VALIDATION REPORT

"Guangxi Bajiangkou Hydropower Project" in the People's Republic of China

25 January 2008

Japan Consulting Institute

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Approved by: Akio YOSHIDA, Executive Director	Organisational unit: JCI CDM Center Japan Consulting Institute (JCI)
Client: Coway International TechTrans Co. Ltd.	Client ref.: Ms. Ling ZHU

JCI has been commissioned by Coway International TechTrans Co. Ltd. to perform a validation of the CDM project listed below. This validation report summarizes the results of the validation of the project.

Project Name: Guangxi Bajiangkou Hydropower Project
Country: People's Republic of China
Methodology: ACM0002
Version: 06
GHG reducing Measure/Technology: Grid connected power generation from renewable source/ Construction and operation of new hydropower plant with reservoir
ER estimate: 1,865,381 tonnes CO2e over the crediting period of seven (7) years.

Size
☒ Large Scale
☐ Small Scale

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

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

In summary, it is JCI's opinion that the "Guangxi Bajiangkou Hydropower Project" in the People's Republic of China, as described in the PDD-Ver.04 of "20 December 2007", meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the approved consolidated baseline and monitoring methodology ACM0002- Ver.06. JCI thus requests the registration of the project as a CDM project activity.

Report No.:	Date of this revision:	Rev. No.
JCI-CDM-VAL-07/012	25 Jan. 2008	02
Report title: "Guangxi Bajiangkou Hydropower Project" in the People's Republic of China		
Work carried out by: Toru KITAGAWA, Junji YOSHIZAWA		
Work verified by: Hideyuki SATO, Manager, Assessment Group, CDM Center		

Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CCPG	China Central Power Grid
CEF	Carbon Emission Factor
CERs	Certified Emission Reductions
China	People's Republic of China
CLAR	Clarification request
CM	Combined Margin
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent
CSPG	China Southern Power Grid
DNA	Designated National Authority
EIA	Environmental Impact Assessment
CDM-EB	CDM Executive Board
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
JCI	Japan Consulting Institute
KP	Kyoto Protocol
NDRC	National Development and Reform Commission, China (DNA of China)
NGO	Non-governmental Organisation
OM	Operating Margin
QA/QC	Quality Assurance/ Quality Control
SD	Sustainable Development
SHP	Small Hydropower Plant
UNFCCC	United Nations Framework Convention on Climate Change
VAT	value-added-tax

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1 EXECUTIVE SUMMARY – VALIDATION OPINION

This validation report concerns the "Guangxi Bajiangkou Hydropower Project" (hereafter denoted as "the Project") to achieve an emission reduction of green house gases (GHGs) by the operation of hydropower plant and displacing electricity generation by other sources servicing the relevant electricity grid in the People's Republic of China (hereafter denoted as China).
Japan Consulting Institute (JCI) was awarded the contract of validation activity from Coway International TechTrans Co. Ltd. and conducted the validation activity by means of a desk review of the project design documents and other related documents, follow-up interviews to local stakeholders of China, including project developer, project site during the field survey, and the resolution of outstanding issues as well as invitation of public comments from 22 June 2007 to 21 July 2007 in accordance with the validation procedure adopted by CDM Executive Board (CDM-EB).

This validation report summarizes the results of the validation of the project, on the basis of the validation requirements under the CDM in the Kyoto Protocol (KP), COP/MOP Decision 3/CMP.1 and all the relevant guidance and decisions by CDM-EB.
The scope of the validation covers the baseline methodology, the monitoring methodology and plan, calculation of GHG emission reductions, environmental impacts and due accounts on the comments from stakeholders on the basis of risk approach.
The Project expects GHG reductions of **1,865,381**tonnes CO2 equivalent over the renewable crediting period of seven (7) years.

Unqualified validation opinion:

In summary, it is the JCI's opinion that the Project as described in the project design document of Version 04 of 20 December 2007 (hereafter denoted as PDD-Ver.04) meets all relevant UNFCCC requirements for CDM and all relevant host country criteria, and correctly applies the approved consolidated baseline and monitoring methodologies ACM0002 (version 06, 19 May 2006) in conjunction with the "Tool for the demonstration and assessment of additionality" (version 03, EB29).

Though both ACM0002 (version 06) and "Tool for the demonstration and assessment of additionality" (version 03) have been revised and replaced by their respective newer versions as of 14 December 2007, they are in the grace period at the time of request for registration according to the paragraph 18 of the "Procedures for the revision of an approved baseline or monitoring methodology by the executive board" (version 07, 04 May 2007), that is fully carried over to it's latest version, (version 09, 19 October 2007).

Consequently, JCI requests for the registration of the Project as CDM project activity.

2 INTRODUCTION

The Client has commissioned JCI to perform a validation of the Guangxi Bajiangkou Hydropower Project in Guangxi Zhuang Autonomous Region (hereafter denoted as Guangxi Region).

This report summarizes the findings of the validation of the Project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project

operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions and guidelines given by the CDM Executive Board.

2.1 Objective

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

2.2 Scope

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

Validation of JCI focussed especially on the assessment and demonstration of additionality, and the determination of baseline emissions of the proposed project activity under the Chinese context of relevant data availability.

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.

2.3 Project Description

New hydropower plant with reservoir of the aggregated rated capacity of 90 MW is constructed and operated in the middle reach of Guijiang River, Pingle County, Guilin City, Guangxi Zhuang Autonomous Region of the People's Republic of China. The construction includes dam, river bed power house, three sets of water turbines and generators of the rated unit power generation capacity of 30 MW, and associated facilities including electricity delivering facilities, and ship lock. The total surface area of reservoir is estimated to be 16.2 km^2 at full reservoir level.

Electricity generated will be delivered to the Guidong Power Grid, a local grid of the provincial level Guangxi Power Grid that constitutes China Southern Power Grid (CSPG) together with the Guangdong Power Grid, Yunan Power Grid, and Guizhou Power Grid. Annual total electricity delivered to the grid is estimated to be **358.9 GWh.**

The construction of the hydropower plant was approved by the Guangxi Zhuang Autonomous Region Development and Planning Commission as of 6th December 2002, /7/, on the basis of the "Preliminary Feasibility Study" report prepared jointly by the Guangxi Design Institute of Water Conservancy-Hydropower and Survey, and Guilin City Design Institute of Water Conservancy-Hydropower and Survey, and the EIA report prepared by the Guangxi Zhuang

Autonomous Region Environmental Protection Science Institute, /5/. While EIA report was approved by the Guangxi Region Environmental Protection Bureau as of 30 July 2003, /6/, and the "Initial Feasibility Study Report", /3/, was approved by Guangxi Region Hydro Resources Bureau as of 10 July 2003, /8/. The construction of the plant was then started ~~i~~on 17 September 2003.

Major part (70 %) of the total construction costs is a loan from the bank, Wuzhou Subsidiary of China Agricultural Bank. However, due to the drastic change in economic circumstances of the Project, such as upward change in compensation for relocation, soaring of good price including additional investment in the transmission line, substantial decrease in the IRR value that was assumed in the "Initial Feasibility Study", /3/, and was employed as the base of financing contract concluded with the bank as of 2003, was predicted, and the project owner had to interrupt the construction of the plant ~~i~~on 7 March 2005.

Reflecting the above, the Board of the Pingle Guijiang Electric Power Company, project owner of the Project, approved the resolution to proceed with the Project as a CDM project, and to convince the bank to continue financing to the project at its eleventh (11th) of the first (1st) term of its meeting held on 14 March 2005, /9/.

The project owner contacted CDM consultancy for their assistance to set-up CDM project in May 2005. The project owner also entrusted the re-assessment of the financial aspects expected in the "Initial Feasibility Study Report", /3/, under the updated several economic parameters to the Guangxi Design Institute of Water Conservancy-Hydropower and Survey, one of the authors of the report, and the "Revised Feasibility Study" report was completed in June 2005, /4/.

The bank was successfully convinced of the incentive from CDM and decided to continue financing the Project. The construction of the plant was then re-started on 10 August 2005, and was expected to complete in August 2007.

Project participants are Pingle Guijiang Electric Power Company Ltd. (project owner, private entity), and Marubeni Corporation (CER buyer, private entity), /1/, /12/, /13/.

3 METHODOLOGY

The validation consists of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

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

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation.

Project specific documents:

/1/	Project Design Document, "Guangxi Bajiangkou Hydropower Project", Version 01, dated 06 March 2007, Version 02, dated 22 August 2007, Version 03, dated 28 November 2007, Version 04, dated 20 December 2007.
/2/	IRR calculation spread sheet for "Guangxi Bajiangkou Hydropower Project".
/3/	Guangxi Design Institute of Water Conservancy-Hydropower and Survey, and the State Electric Company East China Survey and Design Institute: Initial Feasibility Study Report of "Guangxi Bajiangkou Hydropower Project", May 2003.
/4/	Guangxi Design Institute of Water Conservancy-Hydropower and Survey: Revised Feasibility Study Report of "Guangxi Bajiangkou Hydropower Project", June 2005.
/5/	Guangxi Zhuang Autonomous Region Environmental Protection Science Institute: Environmental Impact Assessment Report of "Guangxi Bajiangkou Hydropower Project", July 2002.
/6/	Guangxi Zhuang Autonomous Region Environmental Protection Bureau: Approval Letter of EIA Report of "Guangxi Bajiangkou Hydropower Project", 30 July 2003.
/7/	Guangxi Zhuang Autonomous Region Development and Planning Commission: Approval Letter of the "Guangxi Bajiangkou Hydropower Project", 6 December 2002.
/8/	Guangxi Zhuang Autonomous Region Hydro Resources Bureau: Approval Letter of the Initial Feasibility Study of Bajiangkou Hydropower Plant, 10 July 2003.
/9/	Resolution of the eleventh meeting of first term Board Meeting, Pingle Guijiang Electric Power Company Ltd., 14 March 2005.
/10/	People's Government of Pingle County, Guilin City, Guangxi Zhuang Autonomous Region: "Notification regarding amendment of the compensation standard and house relocation promotion regulation for the Bajiangkou Power Station Project "(Notification No.[2003] 74), 31 December 2003.
/11/	Power Purchase and Tariff Agreement, between Guangxi Guidong Power Grid Company Ltd. and Pingle Guijiang Electric Power Company Ltd., 1 December 2005.
/12/	Letter of Approval by DNA of China dated 20 July 2007.
/13/	Letter of Approval by DNA of Japan dated 27 July 2007.

Project design, methodology, and other referenced documents:	
/14/	International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. (http://www.vvmanual.info)
/15/	CDM-EB: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", ACM0002, version 06
/16/	CDM-EB: "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources", ACM0002. version 06.
/17/	CDM-EB: "Tool for the demonstration and assessment of additionality" version 03.
/18/	National Power Company: Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects, 2002.
/19/	CDM-EB: Guidance for "Request for deviation: Application of AM0005 and AMS-I.D. in China" 7 October 2005.
/20/	China Electric Power yearbook, 2002, 2003, 2004, 2005, 2006.
/21/	China Energy Statistical Yearbook, 2000-2002, 2004, 2005, 2006.
/22/	NDRC-China: Baseline Emission Factor of Chinese Power Grid, 09 August 2007.
/23/	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Workbook.
/24/	2006 IPCC Guidelines for National Greenhouse Gas Inventories, vol. 2.
/25/	China's Sustainable Development Programme (SDNP/China): The Priority Programme for China's Agenda 21 (Revised and Expanded Version) (can be accessed at: http://www.acca21.org.cn/indexe8.html)
/26/	The Renewable Energy Law (cab be accessed at: http://china.lbl.gov/publications/re-law-english.pdf)
/27/	China Electricity Council: "Electricity Sector in China: Policy, Regulation and Reform", 21st -22nd September , 2004 (can be accessed at: http://www.iea.org/Textbase/work/2004/brazil/mi_jianhua.pdf)
/28/	By Li Junfeng, Shi Jinli and Ma Lingjuan: China: Prospect for Renewable Energy Development. (can be accessed at: http://www.hm-treasury.gov.uk/media/5/2/Final_Draft_China_Mitigation_Renewables_Sector_Research.pdf)
/29/	China Finance Information: Power Generation Industry- Mid- and Long-term Prospect of Renewable Energy, 11 June 2007. (can be accessed at: http://www1.cfi.net.cn/newspage.aspx?id=20070611000970&AspxAutoDetectCookieSupport=1)
/30/	Zhang Anhua, Zhao Xingshu: Efficiency Improvement and Energy Conservation in China's Power Industry (can be accessed at: http://www.hm-treasury.gov.uk/media/D/E/final_draft_china_mitigation_power_generation_sector.pdf)
/31/	Guangxi Statistical Bureau: Guangxi Statistical Yearbook: 2002, 2004, 2005, 2006.
/32/	International Monetary Fund: IMF- Data and Statistics, (can be accessed at: http://www.imf.org/external/pubs/ft/weo/2007/02/weodata/weoselgr.aspx)
/33/	Yearbook of China Water Resources, 2000, 2001, 2002, 2003, 2004, 2005, 2006.

All documents referred in PDD-Ver.04 were confirmed during the validation activity, but are not listed in the above table.

Summary of Comments by Local Stakeholders is included in PDD-Ver.04, /1/.

Revision history of PDD for the "Guangxi Bajiangkou Hydropower Project" is shown below,

Version 01 (for Public Comments for Validation): dated 06 March 2007,

Version 02: dated 22 August 2007,

Version 03: dated 28 November 2007,

Version 04 (for Request for Registration): dated 20 December 2007.

