regulating that the electricity tariff for new small hydropower projects should be at the level of 0.25 RMB/kWh, then the Project must be economically unattractive. Considering this situation, the Project owner decided to develop the Project as a CDM project on Aug. 23 rd , 2004, and the Project acquired <i>Letter of Loan Intent</i> issued by the Zixi Subbranch of China Agriculture Bank on Sep. 15 th , 2004. The evidences of CDM consideration including the Memo of Board Meeting and the LoI have been provided.	on 15 September 2004, before the start of the construction. The evidences are provided to DNV. It is verified that CDM was seriously considered in the decision to proceed with the project activity.
CL 3 The measurement accuracy and the procedures in place on how to deal with erroneous measurements are not addressed in PDD.	B.10.5	The information of measurement accuracy and dealing with erroneous measurement has been stated in the <i>CDM Management and Monitoring Manual of Liujiashan Project</i> which has also been provided to the auditor.	OK. These parts have been described in the CDM Management and Monitoring manual which has been provided to DNV.

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
CL 4 Detailed procedures, for training of monitoring personnel, for review of reported results/data, and for corrective actions, are needed.	B.13.2 B.13.4 B.13.5	The procedures have been stated in Section B.7.2 of the PDD and the <i>CDM Management and Monitoring Manua of Liujiashan Project</i> .	OK. These parts have been added in the PDD.
CL 5 The evidence of the project's starting date needs to be provided.	C.1.1	The evidence has been provided. It's the <i>Letter of Approving the Construction of Liujiashan Project</i> issued by the Water Conservancy & Electric Power Bureau of Zixi County.	OK.
CL 6 It needs to be clarified as to what medium has been used to invite comments from local stakeholders. How was the project information provided to all possible stakeholders for the project?	E.1.2	To invite comments form local stakeholders, the Project owner carried out a survey of local residents through distributing and collecting response to a questionnaire, and the project information has been provided to stakeholders in the questionnaire. The returned questionnaires have been provided to the auditor. Please see Section E.1 of the PDD for more.	OK.

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Sequoia (Qingxing) A

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	--	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 18 July 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

Shu Yong Sun

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 12 March 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Mari Viddal

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	Yes	<i>JI Validator:</i>	Yes
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	--		
<i>Technical Reviewer for (group of) methodologies:</i>			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes		
ACM0002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-IA-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0030	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0031	Yes
ACM0004, ACM0012	Yes	AM0032	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0035	Yes
ACM0007	Yes	AM0038	Yes
ACM0008	Yes	AM0041	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0034	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0043	
AM0009, AM0037	Yes	AM0046	
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	AM0047	
AM0014	Yes	AMS-II.A-F, AM0044	Yes
AM0017	Yes	AMS-III.A	Yes
AM0018	Yes	AMS-III.E, AMS-III.F	Yes
AM0020	Yes		
AM0021, AM0028, AM0034, AM0051	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director