Validation Report

Report for:

Quzhou Tadi Hydro Complex Development Co., Ltd.
Cleanergy Investment Service (Beijing) Co., Ltd.

Validation of CDM project for
Tadi 16 MW Hydropower Project in Zhejiang Province

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1 Executive Summary

Lloyd's Register Quality Assurance Limited has been contracted by Cleanergy Investment Service (Beijing) Co., Ltd. representing the project participants (PP), to undertake validation of the proposed project activity "Tadi 16 MW hydropower project in Zhejiang Province". The validation has been performed by document review based on the project design document Version 01 dated 07/12/2007 and subsequent versions with the latest being version 07 dated 15/06/2009, follow-up interviews with the stakeholders and resolution of outstanding issues and issuance of the validation report.

The project intends to reduce greenhouse gas (GHG) emissions by installation and operation 16 MW hydropower in Tadi, Quzhou, Zhejiang province. The electricity generated by hydro source, is exported to the East China Power Grid and expected to displace the dominated fossil fuel based electricity generation thereby reducing the CO2 emissions.

The fulfilment of the requirements as set forth in the Article 12 of the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC), the modalities and procedures for a CDM and relevant decisions of the Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol (COP/MOP) and the Executive Board of the CDM (CDM-EB) has been evaluated and the conformance to the validation requirements were confirmed based on the given information. A risk based approach was taken to conduct the validation and corrective action requests (CARs) and clarifications (CLs) were raised for relevant actions by the PP.

Through the process of the validation, the validation team identified 8 CARs and 4CLs. The validation team is the opinion that the proposed project activity as described in the project design document version 07 dated 15/06/2009 meets all the relevant UNFCCC requirements for CDM as well as the host country's national requirements, and if implemented as designed is likely to achieve the emission reductions and contribute to the sustainable development of the host country. Therefore LRQA requests the registration of "Tadi 16 MW Hydropower Project in Zhejiang Province" to the CDM Executive Board as a CDM project activity.

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Abbreviations

BM	Build Margin
CARs	Corrective action requests
CCPG	Central China Power Grid
CDM	Clean Development Mechanism
CDM-EB	Executive Board of Clean Development Mechanism
CDM M&P	Modalities and procedures for a clean development mechanism
CER	Certified Emission Reduction
CLs	Clarifications
COP/MOP	Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol
DNA	Designated National Authority
EIA	Environmental impacts assessment
ERPA	Emission Reduction Purchasing Agreement
FSR	Feasibility Study report
GHG	Greenhouse gas
IPCC	Intergovernmental panel on climate change
IRR	Internal Return Rate
KP	Kyoto Protocol of the United Nations Framework Convention on Climate Change
LoA	Letter of approval
LR	Lloyd's Register
LRQA	Lloyd's Register Quality Assurance Limited
NDRC	National Development and Reform Commission (China DNA)
NGO	Non governmental organization
OM	Operating Margin
PDD	Project design document
PDR	Preliminary Design Report
PP	Project participant
SSC M&P	Modalities and procedures for small scales CDM activities
tCO_{2e}	Ton of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

2 Introduction

The project participant (PP) represented by by Cleanergy Investment Service (Beijing) Co., Ltd. has contracted with Lloyd's Register Quality Assurance Limited (LRQA) to undertake validation of the proposed project activity "Tadi 16 MW hydropower project in Zhejiang Province". This report summarises the findings through the validation process that has been conducted on the validation requirements of the CDM.

The validation has been undertaken by the team formed of the qualified personnel of LRQA as follows.

Ketan S Deshmukh	LRQA Asia	Team Leader	CDM Lead Validator, Sector expert
Zhiyong Wang	LRQA China	Team member	CDM Validator
Ru, Bai	LRQA China	Team member	Trainee Validator
Prabodha C Acharya	LRQA Ltd., India	Technical Reviewer	CDM Lead Validator, Sector expert
Madlen King	LRQA Ltd.	Decision Maker	

Personnel being engaged in a CDM project validation are qualified based on the established procedures of LRQA to assure the resource requirements that satisfy all the requirements of competence criteria for a DOE under CDM CDM-ACCR-06. LRQA is accredited / designated as an operational entity and holds the full responsibility on decision-making regarding the validation in accordance with the accreditation requirements of the CDM-EB. The certificate of appointment of the team personnel is attached to this report.

2.1 Objective

Validation is the process of an independent third party evaluation of a project activity against the requirements of the CDM as set out in the Article 12 of the Kyoto Protocol, the CDM M&P, the present annex, subsequent decisions made by the COP/MOP and CDM-EB, and the other rules applicable to the proposed project activity including the host country's legislation and its specific requirements for sustainable development on the basis of the PDD. The validation follows the requirements of the current version of the CDM validation and verification manual (CDM VVM) to ensure the quality and consistency of the validation work and the report.

2.2 Scope

The scope of validation is an independent and objective review of the project design. Review of the PDD is conducted against the requirements of KP, the CDM M&P and relevant decisions of the COP/MOP and the CDM-EB. LRQA follows a

risk-based approach in the validation focusing on the identification of significant risks for project implementation and generation of CERs. Validation is not meant to provide any consulting towards the PP, however, the corrective actions requests (CARs) and clarifications (CLs) might provide input for improvement of the project design. A validation conclusion shall become final subject to the decision maker's review and the review by the LRQA Ltd.

2.3 GHG Project Description

The Tadi 16 MW Hydropower Project in Zhejiang Province developed by Quzhou Tadi Hydro Complex Development Co., Ltd is sited on the Qujiang River, downstream from the Quzhou City, Zhejiang Province. The primary purpose of the Project is to utilize the water resources of the Qujiang River to generate clean electricity to deliver to East China Power Grid (ECPG) through the Zhejiang Power Grid (ZJPG) without CO2 emissions.

The estimated electricity supplied to the grid will be 57.842 GWh annually. The Project activity will achieve greenhouse gas (GHG) emission reductions by avoiding CO2 emissions from the business-as-usual scenario, electricity generated by those fossil fuel-fired power plants connected into ECPG. The estimated emission reductions are 52,324 tCO2e per year.

3 Methodology

3.1 Review of documents

The validation is performed primarily based on the review of the project design document (PDD) and the other supporting documentations. The PDD Version 01 dated 07/12/2007 was initially reviewed and LRQA requested the PP to present the supporting information and documents related with the project design and such additional information and documents were also reviewed by LRQA. Through the process of the validation, the PDD and the supporting documents of the same were evaluated to confirm the actions taken by the PP to the CARs and CLs issued by LRQA. The documents reviewed by LRQA are listed in the Appendix B.

3.2 Follow-up interviews

Follow-up interviews with the stakeholders and field survey were conducted to the parties and in the schedule as below.

22 Feb 2008 (Friday)
- Quzhou Irrigation Bureau
- Quzhou Environmental Protection Bureau
- Quzhou Electricity Power Company
- Quzhou irrigation and hydropower design Co., Ltd.
- Quzhou Tadi hydropower complex development Co., Ltd.
- Cleanergy Investment Service (Beijing) Co., Ltd.

23 Feb 2008 (Saturday)
- Quzhuo industrial & commercial vocational school

- Zhang Tan office of Quzhou District Government
- Representatives of Shangfutou village
- Representatives of Tadi village
- Quzhou Tadi hydropower complex development Co., Ltd.
- Cleanergy Investment Service (Beijing) Co., Ltd.

The list of persons interviewed is shown in the Appendix C.