Major changes between the version published for the 30 days stakeholder consulting period (version 01) and the final version submitted for registration (version 04) are,

(1) Description of the investment analysis for the demonstration and assessment of additonality was revised to improve transparency and consistency.

(2) Criteria of selection of the existing projects were provided in the common practice analysis.

(3) Data vintage for calculation of the baseline emission factor of the relevant grid, that covered only up to 2004, was updated to the latest one available (up to 2005).

(4) Combined margin of CCPG was applied for the electricity import in 2005 to CSPG instead of its average emission factor to calculate OM.

(5) Energy efficiency of the coal fired power plant for calculation of BM was changed to the conservative one.

Items, (3) through (5), above caused total 7 % upward adjustment of the baseline emission factor but 1.3 % lower than that published by NDRC-China as of 09 August 2007, /22/. IRR calculation was revised according to the change in the baseline emission factor. The rest of the items above cause none of the influence to the baseline emission factor of the project. Amount of CERs is changed due to change in the baseline emission factor as stated above. Estimated annual emission reduction was then adjusted upwards by 7.9 % including project emissions that remain unchanged in comparison with that in the initial version of PDD.

3.2 Follow-up Interviews with Project Stakeholders

Following persons were interviewed during on-site visit:

	Date	Name	Organization	Topic
/34/	4 Aug. 2007	Mr. L. Huafang, Vice President Mr. H. Fenwei, Assistant President Mr. X. Qinfeng, Sales Manager	Guidong Power Grid Company	➢ Operational overview ➢ Policy/Regulation of electricity from IPP ➢ Role of the Project in grid operation
/35/	8 Aug. 2007	Mr. Ye Jianping, President Mr. Yan Chunguang, Vice President,	Guangxi Design Institute of Water Conservancy-Hydropower and Survey	➢ Water availability of Guijiang River over a year ➢ Scheme of estimation of power to be generated

		Mr. Zhou Wanwen, Deputy Chief Engneer, Ms. Deng Jian, Engineer		➢ Scheme of measurement of surface area of reservoir ➢ General information of Xiaqiao Hydro Plant
/36/	6 and 7 Aug. 2007	Mr. Zhou Yongyi, President Mr. Li Guoquan, Vice President Mr. Zhang Xiaowei, Vice President	Pingle Guijiang Electric Power Company	➢ Project history & current status of construction ➢ Progress in migration ➢ Stakeholder's consultation ➢ Specifications of equipment employed ➢ Training needs
/37/	8 Aug. 2007	Mr. L. Fang, Senior Staff- District Div. Mr. C. Weilong, Senior Engineer- Energy	Guangxi Zhuang Autonomous Region Development and Planning Commission	➢ Approval criteria of the project ➢ Social impact of the project ➢ Migration issues ➢ Concern/Anticipation of the Project
/38/	8 Aug. 2007	Mr. L. Jie, Staff- Supervision & Management	Guangxi Zhuang Autonomous Region Environmental Protection Bureau	➢ Approval criteria of EIA ➢ Concern/Anticipation of the Project ➢ Current environmental issues of the Region

3.3 Resolution of Outstanding Issues

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

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

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

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

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

iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CLAR) may be used where additional information is needed to fully clarify an issue. The item requested for clarification may lead further CLAR or CAR.

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

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question.*	*This is either acceptable based on evidence provided (**OK**), or a c**orrective action request (CAR)** due to non-compliance with the checklist question (See below). A request for clarification **(CLAR)** is used when the validation team has identified a need for further clarification.*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	***Ref. to checklist question in Table 1 or Table 2***	***Summary of project owner response***	***Validation conclusion***
If the conclusions from the draft Validation are either a CAR or a CLAR, these should be listed in this section.	*Reference to the checklist question number in Table 1 or Table 2 where the CAR or CLAR 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

3.4 Internal Quality Control

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

3.5 Validation Team

Reflecting the competence criteria of JCI in accordance with "Criteria for operational entities of LIST of SECTORAL SCOPES", the validation team of JCI specified below for the Project were organized as per Validation Procedure established by JCI CDM Center.

Role/Qualification	Last Name	First Name	Country
Validation Team Leader/ All relevant criteria	Dr. KITAGAWA	Toru	Japan
GHG auditor	Mr. YOSHIZAWA	Junji	Japan

It shall be noted that Mr. Yoshihisa SAKAI of JCI participated in the validation activities of the Project for the quality issues under its quality management scheme.

The certificate of appointment of the validation team by JCI, and its approval by the client are attached as Appendix B to this report.

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.
The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation.

4.1 Participation Requirements

Parties involved in the Project are China (host party), and Japan. Project participants are Pingle Guijiang Electric Power Company Ltd. (project owner, private entity, China), and Marubeni Corporation (CER buyer, private entity, Japan).

China and Japan ratified Kyoto Protocol as of 30 August 2002, and 04 June 2002, respectively.

Letter of approval from China dated 20 July 2007 that describes ratification of Kyoto Protocol, fulfillment of permission requirements, assistance China in achieving sustainable development, authorization of voluntary participation of the said Chinese project participant, and permission of transfer a part of CER to be generated was confirmed.

Letter of approval from Japan dated 27 July 2007 that describes ratification of Kyoto Protocol, and authorization of the voluntary participation of the said Japanese project participant were confirmed. Though the title of the proposed project indicated in the English translation of the approved letter from Japan is not exactly the same as the original project title in PDD, JCI confirmed the translation is for the said proposed project in its original document in Japanese.

There is none of the indication that the Project uses the public funding including official development assistance.

This may also be supported by the fact that the proposed project was approved by DNA of China under the Articles 8, and 9, II. Permission Requirements, “Measures for Operation and Management of Clean Development Mechanism Projects in China”, (effective as of 12 October 2005, can be accessed at, http://cdm.ccchina.gov.cn/english/NewsInfo.asp?NewsId=905) as quoted below,

> **-Quote-**
>
> **Article 8** The implementation of CDM project activities shall not introduce any new obligation for China other than those under the Convention and the Protocol.
>
> **Article 9** Funding for CDM projects from the developed country Parties shall be additional to their current official development assistance and their financial obligations under the Convention.
>
> **-Unquote-**

It can then be concluded that all the participation requirements are fulfilled.

4.2 Project Design

New hydropower plant with reservoir of the aggregated rated capacity of 90 MW is constructed and operated in the middle reach of Guijiang River, Pingle County, Guilin City, Guangxi Zhuang Autonomous Region of the People's Republic of China. The construction includes dam, river bed power house, three sets of water turbines (ZZA401-LH-430) and generators (SF30-40/6800) of the rated unit power generation capacity of 30 MW, and associated facilities including electricity delivering, and monitoring system. Electricity generated will be delivered to the China Southern Power Grid through Jiangkou Substation, and Tongle Substation to Guidong Power Grid, a local grid of the provincial level Guangxi Power Grid. Annual total electricity delivered to the grid is estimated as **358.9** GWh. Specifications of both water turbines and power generators are in compliance with the Chinese national standard. Monitoring equipment and its arrangement are complied with the "Technique Management Regulation of Power Measuring Equipment" of China (DL/T448-2000).

Technology to be employed is considered as good practice in China, and also environmentally safe and sound.

None of the technology transfer is associated in the Project but operator of the power plant will be trained at Heminnsh Hydropower Station located in the same drainage area as the Project prior to operation. Training of monitoring procedures will also be provided by CDM consultant.

The construction of the hydropower plant started in September 2003, and was expected to complete in August 2007. The starting date of the project described in section C.1.1. of PDD-Ver.04, is explained in the section, 4.4 (Additionality) of this validation report. The Project life time is expected to be 34 years consisting 4 years of construction, and 30 years of operational lifetime.

Renewable crediting period of seven (7) years and zero (0) month has been chosen, and starting date of the crediting period is specified as 1 April 2008. The project participants confirmed that the emission reductions generated before the date of registration of the Project are not claimed, and the starting date of the crediting period will be adjusted when the registration date of the Project is determined.

4.3 Baseline Determination

Approved consolidated baseline methodology, ACM0002-Ver.06 "Consolidated methodology for grid-connected electricity generation from renewable sources" is applied.

Applicability of previously approved baseline methodology

The methodology employed was revised and replaced by a newer version on 14 December 2007 but was effective at the date of publication, 22 June 2007, of PDD for public comments for validation. It is in the grace period at the date of request for registration as per paragraph 16 of the "Procedures for the revision of an approved baseline or monitoring methodology by the executive board" (version 09).

The consolidated baseline methodology, ACM0002 (version 06) is applicable to grid-

connected renewable power generation project activities under the following conditions:
(1) Applies to electricity capacity additions from:
- Run-of-river hydro power plants; hydro power projects with existing reservoirs where the volume of the reservoir is not increased.
- New hydro electric power projects with reservoirs having power densities (installed power generation capacity divided by the surface area at full reservoir level) greater than 4 W/m^2.
- Wind sources;
- Geothermal sources;
- Solar sources;
- Wave and tidal sources.

(2) This methodology is not applicable to project activities that involve switching from fossil fuels to renewable energy at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;
(3) The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available; and
(4) Applies to grid connected electricity generation from landfill gas capture to the extent that it is combined with the approved "Consolidated baseline methodology for landfill gas project activities" (ACM0001).

Since proposed project is a grid-connected hydropower project, preamble of the applicability conditions is fulfilled. The Project is a new hydro electric power project with reservoir having a power density of 5.56 W/m^2. Therefore, the applicability condition (1) is fulfilled. The project activity does not involve fuel switching from fossil fuels to renewable energy at the site of the project activity. Therefore applicability condition (2) is fulfilled.

Geographic boundary of the Project is defined as the power plant including reservoir as indicated in the table at the bottom of this section, /1/.

Electricity generated by the Project will be delivered to Guidong Power Grid, a local grid consisting Guangxi Power Grid. According to the guidance of NDRC-China, /22/, Guangxi Power Grid is defined as a part of CSPG together with Guandong Power Grid, Yunnan Power Grid, and Guizhou Power Grid. Since CSPG imports some amount of electricity from CCPG, CCPG is also considered as the “relevant electricity system” of the Project. Information on the characteristics of both CSPG and CCPG is available in the official publications, such as China Electric Power Yearbook, /20/, China Energy Statistical Yearbook, /21/.

Therefore, applicability condition (3) is also fulfilled.

All the relevant applicability conditions of the consolidated baseline methodology, ACM0002-Ver.06, are fulfilled.

Baseline scenario identification

Following four (4) alternative scenarios were considered for the proposed project of 90 MW power generation,

(1) Implementation of the proposed project not as a CDM project;

(2) Construction of a fossil fuel power plant with the same amount of annual electricity generation as the proposed project;

(3) Construction of a power plant using other sources of renewable energy with the same amount of annual electricity generation as the proposed project;

(4) CSPG provides the same amount of annual electricity as the proposed project.

"Alternative (4) CSPG provides the same amount of annual electricity as the proposed project" above has been identified as the plausible and credible baseline scenario through analysis of the following criteria; (i) current laws and regulations, and (ii) availability of local resources, and (iii) investment barriers.

JCI considers that the approach and criteria employed for baseline scenario identification are appropriate and convincing. The outcome of this step through discussions with evidences referred are also considered to be appropriate.

System boundary

"Project electricity system" specified in ACM0002-Ver.06 has been defined as CSPG that consists of Guandong Power Grid, Yunnan Power Grid, Guizhou Power Grid, and Guangxi Power Grid that the project activity is directly connected. Since CSPG imports some amount of electricity from CCPG, a regional power grid in China and consisting provincial level grids of Henan province, Hubei province, Hunan province, Jiangxi province, Sichuan province and Chongqing city, CCPG is addressed as the "connected electricity system" specified in ACM0002-Ver.06. The system boundary of the Project is thus defined as CSPG and CCPG, /1/. Such definitions of relevant grids for the Project are in line with the latest guidance published by NDRC-China as of 9 August 2007, /22/. Since NDRC-China is the DNA of China, the grid definitions employed in PDD, /1/, are in compliance with ACM0002-Ver.06 and thus considered to be appropriate.

The GHGs in the system boundary can be presented in the table below.

Table 4.1 Inclusion/exclusion of GHG in the project system boundary.

	GHGs involved	Description
Baseline emissions	CO2	Included as per ACM0002-Ver.06
	CH4	Excluded as per ACM0002-Ver.06. This is conservative.
	N2O	Excluded as per ACM0002-Ver.06. This is conservative.
Project emissions	CO2	N.A. as per Project characteristics.
	CH4	Emissions from newly created flooded area caused by formation of reservoir in the Project. Included as per ACM0002-Ver.06 since power density assessed is 8.11 W/m^2 that is less than 10 W/m^2.
	N2O	N.A. as per Project characteristics.
Leakage	N.A.	As per ACM0002-Ver.06.

Project boundary definition employed in PDD-Ver.04 as summarized above is considered to be appropriate.

4.4 Additionality

"Tool for the demonstration and assessment of additionality (Version 03, EB 29)" is employed to demonstrate the additionality of the Project as per baseline methodology employed, ACM0002-Ver.06. The "Tool for the demonstration and assessment of additionality (Version 03, EB 29)" was revised and replaced by newer version on 14 December 2007 but was effective at the date of publication, 22 June 2007, of PDD for public comments for validation. It is therefore in the grace period at the date of request for registration as per paragraph 16 of the "Procedures for the revision of an approved baseline or monitoring methodology by the executive board" (version 09).

