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# VALIDATION REPORT

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## PINGWU RENJIABA 12.6 MW SMALL HYDROPOWER PROJECT, P.R. CHINA

REPORT No. 2007-0615

REVISION No. 01

DET NORSKE VERITAS



## VALIDATION REPORT

Date of first issue: 2007-04-23	Project No.: 63602242.	DET NORSKE VERITAS DNV CERTIFICATION AS  Veritasvegen 1 N1322 Høvik Norway <a href="http://www.dnv.com">http://www.dnv.com</a>
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<b>Summary:</b> Det Norske Veritas Certification AS (DNV) has performed a validation of the “Pingwu Renjiaba 12.6 MW Small Hydropower Project, P.R.China” 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. This validation report summarizes the findings of the validation.  The validation consisted of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.  In summary, it is DNV’s opinion that the project, as described in the project design document of 16 June 2007, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology AMS-1.D version 10. Hence, DNV requests the registration of the “Pingwu Renjiaba 12.6 MW Small Hydropower Project, P.R.China” as a CDM project.		

Report No.: 2007-0615	Subject Group: Environment	<b>Indexing terms</b>	
Report title: Pingwu Renjiaba 12.6 MW Small Hydropower Project, P.R. China		Key words Climate Change Kyoto Protocol Validation Clean Development Mechanism	Service Area Verification
			Market Sector Renewable energy
Work carried out by: Lu Zhou , Ming Yue, Michael Lehmann		<input checked="" type="checkbox"/> No distribution without permission from the client or responsible organisational unit  <input type="checkbox"/> free distribution within DNV after 3 years  <input type="checkbox"/> Strictly confidential  <input type="checkbox"/> Unrestricted distribution	
Work verified by: Einar Telnes	Date of this revision: 2007-07-20	Rev. No.: 01	Number of pages: 13
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### ***Abbreviations***

BM	Building Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH <sub>4</sub>	Methane
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide equivalent
CCPG	China Central Power Grid
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
N <sub>2</sub> O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operational Margin
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change
NDRC	National Development and Reform Commission



## 1 INTRODUCTION

The College of Environmental Science and Engineering, Hunan University (hereafter called “Hunan University”) has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation the “Pingwu Renjiaba 12.6 MW Small Hydropower Project, P.R.China” (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for small-scale CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consisted of the following personnel:

Mr. Lu Zhou	DNV Beijing	Team leader, GHG auditor
Ms. Ming Yue	DNV Beijing	CDM validator
Mr. Einar Telnes	DNV Norway	Technical reviewer
Mr. Michael Lehmann	DNV Norway	Sector expert

### 1.1 Validation 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).

### 1.2 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 baseline and monitoring methodology AMS-I.D. The validation team has, based on the recommendations in the Validation and Verification Manual/6/ 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.

### 1.3 Description of Proposed CDM Project

The project is a grid-connected run-of- river small hydropower plant located in Shuijing Town of Pingwu County, Sichuan Province.

The total installed capacity of the project is 12.6 MW, consisting of two turbines of 6.3 MW capacity each. The project is expected to supply 77 458MWh electricity annually to Nanba Grid of Pingwu County, which is a part of the China Central Power Grid (CCPG). The power plant



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project is developed by a private company, the Pingwu Chuanjiang Hydropower Development Co. Ltd.

As a renewable energy project, the proposed project will displace partial electricity of the CCPG which is dominated by coal-fired power plants, and the estimated annual GHG emission reduction of 73 089 tCO<sub>2</sub>e could be achieved.

## **2 METHODOLOGY**

The validation consists of the following three phases:

- I a desk review of the project design, the baseline and monitoring plan
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual/6/. 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 Figure 1.

The completed validation protocol for the “Pingwu Renjiaba 12.6 MW Small Hydropower Project, P.R.China” is enclosed in Appendix A to this report.

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

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol 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.

The term Clarification may be used where additional information is needed to fully clarify an issue.



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<b>Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities</b>			
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>	<b>Cross reference</b>
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 ( <b>OK</b> ), a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements or a request for <b>Clarification (CL)</b> where further clarifications are needed.	Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.

  

<b>Validation Protocol Table 2: Requirement Checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	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 ( <b>OK</b> ), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). A request for <b>Clarification (CL)</b> is used when the validation team has identified a need for further clarification.

  

<b>Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification</b>			
<b>Draft report corrective action requests and requests for clarifications</b>	<b>Ref. to Table 2</b>	<b>Summary of project participants' response</b>	<b>Final conclusion</b>
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request 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



## 2.1 Review of Documents

The PDD version 2 of 16 June 2007 and version 1 (the PDD of version 1 was published)/1/ submitted by the client and additional background documents/1/-/17/ related to the project design and baseline were assessed as a part of the validation.

## 2.2 Follow-up Interviews

In the period of 16 April 2007, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Pingwu Chuanjiang Hydropower Development Co. Ltd., the College of Environmental Science and Engineering, Hunan University were interviewed. The main topics of the interviews are summarised in the table below.