3.3 Resolution of clarification and corrective action requests

LRQA applies the risk based approach aiming at focusing on high risk issues to the validation results but that does not omit any part of the mandatory processes and complete validation is conducted.

Findings identified in the process are indicated under the titles Corrective Action Requests (CARs) and Clarifications (CLs). CARs and CLs require the PP to take relevant actions. Criteria for judging items as CAR or CL are as follows:

Corrective Action Request (CAR):

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

Clarification (CL) Request:

- Information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met

In addition, Forward Action Requests (FARs) is to be raised to highlight issues related to project implementation that require review during the first verification of the project activity. A FAR is not used for issues that relate to the CDM requirements for registration.

CARs and CLs are to be resolved or closed out if the PP modify the project design, rectify the PDD or provide adequate additional explanations or evidence that satisfies the concerns. If this is not done, the project activity cannot be recommended for registration to the CDM Executive Board.

3.4 Internal quality control

The technical review by a qualified person independent from the validation team and a review by the authorized decision maker are conducted prior to the submission of the validation report to the PP and requesting registration of the project activity.

4 Validation findings

The findings of the validation are stated in the following sections. The further detail of each finding is shown in the Validation Findings Log.

The findings are structured based on the main validation scopes as follows.

- Participation requirements

- General description
- Baseline methodology
- Emission reductions
- Monitoring methodology and monitoring plan
- Duration of the project activity / crediting period
- Environmental impacts
- Stakeholders' comments

4.1 Participation requirements

A CDM project shall be approved by the Parties involved.

The host party of the proposed project is People's Republic of China. China has ratified the Kyoto Protocol on 30 August 2002 and the National Development and Reform Commission (NDRC) has been designated as the national authority for the CDM.

The Annex I party is Netherlands and it was confirmed that the State of Netherlands has ratified the Kyoto Protocol on 31 May 2002 and Ministry of Housing, Spatial Planning and the Environment has been designated as the national authority for the CDM.

The information of the DNA of China and Netherlands had been confirmed by the validation team against the relevant information on the UNFCCC CDM website (http://cdm.unfccc.int/DNA/index.html).

LRQA received the letters of approvals (LoAs) of this project from the project participants.

A coloured scanned copy of the LoA dated Jan 2008 issued by DNA China was presented by the PP. The LoA was deemed to be authentic; however, LRQA further confirmed the authenticity of the issued LoA through visiting the following web address.

http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1658.pdf

The LoA mentioned the following "Quzhou Tadi Hydro Complex Development Co. Ltd. is permitted to transfer to Essent Energy Trading B.V. that is authorized by the Government of Netherlands no more than 260,000 tCO2e in total Certified Emission Reductions (CERs)".

The LoA from DNA Netherlands that was presented by the PP was dated 22nd April 2008 and was issued by the General Director of SenterNovem and signed by Joop van Meel, Manager Climate, Enterprises and International Affairs. The website of DNA Netherlands was visited which showed SenterNovem has been authorised to correspond with respect of issuance of Letter of Approvals. LRQA confirmed the authenticity of the issued Letter of Approval through email communication with DNA Netherlands.

LRQA reviewed the contents of the LoAs issued by the DNA China and The Netherlands and confirm that these meet with the requirements stated within the "Clarification on elements of a written approval" (EB16 Annex 06).

CAR 1 was issued because the LoAs from the Annex-I country was not presented at the initial stage of the validation. This was subsequently addressed as above and **CAR 1** was therefore closed accordingly.

4.2 General description

The validation team checked and confirmed that the PDD follows the CDM- PDD Version 03.2 and the Guidelines for Completing the Project Design Document CDM-PDD version 07 issued at EB41 (Annex 12) and the format is in accordance with PDD Form v03.2. **CAR 2** was issued with respect of the identified deficiencies related to the Project Design Document Form (CDM-PDD) ver 03.2. This was suitably addressed in subsequent version of the PDD and therefore **CAR 2** was closed out.

The Validation team reviewed the PDD and other evidences and confirmed the aspects below.

The objective of the project activity is to utilize the hydrological resource of Qujiang River downstream from Quzhou City, Zhejiang Province. The project plans to newly establish a river-bed hydro power plant with a total installed capacity of 16MW that consists of 4 sets turbines and generators (each unit has 4 MW generating capacity). The average annual operating hours are estimated as 3946 hours based on the estimated hydrology data that is detailed in the Preliminary Design Report (PDR) formally approved by the host Government. The reservoir capacity is 20.80 million m3 and the maximum dam height is 5.25 m.

The size of hydro turbine and generator technology has been localized in China and the project employs domestically produced equipments. The project activity also constructs over-flown water intake dam, underground tunnel, drainage pipe to deliver water flow to the power house. The electricity produced is transferred to the grid system through 35kV transmission line which was confirmed during the site visit.

LRQA raised **CL1** asking PP to clarify and support with evidences the following:
1. Power density is 12.3 W/m2.
2. Electricity supply to the grid is 57,842 GWh annually.

PP clarified that the power density was based on the increased flooded land area from the project which was anticipated to be 1,298,408 m2. Evidence from the bureau of Quzhou city after the project implementation was presented which showed the flooded land area as 7,26,400 m2. Using the flooded land area in-lieu of the surface water area will result in a conservative estimate of the power density. It could therefore be concluded that the power density is greater than 22.0 W/m2.

With respect of the electricity supply, it was confirmed that the generation of electricity was 63.14 GWh annually as provided in the PDR. This value was independently confirmed from information from the Irrigation Bureau of Zhejiang Province on basis of the average data (set of yearly hydrological data from 1958 to 2001, 44 years totally) which were monitored by the Quzhou Hydrographic Station on a multi-year basis designed by a professional institute. The value of this data has been confirmed in the official approval letter of the PDR.

In determining the electricity supply to the grid, the validation team confirmed that the PDR had considered assumption of a power factor of 0.93, auxiliary consumption of 1% and line (transmission) loss of 0.5% to arrive at 57.842 GWh.

Electricity Supply = 63.14 x 0.93 x (1-1%) x (1-0.5%) = 57.842 GWh.

Assumptions are validated to be consistent with the PDR and considered reasonable for the size of the hydro power plant facility. These were further compared with the generation and supply figures of other registered hydro power project activities and noted that this varies between 2.98% to 10.18%. LRQA considered the Meth Panel recommendations in its panel report 35, para 37 and confirmed that the PDR, a design engineering document was prepared by an independent design institute of repute approved by the government and that the PDR was the basis of government approval for the project activity.

The total volume deducted to estimate the net electricity supply to the grid is 8.39% and considered as acceptable following decision in paragraph 43 (r) of the report of 45th meeting of the CDM-EB because the project's IRR does not reach the benchmark even with power factor of 1.

CL1 was therefore closed out.

The GHG emission reduction will be achieved by replacement of electricity that would be produced by the power plants connected with the ECPG that the main source is thermal power plants.

The project is expected to contribute towards sustainable development of the host country by reducing pollution associated with the energy production and supplying the clean energy produced from renewable sources, producing employment opportunity to the local people in China. The LoA issued by the host country's DNA confirmed that the project activity contributes to the sustainable development of the host country.

It was confirmed that the project receives no public funding from the Annex I countries. The project owner provides from its own fund and the local private finances.

The description in the PDD was cross checked with the PDR and the official documents of the host Government and the relevance was confirmed by the validation team.