Since the construction of the hydropower plant for the Project started before the date of validation, JCI first confirmed if the Project meets the additionality criteria specified especially in paragraph 43 and 44, Decision 3/CMP.1 (Modalities and procedures for CDM).

Primary screening by the request for CDM project

Project proponent provided brief history of the Project in PDD-Ver.04, /1/. They also provided JCI with evidences that the incentive from the CDM was seriously considered in the decision to proceed with the Project. The issue is outlined below.

The Project started ~~i~~on 17 September 2003 without considering CDM. Major part (70 %) of the construction costs was financed by Wuzhou Subsidiary of China Agricultural Bank on the basis of information provided in the "Initial Feasibility Study", /3/. However, due to the drastic change in economic circumstances of the Project, such as upward change in compensation for relocation as per Notification issued by the Pingle Government, /10/, soaring of construction materials including additional investment costs for the transmission line, the return on investment (ROI) of the Project estimated in the "Initial Feasibility Study", /3/, became impossible to achieve. Since the IRR value specified in the "Initial Feasibility Study", /3/, was a basic condition of the financing contract with the bank, the Company had to stop constructing the plant ~~i~~on 7 March 2005.

The Board of the Company decided to develop the Project as a CDM project on 14 March 2005, /9/, and contacted a domestic CDM consultancy for their assistance to set-up CDM project, and also entrusted re-assessment of the financial aspect of the Project under the updated economic conditions to Guangxi Design Institute of Water Conservancy-Hydropower and Survey. The bank was convinced of the incentive from CDM and decided to continue financing the Project. The construction of the plant then re-started on 10 August 2005, and was expected to complete in August 2007. The documents describing the time line of the construction, especially dates of stop construction and re-start construction were confirmed, /36/.

JCI confirmed the information relevant to those described in section B.5. in PDD-Ver.04, /1/, and others provided by the project proponents, /3/, /4/, /9/, /10/, including the following documents to support the information that is relevant to the issue provided in section B.5. in PDD-Ver.04,

(1) Pingle Guijiang Electric Power Company Ltd.: Formal inquiry document headed to the CDM consultancy to apply CDM project, 19 May 2005,

(2) CDM consultancy: Formal reply to the project owner to accept inquiry above, 25 May 2005,
(3) Wuzhou Subsidiary of China Agricultural Bank: Proof of the information that the bank's view in 2005, on the financing the Project that described their concern about the pay-back ability of the Project without CDM, and their decision to continue financing the Project to proceed CDM registration, 26 July 2007.

The "Notification" issued by the People's Government of Pingle County, /10/, specified compensation standard for five (5) categories including, land itself, forest and vegetation, plants for fruits, timber forests, houses and associate buildings, that are further sub-divided into 62 items as its annex 1. In annex 2, compensation for families for relocation as per regulation is specified. It did not mention the total figure on the compensation necessary for relocation due to the construction of the power plant but the unit of compensation. Considering the potential benefits from the project to the local community, the last response to the item 1), CAR4 on the local government proposal and the reason of delay in addressing the issue by the project owner could be understandable to occur.

In order to confirm the contents of the "Resolution of the Board Meeting of the Company", /9/, JCI further referred economical circumstances of the Project, /31/, /32/, as summarized in the "Appendix C" of the validation report.

Economical situations represented by several indices in both Guangxi Zhuang Autonomous Region, /31/, and China, /32/, are analyzed as indicated in Appendix C of this validation report. Ex-factory price of gross and the selected categories of commodity that include major materials or goods for the construction of hydropower plant in Guangxi Region showed remarkable increase during the period of 2002 through 2004 when the major decisions to proceed with the Project were made. This is also observed in whole of China in the IMF statistics. Therefore, the background of the economic situation in Guangxi Region described in PDD-Ver.04 is considered to be plausible.

The resolution of the Board Meeting of Pingle Guijiang Electric Power Company, /9/, can be considered eligible for demonstrating that the incentive from the CDM was seriously considered in the decision to proceed with the Project as per "Guidelines for Completing the Project Design Document (CDM-PDD)", version 06.2 for the section B.5. of PDD. The English translation of the "Resolution of the Board Meeting" of the project owner has been confirmed by JCI, and up-loaded as a part of "PDD appendices".

Considering all above stated information, JCI thus considered that the Project would have been terminated without the support of CDM. The starting date of the project activity shown in section C.1.1. of PDD-Ver.04 as 10/08/2005 (re-starting date of construction), thus represents the starting date of the CDM project activity.

Identification of alternatives:
Following four (4) alternative scenarios were considered for the proposed project of 90 MW power generation,

(1) Implementation of the proposed project not as a CDM project;

(2) Construction of a fossil fuel power plant with the same amount of annual electricity generation as the proposed project;

(3) Construction of a power plant using other sources of renewable energy with the same amount of annual electricity generation as the proposed project;

(4) CSPG provides of the same amount of annual electricity as the proposed project.

Alternative (4), "CSPG provides of the same amount of annual electricity as the proposed project" has been identified as the plausible and credible baseline scenario to the proposed project activity through analysis using criteria; (i) current laws and regulations, and (ii) availability of local resources, and (iii) investment barriers.

JCI confirmed the information referred to filter-out the alternative scenarios and complementally referred information on the power generation from renewable energies in China, /25/, /26/, /27/, /28/, and /29/, to consider the appropriateness of procedures to identify the alternative scenarios of the Project. As the result, JCI considers the process and the outcome of the step are in line with the "Tool for the demonstration and assessment of additionality" (version 03), /17/, for this step, and are appropriate.

Investment analysis:

Financial indicator and benchmark: Considering the baseline scenario identified, "CSPG provides the same amount of annual electricity as the proposed project" that does not associate with the investment, and proposed project produces economic benefits other than CDM related income, Option III (Benchmark analysis) in Sub-step 2 of the "Investment analysis" (Step 2) is employed. Project IRR was selected as the financial indicator for the "Benchmark analysis". Referring "Interim Rules on Economic Assessment of Electrical Engineering Retrofit Project", /18/, issued by the National Power Corporation of China, 2002, benchmark IRR of 8 % (after tax) was selected.

JCI considered that the financial indicator selected and the benchmark employed are incompliance with the Additionality Tool, /17/, and therefore appropriate.

Parameters employed: Parameters employed in the project IRR calculation for the benchmark analysis are, "Estimated annual electricity output", "Total static investment", "Liquid capital", "Annual O&M cost", and "Tariff (the electricity price sold to grid, excluding VAT)". Applicable taxes, such as VAT, additional tax, and income tax, are also specified and employed in the project IRR calculation.

It is explained that all the parameters employed are quoted from the Revised Feasibility Study Report, /4/, in PDD-Ver.04.

The parameter that gives the most critical effect on IRR is the "Estimated annual electricity output" and "Tariff". The former is referred to the annual electricity to be delivered, and the latter is referred to the selling price of electricity to the grid, /1/. JCI confirmed in the feasibility study reports, /3/, /4/ that the annual electricity output was estimated on the basis of gross amount of electricity generation, and effective factor, and self consumption of the plant. Gross amount of electricity generation is estimated by the computer simulation model from the hydrological conditions of Guijiang River observed over the decades, /36/. Since the value is a result of simulation model, it is multiplied by the effective factor of 85 % to estimate the most probable out-put from the generator. Considering the amount of self-consumption and line loss is not greater than 1 %, multiplication of the effective factor causes the major part of

difference between the gross amounts of electricity generation and the amount of electricity to be delivered.

JCI confirmed that the same figures for the "gross amount of electricity generation", "effective factor", "internal consumption rate", and "line loss" were applied to both "Initial Feasibility Study Report, /3/", and the "Revised Feasibility Study Report, /4/". Since initial feasibility study was carried out for the operation of the plant without CDM, /1/, the annual electricity to be delivered denoted as "Estimated annual electricity output" can be considered credible.

JCI confirmed that the annual operational hour defined by the gross amount of electricity generation divided by the installed capacity of the Project is in a reasonable range of those recorded by the hydropower plants of similar generation capacity (69 - 80MW) over seven years covering 1999 through 2005 in the Guangxi Region, /33/.

Some amount of electricity will be fed by the power grid during the period when the power plant is not operational. Though such amount of electricity will be monitored during the project activity, it is assumed to be "zero" in the project IRR calculation, which is conservative for the purpose of project IRR calculation.

JCI also confirmed the electricity tariff employed in the IRR calculation in the "Power Purchase and Tariff Agreement", /11/.

The total investment in fixed assets for the Project is referred to as "Total static investment", /1/, /2/. JCI confirmed the total investment in fixed assets employed in IRR calculation, /2/, in the "Revised Feasibility Study Report" summarized as of June 2005, /4/.

It is described in PDD-Ver.04, /1/, that the increase in investment in compensation for relocation, and price raise of construction materials including additional investment costs for transmission line cause the economic difficulty of the Project.

The figure employed in IRR calculation is larger by 12.7 % from the initially employed in the "Initial Feasibility Study Report". The detailed re-calculation of the investment for compensation for relocation as per "Government's Notification", /10/, is provided in the "Revised Feasibility Study Report". According to the calculation result, share of increase in compensation is 8.6 % out of 12.7 % of total difference in investment. Though the rest part of the difference, 4.1 %, shall be attributable to the raise in construction material costs and additional investment for distribution line, only additional investment for distribution line is considered but the price increase in the construction materials is not included in this part.

Considering the ex-factory price for the goods relevant to the power plant construction during period of the constriction shown in Appendix C, such assumption is considered conservative.

Since initial feasibility study was carried out in early 2003 for the construction and operation of the plant without CDM, /1/, the figure for the total investment in fixed assets for the Project employed in the IRR calculation, /2/ can be considered credible.

Appropriateness of other parameters employed can also be confirmed in the "Revised Feasibility Study Report", /4/, though they only give minor effect on the results of IRR calculation. O&M costs include personnel costs, maintenance, and associated material costs for the operation of the hydropower plant, /4/. Referring share of O&M costs in the total investment costs for similar hydropower projects in China, the item is considered appropriate.

IRR calculation: Project IRR using the parameters mentioned above was calculated over the project lifetime of 34 years including 4 years of construction and 30 years of operational lifetime, /2/. JCI considered the time span of IRR calculation to be appropriate.

The cases for calculations are, project activity without CDM incentive- the base case, project activity with CDM incentive, and sensitivity analysis as mentioned below.

It is confirmed that the "annual electricity output" is multiplied by the "Electricity price" in the IRR calculation as explained at footnote 15 in the section Sub-step 2d, section B.5. of PDD-Ver.04, /1/.

Calculated IRR value (after tax) for the Project is 6.51 % for the case without CDM, and 9.34 % for the case with CDM incentive mentioned, /1/. Since benchmark level for the Project is 8 % (after tax), it can therefore be concluded that the Project cannot be considered as financially attractive without CDM, and the financial barrier will be overcome if CDM incentive is included.

Sensitivity analysis: The sensitivity analysis was conducted by choosing parameters, "total static investment", "annual O&M costs", and "annual electricity output" as the critical parameters.

It is shown that even if extreme values for the critical parameters, that is plus (+) 10 % to the base case of "annual electricity output", and minus (-)10 % to the base case for both "annual O&M" and "total static investment", are assumed, project IRR calculated is still below the bench mark value of 8 % (after tax). It can be confirmed in the spreadsheet provided, /2/, that all the IRR values for the sensitivity analysis are after tax.

It can therefore be concluded that the statement in the Sub-step 2c, "the Project is unlikely to be financially attractive", is robust through the Sensitivity analysis under Sub-step 2d.

Conclusion of the investment analysis: It is JCI's view that all the parameters employed are on the conservative assumption, and therefore result of this step is appropriate and convincing. As the outcome of Sub-step 2c (benchmark analysis), and Sub-step 2d, it can be concluded that the Project is unlikely to be financially attractive.

Project proponents skipped the Step 3 (barrier analysis) to proceed Step 4. (Common practice analysis)

Selection of other activities similar to the project: Project proponents selected the other activities similar to the Project with the following criteria,

(1) hydropower plant in Guangxi Region, (2) installed capacity of approximately 90 MW, (3) start of construction of after 2002.

They justified the criterion (1) as, tax rate, loan policy, and electricity tariff are different by province by province. For the criterion (3), project proponents claimed that China State Power Corporation was split into five regional grids in 2002, and the investment environment for power generation projects was substantially affected. To answer the request for clarification in the validation protocol, CLAR 5, China Electric Power Yearbook, 2006, /20/, and Yearbook of China Water Resources, 2006, /33/ were referred to select the similar activities. The information was also collected additionally by browsing the relevant web sites.

JCI confirmed the restructuring of Chinese power industry in 2002 in the official sources such as, /27/. Considering the change in investment policy associated with the restructuring, the criteria of "start of construction after 2002" is therefore appropriate. JCI therefore considers that the criteria for selecting similar activities and data base referred are objective and thus appropriate.

Discussion on similar options that are occurring: Reviewing the listing of hydropower plants in Guangxi Region in China Electric Power Yearbook, 2006, and China Water Resources, 2006, none of existing project of similar installed capacity is observed. Jinjitan Hydropower project was confirmed in both project lists approved by Chinese DNA referred in PDD, /1/, and for validation stage in UNFCCC-CDM web site. Strictly speaking, Dapu Hydropower project mentioned, /1/, is not eligible under the selection criteria employed, it is further explained that the project can be differentiated to the proposed project by the difference in the investment environment and financial structure. JCI confirmed that the power generation of Dapu plant in terms of operational hour (defined by the annual power generation divided by its installed capacity) recorded is one of the largest hydropower plants in Guangxi Region, /33/. The statement on the financial support provided is convincing if one considers that the starting date of the Project is before restructuring of the power sector in 2002, /27/.