**Table 1 Interview topics**

Interviewed organisation	Interview topics
Pingwu Chuanjiang Hydropower Development Co. Ltd.	<ul style="list-style-type: none"> <li>➤ The status of the project construction;</li> <li>➤ The preliminary engineering design report of the project;</li> <li>➤ The approval of the report;</li> <li>➤ The technical issues;</li> <li>➤ The investment barriers;</li> <li>➤ The Environment Impact Assessment;</li> <li>➤ The approval letter of the EIA;</li> <li>➤ The implementation of the compensation measures to relevant residents; affected by the project;</li> <li>➤ The status of the power purchasing agreement;</li> <li>➤ The process of the project construction;</li> <li>➤ The quality of the construction as per the feasibility study report;</li> <li>➤ The management during the construction of the project</li> </ul>
	<ul style="list-style-type: none"> <li>➤ The impact of the construction on environment and local stakeholders;</li> <li>➤ The status of economy in the local area;</li> <li>➤ The development of hydropower projects in the local area;</li> <li>➤ The implementation of the policy and regulation related to the project;</li> <li>➤ The implementation of the compensation measures</li> </ul>
College of Environmental Science and Engineering, Hunan University	<ul style="list-style-type: none"> <li>➤ PDD process;</li> <li>➤ The consulting process on the stakeholder's comments;</li> <li>➤ The additionality of the project;</li> <li>➤ The GHG emission calculation;</li> <li>➤ The methodology justification</li> </ul>



	<ul style="list-style-type: none"> <li>➤ The potential impacts on their daily life by the construction and operation of the project;</li> <li>➤ The comments on the project by local stakeholders;</li> <li>➤ The implementation of the compensation measures</li> </ul>
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### 2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. Response to corrective action requests (CARs) and requests for clarification (CLs) initially raised by DNV and presented to the project participants in DNV's draft validation report of 23 April 2007 (rev. 0) were invited from Hunan University. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A.

Since modifications to the Project Design Document were necessary to resolve DNV's concerns, Hunan University has revised the PDD and resubmitted the PDD on 16 June 2007. After reviewing the revised PDD, DNV issued this final validation report.

### 2.4 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 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 document version 2 dated 16 June 2007.

### 3.1 Participation Requirements

The project participants are Pingwu Chuanjiang Hydropower Development Co. Ltd. of China and Carbon Asset Management Sweden AB.

The DNA of China has issued a Letter of Approval (LoA) /2/ on 22 May 2007, authorizing Pingwu Chuanjiang Hydropower Development Co. Ltd. as project participant and confirming that the project assists in achieving sustainable development.

The DNA of Netherlands has issued a LoA/3/ on 21 June 2007 authorizing Carbon Asset Management Sweden AB as project participant in this proposed CDM project activity.

The project does not involve public funding, and 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.



### 3.2 Project Design

The main activity of the proposed project is to make full use of hydraulic resource in the upstream of Fujiang river to generate the electricity to Nanba grid of Pingwu County, which is connected to CCPG /12/. The project will also contribute to alleviation of power shortages in the local area.

The project involves the implementation and operation of a run-of-river hydropower plant of 12.6MW, provided by two turbines /4/. The project qualifies as a small-scale CDM project activity according to category I.D (less than 15 MW generation capacity) as defined in the simplified modalities for small-scale CDM project activities.

The project proponent has not registered any small scale CDM projects in the last 2 years and the project boundary 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 the existing hydropower projects and represents current good practice.

As a renewable energy project, the proposed project activity will be expected to supply electricity of 77 458MWh annually, which will achieve 73 089tCO<sub>2</sub>e GHG emission reductions annually through displacing a part of the electricity generated by CCPG, which is dominated by coal-fired power plants.

DNV recognized that the proposed project activity fulfills the Chinese domestic regulations and policy of promoting sustainable development. The project is in line with host-country specific CDM requirements and the confirmation thereof by the DNA of China was issued on 22 May 2007.

The project started on 21 June 2004 /13/ and the designed operation life of the project is 22 years/4/. The length of the first selected crediting period is 7 years, starting on 01 January 2008.

### 3.3 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 by DNV due to that i) the project is a run-of-river hydropower project and ii) is connected to an regional electricity grid (CCPG).

The baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO<sub>2</sub> equ/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. The ex-ante method was selected on OM and BM calculation based on the most recent information available of years 2000-2004/9//10/. The baseline is the MWh produced by the



project power plant multiplied by an emission coefficient (in tonnes CO<sub>2</sub>e/MWh), calculated based on the weighted average emissions of the current CCPG generation mix.

The project boundary is clearly defined as the site of project activity and the system boundary is defined as CCPG of China, including Jiangxi Province, Henan Province, Hubei Province, Hunan Province, Sichuan Province and Chongqing City grid. There are no significant transmission constraints between the power plants of the CCPG grid, nor with the proposed project.

The project boundary defined is in line with AMS I.D. The CCPG is dominated by thermal power generation and further information on future expected developments of the CCPG has been provided, showing continued domination by thermal power generation during the crediting period./9/

The application of the baseline methodology is transparent and conservative.

### **3.4 Additionality**

The additionality of the project is demonstrated through the existence of investment barriers.

In China an IRR of 10 % is regarded as the benchmark for investing in the small-scale hydropower/11/. The total investment was increased greatly because several collapses occurred during the construction of the water import tunnel, which lead to extra 2256.8 million RMB input/18/. Considering these factors, the project's IRR without CER revenues is 5.61%. This shows that the project is not financially attractive in absence of CDM revenues, which lead to an investment barrier for the project. The project operator applied for loan to Industry and Commercial Bank of China Pingwu County Branch in order to meet lack of finance of project on 18 December 2004. However, the loan application was rejected/15/ due to poor profit and low ability of resisting risk of the project. The construction was thus forced to stop from December 2004 to July 2005 and the evidence of the discontinued activity has been provided and verified by DNV/14/.

During the period of project stopping, the project operator received information of CDM from a CDM expert in the Hunan province and signed a CDM project development contract with the consulting company on 16 February 2005/16/. These incentive factors with CDM attracted six new local investors willing to finance to the project, convinced the project operator to reform its shareholders structure/17/, and the project returned to construction/20/. Relevant evidences supporting this information have been provided and verified by DNV.

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

### **3.5 Monitoring Plan**

The approved baseline and monitoring methodology as described in AMS-1.D. –Grid connected renewable electricity generation is used. 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 application of the monitoring methodology is transparent.



The monitoring methodology will give opportunity for real measurements of achieved emission reductions. According to the requirement of EB, the project is a run-of-river hydropower project and no flooded area/4/, hence no indicators have been defined regarding project emissions and leakage emissions.