4.3 Baseline methodology

Application of baseline and monitoring methodology

The project applies the approved consolidated baseline and monitoring methodology ACM0002 / Version 07 –"Consolidated baseline methodology for grid-connected electricity generation from renewable sources". The current version of ACM0002 is Version 10. ACM0002 Version 07 was valid during 14 December 2007 to 04 December 2008 that the period of the global stakeholders' consultation process (GSP) for the project activity was held from 29 January 2008 to 27 February 2008 and it is applicable for requesting registration until 04 August 2009 23:59 GMT.

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The methodology refers to the latest version of "Tool to calculate the emission factor for an electricity system" and "Tool for the demonstration and assessment of additionality" (Additionality Tool). The current versions of the tools are Version 01.1 and Version 05.2 respectively. The methodology also refers to "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" but the project activity does not contain the respective project emission or leakage emission that is to be covered by the tool.

The validation team reviewed the design and technical specification of the project activity, connection to the electricity system and definition of the grid boundary by the China DNA and the energy sources and confirmed that the proposed project meets the applicability criteria of ACM0002 (ver 07) as below.

- The project activity is to construct a new hydro power plant (run-of-river)
- The project activity results in new reservoirs and the power density of the power plant is greater than 4 W/m2.
- The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available, which was confirmed based on the formal definition in the "Notification on Determining Baseline emission factor of China Grid" issued by China's DNA.

LRQA requested the PP to clarify the statement that the power density of the reservoir as 12.3 W/m2. LRQA confirmed that the power density of 12.3 W/m2 was based on the anticipated increase in flooded area of 1,298,408 m2. PP further provided evidence of a clarification on the flooded land area resulting from Tadi Hydropower station issued by The Irrigation Bureau of Quzhou City that the actual flooded land area is 7,26,400 m2. Although, the power density is calculated by dividing the installed capacity of the power plant in Watts by the increased flooded water surface area, use of the flooded land area instead of the flooded water surface area would result in a conservative estimate of the power density. It was therefore, confirmed that the power density of the project activity is greater than 16 x 10^6/ 726400 = 22.0 W/m2. Please refer **CL1** and its closure.

CAR 3 was issued since the PDD had applied previous versions of the tools that were valid at the time of commencement of the validation. The PP subsequently revised and applied the current tools stated above and therefore the **CAR3** was closed out.

Project boundary

In compliance to ACM0002, the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to. The project boundary encompasses the physical and geographical site of the renewable energy source and displaced fossil fuel based power plant sources. The proposed project will be connected to the ECPG. According to Notification on Determining Baseline emission factor of China Grid issued by China DNA, the ECPG consists of Provincial Grids of Zhejiang, Jiangsu, Shanghai, Fujian and Anhui. The validation team confirmed the appropriateness based on the official definition issued by the China DNA.

The project activity includes a reservoir, rubber dams, drainage pump rooms, a power house, a booster station, a sand flushing sluice, a ship lock and a 35kV transmission line to the substation.

The validation team reviewed the project documentation including the PDR and the engineering drawings, conducted a physical visit to the project site and confirmed that the project activity does not include any on-site fossil fuel based energy system. The project activity consists of 4 units of hydro turbine generators that can operate independently. The relevance of the project boundary was confirmed.

CAR4 was raised since the project boundary was not depicted as required by the Guidelines for completing CDM-PDD (v07). PP added the project boundary that included the 4 turbines, the grid and auxiliary power consumption. **CAR4** was therefore closed out.

Baseline scenario

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

Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

Since the project activity is installation of a new grid connected renewable power plant, the PP have identified the baseline scenario as the 'electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of the grid-connected power plant and by the addition of new generation sources within ECPG as selected in the combined margin calculations'.

Additionality

The additionality of the project activity is demonstrated based on the Tool for Demonstration and Assessment of Additionality. PP have applied a step-wise approach to demonstrate additionality.

Step 1: Three alternative scenarios are considered:
Alternative I – To implement the proposed project activity, but, not as a CDM project activity.
Alternative 2 – To construct a thermal power plant with the same annual electricity generation as the Project.
Alternative 3 – To provide for the same annual electricity output as the project by ECPG.

Alternative 2 that is construction of a thermal power plant with the same annual electricity generation as the Project is not legally permitted in view of the notice on Strictly prohibiting the installation of fuel fired generators with capacity of 135 MW or below which is issued by the General office of the State Council, decree no 2002-6. The Interim rules on the installation and management of small scale fuel fired generators (Aug 1997) strictly prohibits the installation of fossil-fuel fired power units with capacity of less than 100 MW. Therefore the alternative 2) cannot be a plausible alternative. Thus only Alternative 1 is further considered using the investment analysis below as Alternative 3 is continuation of power generation by the grid connected generation sources that does not involve any additional investment or face barrier on implementation.

Step 2: Investment Analysis

Investment analysis had been used for demonstration of the additionality. Benchmark analysis is selected out of the options for the analysis method as the project activity will produce economic return by electricity sales other than the CDM related revenue and the project owner has no other investment option to compare with.

Simple cost analysis can not be applied because the project activity produces other revenues than those associated with the sale of CERs specifically sale of electricity produced. Investment comparison analysis can not be applied because the baseline scenario is equivalent electricity supply by the electricity grid system that does not have investment activity.

As a hydro power project, the project activity could be developed by other entity than the project participant and a benchmark should base on a publicly available data source. The benchmark used for the investment analysis has been determined by the Ministry of Water Resources of the P.R. China and it was confirmed as publicly available at http://apps.lib.whu.edu.cn/12/test/gfbz/2/j/xsdpj.html.

The data source is the Economic Evaluation Code for Small Hydropower Projects SL16-95 that is applied to the economic evaluation in the formal PDR to be

approved by the Government of China for small hydropower project with the capacity equal to or less than 25MW (50MW for a project in rural area).

With respect of the project activity, the PDR recorded an FIRR of 7.57%that did not cross the benchmark for FIRR (10%).

The investment decision for the proposed project activity was made based on the Preliminary Design Report completed on 1 Aug 2003 that concluded that the project activity was financially feasible if it would be developed as a CDM project activity though the project IRR was lower than the standard value of 10% based on the Economic Evaluation Code for Small Hydropower Projects SL16-95. It was during the management meeting on 06 August 2003 wherein the support from CDM was seriously considered.

The Economic Evaluation Code SL16-95 was published on 2 June 1995 and became effective on 1 July 1995. The validity of the benchmark at the decision making for investment to the proposed project activity was confirmed with the bulletin of the Ministry of Water Resources on valid technical standards for hydro energy projects [2002]07 issued on 18 June 2002 as available at http://www.ches.com.cn/jishubiaozhun/001.htm .

The chronology of the project activity was cross-checked with the information publicly available as above referenced and it was confirmed that the Economic Evaluation Code was valid when the investment decision was made for the project activity. The validation team also conducted a research on the similar CDM project activities in China and confirmed that the same standard is applied for the investment analysis in a consistent manner.

The selected parameters for IRR calculation are found in Section B.5 of the PDD. They were confirmed with the PDR as under:

Item	Value	Source
Installed capacity（MW）	16	PDR pg 150
Annual power delivery to the grid(MWh)	57,842	PDR pg 85 & 303
Total static investment (yuan)	196.55 million	PDR pg 302
Annual operating cost (yuan)	3.69 million	PDR pg 305
Expected tariff（including VAT）(yuan/kWh)	0.425	PDR pg 303
Income tax rate	33%	PDR pg 303
VAT rate	6%	
Tax on city maintenance and construction	1%	PDR pg 306
Tax on education	3%	PDR pg 306
Lifetime（year）	30	PDR pg 299
Residual value at the end of operational lifetime	0	PDR pg 304

The IRR of the project was calculated without support of CDM funds and noted to be 7.59%. The validation team assessed the calculation and the supporting evidences and confirm that the IRR is less than the benchmark without CDM support.