JCI therefore considers that there is none of the similar activity cannot be observed, and the proposed project is therefore additional.

4.5 Monitoring

The approved monitoring methodology, ACM0002 "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources" version 06 was employed. The selected monitoring methodology is applicable for the Project as is described in section 4.3 (Baseline Determination) of this validation report.
The baseline emission factor is determined in *ex-ante* by using the most recent official information available.

To determine the emission reductions of the Project, net amount of electricity delivered to the grid by the Project will be measured continuously and monthly recorded. This data will be cross verified against the sales receipt from the grid company. Leakage effect is not required under ACM0002-Ver.06 and thus is not considered for the Project. Since the Project is a new hydro power project with reservoir whose estimated power density, as 5.56 W/m^2, surface area of reservoir at the full reservoir level will also be monitored at start of the project.

Monitoring of sustainable development indicators is not required by the Chinese DNA. Since environmental impacts are regarded as minor, impacts on the environment will be monitored by the local environmental protection authority during the project lifetime. Detailed procedures were developed and the implementation of these will enable subsequent verification of emission reductions.

All the relevant documents will be archived for two years after the end of crediting period, or the last issuance of CERs, whichever occurs later.

4.5.1 Parameters determined ex-ante

Baseline emission factors, operating margin, OM, and build margin, BM, for the project electricity system are calculated in *ex ante* as per provisions of approved baseline methodology, ACM0002 (version 06). Data vintage for OM and BM calculations is of the most recently available that is covering up to 2005.

Due to the limited availability of published data on the power generation in China, the guidance of CDM-EB given to the "Request of Deviation" submitted by DNV as of 7 October 2005, /19/, for the several projects in China using AM0005 and AMS-I.D is applied in the detailed calculation of BM. Since disaggregated data for plant wise power generation and fuel consumption are not officially available in China, OM was calculated provincial grid wise aggregated generation and fuel consumption data was employed as per ACM0002-Ver.06.

CSPG composed of provincial grids of Guangxi Region, Guangdong province, Yunnan province, and Guizhou province was defined as the "project electricity system" as per definition of NDRC-China, /22/, which is allowed by ACM0002-Ver.06. Since CSPG imports electricity from CCPG that comprises provincial level grids for Henan province, Hubei province, Hunan province, Jiangxi province, Sichuan province, and Chongqing City, CCPG was defined as the connected electricity system for OM calculation, and imported amount of electricity was treated as one power source in OM calculation as per ACM0002-Ver.06.

Option, (a) Simple OM, was employed for OM calculation. This selection was justified by the fact that limited data availability does not allow to apply dispatch data analysis specified as the first methodological choice for OM calculation in ACM0002-Ver.06, and also by the fact that low-cost/must run resources constitute less than 50 % all the year from 2001 to 2005 by providing the data for generation from low-cost/must run resources. Low operating cost/must run resources were defined as, hydro, nuclear, and others for CSPG. Data and parameters that are not monitored during the project activity but are determined once (*ex ante*) and thus fixed throughout the crediting period are identified such calculation scheme of baseline emission factors.

JIC confirmed the definition of low-cost/must run resources employed in PDD-Ver.04, /1/, is appropriate for CSPG since "others" include power generation from other renewable resources such as wind, biomass, and geothermal than hydro in China. The shares of generation from the low-cost/must run resources provided in PDD-Ver.04, /1/, as, 32.33 %, 31.26 %, 31.06 %, 28 %, and 28.61 % for the respective year from 2001 through 2005 were confirmed, /20/. Though it is requested by the ACM0002-ver.06 that "1) average of the five most recent years" but the "average value" is not provided, the average share for these five years is obviously less than 50 %. Therefore, justification provided by the project proponents and selected option for OM calculation are considered appropriate.

For OM calculation with simple OM, it is necessary to evaluate all the amount of CO2 emission from all generating sources serving the system except low-cost/must run power plants, and electricity delivered to the grid from those sources for the most recent 3 years for which data are available at the time PDD submission as per ACM0002-Ver.06. To estimate all of the amount of CO2 emission, "Primary fuel input for thermal power supply", "Net calorific value of fuels for thermal power generation", and "Carbon emission factors (for relevant several fuels)" for three (3) years from 2003 to 2005 were employed.

"Primary fuel input for thermal power supply" are originally taken from China Energy Statistical Yearbook of relevant versions, /21/. "Net calorific values of fuels for thermal power generation" are taken from the same sources, /21/. "Carbon emission factors (for relevant several fuels)" employed are provided by the Baseline Emission Factor of Chinese Power Grid, NDRC, /22/, citing the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Workbook, /23/. However, unique category for different coals is defined in the China Energy Statistical Yearbook other than those provided in the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Workbook, /23/. Therefore, "Carbon emission factors (for relevant several fuels)" can be assumed as the country specific values as per ACM0002-Ver.06.

Oxidation factors for each fuel employed are also those recommended by NDRC-China, /22/. Among oxidation factors provided for different category of fuels in 2006 IPCC Guidelines for national Greenhouse Gas Inventories, Workbook, /24/, same values were applied by the NDRC-China to the relevant domestic fuels for OM and BM calculations. Therefore oxidation factors employed in PDD-Ver.04 were also assumed as the country specific values for the same reasons for carbon emission factors.

JCI independently evaluated the difference of baseline emission factors between those employed in the proposed project and those calculated on the basis of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, /23/. As the results, OM, and BM calculated on the bases of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, /23/, are less than those employed in the proposed project by 1.83 %, and 2.03 %, respectively. These result in less baseline emission factor than the proposed project by 1.91 %. Though the difference is assumed to be material, from the context of determination of oxidation factors in China specified above, and the conservative assumptions of the project emission as described in the section 4.5.2, JCI considers application of the oxidation factors in the current project design is acceptable.

JCI therefore considered the parameter employed for OM calculation in *ex-ante* to be appropriate.

To estimate "electricity delivered to the grid from the sources", data on "Power generation by sources", "Internal power consumption rate of power plants" are taken from China Electric Power Yearbook of 2003 through 2005 versions, /20/. All the values are also recommended by NDRC-China, /22/.

Electricity imported from CCPG was evaluated for OM calculation of CSPG as per provision of ACM0002-Ver.06. Share of electricity import in the total generation of CSPG was less than 20 % for 2003, and 2004, but exceeded 20 % for 2005. Therefore, project proponents employed the "average emission rate" of CCPG for years 2003 and 2004, (option (c) of ACM0002-Ver.06 for electricity import), and CM of CCPG for the year of 2005, (option (d) of ACM0002-Ver.06 for electricity import) for estimation of carbon dioxide emission for the amount of imported electricity. JCI considered that the action taken for **CAR5** is in line with the requirement of ACM0002-ver.06, and that the data handling of import from CCPG is appropriate.

The "Internal power consumption of power plants" for the year 2003 is provided as an aggregate value in China Electric Power Yearbook of 2004. The value is assumed to include hydropower plant that is considerable low internal consumption rate, e.g. less than 2 %. It can be concluded that the application of the value for the thermal power plant is regarded as a conservative assumption. The simple OM emission factor is thus calculated as **1.0329** tCO2/MWh.

For BM calculation in the context of China, it is necessary to obtain annual data for power plant capacity addition instead of power generation, and the efficiency level of the best technology commercially available in the national grid of China, as a conservative proxy, for each fuel type, i.e. coal, gas, and oil, in estimating the fuel consumption for each type of the plant was employed in PDD-Ver.04 as per CDM-EB guidance specified above, /19/. Though this CDM-EB guidance was originally given for the application of AM0005 and AMS-I.D to several project in China, the approach to calculate BM in AM0005 was fully took over by ACM0002. It is therefore the CDM-EB guidance, /19/, can also be applicable to the proposed project that employs ACM0002-Ver.06.

The data for "Capacity by power generation source" are taken from China Electric Power Yearbook, 2004 and 2006 version, /20/. During 2003 through 2005, 21.42 % of total capacity of 2005 was added, that is in line with CDM-EB guidance specified above, /19/. For estimation of fuel consumption for coal fired power plants, "Energy consumption of advanced coal-fired power plant additions" as 0.32058 tce/MWh was employed though the value of 0.3433 tce/MWh was employed in the publication of NDRC-China, /22/. Referring /30/ for the best technology of coal fired power plants in China, the application of the efficiency above is considered to be a conservative assumption, and in compliance with "General guidance" by CDM-EB at its 29th Meeting (paragraph 74 of the report).

JCI confirmed that the same efficiency level, 0.32058 tce/MWh, was also applied for calculation of CM (for 2005) of CCPG for OM calculation of CSPG.

The conservativeness of the "Efficiency of advanced thermal power plant additions" for oil and gas fired power plants is not well documented in PDD-Ver.04.

JCI carried out the sensitivity analysis on its materiality in calculating emission reduction of the Project by changing the efficiency level. As the result, five percent (5 %) increase of the value, that is the efficiency level of as high as 52.7 %, leads to the emission reduction decrease by only 0.27 % that is well below other conservative assumption employed for the project design. JCI has thus considered the application of the present values is appropriate.

JCI has confirmed that the approach to determine share of emission from each group of fuel, coal, gas, and oil, to the total GHG emission, λ i, and emission factors to represent these fuel group are also appropriate. The BM emission factor is thus calculated as **0.6320** tCO2/MWh.

Finally combined margin emission factor is calculated by weights of OM and BM emission default weight of 0.5 and 0.5, respectively as per baseline methodology ACM0002-Ver.06. The combined margin is then calculated as **0.8325** tCO2/MWh.

JCI considers that the approach, data parameters employed, and the baseline emission factor calculated are appropriate.

4.5.2 Parameters monitored ex-post

The data to be monitored during crediting period are, gross amount of electricity supply to the grid, EG_{output}, and internal consumption associated with the operation of the hydropower plant, EG_{imput}. Net amount of electricity supplied to the grid by the Project, EGy, is calculated by these values. Both EG_{output}, and EG_{imput} are measured by a bi-directional ammeter at the same time. Since electricity generated by the plant will be delivered to two substations, Jiangkou Substation and Tongle Substation with two and single power lines, respectively, three ammeters, EM5, EM6, and EM7 will measure both EG_{output}, and EG_{imput} to determine net amounts of electricity delivered to respective substations. Ammeters, EM5 through EM7, are backed up by EM4 and/or EM1 through EM3, for any malfunctions. All the ammeters have the accuracy class 0.5, and are installed as per national regulation of China, DL/T448-2000. They will be calibrated annually according to the Standard and Regulation of the State Electric Power Industry that are complied with Chinese national regulations. All the measurements are carried out continuously by computer system, and the data are monthly recorded according to the consolidated monitoring methodology, ACM0002-Ver.06. The monitored data, both supplied and received, will be verified for their consistencies with the sales bills issued by the grid operator.

Data employed for EG_{output}, and EG_{imput} are 358,900, and 0 MWh, respectively for *ex ante* calculation. Net amount of electricity supplied to the grid by the Project, EGy, is therefore 358,900 MWh.

Since the Project is a new hydro power project, surface area of reservoir at the full reservoir level will be monitored by measuring the water level at full reservoir level at start of the Project as per ACM0002-Ver.06.

According to the definition of the “surface area at full reservoir level” approved by 33rd CDM-EB meeting for the “Request for Clarifications” (AM_CLA_0049), the “surface area at full reservoir level” employed in ACM0002-Ver.06 is clarified as “the increased flooded area measured in the water surface”. Therefore, the power density shall be calculated from the installed power generation capacity divided by the “the increased flooded area measured in the water surface”. The increased flooded area measured in the water surface by creation of the reservoir is basically to be calculated from the “total water surface area of reservoir at the full reservoir level” minus “surface area of the original river within the reservoir area”.

Project proponents applied “total water surface area of reservoir at the full reservoir level” to calculate the power density of the Project instead of “the increased flooded area measured in the water surface” as a conservative assumption because of difficulties to determine the “surface area of the original river within the reservoir area”. As the result, power density of 5.56 W/m^2 was calculated that lead to taking account of the project emissions as per ACM0002-Ver.06. The “total water surface area of reservoir at the full reservoir level” will be determined by the nomograph established on the basis topographic date around the reservoir area that enables to determine the “total water surface area of reservoir at the full reservoir level” by specifying the altitude of the water level of the reservoir. The topographic data was established by the National Measuring Bureau. Scale of the topographic map is in 1: 10,000, /36/.

JCI confirmed that the nomograph covered the full reservoir level of 97.6 meters in altitude assumed in the construction of the plant and considered the approach employed is accurate enough, and conservative, and thus appropriate.

The total water surface area of reservoir at the full reservoir level employed in PDD-Ver.04, /1/, is 16.2 km^2 while approximate figures of the original river width at both near the dam and the upstream end of the reservoir, and the backwater distance of the reservoir, are provided by the project owner, as, 300 meters, 290 meters, and 51 kilometers, respectively for CLAR7,and /36/. According to these three figures, the approximate surface area of the original river within the reservoir can be calculated as 15.05 km^2. Consequently, "the increased flooded area measured in the water surface" clarified by CDM-EB at the 33rd Meeting is calculated 1.15 km^2. On the basis of these three figures, power density of the Project, whose power generation capacity is 90 MW, can be estimated as, 78.3 W/m^2 that is far beyond $10W/m^2$. In other word, more than 30 % reduction of the above three figures on the dimension of the original river is necessary to give the flooded area of 9.00 km^2, the threshold for $10W/m^2$. It is obvious from the information provided, /36/, and air photograph around the project site browsed at, http://maps.live.com/?q=Virtual%20Earth%2C%20China&mkt=ja-JP&FORM=BYRE, that such reduction of the figures is far unrealistic.