Leakage accounting 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.

The electricity generated by the hydropower plant and supplied to the grid will be monitored with calibrated meters and checked jointly by national designated authority and the project proponent according to the electricity meter monthly. In addition, the electricity sales receipts may be provided for data quality control and cross check.

Details of the data to be collected, the frequency of data recording and its format, responsibilities and authorities for project management, procedures for monitoring and reporting, QA/QC procedures, procedures for calibration of metering equipment and procedures for training and maintenance have been elaborated in the monitoring plan which defined in the resubmitted PDD. The application of the monitoring methodology is transparent.

### **3.6 Calculation of GHG Emissions**

The project will partly displace fossil fuel-based electricity generation. The methodology complies with one of the approaches proposed for category I.D project activities.

The baseline emission factor for the project is determined ex-ante as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM).

The operating margin (OM) is calculated using the “simple OM” method which is justified because low cost and must run power plants constitute less than 50% of the total grid generation.

The aggregated generation and fuel consumption data are used due to the more disaggregated data are not available in the CCPG. The IPCC default value for the carbon content of coal (25.8 tC/TJ), a carbon oxidation factor of 98% and the local value of 29271.2 MJ/tce are used to calculate the OM. Vintage data for the years 2002, 2003 and 2004 are used for calculation of the operating margin. The OM is evaluated to be 1.2526 tCO<sub>2</sub>/MWh.

Because plant specific fuel consumption and electricity generation data is not public available in China, DNV requested guidance from the CDM Executive Board for a deviation of the baseline methodology of AM0005 and received the following answers\* which are deemed to be applicable for this project.

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

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\* <http://cdm.unfccc.int/Projects/Deviations>

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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).

Since AM0005 was replaced by ACM0002, the deviation is deemed to be applicable to this project. Following the EB's guidance the build margin is calculated as follows:

- The capacity additions from the years 2000 to 2004 is chosen and reach 22.5% of the total installed capacity.
- The weight of installed capacity additions for thermal power plant is accounted for 69.8% of total installed capacity additions.
- The coal consumption efficiency of 336.66 g SCE/kWh is selected as the best technology commercially available in China.

(Data source: 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>).

This can be acknowledged as the best available data available for coal-fired power generation for calculating the BM in the CCPG. The official supporting documentation has been verified.

- The IPCC default value of emission factor 25.8 tC/TJ for carbon content of the coal, carbon oxidation factor of 98% and the local value of 29271.2 MJ/tce are used to calculate the BM./8/

- It is noted that there is no data of installed capacity additions for oil and gas public available in CCPG. However, China Energy Statistics Yearbook (data of 2004) shows that the oil and gas used in CCPG as secondary fuels are very small, and only for starting and warming up systems of coal fired power plant. DNV has verified that the emissions from both oil and gas consumption in CCPG was only account 0.49% in 2004\*. It is unlikely that there will be significant additions of oil and gas fired power plant in the CCPG during the first crediting period considering the local shortage of the oil and gas resources. So the installed capacity addition for oil and gas power plant being regarded as zero is deemed reasonable. The conservative estimation of emission factor of BM can be calculated as 0.6346tCO<sub>2</sub>/MWh. The weights  $\omega_{OM}$  and  $\omega_{BM}$  are selected as 0.5 and 0.5 respectively for the hydropower project by the default (i.e.  $\omega_{OM} = 0.5$  and  $\omega_{BM} = 0.5$ ) stipulated on the ACM0002 version 06. The combined margin of 0.9436 tCO<sub>2</sub>/MWh is fixed ex-ante for the entire first crediting period. The lasted data used to calculate OM is derived from China Energy Statistical Yearbooks of the year 2003 to 2005; to calculate the BM is derived from China Power Electric Power Yearbooks of the year 2001 to 2005./9//10/

The emission reduction E<sub>Ry</sub> by the project activity during the crediting period is the difference between baseline emissions (B<sub>ey</sub>), project emissions (P<sub>ey</sub>) and emissions due to leakage (L<sub>y</sub>), as follows:

1) Baseline emissions: Baseline emissions (B<sub>ey</sub> in tCO<sub>2</sub>) are the product of the baseline emissions factor (E<sub>fy</sub> in tCO<sub>2</sub>/MWh) times the electricity supplied by the project activity to the grid (E<sub>gy</sub> in MWh).

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\* See: <http://cdm.ccchina.gov.cn/Website/CDM/UpFile/File1051.pdf>

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- 2) Project emissions: The project emissions are regarded as zero.
- 3) Leakage: No leakage has to be considered for the proposed project activity.
- 4) Emission reduction: Ery= Bey- Pey- Ly= Bey.

According to the process above, the calculation result of emission reduction is 73 089tCO<sub>2</sub> for the project per year.

The GHG calculations are complete and transparent, and their accuracy has been verified.

### **3.7 Environmental Impacts**

The proposed project is a small run-of-river hydropower plant and the environmental impacts of the project are not considered significant. An environmental impact assessment (EIA) according to China environmental law has been carried out. The mitigation measures for all potential impacts seem well planned and documented/5/. The approval letter was issued by Mianyang City Environment Protection Bureau on 27 July 2004.

The conclusions of the report have been described in the PDD. As the project power plant is a run-of-river project without reservoir, resettlement is not required nor are any significant environmental impacts expected.

### **3.8 Comments by Local Stakeholders**

The stakeholder consultation process was conducted in phase of EIA in June 2004; moreover a special stakeholder consulting process was conducted in manner of questionnaire in January 2007, which includes public personnel of different age, different gender, different ethnics, and different occupations.

There are total 45 questionnaires were handed out and return completed, 100% participants agreed to the construction of the project and raised some constructive suggestions, which were seriously considered by project owner. The comment received has been taken into consideration and the project owner has planned to put relevant measures listed in the EIA and the Soil and Water Maintenance Plan into effect during construction and operation to achieve environmental benefits, social benefits and economic benefits.