Further details and the calculation process are given in the calculation spreadsheet in a transparent manner and relevant evidences were presented to the validation team.

In paragraph 54 of the 38th meeting, the CDM-EB clarified that in cases where PPs rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed project activities, DOEs are required to ensure that:

(a) The FSR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed.
(b) The values used in the PDD and associated annexes are fully consistent with the FSR, and where inconsistencies occur the DOE should validate the appropriateness of the values.
(c) On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision.

The PDR was produced and approved by the local Government in place of the FSR for the project. The PDR contains the project design details but it functions the same as the FSR for the project and that was the formal document applied for the Government approval of the project implementation.

The PDR was completed on 1 August 2003 and the real action for implementation of the project activity started from 29 August 2003 (which reflects the purchase date of major equipment) immediately following the completion of the PDR.

The PDR was finalized on 07/2003 and approved on 01/08/2003 by Zhejiang Development & Planning Committee. The investment decision was made on 06/08/2003 on the Stakeholder Meeting of Quzhou Tadi Hydro Complex Development Co. The approval letter and Stakeholder Meeting minutes were presented for validation. The investment decision was made only a month after the PDR was finalized. It is unlikely in the context of the underlying project activity that the input values would have materially changed.

LRQA raised **CAR 7** to seek the calculations to support the IRR of 6.26% (PDD ver 01) investment analysis and to seek sensitivity analysis on total electricity generation.

In validating the investment analysis presented by the PP, LRQA confirmed the input values with those in the PDR. For key inputs such as the fixed asset investment, tariff and various taxes, LRQA confirmed with other alternative source such as the audited results of the investment, the tariff that is being paid and source taxation documents such as income tax, VAT, city maintenance tax and education fee tax.

Since, the first 2.5 years was the planned construction phase, the PP had considered the investment analysis for a total of 30 + 2.5 = 32.5 years, 30 years being the project life. This is in line with para 3 of the "Guidance on the

assessment of Investment Analysis" where it clearly mentions that the period of assessment should not be limited to the proposed crediting period of the CDM project activity. The period of expected operation of the underlying project activity (technical lifetime), should be considered or - if a shorter period is chosen - include the fair value of the project activity assets at the end of the assessment period. Since, the rate of depreciation was confirmed as 3.33%, the scrap value at the end of the project lifetime is "zero". Noted that the PDR has considered "nil" for scrap value and therefore, the PP has not considered any returns.

LRQA further confirmed that the depreciation has not been used in the cash flow that is used for the purpose of calculating the financial indicator (IRR) and is in line with guidance para 5.

Given that the IRR of the project activity without CDM is much lesser than the benchmark of 10%, it is unlikely that any investor would have considered going ahead with the project activity without the benefits of CDM.

LRQA confirmed that the sensitivity parameters chosen for the project activity include the fixed investment, annual O&M costs and electricity tariff and annual electricity generation. PP revised the presentation of the sensitivity analysis to show the % change in the variable that is necessary to cross the benchmark of 10%. The values presented in the PDD with respect of the sensitivity analysis could be reproduced and therefore stands validated.

The total investment as per PDR considered for the project activity is 19655 x 10^4 RMB. LRQA reviewed the audited report of the money actually spent on the fixed investment of project activity and noted it to be 19237.42 x 10^4 RMB, i.e. a variation of -2.12% than that originally considered at the time of investment decision making. It is therefore unlikely that the total investment on fixed asset could have been reduced by 23.3% of that originally envisaged.

Power industry is highly regulated especially in the developing country like China and adjustment of electricity tariff to absorb increase of the operational costs is not easy. Therefore the analysis using the fixed values is considered as more reliable and conservative for determination of the project's additionality. The validation team validated the values used in the PDD and associated annexes are consistent with the FSR. Cross-checking was conducted by the validation team and found that it is unlikely in the context of the project activity that the input values would have materially changed.

The validation team assessed and confirmed that there was no change of input values and assumptions within the time gap between the time of PDR completion and the investment decision made that have significant impact to the resultant IRR value. LRQA confirmed that the actual tariff is 0.45 RMB/KWh (considering VAT), i.e. 0.425 RMB/KWh without VAT. It is therefore unlikely to consider a variation of +29.6% in electricity sale price to be expected.

With the current PLF of 41.27% based on the considered supply of electricity, a 29.6% additional electricity supply would make the PLF as 53.48% which is unlikely given that the estimate is based on 44 years of statistical hydrological

data provided in the PDR and confirmed from the Irrigation Bureau of Quzhou city.

With respect of Annual O&M cost variation, it is obvious that the cost cannot be considered as negative.

Further, LRQA tested the robustness of additionality through use of power factor of 1.00. The IRR in this case improves to 8.22% but still lesser than the benchmark of 10%. The table below provides a summary of the fluctuation necessary in other parameters to reach the benchmark value of 10%.

	Fluctuate	**Corresponding IRR**
Total investment	-17.40%	10.00%
Electricity tariff	20.50%	10.00%
Annual electricity generation	20.50%	10.00%
Annual O&M cost	-147.00%	10.00%

For reasons justified above, such fluctuations in these parameters are unlikely.

The validation team confirms that the result of sensitivity analysis consistently supports the conclusion that the project activity is not financially attractive. LRQA therefore closed **CAR 7**.

Step 3: Barrier Analysis

Barrier analysis is not employed to demonstrate additionality.

Step 4: Common Practice Analysis

The PP provided the tariffs prevalent in various provinces providing references to public information sources which were verified by LRQA as accurate. Since, the regulation of tariff is within the purview of a province, Zhejiang province under which the project activity is located was considered as appropriate region to conduct the common practice analysis.

In PDD ver 01, the PP had provided information on hydropower plants which had commenced operations prior to 2002 when the power plants and the grid were mostly state owned. Besides, details with respect of investment were incomplete in table 5. LRQA therefore raised **CL3** asking the PP to clarify the relevance of the hydropower plants built prior to 2002 in view of the major policy change within PR China.

Acknowledging that the policy and in-depth reforms had undertaken since 2002 wherein the power plants were separated from the grids and electricity tariff was determined through competition, the PP removed the data prior to 2002 in the next version of the PDD. Recognising that the unit rate of investment will be lesser for higher capacity power plants, LRQA further asked the PP to provide details of power plants in 15-25 MW range. The PP in its revised PDD addressed

additional plants in the stipulated range providing additional references which were verified by the validation team and found acceptable.

The data in the table was confirmed with the sources referenced through the PDD and confirmed to have been accurately represented. In addition, LRQA researched other registered PDDs and noted that the unit investment of the project activity of 12,284 RMB/KW has been much higher than 4032 RMB/KW to 7645 RMB/KW for the sample group considered other than project activity (ref 2142) wherein the unit investment cost was higher at 15,106 RMB/KW. It was established that the project activity differs from other hydropower plants since it has a low hydraulic head (5.0 m) and higher discharge flow (292.6 m3/s). The hydraulic head on other project activities were noted to vary from 8.5m to 55m and the discharge flow varied from 18.78 – 225 m3/s.