JCI therefore judges that the power density of the Project is far beyond $10W/m^2$. Therefore, the power density of $5.56W/m^2$ employed in the current project design is considered conservative. This conservative assumption causes decrease in the certified emission reductions by 10.8 %.

The definition of "Electricity produced by the hydro electric power project in year y", "EGy", in equation (15b) provided in ACM0002-Ver.06 is the gross amount of power generated by the project that includes "self consumption" by the plant. While "EGy" employed for project emission calculation is the "net amount" of electricity to be delivered to the grid. Considering that the self consumption of the hydro power plant in China is generally less than 0.7 %, and at most 1 % , the effect of the above approach can be assessed as +0.12 % upward shift in CERs for conservative assumption as the self consumption of 1 %. JCI therefore considered the different in definition of EGy for the calculation of project emissions is not material.

The monitoring plan provided is in the context of approved consolidated monitoring methodology, ACM0002-Ver.06 and the accuracy of measurement as described PDD, /1/, is considered to be secured.

4.5.3 Management system and quality assurance

The power plant is operated by three groups that consist of two groups for operation and maintenance of the power plant, and one group of CDM monitoring, and belong to the Administration Department. CDM monitoring group is lead by the "CDM Group Director" who supervises and has the overall responsibility of the work conducted by the three sections, that are "Data recorder", "Ammeter supervisor", and "Data check". Ammeter supervisor is responsible to maintain ammeters for accurate monitoring. Data recorder is responsible to measurement specified items with computer system, recording – archiving of monthly aggregated data. Data check is responsible to independently verify the measured, and recorded data, /1/, /36/.

Consistency in the measurement at both project side and grid operator is to be confirmed at 24:00 on 25th of every month. In case any inconsistencies in measurement or malfunction of ammeters are found, corrective action is implemented within 10 days. JCI confirmed that the "continuously measured" data will be kept in a software in the data compiling system for years that enables the project owner to take such corrective action. The measured amount of electricity delivered monthly aggregated is confirmed by sales bill issued by the grid operator.

4.6 Estimate of GHG Emissions

GHG emission reductions will be calculated from the baseline emissions and project emissions.

Baseline emissions are to be calculated as the product of net amount of electricity supplied to the grid and the baseline emission factor determined in *ex ante* while project emissions are calculated as the product of the amount of net amount of electricity supplied to the grid and the default emission factor provided in ACM0002-Ver.06.

Since the net amount of electricity supplied to the grid is calculated from the directly measured with three (3) meters on the basis of national standard of China with the accuracy level of 0.5, uncertainties involved will be minimized.

The baseline emission factor has been determined in a conservative manner in compliance with ACM0002-Ver.06, and CDM-EB guidance given to the "Request of Deviation", /19/, specified in section 4.3 (Baseline Determination) of this validation report.

The project emissions are determined under the conservative assumption described in the section 4.5.2 (Parameters monitored ex-post) above.

As the results, GHG emission reductions of the Project are conservatively determined and are considered in compliance with the UNFCCC rules. On the basis of baseline emission factor, **0.8325** tCO2/MWh determined in *ex ante,* and default project emission factor, **0.09** tCO2/MWh, and the net amount of electricity supplied to the grid by the Project, EGy, of 358.90 GWh, annual emission reduction is calculated as **266,483** tCO2e. Total amount of emission reduction of **1,865,381** tonnes CO2 equivalent can be estimated over the crediting period of seven (7) years.

4.7 Environmental Impacts

EIA is conducted by the Guangxi Zhuang Autonomous Region Environmental Protection Science Institute, according to the national environmental protection rules, /5/.

Impact on the environment of the project activity focuses on the ecological effect, impact on the quality of surface water, air pollution, noise, and solid wastes during construction periods, and for the operational period, impact on aquatic creatures and soil erosion, /5/.

It is analysed that the vegetation in the project area will be damaged to some degree due to the construction work of reservoir but it will be re-flourish after completion of the construction work. It is also concluded on the ecological effect that the biodiversity of plants and animals will not be affected for a long period.
For the quality of the surface water during construction will not be deteriorated by taking appropriate prevention measures from discharge waste and waste water from both equipment and workers.

It is mentioned that the air pollution from fuel combustions would be minimized to comply with relevant emission standard during construction. Dust emissions will also minimized by watering in the construction area.
Regarding noise during construction, low-noise equipment and noise reduction measures will be taken for the fixed sources. Workers at the construction site will also protected by waering sound blocking gear.
Solid wastes from construction work and at the evacuation area will be appropriately managed to prevent pollution of the water body.

Impact on aquatic creatures after completion the plant will be mitigated by the construction of fish multiplication station. Bank protection measures will be implemented to prevent soil erosion after implementation of the Project.

It was concluded that the disadvantageous impacts can be minimized if appropriate mitigation measures were taken, and the advantageous impacts brought by the Project would far outweigh the otherwise, /1/.

On the basis of the EIA summarized above and relevant guideline and policy of China, the Project has been approved by the Guangxi Environment Protection Bureau as of 31 July 2002, and periodic monitoring will be implemented by the local government authority, /6/.

JCI considered that EIA was appropriately conducted, and the measures taken to alleviate the potential impact to the environment are also appropriate.

4.8 Comments by Local Stakeholders

Consultation to the local stakeholders was conducted in August 2006, by distributing 120 questionnaire sheets that were more than those suggested by the Environmental Protection Bureau. Questionnaires consisted of 8 items focused on the migration issues, effect on the local economy, and the impact to the environment. All of the questionnaire sheets were collected, and found to be effective, /36/.

It can be summarized as,
The most of the informants, including those who have to migrate from the original place, have optimistic opinions on the Project. However, major concerns are on the impact to the ecological environment and on the change in natural landscape due to construction of reservoir. They wish to have forests for timber and fruit at the site of relocation, and to develop breeding of fish. Majority of the informants thought bank protection measures and water and soil conservation measures shall be taken. Considerable number of the informants thought vegetation restoration measures shall be implemented. They also concerned about the pollution of Guijiang River during construction.

The Project owner took due account the comments received by, taking bank protection measures to improve stability and to prevent soil erosion and to mitigate water body pollution, restoration of vegetation, and fish multiplication station is planned to set up to mitigate the impact to the fish resource. For the migration issues, the project owner offers migrants compensation as per national rules.

It was summarized that the favorable effect of the Project to the local economy and social development will far outweigh the negative impact.

JCI confirmed that almost all relocation, 304 families out of 310, have been relocated from their original site smoothly, and remaining six families may not be necessary to relocate as per regulations, /36/.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD version 01, dated on 06 March 2007 was made publicly available on JCI's website (http://jci-plant.or.jp/projects/projects%20details%20VAL-07%20012.htm) and Parties, stakeholders, and NGOs were invited to provide comments during a 30 days period from 22 June 2007" to 21 July 2007.

None of the comment was received during the period.

Comment by:		
☐ Accredited NGO	☐ Party	☐ Stakeholder
Inserted on:		
Subject:		
Comment:		

APPENDIX A

CDM VALIDATION PROTOCOL –REV.02

INTRODUCTION

This document is the Validation Protocol on the "Guangxi Bajiangkou Hydropower Project"

The validation protocol is prepared for the following purposes:

- To organise, detail and clarify the requirements that the CDM project is expected to meet
- To ensure a transparent validation process with the documenting how a particular requirement has been satisfied and which conclusions have been reached

The validation protocol is consisted of the following three types of tables, which are effective for the purposes of validation above.

Table 1 show the mandatory requirements, which the proposed project activity has to meet as a CDM project activity and the conclusion by the validator of how the requirements are met.

Table 2 contains the checklist with questions which ask how the requirements in Table 1 are fulfilled methodologically, qualitatively and quantitatively, and conclusion by the validator with such marks as **OK**, **CAR** and **CLAR** *.

Table 3 shows the corrective actions or clarifications which are requested to be taken in Table 1 & 2.

*Note:

- Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (**CAR**) are issued, where,
  i) mistakes have been made with a direct influence on project results;
  ii) CDM and/or methodology specific requirements have not been met; or
  iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified
- A request for clarification (**CLAR**) may be used where additional information is needed to fully clarify an issue. Depending on the result of clarification, it may lead to additional corrective action request(s) or further request(s) for clarification.

Index:

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

Requirement	Reference	Conclusion	Cross Reference/Comment
About Parties			
(M. 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**	Letter of approval by DNA of China clearly mentions to answer this item.
(M. 2) The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	**OK**	Ref. to (B.10) through (B.13) in Table 2/ Yes.
(M. 3) The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	**OK**	Ref. to (A.4) and (A.5) in Table 2/ The written approvals of voluntary participation from China (dated 20 July 2007) and Japan (dated 27 July 2007) have been received.
(M. 4) The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	**OK**	Ref. to (A.10) and (A.11) in Table 2/ Though sustainable development policies of the host country are not positively referred in PDD-Ver.01, features of the proposed project described in it are considered in-line with the sustainable development plans of the host country. This is explicitly confirmed in the letter of approval from the host country.
(M. 5) In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	**OK**	Ref. to (A.6) in Table 2/ None of the indications of a diversion of ODA from Parties in Annex I was not recognized for the proposed project activity.
(M. 6) Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures	**OK**	Ref. to (A.5) in Table 2/ All the parties involved in the proposed project activity designated DNA for

Requirement	Reference	Conclusion	Cross Reference/Comment
	§29		CDM.
(M. 7) The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities and Procedures §30/31a	**OK**	Ref. to (A.5) in Table 2/ China ratified the Kyoto Protocol on 30 August, 2002. Japan ratified the Kyoto Protocol on 4 June, 2002.
(M. 8) The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	**OK**	Japan calculated assigned amount pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol and submitted its initial report to UNFCCC as of 30 August 2006.
(M. 9) The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	**OK**	Japan set up national registry system as of 16 February 2005.
About additionality			
(M.10) Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registration as an CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	~~**(CAR)**~~ ~~**(CLAR)**~~ **OK**	Ref. to (B.10) through (B.13) in Table 2/ The additionality is discussed using "Tool for the demonstration and assessment of additionality (version 03)" in the PDD.
About forecast emission reductions and environmental impacts			
(M.11)The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	~~**(CAR)**~~ ~~**(CLAR)**~~ **OK**	Ref. to (B.14) through (B.54), (C.1), and (C.2) in Table 2/ The electricity generated from the renewable resource by the project activity will be delivered to the China Southern Power Grid and substitute the same amount of power generation from the thermal plants servicing the grid. The proposed project activity thus contributes real and

Requirement	Reference	Conclusion	Cross Reference/Comment
			measurable GHG reduction, and gives long term benefits related to mitigastion of climate change.
(M.12) Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	**OK**	Ref. to section "D" in Table 2/ The EIA Report was approved by Guangxi Environment Protection Bureau on 16 July 2003 and JCI confirmed and reviewed it during the on-site assessment of the proposed project.
About stakeholder involvement			
(M.13) Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	**OK**	Ref. to section "E" in Table 2/ The project participants invited comments from local stakeholders by distributing the questionnaires and took due account of the comments received. The PDD justifies that appropriate actions were taken on the comments received.
(M.14) Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	**OK**	The PDD Version 01 was made publicly available on JCI CDM Center web linked to the UNFCCC web site to invite comments from Parties, stakeholders and NGOs, from 22 June through 21 July 2007. No comments were received.
Others			
(M.15) The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	**OK**	Ref. to section "B" in Table 2/ The approved consolidated baseline methodology, ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" and the approved consolidated monitoring methodology ACM0002 "Consolidated monitoring

Requirement	Reference	Conclusion	Cross Reference/Comment
			methodology for zero-emissions grid-connected electricity generation from renewable sources" both of which are effective from 19 May 2006 onwards are employed. Though both of them, and the Tool referred were revised as of 14 December 2007, all the methodologies and Tool employed are in their grace periods at the time of request for registration.
(M.16) A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	~~(CAR)~~ ~~(CLAR)~~ **OK**	Refer to section "B" in Table 2.
(M.17) The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	**OK**	Yes. None of the case that leads to earning CERs for decreases in activity levels outside the project activity or due to force majeure is envisaged.
(M.18) The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	~~OBS1~~ **OK**	CDM-PDD Form Version 03 (valid from 28 July 2006 onwards) was employed. However, part of it (inclusion of title page, headings of the sections B.1 and B.3, headings of the table provided in A.4.4 and B.6.4, portrait page format to landscape in Annex 3, and font of letters employed in a part of PDD-Ver.01) was altered to use.
(M.19) Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	~~(CLAR)~~ **OK**	Detailed information on the part of the monitoring plan shall be further provided to judge if it meets the requirements by UNFCCC.