## **4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS**

The PDD of 16 January 2007 was made publicly available on DNV's climate change website (<http://www.dnv.com/certification/climatechange/Projects/ProjectDetails.asp?ProjectId=963>) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 30 January 2007 to 28 February 2007.

No comments were received during this period.



## 5 VALIDATION OPINION

*Det Norske Veritas Certification AS (DNV) has performed a validation of the “Pingwu Renjiaba 12.6 MW Small Hydropower Project, P.R.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 country is China and the Annex I country is Netherland. Both countries 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.*

*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.*

*Having an installed capacity of 12.6 MW, the project is eligible as type I small-scale CDM project activity.*

*The project correctly applies the simplified baseline and monitoring methodology AMS-I.D.*

*By generating renewable energy which will displace fossil fuel based electricity in the CCPG, the project results in reductions of CO<sub>2</sub> 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 73 089 tCO<sub>2</sub>e/year during a seven years renewable crediting period. The emission reduction forecast has been checked and is deemed likely that the state amount is achieved given that the underlying assumptions do not change.*

*The monitoring methodology AMS-I.D has been applied correctly. The monitoring plan has been generally identified. As the project is under construction stage, detailed procedures for monitoring, operating and maintenance will be finalized and put in place prior to the start of the crediting period.*

*Local stakeholders’ comments were invited through public discussion during the EIA process. All comments received and how they were or will be taken into account are included in the EIA report. Public stakeholders’ inputs have also been invited via the UNFCCC web-site. No comments have been received.*

*In summary, it is DNV’s opinion that the project, as described in the project design document of date, meets all relevant UNFCCC requirements for the CDM, is eligible as category I.D small-scale CDM project activity and correctly applies the approved simplified baseline and monitoring methodology AMS-I.D. Hence, DNV requests the registration of the “Pingwu Renjiaba 12.6 MW Small Hydropower Project, P.R.China” as a CDM project activity.*



## REFERENCES

*Documents provided by the project proponent that relate directly to the project:*

- /1/ Project Design Document for Renjiaba 12.6 MW Small Hydropower Project in Sichuan Province, version 1 of 16 January 2007, revised version 2 of 16 June 2007
- /2/ Letter of Approval issued by DNA of China on 22 May 2007
- /3/ Letter of Approval issued by DNA of Netherlands on 21 June 2007
- /4/ The Preliminary Design Report of Pingwu County Renjiaba Hydropower Station and the approval letter by Mianyang City Development and Planning Commission, 24 September 2003, No.[2003]24
- /5/ The project environmental impact assessment report and the approval letter by Environmental Protection Bureau of Mianyang City, 27 July 2004, No.[2004]127

*Background documents related to the design and/or methodologies employed in the design or other reference documents:*

- /6/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /7/ 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 activity categories*. Version 10: 23 December 2006.
- /8/ IPCC: *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories Reference Manual*. 1996.
- /9/ China Electric Power Yearbook 2001, 2002, 2003, 2004 and 2005
- /10/ China Energy Statistical Yearbook 2001—2005
- /11/ Economic evaluation code for small hydropower projects (SL 16-95)
- /12/ Grid connecting agreement between Pingwu Chuanjiang Hydropower Development Co. Ltd., and Sichuan Pingwu Power Group Company, 15 August 2003
- /13/ Construction Permit of Engineering, Mianyang City Development and Planning Commission and Mianyang City Water Affair Bureau, 21 June 2004
- /14/ Evidence of construction delay, Mianyang City Yuxing Construction Engineering Monitoring Company, 26 December 2004
- /15/ Reply letter to loan application, Industry and Commercial Bank of China Pingwu Branch, 18 December 2004
- /16/ CDM project development contract between Pingwu Chuanjiang Hydropower Development Co. Ltd. and Hunan Sangzhi County Hydropower Development Co. Ltd., 16 February 2005
- /17/ Company Statute and shareholder board memo of Pingwu County Chuanjiang Hydropower Development Co. Ltd., 28 May 2005 and 14 August 2005

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- /18/ Letter of investment increasing of Pingwu County Renjiaba Hydropower Project, Mianyang City Yuxing Construction Engineering Monitoring Company, 30 December 2005
- /19/ Approval letter of Water and Soil Conservation report for Pingwu County Renjiaba Hydropower Project, Mianyang City Water Affair Bureau, 20 October 2004, [2004]No.17
- /20/ Notification of returning to construction, Mianyang City Yuxing Construction Engineering Monitoring Company, 1 July 2005

*Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:*

- /21/ Mr. Zheng Daihua, Vice-President, Pingwu Chuanjiang Hydropower Development Co. Ltd.
- /22/ Mr. Li Li, Director of Office, Pingwu Chuanjiang Hydropower Development Co. Ltd.
- /23/ Ms. Liu Hongyu, Project Principal, College of Environmental Science and Engineering, Hunan University
- /24/ Ms. Li Jing, Project assistant, College of Environmental Science and Engineering, Hunan University
- /25/ Mr. Xia Jiahua, Expert, Sangzhi County Southern Hydropower Development Co. Ltd.