LRQA therefore confirms the conclusion drawn by the PP that the special characteristic of the project activity with respect of low head, higher discharge flow, the rubber dams and bulb tubular turbines drives the higher cost and therefore not a common practice. **CL3** was therefore closed out.

Prior Consideration

The starting date of the project is defined as 15 September 2003, the signing date of the contract for engineering and construction works. As part of the validation, LRQA identified that the purchases of major equipment were undertaken on 29/08/2003. LRQA therefore raised **CAR5** with respect of the start date. In the revised PDD, the PP amended the start date to reflect 29 August 2003. **CAR5** was therefore closed.

The project activity started before the PDD was submitted to LRQA for validation. LRQA raised **CAR6** to determine whether CDM was seriously considered at the time of decision making and whether continuous actions were taken in parallel to secure CDM status in parallel to project implementation. PP amended the PDD providing a timeline of the various activities undertaken and provided LRQA with supporting evidence.

LRQA carefully assessed the serious consideration of CDM prior to the starting date during the validation following the guidance of the CDM-EB. The validation team reviewed all the key project documents including the contract agreements, the government permits and others related with the project implementation and the consideration and preparation for CDM application.

LRQA confirmed the serious consideration of CDM prior to the starting date through the following:
1. PDR clearly shows that the returns on investment from the project activity is not attractive to meet the benchmark.
2. PDR addresses that CDM funds would support the project activity and make it financially viable.
3. A meeting of the directors was held on 06 Aug 2003 wherein it was agreed to develop the project as a CDM project activity.

It may be noted that the Guidelines for prior consideration of CDM was issued only at EB41 and although the text of the meeting minutes does not mention the returns expected from CDM to support the project activity, it was established through discussions with the PP that they were not aware of the CER rate at the time of the investment decision making in Aug 2003. That the returns without CDM support was much lower than the benchmark, PP's claim in their belief while approving the investment towards the project activity that CDM funds would prop up the returns on investment is considered reasonable and serious.

In validating that continuous efforts were taken towards the CDM status of the project activity, LRQA reviewed the documents mentioned within the timelines and confirmed the authenticity of such documents. The claim by the PP that they relied on the Institute of Electrification in Rural Areas (IERA) in developing the PDD only to realise that not much progress has been made was noted to be credible based on LRQA's discussions with Mr. Li Zhiwu who was responsible for Tadi consulting work in 2003. Written communications were sighted to and from PP/ IERA established follow-up by the PP on progress of the PDD which finally culminated in termination of the agreement in March 2006. Selection of another consultant, Farsighted Investment Group towards end May 2006 within two months of the termination of the agreement with IERA is considered a reasonable timeframe. Claims that the fuel consumption data of Yancheng Power plant was not available was independently confirmed by LRQA which resulted in further delay in the estimation of the emission reduction credits that the project activity can earn. It was also confirmed that China DNA requires estimated ER to be included in the application for seeking the host country approval status for the project activity. LRQA therefore confirms that the PP had taken continuous efforts towards securing the CDM status of the project activity and that the delay caused has been circumstantial which has been adequately substantiated.

CAR6 was therefore closed out.

4.4 Emission reductions

The emission reductions by the project activity are estimated following the applied methodology. Emission reductions are calculated as follows:
ERy = BEy – PEy – LEy

Baseline emission
According to methodology ACM0002, baseline emissions include only CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.

BEy = (EGy - EGbaseline) EFgrid,CM,y
Where, BEy = Baseline emissions in year y (tCO2/yr)
EGy = Electricity supplied by the project activity to the grid (MWh)
EGbaseline = Baseline electricity supplied to the grid
EFgrid,CM,y = Combined margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system".

Since EGbaseline is zero for new power plants,

BEy = EGy x EFgrid,CM,y

The PDD adopts a step-wise approach as detailed in the tool to calculate the emission factor for an electricity system.

Step 1: Identify the relevant electric power system

The project is located in Zhejiang province and the delineation of the project electricity system and connected electricity systems have been identified as the ECPG following the Notification on Determining Baseline emission factor of China Grid issued by China DNA which includes the grids of Zhejiang, Jiangsu, Shanghai, Fujian and Anhui.

Refer **CAR 8(i)** issued since there are no imports from NCPG to ECPG as erroneously mentioned in the PDD. Rather, electricity import from Yancheng Power Plant takes place. PP revised the PDD to reflect electricity imports from CCPG and Yancheng Power plant.

Step 2: Select an Operating Margin (OM) method

The PP has chosen ex-ante determination of the emission factor EFy calculated as a combined margin (CM), consisting of the operating margin (OM) and build margin (BM) is selected as the emission coefficient based on data of full generation-weighted average for the most recent 3 years in accordance with the guidance provided by the latest version of Tool to calculate the emission factor for an electricity system.

Following the methodological tool, the simple OM is selected for ex-ante determination of OM emission factor. The China Electric Power Yearbook 2004-2006 (for data of years 2003 to 2005) and China Energy Yearbook 2004-6 (for data of years 2003 to 2005) has been used. LRQA confirmed that the China Energy Statistical Yearbook 2007 was published in March 2008 and was not available at the time of commencement of the validation on 29 Jan 2008; therefore, the China Electric Power Yearbook 2006 and the China Energy Statistical Yearbook 2006 were the latest reference material available and have been appropriately used in computations of OM & BM.

In China, sufficient data for the simple adjusted OM and dispatch data analysis methods is not publicly available, and the average OM method can not be applied because the low cost/must run source is less than 50% of total grid generation in the ECPG. Thus it was confirmed that the use of Simple OM method is relevant for the project activity.

Step 3: Calculate the operating margin emission factor according to the selected method.

Data required for Options A & B are not available. Therefore, Option C is chosen to determine the simple OM emission factor which is based on the net electricity

supplied to the grid by all power plants serving the system, not including low cost must run power plants/ units.

$$EF\ grid,\ OM,\ simple,\ y = \frac{\sum FCiy \times NCVi,y \times EFCO2,i,y}{EGy}$$

PP has presented the data in Annex 3 of the PDD. The data was confirmed for correctness through comparison with the Electricity Power Yearbook (2004-6) and Energy Statistical Yearbooks (2004-6). The emission factor (tc/TJ) and NCV (MJ/t, Km3) were confirmed with "2006 IPCC Guidelines for National Greenhouse Gas Inventories".

Country specific data for the net calorific value (NCV) of each type of fossil fuel were confirmed with the China Energy Statistical Yearbook and the oxidation factor of each type of fossil fuel were confirmed with IPCC 2006 default values.

LRQA raised **CAR8(ii)** since for calculating the Operating Margin Emission Factor, EFOM,y, the PP had not considered the electric imports from CCPG and Yangcheng Power plant. PP amended the PDD that incorporated imports from CCPG and Yancheng Power Plant in deriving the OM emission factor. LRQA confirmed the calculation as correct that yields a generation weighted average for the three years, EFOM,y as 0.9421 tCO2e/MWh. **CAR8** was therefore closed out.

Step 4: Identify the cohort of power units to be included in the build margin &
Step 5: Calculate the build margin emission factor

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" has been applied as follows:

a. Use of capacity additions for estimating the build margin emission factor for grid electricity.
b. Use of weights estimated using installed capacity in place of annual electricity generation.
c. 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:

a. The capacity addition from the years 2004 to 2005 is chosen and reach 21.55% of total installed capacity
b. The weight of installed capacity additions for thermal power plant is accounted for 92.53% of total installed capacity additions.
c. The efficiency of supplying electricity for coal, oil and gas fired plants were noted to be 35.82%, 47.67% and 47.67% (Notification on Determining Baseline Emission Factors of China Power Grid).