Table 2 Requirements Checklist

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity *The project design is assessed.*					
Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
(A. 1) Are the project's spatial boundaries (geographical) clearly defined?	/1/	DR	It is requested to provide specific description of the spatial boundaries of the proposed project activity.	~~CAR1~~	**OK**
(A. 2) Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	Additional information on the connected electricity system needs to be provided to judge the item.	~~CLAR1~~	**OK**
Participation Requirements *Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.*					
(A. 3) Which Parties and project participants are participating in the project?	/1/ /12/ /13/	DR	Parties involved are China (host) and Japan. Project participants described in PDD-Ver.01 are Pingle Guijiang Electric Power Co., Ltd. (project owner, China) and Marubeni Corporation (Japan).	OK	**OK**
(A. 4) Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/ /12/ /13/	DR	Yes. Letter of approval from each Party involved was provided. It is confirmed that all project participants are authorized by the Parties involved.	OK	**OK**
(A. 5) Do all participating Parties fulfil the	/1/	DR	Yes. Both Parties involved fulfil the all participation	OK	**OK**

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated National Authority (DNA)	/12/ /13/		requirements.		
(A. 6) Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR I	None of the indication of a diversion of ODA from Parties in Annex I was not recognized for the proposed project .	OK	**OK**
Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
(A. 7) Does the project design engineering reflect current good practices?	/1/ /3/ /4/	DR I	Additional information on its details is required to confirm that the technology employed reflects good practice in the host country.	~~CLAR2~~	**OK**
(A. 8) Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/ /3/ /4/	DR I	The same as (A.7) above.	~~CLAR2~~	**OK**
(A. 9) Does the project make provisions for meeting training and maintenance needs?	/1/	DR I	None of the information for meeting training of operation including maintenance, and monitoring needs is provided.	~~CAR2~~	**OK**
Contribution to Sustainable Development					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
The project's contribution to sustainable development is assessed.					
(A. 10) Has the host country confirmed that the project assists it in achieving sustainable development?	/1/ /12/	DR	Yes. Letter of Approval issued from China dated 20 July 2007 explicitly mentions that the project assists it in achieving sustainable development of China.	OK	**OK**
(A. 11) Will the project create other environmental or social benefits than GHG emission reductions?	/1/ /25/	DR I	Yes. As described in PDD-Ver.01, the project creates other environmental and social benefits than GHG emissions.	OK	**OK**
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
(B. 1) Does the project apply an approved methodology and the correct version thereof?	/1/	DR	Yes. Approved consolidated baseline methodology, ACM0002-version 06 is employed. However, the methodology title is not correctly represented in PDD-Ver.01.	~~OBS2~~	**OK**
(B. 2) Are the applicability criteria in the baseline methodology all fulfilled?	/1/	DR I	Applicability criteria seem to be met by the context of PDD-Ver.01. It is requested to provide the explicit description on this item to confirm.	~~CLAR3~~	**OK**
Baseline Scenario Determination *The choice of the baseline scenario*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.					
(B. 3) What is the baseline scenario?	/1/	DR I	Baseline scenario identified is "(4) CSPG provides the same amount of annual electricity as the proposed project".	OK	**OK**
(B. 4) What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /28/ /29/	DR I	Other alternatives scenarios, (1) Implementation of the proposed project not as a CDM project; (2) Construction of a fossil fuel power plant with the same amount of annual electricity generation as the proposed project, and (3) Construction of a power plant using other sources of renewable energy with the same amount of annual electricity generation as the proposed project, are considered. However, additional information especially on the reason why the alternative (3) can be filtered out shall be provided with appropriate evidence(s).	~~CLAR4~~	**OK**
(B. 5) Has the baseline scenario been determined according to the methodology?	/1/	DR	Yes. The scheme of baseline determination is in line with a part of section of the "Tool for the demonstration and assessment of additionality" (Version 03) that is linked to the approved baseline methodology employed.	OK	**OK**
(B. 6) Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Additional information is required to judge this item as pointed out in item (B.4) above.	~~CLAR4~~	**OK**
(B. 7) Does the baseline scenario sufficiently take into account relevant national and/or sectoral	/1/	DR	Yes. Relevant regulations, structure change of power sector over time, etc. are taken into account to identify	OK	**OK**

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
policies, macro-economic trends and political aspirations?	/25/ /26/	I	the baseline scenario and demonstration and assessment of additionality.		
(B. 8) Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	None of the reference to filter out the alternative (3), "Construction of a power plant using other sources of renewable energy with the same amount of annual electricity generation", is provided as pointed out item (B.4) above.	~~CLAR4~~	**OK**
(B. 9) Have the major risks to the baseline been identified?	/1/	DR	Additional information shall be provided as pointed out item (B.4) above.	~~CLAR4~~	**OK**
Additionality Determination *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.*					
(B.10) Is the project additionality assessed according to the methodology?	/1/ /15/ /17/ /18/	DR	Yes. The project additionality is assessed according to the "Tool for the demonstration and assessment of additionality" (Version 03) that is linked to the approved baseline methodology employed.	OK	**OK**
(B.11) Are all assumptions stated in a transparent and conservative manner?	/1/ /2/ /3/ /4/ /9/ /10/ /11/	DR I	Additional information on the benchmark analysis shall be provided for the following items. 1) It is not clear if benchmark IRR is after tax or before tax. 2) Relevancy of parameters to the IRR calculation employed. 3) Though IRR values for the proposed project activity with and without CER revenue are presented, it is not	~~CLAR5~~	**OK**

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/15/ /17/ /18/ /25/ /26/ /27/ /28/ /29/ /31/ /32/ /33/		clear if IRR is equity IRR or project IRR, and if it were before tax or after tax. 4) Time span for IRR calculation is not provided. 5) Definition of horizontal and vertical axes of the graph for sensitivity analysis is not provided. 6) Scale of the vertical axis may not be appropriate. 7) It is not clear if compiling method and criteria employed to select similar projects in the common practice analysis is objective. 8) Analysis of other similar projects is less convincing due to the lack of relevant information.		
			It is requested to provide IRR calculation sheet.	~~CAR3~~	**OK**
(B.12) Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR I	Reference to the "feasibility study report" is not provided.	~~CLAR6~~	**OK**
(B.13) If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/ /3/ /4/ /9/ /10/ /27/ /29/ /31/ /32/	DR I	Following information shall be provided to identify the issue for this item. 1) Considering that the proposed project activity involves heavy construction of hydropower plant including dam, starting date of the project activity provided shall not be the same date as the starting date of crediting period. 2) None of the status of construction of the hydropower plant nor of the information showing that the incentive from the CDM was seriously considered in the decision to proceed with the project activity are not included in PDD-Ver.01.	~~CAR4~~	**OK**
Calculation of GHG Emission					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
(B.14) Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /15/	DR	Is the "normal storage area" of the reservoir for power density calculation the same as the "surface area at full reservoir level" defined in ACM0002-Ver.06?	~~CLAR7~~	**OK**
(B.15) Have conservative assumptions been used when calculating the project emissions?	/1/ /15/	DR I	Yes. In ex-ante estimation of the project emission is calculated on the basis of the net amount of power delivered to the grid under the assumption that the "internal consumption" is zero, which is conservative.	OK	**OK**
(B.16) Are uncertainties in the project emission estimates properly addressed?	/1/ /15/	DR I	N.A. Since net amount of power delivered will be monitored during project activity and default emission factor provided in ACM0002-Ver.06 will be employed, material uncertainty is not envisaged.	OK	**OK**
Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
– is justified.					
(B.17) Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /15/ /16/ /19/ /20/ /21/ /22/ /23/ /24/	DR	PDD-Ver.01 includes several points that need to be clarified as follows, 1) data vintage employed for baseline emission factor calculation of the relevant power grid that are available on the date of submission of PDD-Ver.01, 2) definitions and sources of data parameters including definition and share of power generation from low-cost/ must-run resources for calculation of baseline emission factor, 3) unit of variables is not provided, and 4) efficiency levels of power plants and share of emissions from each type power plant for BM calculation.	~~CLAR8~~	**OK**
			Methodological options employed such as, 1) ex-ante or ex-post determination of OM and BM calculations, and 2) data handling of import or export of electricity shall be provided.	~~CAR5~~	**OK**
(B.18) Have conservative assumptions been used when calculating the baseline emissions?	/1/ /19/ /20/ /21/ /30/	DR	Additional information shall be provided to judge the item as requested in (B.17) above.	~~CLAR8~~ ~~CAR5~~	**OK**
(B.19) Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Additional information shall be provided to judge the item as requested in (B.17) above.	~~CLAR8~~ ~~CAR5~~	**OK**

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
(B.20) Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /15/	DR	Approved consolidated baseline methodology employed, ACM0002-Ver.06, does not require leakage calculation.	OK	**OK**
(B.21) Have conservative assumptions been used when calculating the leakage emissions?	/1/ /15/	DR	The same as (B.20) above.	OK	**OK**
(B.22) Are uncertainties in the leakage emission estimates properly addressed?	/1/ /15/	DR	The same as (B.20) above.	OK	**OK**
Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*					
(B.23) Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	The proposed project activity is believed to bring real and measurable emission reductions and to give long-term benefits related the mitigation of climate change. However, the description of the section B.6.3 of PDD-Ver.01 does not meet the requirements provided by the "PDD-Guidelines**" for the section. As the result, the algorithm of emission reduction is neither complete nor	~~CAR6~~	**OK**

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			transparent.		
Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
(B.24) Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/ /16/	DR I	Additional information including diagram showing the monitoring system, calibration procedure, measuring/recording frequency, accuracy level of measurement, etc. that are required by the monitoring methodology, ACM0002-Ver.06, and "PDD-Guidelines" shall be provided to judge the item.	~~CLAR9~~	**OK**
(B.25) Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/ /16/	DR I	Additional information is required to judge the item since archiving period described is not consistent throughout PDD-Ver.01.	~~CLAR10~~	**OK**
Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
(B.26) 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/ /15/ /16/	DR I	Yes. Project emission of the proposed project activity specified in the baseline methodology is methane emission from the flooded area caused by the project activity where vegetation will be submerged to be anaerobically digested. Emission factor for the component is provided as default value in ACM0002-	OK	**OK**

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Ver.06. The net electricity delivered will be monitored and is employed as the activity data for this component.		
(B.27) Are the choices of project GHG indicators reasonable and conservative?	/1/	DR I	Yes.	OK	**OK**
(B.28) Is the measurement *method* clearly stated for each GHG value to be monitored and deemed appropriate?	/1/	DR I	Yes.	OK	**OK**
(B.29) Is the measurement *equipment* described and deemed appropriate?	/1/ /16/	DR I	Since project emission will be determined with default emission factor provided by the baseline methodology employed and the amount of power delivered to the grid. The monitoring of the latter includes ambiguous points as specified in item (B24) above.	~~CLAR9~~	**OK**
(B.30) Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/ /16/	DR I	The same as item (B29) above.	~~CLAR9~~	**OK**
(B.31) Is the measurement *interval* identified and deemed appropriate?	/1/ /16/	DR I	The same as item (B29) above.	~~CLAR9~~	**OK**
(B.32) Is the *registration, monitoring, measurement* and *reporting* procedure defined?	/1/ /16/	DR I	The same as item (B29) above.	~~CLAR9~~	**OK**
(B.33) Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/ /16/	DR I	The same as item (B.29) above.	~~CLAR9~~	**OK**
(B.34) Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to project performance documentation)	/1/ /16/	DR I	The same as item (B.29) above.	~~CLAR9~~	**OK**

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.*					
(B.35) 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 I	Since baseline emission will be determined with the emission factor of the relevant power grid that is calculated on the ex-ante basis, and the net amount of electricity delivered to the grid that is monitored during project activity. Both baseline emission factor determination and monitoring of net amount of electricity delivered to the grid include several issues that require additional information as described in (B.17) and (B.24) above.	~~CLAR8, CAR5, CLAR9~~	**OK**
(B.36) Are the choices of baseline GHG indicators reasonable and conservative?	/1/ /15/	DR I	Yes.	OK	**OK**
(B.37) Is the measurement *method* clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/ /16/	DR I	The same as item (B.35) above.	~~CLAR8, CAR5, CLAR9~~	**OK**
(B.38) Is the measurement *equipment* described and deemed appropriate?	/1/	DR I	The same as item (B.35) above.	~~CLAR8, CAR5, CLAR9~~	**OK**
(B.39) Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR I	The same as item (B.35) above.	~~CLAR8, CAR5, CLAR9~~	**OK**

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
(B.40) Is the measurement *interval* for baseline data identified and deemed appropriate?	/1/ /15/	DR I	The same as item (B.35) above.	~~CLAR8, CAR5, CLAR9~~	**OK**
(B.41) Is the *registration, monitoring, measurement* and *reporting* procedure defined?	/1/	DR I	Yes.	OK	**OK**
(B.42) Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR I	The same as item (B.35) above, especially on calibration procedure for the item.	~~CLAR8, CAR5, CLAR9~~	**OK**
(B.43) Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to project performance documentation)	/1/	DR I	The same as item (B.35) above.	~~CLAR8, CAR5, CLAR9~~	**OK**
Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
(B.44) Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /15/ /16/	DR	None of the leakage effect will be associated with the proposed project activity except construction period. However, the leakage emission is not necessary to take account for the proposed project activity as per ACM0002-Ver.06.	OK	**OK**
(B.45) Are the choices of project leakage indicators reasonable and conservative?	/1/ /15/ /16/	DR	The same as item (B.44) above.	OK	**OK**
(B.46) Is the measurement *method* clearly stated for each leakage value to be monitored and	/1/	DR	The same as item (B.44) above.	OK	**OK**