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## **APPENDIX A**

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### **VALIDATION PROTOCOL FOR SMALL-SCALE CDM PROJECT ACTIVITIES**

**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	ok	Table 2, Section E.4.1
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	<del>CAR-1</del>	Table 2, Section A.3
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 the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	<del>CAR-2</del>	Table 2, Section A.3
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. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall	Decision 17/CP.7, CDM Modalities and	ok	The validation did not reveal any information

Requirement	Reference	Conclusion	Cross Reference/ Comment
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.	Procedures Appendix B, § 2		that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	ok	China: National Development and Reform Commission of People's Republic of China.  Netherlands: The Ministry of Housing , Spatial planning and the Environment
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities and Procedures § 30, 31b	ok	China ratified the Kyoto Protocol on 30 August 2002.  Netherlands ratified the Kyoto Protocol on 31 May 2002
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	ok	The Netherlands assigned amount is 92% of the emissions in 1990.
11. 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	The validation has not in detail assessed Netherlands's compliance with article 5 and 7 of the

Requirement	Reference	Conclusion	Cross Reference/ Comment
			Kyoto Protocol. The Netherlands has in place a national system for estimating GHG emissions and annually submits its most recent inventory to the UNFCCC.
12. 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
13. 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	The project design document does conform with the Small Scale CDM Project Design Document format (version 03) valid by the time of PDD submission.
14. The proposed project activity shall conform 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, B and D
15. 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

Requirement	Reference	Conclusion	Cross Reference/ Comment
16. 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
17. 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	The PDD has been published on DNV's climate change website and Parties, stakeholders and NGOs have through the UNFCCC CDM website been invited to provide comments on the validation requirements during a period of 30 days from 30 January 2007 to 28 February 2007.

**Table 2 Requirements Checklist**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>A. Project Description</b> The project design is assessed.					
<b>A.1. Small scale project activity</b> 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?	/1/	DR	Yes. The installed capacity of the project is 12.6MW, which does not exceed the stipulated limit of 15 MW. The project thus qualifies as a small scale CDM project activity Type I, Category D as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM.		ok
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/	DR	No, The proposed project is not a debundled component of any larger scale project. The proponent has not registered any small scale CDM projects in the last 2 years and the project boundary is not within 1 km radius of any other proposed small scale CDM project.		ok
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	/1/	DR	Yes. The project conforms to Type 1 (Renewable energy projects) category I.D (Renewable Electricity Generation for a Grid)		ok

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>A.2. Project Design</b> 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?	/1/	DR	Yes. The spatial boundaries of the project are clearly defined in the PDD. The spatial boundary of the project includes the project site. The project is located in Shuijing Town, Pingwu County, Sichuan Province 353km to Mianyang City.		ok
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/	DR	Yes. The project's system boundaries is clearly defined as China Central Power Grid (CCPG) Including Jiangxi Province, Henan Province, Hubei Province, Hunan Province, Sichuan Province and Chongqing City grid.		ok
A.2.3. Does the project design engineering reflect current good practices?	/1/	DR	Yes. The project design engineering reflects current good practices.		ok
A.2.4. Will the project result in technology transfer to the host country?	/1/	DR	The technology is already available in the country and thus no technology transfer is envisaged in the project.		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?	/1/	DR	There are no relevant descriptions on the training and maintenance needs.	<del>CL4</del>	ok

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>A.3. Contribution to Sustainable Development</b> 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?	/1/	DR	Yes. The project is providing benefits such as generating employment during construction and operation of the project, ensuring environmental wellbeing and in bridging the gap between demand and supply of power.		ok
A.3.2. Will the project create any adverse environmental or social effects?	/1/ /5/	DR	In view of the common practice of China, the environmental impacts of the project are considered negligible. The EIA report and the feasibility report of the project show the project will not create any remarkable adverse environmental or social effects.		ok
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	The approval letter from the Chinese DNA is not obtained yet.	<del>CAR 4</del>	ok
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/ /4/	DR	Yes. The project has been approved by Mianyang City Development and Planning Commission on 24 September 2003.		ok

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>B. Project Baseline</b> 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>B.1. Baseline Methodology</b> 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?	/1/	DR	Yes. It is a Renewable Energy Project. Category I.D of the simplified modalities and procedures for small scale CDM project activities. This methodology applies to hydro project activities that supply electricity to an electricity distribution system that is or would have been supplied by at least one fossil fuel unit.		ok
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/	DR	Yes. The project applies one of the simplified baseline methodologies proposed for type I.D small-scale project activities (AMS-I.D). According to the two methods given by simplified baseline methodology for small scale CDM project activities (AMS-I.D), the second method (AMS-I.D. Option (b): the weighted average emissions of the current generation mix is selected as the calculation method for the proposed project activity's baseline emission coefficient. The baseline is kWh produced by the renewable generating unit multiplied by an emission co-efficient (measured in kgCO <sub>2</sub> equ /kWh).		ok

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<p><b>B.2. Baseline Determination</b></p> <p>It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.</p>					
<p>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?</p>	<p>/1/ /14/ /15/ /16/ /17/ /18/ /20/</p>	<p>DR I</p>	<p>The additionality of the project is demonstrated through the existence of investment barrier and other barriers.</p> <p>Investment barrier:</p> <p>In China an IRR of 10 % is regarded as the benchmark for investing in the small-scale hydropower. The project's IRR without CER revenues is 5.61%, which shows that the project is not financially attractive in absence of CDM revenues, which lead to investment barrier to the Project.</p> <p>The process of the calculation of FIRR, including all necessary parameters, data sources are requested to be provided in the PDD or as an Annex. The evidences of project stopping and restarting are requested to be provided for confirmation by DNV.</p> <p>The project operator applied for loan to Industry and Commercial Bank of China Pingwu County Branch in order to meet lack of finance of project on 18 December 2004. However, it was refused due to poor profit and low ability of anti-risk of the project. The construction engineering was forced to stop. However, the evidence of the stopping should be provide and confirmed further.</p>	<p><del>CL2</del></p>	<p>ok</p>

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			<p>Meanwhile, the project operator heard CDM affair from its counterpart and signed a CDM project development contract with a company on 16 February 2005. These incentive factors with CDM attracted six new local investors to input finance to the project, which promoted the project operator to reform its shareholders structure, and the project returned to construct.</p> <p>The above presented arguments thus sufficiently demonstrate that the project is not a likely baseline scenario and that emission reductions resulting from the project are additional.</p>		
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/1/	DR	The baseline is the weighted average emissions of the current generation mix (CCPG), which is considered conservative and transparent.		ok
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/	DR	Yes. The national policy favours the renewable energy. But there is no enforcement for the implementation of the project.		ok
B.2.4. Is the baseline selection compatible with the available data?	/1/	DR	Yes. See B2.2 The baseline selection is compatible with the available data.		ok
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/	DR	Yes. It is likely that the regional grid will remain dependent on fossil fuel energy for the first seven years of the crediting period.		ok