LRQA verified the calculations presented in Annex 03 with respect of BM and confirm the calculations that result in EF BM,y of 0.8672 tCO2e/MWh as accurate.

EF grid,CM, y = EFgrid,OM,y x wOM + EF grid BM,y x wBM

In accordance with the tool to calculate the emission factor for an electricity system, for all projects other than wind and solar power generation, wOM = 0.5 and wBM = 0.5 for the first crediting period. Since the subject project activity is in its first crediting period, wOM and wBM = 0.5.

Therefore, EFgrid,CM,y = 0.9421 x 0.5 + 0.8672 x 0.5
= 0.9046

Project Emissions
According to ACM0002, if the power density of the power plant is greater than 10 W/m2, then PEy = 0.

Refer the Baseline Methodology in section 4.3 of this report wherein it was confirmed that the Power Density is greater than 10 W/m2.

Leakage
ACM0002 does not require any leakage to be considered while applying the methodology.
Ly = 0

Emission reductions by the project activity are calculated;
ERy =BEy – PEy – Ly

Since both PEy and Ly are zero,
ERy = BEy = EGy × EFy

Since the estimated supply of electricity to the plant is 57.842 GWh, annual emission reductions = 57.842 x 1000 x 0.9046 = 52,324 tCO2e.

This emission calculation is confirmed by validaition team. The estimated emission reduction has been revised from 53,082 tCO2e/annum to the validated figure of 52,324 tCO2e/annum due to change in the EFF_{OM}.

Since the crediting period according to PDD ver 07 starts on 1 Oct 2009, the ERs for the year 2009 works out to 92/365 x 52,324 = 13,189 t CO2e. For the last year of the crediting period which ends on Sept 30, 2016, the ERs works out to 273/365 x 52,324 = 39,135 tCO2e.

4.5 Monitoring methodology and monitoring plan

The approved consolidated monitoring methodology ACM0002/Version 07 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" is applied to the project.

Because project emission and leakage are zero and combined emission factor has chosen ex-ante option, only the parameter EGy is monitored.

The electricity meters are installed in compliance with the national guidelines and requirements of the grid company for accuracy (0.5 S) and reliability (referenced to DL/T448-2000).

The monitoring and reporting plan contains;
1. Monitoring Objective
2. Monitoring Organization
3. Monitoring Equipment and program
4. Quality assurance and quality control
5. Verification

The validation team evaluated the relevant monitoring procedures provided in PDD and confirmed the appropriateness. It was noted that the relevant data records will be kept by the Project owner during the crediting period and for two years after verification.

LRQA raised CL4 seeking the following:
1. Although, TEGy appears in the data tables, it does not figure in any equations. PP to confirm relevance of this parameter.

PP amended the PDD and removed TEGy since the parameter was not relevant. EGy was clarified to be the net supply to the grid after consideration of any imports. CL4 was therefore closed out.

4.6 Duration of the project activity / crediting period

The project activity start date has been provided as 15/09/2003 the permission of starting construction. As part of validation, LRQA identified that purchase date of the major equipment was issued on 29 Aug 2003 and therefore **CAR5** was raised.

The permission of start of construction, 15/09/2003 was provided as the start date for the project activity. However, LRQA identified that the purchase date on major equipment was issued on 29 Aug 2003 which is earlier than that provided in C.1.1.

PP attended to the CAR by changing the start date to 29 Aug 2003. LRQA confirms that this represents the earliest date on which real action of a project activity began and closed out **CAR5**. Further, it was confirmed that the serious consideration of CDM was prior to this start date.

The operational lifetime is expected for 30 years which was confirmed to have been obtained from PDR. This was found to be reasonable compared to other hydro power projects where the lifetime ranged from 20-40 years. It was confirmed that 30 years is the operational lifetime considered in the Investment Analysis used by the PP to demonstrate additionality of the project activity.

The PP selected the 7 years renewable crediting period.

The length of the first renewable crediting period is 7 years, starting on 01 October 2009 as per PDD ver 07. If the registration of the project activity happens

after 1 Oct 2009, then the starting date of the crediting period will be the actual date of the registration of the project activity.

4.7 Environmental impacts

The environmental impact assessment (EIA) of the proposed project activity has been conducted following the legal requirements of the host country. The validation team reviewed the EIA report and the letters for approval of the EIA, interviewed the local environmental bureau and the PP and confirmed compliance with the legal requirements of the host country.

The EIA was undertaken by Environmental Science Research and Design Institute of Zhejiang Province on 12/2002 and the approval letter of EIA issued by the Environmental Protection Bureau of Zhejiang Province on 28/03/2003. LRQA confirms that the environmental impacts including waste water, air pollution and noise, ecologic impacts and water and solid loss are addressed in section D.1 in the PDD.

No significant environmental impact was identified for the project activities, however environmental monitoring of the project need to be carried out regularly as per the conditions of the environmental clearance. Evidence of acceptance of an inspection carried out by Quzhou Environmental Protection Bureau, confirming that it meets local requirement dated 14/12/2007 was sighted.

4.8 Stakeholders' comments

The comments by local stakeholders are to be invited in an open and transparent manner. During the site visit, interviews with certain villagers confirmed that a notice was put up on a board approximately a month prior to the meeting explaining the purpose of the project and its impact to the local environment and ecology. The project survey questionnaires were distributed in a random manner to obtain public opinion.

LRQA reviewed the questionnaire and the responses submitted. The Questionnaires contain a brief introduction about the project including the information on the project location, project's purpose, installation capacity and annual electricity generation. The analysis of the comments expressed were confirmed as part of the validation.

The EIA process also requires collecting stakeholder's comments. Through review of the EIA, LRQA confirmed that the opinion expressed by the stakeholders matches with the public opinion and that no negative opinion with respect of the project activity was expressed.

During the site visit, the validation team reviewed the survey opinion, survey and data analysis process adopted by the PP. The validation team interviewed the representatives of local village and nearby school, local government officer and officer of local environment protect bureau during field survey.

Compensation to local residents was confirmed to have been provided in line with the land occupation agreement. The comments of stakeholder were positive to

support the project, no negative opinion was heard. The validation team confirmed the stakeholders are benefited in various areas such as employment, fiscal revenue, village development, etc.

5 Comments by parties, stakeholders and NGOs

In accordance with the requirement of paragraph 40 of the CDM M&P, the PDD is to be made publicly available for 30 days subject to confidentiality provisions agreed with the PP and receive comments from Parties, stakeholders and UNFCCC accredited NGOs on the validation and registration requirements.

The PDD was made publicly available in accordance with the requirements of the procedure for the period of 29 January 2008 to 27 February 2008.

http://cdm.unfccc.int/Projects/Validation/DB/7WZWZ2PI8BJJZQOFNLIB0N14YNJEMY/view.html

No comment was received during this period.

6 Validation Opinion

LRQA has undertaken the validation of the proposed project activity "Tadi 16 MW hydropower project in Zhejiang Province" based on the requirements of CDM as set out in the Article 12 of the Kyoto Protocol, the CDM M&P, the present annex, subsequent decisions made by the COP/MOP and CDM-EB, and the other rules applicable to the proposed project activity including the host country's legislation and its specific requirements for sustainable development.