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deemed appropriate?	/15/ /16/				
Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
(B.47) Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR I	Monitoring of sustainable development indicators is not required by ACM0002, or by the Chinese DNA. The environmental impacts will be monitored by the local environmental authority during the construction period and the operational lifetime of the peoject.	OK	**OK**
(B.48) Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR I	The same as item (B.47) above.	OK	**OK**
(B.49) Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/ /25/	DR I	The same as item (B.47) above.	OK	**OK**
Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
(B.50) Is the authority and responsibility of overall project management clearly described?	/1/	DR I	Additional information shall be provided to describe the organization chart included, especially role and	~~CLAR1 1~~	**OK**

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			responsibility of each personnel to confirm the item.		
(B.51) Are procedures identified for training of monitoring personnel?	/1/	DR I	The same as item (A.9) The same as item (B.50)	~~CAR2~~ ~~CLAR11~~	**OK**
(B.52) Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	The same as item (B.50)	~~CLAR11~~	**OK**
(B.53) Are procedures identified for review of reported results/data?	/1/	DR I	The same as item (B.50)	~~CLAR11~~	**OK**
(B.54) Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR I	Yes.	OK	**OK**
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
(C. 1) Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/	DR I	Additional information shall be provided on the starting date of the project as per "Glossary of CDM terms" (version 02).	~~CLAR12~~	**OK**
(C. 2) Is the start of the crediting period clearly defined and reasonable?	/1/	DR I	Yes. The renewable crediting period option is selected for the proposed project activity. ~~The starting date of the first crediting period will described to start on 1st January 2008 that is reasonable at the validation stage.~~ Considering, current progress in validation activity, it is requested to confirm that the project participants do not	~~OK~~ ~~CLAR13~~	**OK**

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			claim the emission reductions generated before the date of registration, and the starting date of the crediting period is subject to adjustment once date of registration is determined. It is also requested to provide correct tables that summarize the estimated emission reduction in each year during the crediting period, accordingly.		
D. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
(D. 1) Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /3/ /5/	DR I	Yes. The environmental impacts to vegetation, soil erosion, surface water quality, air pollution, biodiversity, solid waste, and noise during both construction and operation phases are all described.	OK	**OK**
(D. 2) Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /5/ /6/	DR I	Yes. EIA was approved by the Guangxi Environmental Protection Bureau.	OK	**OK**
(D. 3) Will the project create any adverse environmental effects?	/1/ /5/	DR I	In general, eutrophication of water at reservoir and hence aquatic creatures could be affected by the creation of a reservoir. Appropriate measures will be implemented to mitigate potential impact to the environment in the proposed project.	OK	**OK**
(D. 4) Are transboundary environmental impacts considered in the analysis?	/1/	DR I	They are not relevant to the proposed project activity.	OK	**OK**
(D. 5) Have identified environmental impacts	/1/	DR	Yes.	OK	**OK**

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been addressed in the project design?		I			
(D. 6) Does the project comply with environmental legislation in the host country?	/1/ /6/	DR I	Yes. EIA for the project was approved by the Guangxi Region Environmental Protection Bureau as per national guidance and policy of China.	OK	**OK**
E. Stakeholder Comments *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.*					
(E. 1) Have relevant stakeholders been consulted?	/1/	DR I	Yes. Consultation with the local stakeholders was conducted.	OK	**OK**
(E. 2) Have appropriate media been used to invite comments by local stakeholders?	/1/	DR I	Yes. Consultation was conducted by the distribution of hundred twenty (120) questionnaires to the local stakeholders as per suggestion by the Environmental Protection Bureau of Guangxi.	OK	**OK**
(E. 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 I	Yes. The process of consultation with local stakeholders employed is in accordance with EIA regulations of China.	OK	**OK**
(E. 4) Is a summary of the stakeholder comments received provided?	/1/	DR I	Yes. Original questionnaire and the summary of comments received were confirmed.	OK	**OK**
(E. 5) Has due account been taken of any stakeholder comments received?	/1/	DR I	Yes.	OK	**OK**

**: "PDD-Guidelines" refers to GUIDELINES FOR COMPLETING THE PROJECT DESIGN DOCUMENT (CDM-PDD)- Version 06.2

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table 1 or 2	Summary of project owner response	Validation team conclusion
CAR1 It is requested to provide specific description of the spatial boundaries of the proposed project activity.	(A.1)	The project boundary is defined as, project site, China Southern Power Grid, and also China Central Power Grid that supplies part of its electricity to the China Southern Power Grid in PDD-Ver.02.	The original request by CAR1 is resolved in PDD-Ver.02. However, the name of sub-grid that the project is directly connected to is shown without any explanations in the diagram newly inserted as per CLAR9 in PDD-Ver.02. It is therefore requested further to describe its relevancy to the project electricity system.
		The explanation was added in PDD-Ver.03.	**OK** The explanation on the project boundary in PDD-Ver.03 is considered appropriate as per baseline methodology employed, ACM0002-Ver.06. The request for this item is closed.
CAR2 None of the information for meeting training of operation including maintenance, and monitoring needs is provided.	(A.9)	Training of operation and monitoring skills were described.	Though actions taken to PDD-Ver.02 deem appropriate, it is requested to add explanation on the relevancy of the Heminnsh Hydropower plant to the proposed project.
		Explanations were added in PDD-Ver.03.	**OK** Explanations on provision of the training needs for operation and monitoring are considered appropriate. The request for this item is closed.
CAR3	(B.11)	The spread sheet for IRR calculation	**OK**

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table 1 or 2	Summary of project owner response	Validation team conclusion
It is requested to provide IRR calculation sheet.		is provided. The spread sheet that includes revised IRR calculation was re-submitted due to the revision of the baseline emission factor employed in PDD-Ver.03.	IRR calculations including sensitivity analysis are considered appropriate. The request for this item is closed.
CAR4 Following information shall be provided to identify the issue for this item. 1) Considering that the proposed project activity involves heavy construction of hydropower plant including dam, starting date of the project activity provided shall not be the same date as the starting date of crediting period. 2) None of the status of construction of the hydropower plant nor of the information showing that the incentive from the CDM was seriously considered in the decision to proceed with the project activity are not included in PDD-Ver.01.	(B.13)	1) The proposed project met economic difficulties at the beginning of 2005 which almost forced to terminate the project. Unless the CDM project, the project cannot gain the credit and will not be realized. According to the reality, the early date construction does not deteriorate the additionality. 2) Current status of construction has been added to section A.2 of PDD-Ver.02.	1) Key events to demonstrate that incentive of CDM benefits were seriously considered in the decision to proceed with the project activity shall be provided with their background information in PDD. 2) **OK**
		1) Explanations on the history of the project were added in section B.5 of PDD-Ver.04. Resolution of the Board Meeting of the project owner (Pingle Guijiang Electric Power Co. Ltd.) was translated in English and submitted to DOE as one of the evidences. Starting date of the project was revised as, 10 August 2005 (re-starting date of construction).	1) The date of "Notification to emend the compensation for relocation" of the local government is 31 December 2003. It is requested to clarify the reason why the project owner discussed to address the increase in compensation at the Board Meeting on 14 March 2005 instead at the date of its receipt.

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table 1 or 2	Summary of project owner response	Validation team conclusion
		1) The local government explained that a part of compensation would be borne by itself at its issuance. However, local government did not agree to bear when project owner re-assessed and showed the amount of compensation to the local government because of the amount of compensation. Project owner consequently had to address all of the compensation and discussed in 2005.	1) **OK** Explanations on the history of the project provided in PDD-Ver.04 appropriately demonstrate that the project would not have been realized without incentive from CDM. Appropriateness of the English translation of the Resolution of the Board Meeting of the project owner was confirmed. This request is thus closed.
CAR5 Methodological options employed such as, 1) ex-ante or ex-post determination of OM and BM calculations, and 2) data handling of import or export of electricity shall be provided.	(B.17)	They were described in PDD-Ver.02	1) **OK** Options for ex-ante/ ex-post determination of PM and BM calculations were appropriately provided in PDD-Ver.02 2) Emissions from imported electricity from the China Central Power Grid are evaluated as the average emission rate of the exporting grid is employed in OM calculation without any justification. However, the amount of imported electricity for the year 2005 exceeds the limit for the option stipulated in ACM0002-Ver.06. It is requested to explain and justify how imported electricity is addressed in PDD.
		Emissions from imported electricity	2) **OK**

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table 1 or 2	Summary of project owner response	Validation team conclusion
		from CCPG for the year of 2005 were re-evaluated in OM calculation of CSPG as per ACM0002-Ver.06 in PDD-Ver.03. Explanation was added accordingly in PDD.	Emissions from imported electricity from CCPG are evaluated as the average emission rate of CCPG for 2003 and 2004, while combined margin of CCPG is employed for 2005 in OM calculation of CSPG in PDD-Ver.03. The appropriateness of the calculation of the baseline emission factors of CSPG has been confirmed. The request for this item is thus closed.
CAR6 The proposed project activity is believed to bring real and measurable emission reductions and to give long-term benefits related the mitigation of climate change. However, the description of the section B.6.3 of PDD-Ver.01 does not meet the requirements provided by the "PDD-Guidelines**" for the section. As the result, the algorithm of emission reduction is neither complete nor transparent.	(B.23)	They were described in PDD-Ver.02.	It is requested to coordinate numerical handling and explanation with citing equations in section B.6.1 or source data in Annnex 3, if appropriate, in order to make PDD readers to reproduce.
		Explanations in section B.6.3 were further elaborated in PDD-Ver.03.	**OK** Explanations provided in PDD-Ver.03 are considered appropriate. The request for this item is thus closed.
CLAR1 Additional information on the connected electricity system needs to be provided to judge the item.	(A.2)	The information was provided in PDD-Ver.02.	**OK** It is confirmed that the China Central Power Grid is now included in the project system boundary as a connected electricity system defined by ACM0002-Ver.06.
CLAR2 Additional information on its details is required to confirm that the technology	(A.7)	The equipment employed is selected and installed according to the national standard of China and was deemed financially and technologically optimal	**OK** The equipment and engineering employed for the proposed project can

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table 1 or 2	Summary of project owner response	Validation team conclusion
employed reflects good practice in the host country.		under the hydrological conditions at the project site. These descriptions were provided in PDD-Ver.02	be considered good practice in China.
CLAR3 Applicability criteria seem to be met by the context of PDD-Ver.01. It is requested to provide the explicit description on this item to confirm.	(B.2)	The specified part was revised in PDD-Ver.02.	Applicability conditions of ACM0002-Ver.06 do not stipulate the upper limit of the power density of 10 W/m2.
		Description was revised in PDD-Ver.03.	**OK** The applicability conditions of baseline and monitoring methodology, ACM0002-Ver.06 are appropriately justified in PDD-Ver.03. The request for this item is thus closed.
CLAR4 Other alternatives scenarios, (1) Implementation of the proposed project not as a CDM project; (2) Construction of a fossil fuel power plant with the same amount of annual electricity generation as the proposed project, and (3) Construction of a power plant using other sources of renewable energy with the same amount of annual electricity generation as the proposed project, are considered. However, additional information especially on the reason why the alternative (3) can be filtered out shall be provided with appropriate evidence(s).	(B.4)	Among all the possible technology options of grid-connected renewable energy power project, only wind power and biomass power plant are technically feasible. The description on reasons why option (3) can be filltered out was added in PDD-Ver.02.	It is requested to provide the relevant document(s) as reference to filler out the alternative (3) in PDD.
		References were provided in PDD-Ver.03 as evidences.	**OK** It is considered that the baseline scenario for the proposed project is appropriately identified in PDD-Ver.03. The request for this item is then closed.

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table 1 or 2	Summary of project owner response	Validation team conclusion
CLAR5 Additional information on the benchmark analysis shall be provided for the following items. 1) It is not clear if benchmark IRR is after tax or before tax. 2) Relevancy of parameters to the IRR calculation employed. 3) Though IRR values for the proposed project activity with and without CER revenue are presented, it is not clear if IRR is equity IRR or project IRR, and if it were before tax or after tax. 4) Time span for IRR calculation is not provided. 5) Definition of horizontal and vertical axes of the graph for sensitivity analysis is not provided. 6) Scale of the vertical axis may not be appropriate. 7) It is not clear if compiling method and criteria employed to select similar projects in the common practice analysis is objective. 8) Analysis of other similar projects is less convincing due to the lack of relevant information.	(B.11)	1) Benchmark IRR (8%) is ”after” tax. 2) Parameters employed for IRR calculation were provided in PDD-Ver.02. 3) Project IRR was calculated and indicated in ”after tax”. 4) Project lifetime and the time span for IRR calculation are specified in Sub-step 2c. 5), 6) Corrected in PDD-Ver.02. 7) The ”China Electricity Yearbook, 2006”, and “Yearbook of China Water Resources, 2006”, were referred, and further effort was made by browsing the web sites to select and compile the relevant information on the existing power plants. Criteria for selecting similar project were described in PDD-Ver.02. 8) The description of ”Discussion” was added in PDD-Ver.02	**OK** for items 1) through 7). Actions taken for 1) through 7) are considered appropriate. 8) It is requested to clarify the meaning of “Start Working” in the table listing existing projects. It is also requested why Dapu project starting 2000 is listed in the table though it seems not to eligible for listing due to the criteria employed.
		8) “Start Working” was revised as, “Start construction” in PDD-Ver.03. Strictly speaking Dapu project is not	**OK** for item 8). 8) Action taken for this item is

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table 1 or 2	Summary of project owner response	Validation team conclusion
		eligible for the existing project according to the criteria employed. Considering long construction period of hydropower plant, Dapu project was selected in PDD-Ver.03.	considered appropriate. The request for this item is thus closed.
CLAR6 Reference to the “feasibility study report” is not provided.	(B.12)	Reference to the feasibility study report was provided with explanation which feasibility study report was referred in PDD-Ver.04.	**OK** Parameters employed in the benchmark analysis were quoted the Revised Feasibility Study Report. It is confirmed that the parameters employed are from the Revised Feasibility Study report. The request for this item is then closed.
CLAR7 Is the “normal storage area” of the reservoir for power density calculation the same as the “surface area at full reservoir level” defined in ACM0002-Ver.06?	(B.14)	The power density is calculated by the installed generation capacity divided by the total surface area of the reservoir at full reservoir level instead of flooded area. Since original river surface area and river bed area are not obtained, flooded area (expressed as ”increased river area” by PDD author) is replaced by the total surface area of reservoir at full reservoir level. This approach is more conservative than one defined in Annex 5 of 23rd meeting report of CDM-EB since total surface area of reservoir is much larger than the flooded area. The approximate original river width and backwater length were also	**OK** Power density is calculated from the installed power generation capacity divided by the total area of reservoir at full reservoir level as a conservative assumption.