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>C. Duration of the Project / Crediting Period</b> 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?	/1/ /13/	DR	The project started to construct on 21 June 2004. The project will be operated on 01 January 2008 and its operational lifetime is defined as 22 years.		ok
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	7 years of renewable crediting period is selected with the starting date of the first crediting period. The date should be justified according to the date of project registration.		ok
<b>D. Monitoring Plan</b> The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
<b>D.1. Monitoring Methodology</b> 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?	/1/	DR	The selected monitoring methodology is in line with the monitoring methodology described in the Simplified Procedures for SSC Projects for AMS. ID.		ok
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/	DR	Yes. The monitoring methodology is applicable to the project.		ok
D.1.3. Is the application of the monitoring	/1/	DR	Yes. The application of the monitoring methodology		ok

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
methodology transparent?			is transparent.		
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/	DR	Yes. According to AMS I.D. the electricity generated will be measured to calculate the emission reductions.		ok
<b>D.2. Monitoring of Project Emissions</b> It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. 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/ /4/		The 12.6MW hydropower project is a run-of-river small hydropower project and according to the requirement of the CDM EB, and no flooded area, hence no indicators have been defined regarding project emissions.		ok
<b>D.3. Monitoring of Leakage</b> If applicable, it is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	According to Paragraph 8 of Appendix B of small-scale CDM project activity modalities, leakage calculation is only needed if the renewable energy technology equipment is transferred from another activity. The equipment of the project is not transferred from another activity and therefore no leakage calculation is required.		ok

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>D.4. Monitoring of Baseline Emissions</b> It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	Yes. The electricity generation will be monitored and baseline emissions will be determined by multiplying the proposed project generation kWh with the emission co-efficient calculated as the weighted average emissions of the current generation mix, which is fixed for the first 7 years crediting period.		ok
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	Yes. The baseline indicators have been chosen in line with the small-scale methodologies approved by the CDM EB.		ok
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes. The electricity generated to the grid will be monitored directly. See 4.1		ok
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	Yes. The baseline emissions will be calculated based on the electricity sold to the grid and double checked with invoices to the grid operator. See 4.1		ok
<b>D.5. Project Management Planning</b> 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?	/1/	DR	Yes. The authority and responsibility for project management, monitoring, measurement, review and reporting has been established.		ok

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/	DR	Yes. The authority and responsibility for registration monitoring measurement and reporting is clearly described. A designated person at site is responsible for monitoring, measurement and reporting.		ok
D.5.3. Are procedures identified for training of monitoring personnel?	/1/	DR	The procedures for training of monitoring personnel need to be formalised.	<del>CL3</del>	ok
D.5.4. 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
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	Yes. The procedures of the calibration is clearly addressed in PDD. It will be undertaken by authorized entity according to the national regulations.		ok
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	The procedures for maintenance of monitoring equipment and installations are expected to be identified prior to the commissioning of the plant. The designated monitoring officers will be responsible for that.		ok
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	The procedures for monitoring, measurements and reporting need to be clearly described and formalised.	<del>CL4</del>	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)	/1/	DR	Yes, as above. The data is archived in electronic format. Receipts of electricity sales will be obtained.		ok
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	The procedures for QA/QC have not been clearly described and established. The monitoring manual covering the content of checklist (D.5.9-12) is	<del>CL5</del>	ok

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			required to outline and establish prior to project registration. The electricity output will be checked by contracted grid and the project developer monthly and double checked by the Electricity Sales Receipts.		
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/	DR	Ditto	<del>CL6</del>	ok
D.5.11. Are procedures identified for project performance reviews?	/1/	DR	Ditto	<del>CL7</del>	ok
D.5.12. Are procedures identified for corrective actions?	/1/	DR	Ditto	<del>CL8</del>	ok
<b>E. Calculation of GHG emission</b>					
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.					
<b>E.1. Project GHG Emissions</b>					
The validation of ex-ante estimated 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?	/1/	DR	Yes. The project is a run-of-river small hydropower project and according to the requirement of EB, no flood area, hence the project emissions may be neglected.		ok

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>E.2. Leakage</b> 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 and estimated ex-ante.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/	DR	According to Paragraph 8 of Appendix B of small-scale CDM project activity modalities, leakage calculation is only needed if the renewable energy technology equipment is transferred from another activity. There is no equipment transferred from another activity and therefore no leakage calculation is required.		ok
<b>E.3. Baseline GHG Emissions</b> The validation of ex-ante estimated 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?	/1/	DR	Yes. All the power plants connected to the CCPG are included for calculating the OM and BM. The baseline emissions are calculated in accordance with ACM0002. The baseline emission factor is based on the combined margin using the 'simple operating margin' Option (a) of the ACM0002 because the low-cost /must run resources constitute less than 50% of total grid generation and the data of the preferred option (c) is not public available.		ok
E.3.2. Are all aspects related to direct and	/1/	DR	Yes. DNV confirms all baseline emissions are		ok