Through the process of the validation, the validation team identified 8 CARs and 4 CLs. The validation team is the opinion that the proposed project activity as described in the project design document Version 07 dated 15/06/2009 meets all the relevant UNFCCC requirements for CDM as well as the host country's national requirements, and if implemented as designed is likely to achieve the emission reductions of 52,324 tCO2e/yr and contribute to the sustainable development of the host country. Therefore LRQA requests the registration of "Tadi 16 MW Hydropower Project in Zhejiang Province" to the CDM Executive Board as a CDM project activity.

7 Appendices

7.1 Appendix A: Letter of approval for the project by the host and investing country DNA

Letter from The National Development and Reform Commission of the People's Republic of China for host country approval to the project activity dated January 2008.

Letter from SenterNovem (acting on behalf of DNA Netherlands) for approval of the project activity dated 22 April 2008.

7.2 Appendix B: List of documents reviewed

Category A documents (documents prepared by the PP)

1) CDM PDD Version 01, date 07/12/2007
2) CDM PDD Version 02, date 09/04/2008
3) CDM PDD Version 03, date 21/102/008
4) CDM PDD Version 04, date 10/02/2009
5) CDM PDD Version 05, date 31/03/2009
6) CDM PDD Version 06, date 13/04/2009
7) CDM PDD Version 07, date 15/06/2009
8) Copy of legal register licence (Quzhou Tadi hydropower development complex Co.,Ltd.) Valid from 06/09/2006 to 5/09/2052
9) The approval issued by Zhejiang Government for integration plan of Qiantangjiang River, etc. Date 13/02/2000
10) The document Approval for EIA issued by Zhejiang Environmental Protection Bureau. Date 28/03/2003
11) Asset loan contract between Quzhou Tadi Hydro Complex Development Co., Ltd. and China Industrial and Commercial Bank. Date 17/06/2003
12) Preliminary Design Report. Date July 2003
13) Document Approval issued by Zhejiang Development and Reform Committee for preliminary design of Tadi Hydro Complex. Date 01/08/2003
14) Purchasing agreement of 4× 4MW Turbine and generator for Tadi Hydropower. Date 29/08/2003
15) The approval issued by Zhejiang Irrigation Bureau for Construction starting of Quzhou Tadi Hydropower. Date 15/09/2003
16) Tariff approval by Quzhou Price Bureau for Tadi Hydropower connected grid. Date 27/06 2007
17) The electricity connecting and purchase agreement between Quzhou Electricity Power Bureau and Tadi hydropower complex development Co., Ltd. Date 29/06/2007
18) Environmental acceptance report approved by Quzhou Environmental Protection Bureau. Date 14/12/2007
19) IRR calculation. Date 17/03/2008
20) Test paper sample (3) of employee training
21) Environmental Impact Assessment report of Quzhou Tadi Hydropower

22) Questionnaire of local public comments
23) Clarification letter provided by Irrigation Bureau of Quzhou dated 15/10/2007 regarding flooded land area
24) Financial Audit report dated 31/12/2008
25) Land Use licence

Following websites were accessed:
http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1658.pdf
http://www.zjds.gov.cn/art/2007/1/17/art_176_1369.html
http://www.zjds.gov.cn/art/2007/1/17/art_177_1362.html
http://www.hwcc.com.cn/nsbd/NewsDisplay.asp?Id=188521,
http://www.34law.com/lawfg/law/1797/3293/law_892524384625.shtml
http://www.chinatax.gov.cn/n480462
http://www.law-lib.com/law/law_view.asp?id=38686
http://www.lawyee.net/Act/Act_Display.asp?RID=18734
http://www.chinawater.net.cn/guifan/bz/SL16-95/
http://www.ches.com.cn/jishubiaozhun/001.htm
http://www.chinawater.net.cn/jishujiandu/CWSNews_View.asp?CWSNewsID=24696.
http://www.mwr.gov.cn/tzgg/qt/20060926000000479251.aspx
http://apps.lib.whu.edu.cn/12/test/gfbz/2/j/xsdpj.html.
http://apps.lib.whu.edu.cn/12/test/gfbz/2/j/xsdpj.html
http://www.ches.com.cn/jishubiaozhun/001.htm
http://www.chinawater.net.cn/jishujiandu/CWSNews_View.asp?CWSNewsID=24696.
http://www.hydrocost.org.cn/UploadFile/zc_dept_cwpj.pdf)
www.bmlink.com/news/message/123944.html,
www.cmwin.com/CBPResource/StageHtmlPage/A280/A28020071180931218.htm.
http://scholar.ilib.cn/A-dfdlgl200601013.html.
http://www.shp.com.cn/news/info/2007/8/6/1410018826.html.
http://www.86ne.com/Ocean/200708/Ocean_82106.html.
www.bmlink.com/news/message/123944.html,
www.cmwin.com/CBPResource/StageHtmlPage/A280/A28020071180931218.htm
http://scholar.ilib.cn/A-dfdlgl200601013.html. and 6
http://www.shp.com.cn/news/info/2007/8/6/1410018826.html
http://www.86ne.com/Ocean/200708/Ocean_82106.html.

Category B documents (Other documents referenced)

1) ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources". (version 07)
2) "Tool to calculate the emission factor for an electricity system" (version 01.1)
3) "Tool for the demonstration and assessment of additionality" (version 05.2)
4) Specific guidelines for completing the Project Design Document (CDM-PDD v03.2)
5) Request for clarification on use of approved methodology AM0005 for several projects in China
6) The economic evaluation code rule for small hydropower projects (SL16-95)
7) OM calculation in 2005_20070809 by China DNA
8) BM calculation in 2005_20070809 by China DNA
9) China OM and BM in 2005_20070908

7.3 Appendix C: List of persons interviewed

Quzhou Irrigation Bureau
1. Mr. Jianwei Fang, deputy director of irrigation and hydropower management department of Quzhou IB

Quzhou Environmental Protection Bureau
1. Mr. Qinghua Wu, deputy director of project control of Quzhou Environmental Protection Bureau

Quzhou Electricity Power Company
1. Mr. Jiahua Zhang, senior staff of sales department of Quzhou Electricity Power Company

Quzhou Tadi hydropower development complex development Co., Ltd.
1. Mr. Shengfu Xu, the board chairman of the company
2. Mr. Huangming Xu, the board member
3. Mr. Wenyuan Yang, the director in routine hydropower operation
4. Mr. Qingqian Li, the operator of hydropower

Cleanergy Investment Service (Beijing) Co., Ltd.
1. Mr. Wei Song, Project Manager

Local stakeholders including villager in Shangfutou and Tadi villages
1. Mr. Xiangyang He, dean of Quzhuo industrial& commercial vocational school
2. Mr. Jingen Wu, officer of Zhang Tan office of Quzhou district government
3. Mr. Yun Yu, the chief of Shangfutou village
4. Mr. Xueyou Mei, villager of Shangfutou village
5. Mr. Xingliang Lan, villager of Tadi village

Institute of Electrification in Rural Areas
1. Mr. Li Zhiwu, Project Manager

7.4 Appendix D: How due account has been taken to the public input made to the validation requirements

The PDD was made publicly available in accordance with the requirements of the procedure for the period of 29 January 2008 to 27 February 2008.

http://cdm.unfccc.int/Projects/Validation/DB/7WZWZ2PI8BJJZQOFNLIB0N14YNJEMY/view.html

No comment was received during the period.

7.5 Appendix E: Certificate of Appointment

Attached to this report.