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table 1 or 2	Summary of project owner response	Validation team conclusion
		provided as reference.	
CLAR8 PDD-Ver.01 includes several points that need to be clarified as follows, 1) data vintage employed for baseline emission factor calculation of the relevant power grid that are available on the date of submission of PDD-Ver.01, 2) definitions and sources of data parameters including definition and share of power generation from low-cost/ must-run resources for calculation of baseline emission factor, 3) unit of variables is not provided, and 4) efficiency levels of power plants and share	(B.17)	1) Data vintage was up-dated as per "China's Regional Grid Baseline Emission Factors 2007" published by DNA of China on 9 August 2007 in PDD-Ver.02. 2) – 3) Unit of variables for the baseline emission factors were specified in PDD-Ver.02. 4) Efficiency level of the best	1) **OK** Data vintage is up-dated to cover the most recent data on the grid information. Some of the data are referred "China's Regional Grid Baseline Emission Factors 2007" published by DNA of China on 9 August 2007. 2) It is requested to provide definitions of low-cost/ must-run resources of power generations for baseline emission factor calculation. 3) **OK**

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table 1 or 2	Summary of project owner response	Validation team conclusion
of emissions from each type power plant for BM calculation		technology commercially available was revised in PDD-Ver.02	Unit of variables for the baseline emission factor calculation is provided in PDD-Ver.02. 4) **OK** Efficiency levels employed in PDD-Ver.02 for BM calculation are in line of CDM-EB guidance, and guidelines.
		2) Definition of the low-cost/ must-run resources of power generations is provided in section B.6.1 in PDD-Ver.04. Share of the low-cost/ must-run resources of power generations was provided in the Annex 3 in PDD-Ver.04.	2) **OK** Definition of the low-cost/ must-run resources of power generations, and their shares in the total generation in CSPG are provided in PDD-Ver.04. The request for this item is thus closed.
CLAR9 Additional information including diagram showing the monitoring system, calibration procedure, measuring/recording frequency, accuracy level of measurement, etc. that are required by the monitoring methodology, ACM0002-Ver.06, and "PDD-Guidelines" shall be provided to judge the item.	(B.24)	Information requested is added in PDD-Ver.02.	Calibration procedures and description of accuracy level of measurement are not provided.
		Calibration procedures and accuracy level of ammeters were described in PDD-Ver.04.	**OK** The description provided in PDD-Ver.04 is considered in line with ACM0002-Ver.06, and "PDD-Guidelines". The request for this item is thus closed.
CLAR10 Additional information is required to judge the item since archiving period described is not consistent throughout PDD-Ver.01.	(B.25)	Corrected at section B.7.1 in PDD-Ver.02.	**OK** Action taken in PDD-Ver.02 for this item is considered appropriate. The request for this item is thus closed.

* MoV = Means of Verification, DR= Document Review, I= Interview, CAR= Corrective Action Request, CLAR= Request for Clarification, OBS= Observation

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table 1 or 2	Summary of project owner response	Validation team conclusion
CLAR11 Additional information shall be provided to describe the organization chart included, especially role and responsibility of each personnel to confirm the item.	(B.50)	Explanation was added to the relevant part in PDD-Ver.02.	**OK** Action taken in PDD-Ver.02 for this item is considered appropriate. The request for this item is thus closed.
CLAR12 Additional information shall be provided on the starting date of the project as per "Glossary of CDM terms" (version 02).	(C.1)	Starting date of the project activity was explained in PDD-Ver.02.	Starting date of the proposed project activity shall be revised as defined in "CDM Glossary of terms" (version 02).
		Starting date of the project activity as CDM was provided in PDD-Ver.04.	**OK** Starting date of the project as CDM is confirmed by the evidence specified for the request, CAR4. The request for this is thus closed.
CLAR13 Considering, current progress in validation activity, it is requested to confirm that the project participants do not claim the emission reductions generated before the date of registration, and the starting date of the crediting period is subject to adjustment once date of registration is determined. It is also requested to provide correct tables that summarize the estimated emission reduction in each year during the crediting period, accordingly.	(C.1)	Starting date of crediting period was updated, and explanation was added in section C.2.1.1, and tables in sections A.4.4 and B.6.4 were revised.	It was confirmed by the project participants that the starting date of the project activity will be adjusted when the registration date is determined. Updated starting date of crediting period is considered appropriate. The tables that summarize the estimated emission reduction are appropriately revised according to the starting date of the crediting period. The request of this item therefore closed.

OBS1: CDM-PDD Form Version 03 (valid from 28 July 2006 onwards) was employed. However, notwithstanding paragraph 13 of Part I of "Guidelines for completing CDM-PDD, and CDM-NM", Version 06.2, part of it, such as inclusion of title page, headings of the sections B.1 and

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B.3, headings of the tables provided in A.4.4 and B.6.4, change in page format- portrait to landscape in Annex 3, and font of letters at several parts, was altered to use in PDD-Ver.01. It is also observed that the volume of section A.4.1.4.of PDD-Ver.01 is more than one page.

Project proponent revised the PDD to comply with the original format, except page format for Annex 3 to accommodate wide tables.

OBS2: However, the methodology title is not correctly represented in PDD-Ver.01.
The name of baseline and monitoring methodologies were appropriately addressed in PDD.

APPENDIX B

CRTIFICATE OF APPOINTMENT OF VALIDATION TEAM

Certificate of Appointment of Validation Team

Project Title	Guangxi Bajiangkou Hydropower Project
Applied Methodology	ACM0002-Ver.06
	Sectoral Scope 1

Date: 5 June 2007

Designated Operational Entity: Japan Consulting Institute (JCI)

Reflecting the competence criteria of JCI, this is to certify the appointment of validation team of JCI specified below for the CDM project activity above, as per CDM Project Activity Registration Form, "**F-CDM-REG**" adopted at the 24th Meeting of CDM Executive Board, and Validation Procedure established by JCI CDM Center.

Signature

Akio Yoshida,
Executive Director, JCI CDM Center

Date: 25 June 2007

Client: Coway International TechTrans Co. Ltd.

Reflecting the curricula vitae provided, this is to agree the validation team of JCI specified below for the CDM project activity above, as per Validation Procedure established by JCI CDM Center.

It is also agreed that Mr. Yoshihisa SAKAI of JCI participates in the validation activities of the said project for the quality issues under its quality management scheme.

Signature

Zhu Ling
Director, Energy & Environmental Division of Coway

Validation Team

Validation Team	Name	Assigned Role
Leader	Toru KITAGAWA	All relevant issues
Member	Junji YOSHIZAWA	CDM auditor

APPENDIX C

ECONOMIC SITUATION IN GIANGXI REGION DURING THE PERIOD 2002 THROUGH 2005

Economic situation in Giangxi Region during the period 2002 through 2005

Purpose:

The purpose of this Appendix is to confirm the background economic situation of Guangxi Zhuang Autonomous Region that is described in section B.5. in PDD-Ver.05 to demonstrate that the early start of the project does not affect the additionality of the project.

Outcome:

Steep rise in gross index of ex-factory price of commodity in Guangxi Region was recorded during the period of 2002-2005, especially during 2002-2004. Among it, ex-factory price of several categories of commodity that were relevant to the construction of the hydropower plant, such as steel, building materials & non-metallic minerals, and electrical equipment & machinery were also significantly soaring in Guangxi Region during the period of 2002 through 2005. Especially, steel price increased by approximately 40 % as of 2004 since 2002. Such tendency was confirmed in the IMF data base for whole of China. Considering these, it can be concluded that economic situation in Guangxi Region as the background of the financial barrier of the Project described in PDD-Ver.05, /1/, is plausible.

Detailed explanation:

Surrounding economical situations of the Project in its construction phase have been analyzed by organizing indices of ex-factory price of commodity that are relevant to the construction of the hydro power plant in both Guangxi Zhuang Autonomous Region. The yearly data for Guangxi Region were compiled between 2000 through 2005, and those for 2002 through 2004, during which major decisions were made, were focussed . The data base referred was "Guangxi Statistical Yearbook", /31/, compiled by the Guangxi Statistical Bureau.

The changes in ex-factory price of gross and the selected categories of commodities that seem to be closely related to the construction of hydropower plant in Guangxi are represented with their normalized value by those in 2000 in Figure Ann. C.1. and inflation rates in China, /31/.

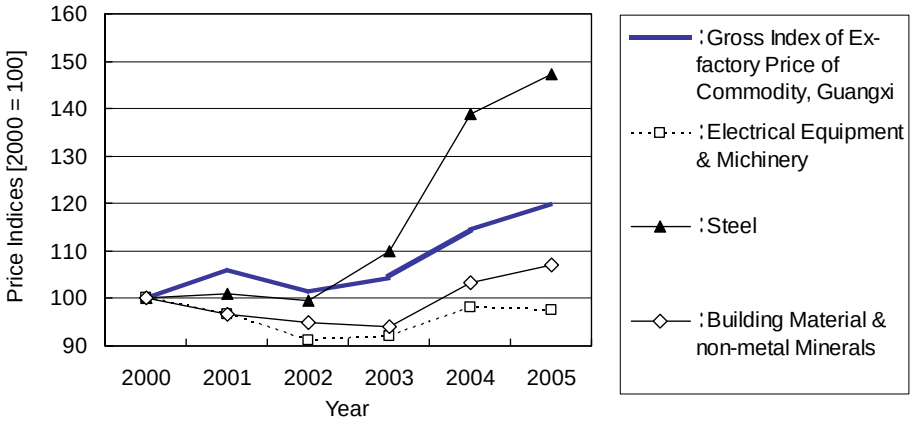

Figure Ann. C.1 Change in ex-factory price indices for selected good categories. (/31/)

"Gross Index of Ex-factory Price of Commodity" once hit its bottom in 2002 and rose more than 10 % as of 2004 as compared to that in 2002. During the same period, ex-factory price of "Steel", "Building

Material & non-metal Minerals", and "Electrical Equipment & machinery" rose by 39.4 %, 8.6 %, and 7.5 %, respectively. All the categories include major materials for construction of hydropower plant such as reinforcing bar, cement, and relating equipment for power generation.

In order to understand the economic situation in Guangxi Region above, gross domestic product (GDP), and inflation rate in whole of China listed in International Monetary Fund (IMF) statistical date, /32/, are represented in Figure Ann. C.2.

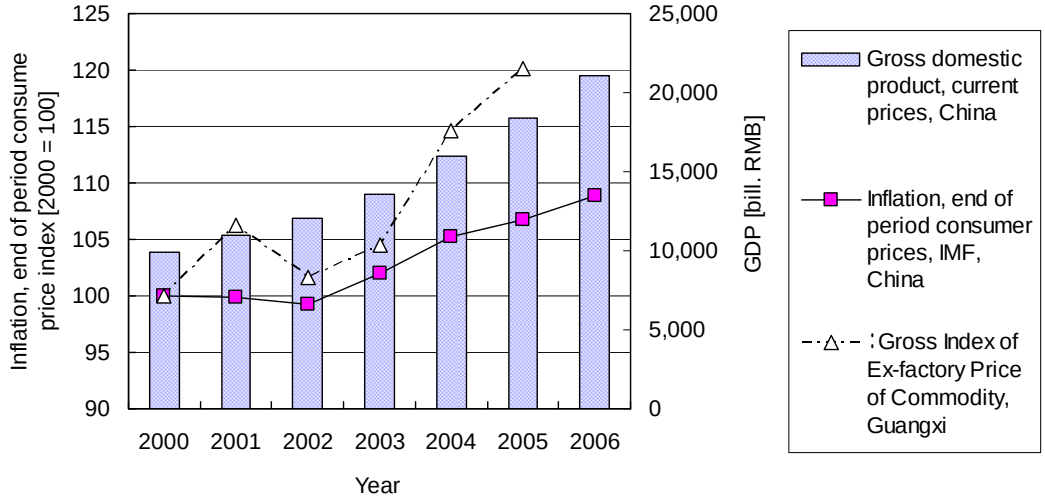

Figure Ann. C.2 Change in GDP and inflation in China. (/32/)

"Gross Index of Ex-factory Price of Commodity" in Guangxi region shown in Figure Ann. C.1 is shown again in Figure Ann. C. 2 in the figure for comparison purpose. It can be observed that the 2002 is the year that GDP starts rapid expansion by more than 10% in yearly rates in China. Inflation rate in China also showed steep rise since 2002 afterward, and particularly during the period between 2002 and 2004. As can be seen in Figure Ann. C. 2, inflation rate in Guangxi is even more remarkable than that for whole of China.