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
indirect baseline emissions captured in the project design?			captured in the project design.		
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes. The evaluation of the greenhouse gases and sources is deemed reasonable.		ok
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/	DR	Yes. The methodology `as per appendix B of the simplified modalities and procedures for small scale CDM project activities.		ok
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/	DR	No. The further clarification is required on the reason of option chosen for calculating OM. And the further clarification is required on the description of electricity export or import between the CCPG and other connected grids. The OM calculation should be described in transparent and details way other than citing relevant website only.	<del>CL-9</del>	ok
E.3.6. Have conservative assumptions been used?	/1/	DR	No. In BM calculation, using the share of the CO <sub>2</sub> emission of each fuel among the total emission of thermal plants as proportion of installed capacity of thermal plant that different fuel based respectively, which is not conservative.  The respective data for coal-fired, oil –fired, and gas-fire installed capacity additions for calculating the BM in the CCPG is available from 2002-2004. So the present calculation of BM in PDD is not conservative. The calculations process of BM and the corresponding indicators should be justified and clarified on key indicator, its source and reason for equation choice.  The BM calculation should be described in transparent and details way other than citing relevant website only.	<del>CL-10</del>	ok

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/	DR	Yes.		ok
<b>E.4. Emission Reductions</b> Validation of ex-ante estimated emission reductions.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/1/	DR	Yes. The emission reductions of the project are expected to be 73 089tCO <sub>2</sub> e per year. The amount needs be justified.		ok
<b>F. Environmental Impacts</b> 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?	/1/	DR	Yes. An environmental Impact Assessment is required by Chinese law & regulation.		ok
F.1.2. Does the project comply with environmental legislation in the host country?	/1/ /5/	DR	Yes. The EIA has been approved by Mianyang City Environmental Protection Bureau on the 27 July 2004.		ok
F.1.3. Will the project create any adverse environmental effects?	/1/ /5/	DR	The project is not deemed to create any significant adverse environmental effects according the EIA.		ok
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/ /5/	DR	Yes. Environmental impacts during the construction and operation period have been identified and discussed. There are no migration of population and the movement of building in the construction of the project.  The environmental impact related to the project should be addressed more in PDD.	<del>CL14</del>	ok

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>G. Comments by Local Stakeholder</b>					
Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/ /5/	DR	Yes. The stakeholder consultation process was conducted in meeting in phase of EIA, moreover a special questionnaire was handed out for comments in January 2007, which includes public personnel of different age, different gender, different ethnics, different occupations and different educational background.  More information should be given on the approach of receiving comments, comments received, and amount of participants.	<del>CL-12</del>	ok
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Yes.		ok
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?	/1/	DR	Yes. The stakeholder consultation process is in accordance with Chinese EIA regulations.		ok
G.1.4. Is a summary of the comments received provided?	/1/	DR	Yes. The summary is available.		ok
G.1.5. Has due account been taken of any comments received?	/1/	DR	Yes. The relevant measures have been taken by the project developer.		ok

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

**Table 3 Resolution of Corrective Action and Clarification Requests**

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p><del>CAR 1</del></p> <p>The approval letter from the Chinese DNA is not obtained yet.</p>	A.3.3	The project was approved by Chinese DNA, NDRC. The LOA letter has been obtained.	<p>OK. The LOA has been provided and verified by DNV.</p> <p>The CAR1 is closed.</p>
<p><del>CAR 2</del></p> <p>The approval letter from the Swedish DNA is not obtained yet.</p>	Table 1 Requirement 4	The project was approved by Netherlands DNA, the Ministry of Housing , Spatial planning and the Environment. The LOA letter has been obtained.	<p>OK. The LOA has been provided and verified by DNV.</p> <p>The CAR2 is closed.</p>
<p><del>CL 1</del></p> <p>There are no relevant descriptions on the training and maintenance needs.</p>	A.2.5	It was described in the revised PDD that the staffs related to the CDM project should be trained by the project consulting company prior to project operation and the record of trained staff will be kept by project developer. The maintenance need was addressed in the monitoring plan as well.	Ok. The CL1 is closed.
<p><del>CL 2</del></p> <p>The process of the calculation of FIRR, including all necessary parameters, data sources are requested to be provided in the PDD or as an Annex. The evidences of project discontinuation and restarting are required to be provided for confirmation by DNV</p>	B.2.1	<p>All the data used for the IRR calculation are from the preliminary design report with the exception of the electricity tariff which can be found in the tariff regulation of local authority.</p> <p>The spreadsheet and evidence of project stopping and restarting have been provided to DNV.</p>	<p>The parameters used in the calculation have been listed in the PDD and the data source has been elaborated in the PDD.</p> <p>DNV has checked the spreadsheet for IRR calculation and was able to verify that IRR calculation is reasonable.</p> <p>The investment analysis and sensitivity assessment have shown that the project activity is unlikely to be the most financially attractive option.</p> <p>Thus, the CL2 is closed.</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
<del>CL3</del> The procedures for training of monitoring personnel need to be formalised.	D.5.3	The training of monitoring personnel was described as a requirement of project monitoring plan in the revised PDD.	The procedure has been identified. The CL3 is closed.
<del>CL4</del> The procedures for monitoring, measurements and reporting need to be clearly described and formalised.	D.5.7	The monitoring, measurement, and reporting need and approach were described as requirements of project monitoring plan in the revised PDD.	The procedures have been identified. The CL4 is closed.
<del>CL5</del> The procedures for QA/QC have not been clearly described and established. The monitoring manual covering the content of data adjustments and uncertainties is required to outline and establish prior to project registration.	D.5.9	QA/QC procedure covering the requirements has been addressed in the revised PDD.	Ok. The CL is closed.
<del>CL6</del> The monitoring manual covering the content of internal audit is required to outline and establish prior to project registration.	D.5.10	QA/QC procedure covering the requirements has been addressed in the revised PDD.	Ok. The CL is closed.
<del>CL7</del> The monitoring manual covering the content of project performance review is required to outline and establish prior to project registration.	D.5.11	QA/QC procedure covering the requirements has been addressed in the revised PDD.	Ok. The CL is closed.
<del>CL8</del> The monitoring manual covering the content of corrective actions is required to outline and establish prior to project registration.	D.5.12	D QA/QC procedure covering the requirements has been addressed in the revised PDD.	Ok. The CL is closed.
<del>CL9</del> The further clarification is required on the reason of option chosen for calculating OM.	E.3.5	The correct reason of option chosen for calculating OM and OM calculation process were addressed clearly in the	The details of OM calculation took the issued documents of Chinese DNA as reference and were addressed as an