7.6 Appendix F: Validation findings log

Attached to this report.

Date: 26 June 2009

To whom it may concern,

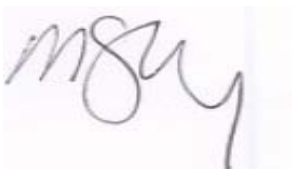
Certificate of Appointment

Subject: Validation of "Tadi 16 MW hydropower project in Zhejiang Province".

We hereby certify that the following personnel have engaged in the validation process that has fully satisfied the competence requirements of the validation of the CDM project activity.

Name of Person	Assigned roles
Ketan S Deshmukh, LRQA Asia	Team Leader, CDM Lead Validator, Sector expert
Zhiyong Wang , LRQA China	Team member, CDM Validator
Ru, Bai, LRQA China	Team member, Trainee Validator
Prabodha C Acharya, LRQA Ltd, India	Technical Reviewer, CDM Lead Validator, Sector expert
Madlen King, LRQA Ltd.	Final Reviewer/ Decision Maker

Decision Maker



CDM Validation Findings Log

"Tadi 16 MW hydropower project in Zhejiang Province"

Version 3.0 – June 2009

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CAR	Closed	The LoA of the Annex I country has not been presented to LRQA by PP.	The validation team receives the LoA issue by Netherlands DNA on 22 April 2008. The LoA noted meeting the requirements specified in the Clarifications related to elements of a written approval.	Participant/ PDD A.3.	15/03/2008	CAR1	CDM M&P Para 40(a)
CAR	Closed	A completeness check of the PDD ver 01 identified the following deficiencies with respect of the Project Design Document Form (CDM-PDD) ver 03 published on the UNFCCC website. 1. The header of the document shows version 03.1 while the Standard template is version 03. 2. Title B.1 should read, "Title and reference of the approved baseline and monitoring methodology applied to the project activity:" 3. The format of the data tables in section B.7.1 is not in accordance with the PDD template. The template requires the following: (a) Source of date to be used: (b) Value of data applied for the purpose of calculating expected emission reductions in section B.5 (c) Description of measurement methods and procedures to be applied: (d) QA/QC procedures to be applied:	Changes made to PDD ver 07 and noted meeting with the requirements.	PDD Template	19/01/2009	CAR2	CDM M&P Para 37 (g)
CAR	Closed	1. Tool for demonstration of additionality ver 04 applied expires on 16 Jan 2009. PP to apply the current version of the tool. 2. The tool to calculate the emission factor for an electricity system (ver 1.0) expires on 28 Mar 2009. PP to apply the current version of the tool.	PDD ver 07 noted addressing the correct version of the tools.	Baseline Methodology PDD/B.1	19/01/2009	CAR3	CDM M&P para 37 (e)

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CAR	Closed	No flow diagram is presented in Section B.3 in PDD. PP to present a flow diagram, according to the requirements of Guidelines for completing CDM-PDD v07.	PDD ver 07 has included a flow diagram that appropriately depicts the project boundary.	Project Boundary PDD/B.3	14/02/2009	CAR 4	CDM M&P para 44
CAR	Closed	The start date was mentioned as 15/09/2003 which reflects the permission towards commencement of construction. However, LRQA identified that major equipment purchases were done on 29/08/2003.	PDD ver 07 now refers 29/08/2003 to reflect the date of purchase of major equipment as the start date. LRQA confirmed that this is the earliest of early start dates with respect of the project activity.	Start Date PDD/ C.1.1	09/01/2009	CAR 5	CDM M&P Para 49(a)
CAR	Closed	The relevant evidences for serious decision of CDM project is not found during the validation of the early starting project	PP updated the PDD with timelines and presented all evidences mentioned within the timeline. LRQA verified the evidences and confirmed PPs serious CDM consideration and continuing efforts to secure the CDM status of the project activity.	Additionality PDD B.5	15/03/2008	CAR 6	CDM M&P Para 43
CAR	Closed	1. PP to present supporting spreadsheet for investment analysis. 2. Electricity generation has not been presented in the sensitivity analysis.	PP presented the spreadsheet calculations to support investment analysis which shows IRR as 7.59%. LRQA validates the input data and the calculations and finds the calculations are in accordance with the guidance on investment analysis. The error in PDD is corrected from 6.26% to reflect 7.59% Sensitivity analysis of electricity generation was included. PP presented the sensitivity analysis to show the variation in the parameter necessary to reach the benchmark. Calculations were confirmed.	Additionality PDD B.5	15/03/2008	CAR 7	CDM M&P Para 43
CAR	Closed	(i) PDD mentions electricity imports from CCPG and NCPG to ECPG. However, no import from NCPG takes place. Rather, import is from CCPG and Yancheng Power plant. (ii) In calculating the Operating Margin Emission Factor, EFOM,y, the PP has not considered the electric imports from CCPG and Yangcheng Power plant.	(i) In the revised PDD, PP considered the electric imports from CCPG and Yancheng Power plant (ii) simple OM emission factor of CCPG and Yancheng Power plant were used to calculate EFOM,y.	Emission Reductions PDD/ B.6	15/03/2008	CAR 8	CDM M&P Para 53(a)

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CL	Closed	PP to support document other than PDR/ FSR that supports the following claims: 1. The increased flooded land area resulting from the project is 1,298,408 m2 and the power density is 12.3 W/m2. 2. It is estimated that the electricity supplied to the grid will be 57,842 GWh annually.	The PDR provides the flooded land area resulting from the project as 1,298,408 m2. Further, it was confirmed that the actual flooded land area measured subsequently by the Irrigation Bureau of Quzhou city was 7,26,400 m2. Using this value will yield a power density greater than 22.0 W/m2. The generation of electricity was confirmed from PDR as 63.14 GWh and the supply of electricity from the project activity was derived on basis of effective power factor of 93% and auxiliary consumption and line losses amounting to 1.5%. Therefore, the total supply to the grid works out to 57,842 GWh. LRQA also referenced other similar registered project activities and confirmed that the difference between generation and supply was within acceptable range. Please see the main body of the report for a detailed explanation.	General Description PDD/A.2	19/01/2009	CL1	CDM M&P Para 52
CL	Closed	Following technical parameters presented in table 1 were noted to be at a variance with those on the nameplate of the equipment: (a) Rated speed of the hydro turbine (b) Run-away speed (c) rated capacity of generator (d) rated speed of the generator	PP revised the technical details in table 1 to reflect the name plate of the equipment. While accepting closure of this finding, LRQA confirmed that (i) the main parameters which can affect the electricity output have not been changed, i.e. the rated water head, the rated power, the rated flow and the efficiency, therefore the power generation will not alter and the additionality will not be affected. (ii) the related investment was confirmed through the Audit Report.	PDD/ A.4.3	19/01/2009	CL2	CDM M&P Para 43
CL	Closed	Refer Table 5. Data with respect of Total Investment and Unit Investment has not been presented for the years 1960-2001. PP to clarify the relevance of the hydropower plants built prior to 2002 in view of the major policy change within PR China.	In PDD ver 07, PP amended and removed data prior to 2001.	Additionality PDD/ B.5/ Sub-step 4a	19/01/2009	CL3	CDM M&P Para 43

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CL	Closed	Although, TEGy appears in the data tables, it does not figure in any equations. PP to confirm relevance of this parameter.	PP agreed that TEGy was not relevant and removed it from the data table.	Monitoring PDD/ B.7.1	19/01/2009	CL4	CDM M&P para 53(a)