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>The further clarification is required on the description of electricity export or import between the CCPG and other connected grids.</p> <p>The OM calculation should be described in transparent and details way other than citing relevant website only.</p>		revised PDD.	<p>annex of PDD.</p> <p>The correctness has been verified by DNV.</p> <p>The CL9 is closed.</p>
<p><b>CL10</b></p> <p>In BM calculation, using the share of the CO<sub>2</sub> emission of each fuel among the total emission of thermal plants as proportion of installed capacity of thermal plant that different fuel based respectively, which is not conservative.</p> <p>The respective data for coal-fired, oil –fired, and gas-fire installed capacity additions for calculating the BM in the CCPG is available from 2002-2004. So the present calculation of BM in PDD is not conservative. The calculations process of BM and the corresponding indicators should be justified and clarified on key indicator, its source and reason for equation choice.</p> <p>The BM calculation should be described in transparent and details way other than citing relevant website only.</p>	E.3.6	<p>In the revised PDD, BM calculation process using the existing reference issued from National Development and Reform Commission, DNA of China. On the basis of the data in that reference, a conservative assumption of oil and gas fuel power plant emission was used, due to the oil and gas used in CCPG as secondary fuels are very small, and only for starting and warming up systems of coal fired power plant. The installed capacity addition for oil and gas power plant being regarded as zero is deemed reasonable, which lead to more conservation calculation result other than using the share of CO<sub>2</sub> emission of each fuel among the total emission of thermal plants directly.</p>	<p>The revised PDD has been provided to DNV. The calculation of BM and its data source were verified by DNV. The BM result was deemed transparent and conservative.</p> <p>Thus, the CL10 is closed.</p>
<p><b>CL11</b></p> <p>The environmental impact related to the project should be addressed more in PDD.</p>	F.1.4	<p>More information related to the environmental impact of the project has been added in the revised PDD.</p>	<p>DNV has checked the consistency of environmental impact of the project addressed in the PDD and EIA report. The description of environmental impact says the project has a positive impact on local environment.</p> <p>Ok, the CL11 is closed.</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
<del>CL 12</del> More information should be given on the approach of receiving comments, comments received and amount of participants.	G.1.1	The process of stakeholder comments has been clarified in the revised PDD.	The original questionnaires have been provided and verified by DNV Ok, the CL 12 is closed.

## **APPENDIX B**

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### **CERTIFICATES OF COMPETENCE**



## CERTIFICATE OF COMPETENCE

### *Einar Telnes*

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

<b>GHG Auditor:</b>	Yes		
<b>CDM Validator:</b>	Yes	<b>JI Validator:</b>	--
<b>CDM Verifier:</b>	Yes	<b>JI Verifier:</b>	--
<b>Industry Sector Expert for Sectoral Scope(s):</b>	Sectoral scope 1, 2, 3 6 & 10		
<b>Technical Reviewer for (group of) methodologies:</b>			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-IA-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0028, AM0034	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0030	Yes
ACM0004	Yes	AM0031	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0032	Yes
ACM0007	Yes	AM0035	Yes
ACM0008	Yes	AM0038	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0041	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0034	Yes
AM0009, AM0037	Yes	AM0043	
AM0013, AM0022, AM0025, AM00379, AMS- III.H, AMS-III.I	Yes	AM0046	
AM0014	Yes	AM0047	
AM0017	Yes	AMS-II.A-F, AM0044	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes
AM0021	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes  
Director, International Climate Change Services

Michael Lehmann  
Technical Director



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## CERTIFICATE OF COMPETENCE

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### *Mindy (Ming) Yue*

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

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

Høvik, 5 January 2007

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)

<b>GHG Auditor:</b>	Yes		
<b>CDM Validator:</b>	Yes	<b>JI Validator:</b>	--
<b>CDM Verifier:</b>	Yes	<b>JI Verifier:</b>	--
<b>Industry Sector Expert for Sectoral Scope(s):</b>	Sectoral scope 1, 2, 3 & 9		
<b>Technical Reviewer for (group of) methodologies:</b>			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0028, AM0034	Yes
ACM003, ACM0005, AM0033, AM0040 ACM0004	Yes Yes	AM0030 AM0031	Yes Yes
ACM0006, AM0007, AM0015, AM0036, AM0042 ACM0007	Yes Yes	AM0032 AM0035	Yes Yes
ACM0008 ACM0009, AM0008, AMS-III.B	Yes Yes	AM0038 AM0041	Yes Yes
AM0006, AM0016, AMS-III.D, ACM0010 AM0009, AM0037	Yes Yes	AM0034 AM0043	Yes Yes
AM0013, AM0022, AM0025, AM00379, AMS- III.H, AMS-III.I	Yes	AM0046	
AM0014 AM0017	Yes Yes	AM0047 AMS-II.A-F, AM0044	Yes Yes
AM0018 AM0020	Yes Yes	AMS-III.A AMS-III.E, AMS-III.F	Yes Yes
AM0021 AM0023	Yes Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes  
Director, International Climate Change Services

Michael Lehmann  
Technical Director



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## CERTIFICATE OF COMPETENCE

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***Lu Zhou***

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

<b><i>GHG Auditor:</i></b>	Yes		
<b><i>CDM Validator:</i></b>	--	<b><i>JI Validator:</i></b>	--
<b><i>CDM Verifier:</i></b>	--	<b><i>JI Verifier:</i></b>	--
<b><i>Industry Sector Expert for Sectoral Scope(s):</i></b>	--		

Høvik, 5 January 2007

Einar Telnes  
*Director, International Climate Change Services*

Michael Lehmann  
*Technical Director*