



VALIDATION REPORT
for the CDM Project Activity

Nanjing Jinling Grid
Connected Natural Gas
Combined Cycle Power
Plant Project

In

P.R. China

Report No. 01 997 9105039069

Version No. 06.1, 2010-04-22

TÜV Rheinland Japan Ltd.

I. Project description:**Project title:** Nanjing Jinling Grid Connected Natural Gas Combined Cycle Power Plant Project**Host Country:** P. R. China**Methodology:** AM 0029 version 03 ☒ Large Scale ☐ Small Scale**Annual average emission reductions (estimate):** 1,044,328 tCO₂e/yr**GHG reducing measure/technology:** Natural Gas Combined Cycle Power Generation Technology

Party	Project Participants	Party considered a project participant
People's Republic of China (Host)	Huaneng Nanjing Jinling Power Generation Co., Ltd. (Project Owner)	No
United Kingdom of Great Britain and Northern Ireland (Annex I country)	Gaisi Peony Carbon Capital s.a.r.l (CER Buyer)	No

II. Validation:**Contract party:** Gaisi Peony Carbon Capital s.a.r.l**Validation Team:**

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Validation Phases:

- ☐ Desk Review
☐ Follow up interviews
☒ Resolution of outstanding issues

Validation Status:

- ☐ Corrective Actions / Clarifications Requested
☒ Full Approval and Submission for Registration
☐ Rejected

III. Validation Report:

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Final approval: ☒	Released on: 2010-04-22 By: Dr Manfred Brinkmann	Designated Operational Entity (DOE): TÜV Rheinland Japan Ltd. Shin Yokohama Daini Center Bldg., 3-19-5, Shin Yokohama Kohoku-ku, Yokohama, JAPAN 222-0033 Tel.: +81 45 470 1850, Fax: +81 45 470-2361 E-mail: cdm@tuv.com
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Executive Summary – Validation Opinion

The validation team assigned by the DOE (TÜV Rheinland Japan Ltd.) concludes that the CDM Project Activity “Nanjing Jinling Grid Connected Natural Gas Combined Cycle Power Plant Project” in P.R. China, as described in the PDD (version 06.4 dated 21st April 2010), meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The selected baseline/monitoring methodology is applicable to the project and correctly applied. The DOE therefore requests the registration of the project as a CDM project activity.

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

The validation was executed in the following steps so far:

- Desk review of preliminary PDD (version 01, September 2006)
- Public stakeholder comment process (28th October to 26th November 2006)
- On-site visit with stakeholder interviews (5th to 6th December 2006; re-visit: 6th to 7th July 2009)
- Issue of checklist with corrective action requests (CARs) and clarification requests (CLs) and the draft validation report & protocol
- Desk review of revised PDD (version 06.4 dated 21st April 2010)
- Review of proposed corrections and clarifications
- Issue of the final validation report & protocol

The host country is P.R. China. The Letter of Approval (LoA) of voluntary participation, including confirmation by China’s DNA – National Development & Reform Commission (NDRC) (Ref no.: FaGaiQiHou[2007](1085)), that the project assists them in achieving sustainable development, has been issued on 22nd May 2007.

The project activity is bilateral CDM-project, with United Kingdom of Great Britain and Northern Ireland (UK) identified as the Annex I party. The LoA from UK (Ref no.: GPCC/2/2007) has also been issued on 12th December 2007.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards China.

The project correctly applies AM0029/Version 03 – “Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas”, in connection with the latest version of “Tool for demonstration and assessment of additionality” (Version 05.2) and “Tool to calculate the emission factor for an electricity system” (Version 01.1).

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

By displacing fossil fuel-based electricity with electricity generated from the natural gas, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 1,044,328 tCO₂e per year over the selected 7-year renewable crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate monitoring procedures have been implemented according to the monitoring methodology ACM0029/Version 03. Training plan is available and the training programme shall tentatively be started in December 2009.

The project proponent has resolved all Corrective Action Requests and Clarification Requests as stated in the first Validation Report and the Validation Protocol, which has resulted in a revision of the PDD. In the opinion of the validation team the “Nanjing Jinling Grid Connected Natural Gas Combined Cycle Power Plant Project” meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0029/Version 03. Therefore, TÜV Rheinland requests the registration of the “Nanjing Jinling Grid Connected Natural Gas Combined Cycle Power Plant Project” as a CDM project activity.

Abbreviations

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

AF	Adjustment Factor
AM	Approved Methodology
ACM	Approved Consolidated Methodology
BE	Baseline Emission
BM	Build Margin
CAR	Corrective Action Request
CCPG	Central China Power Grid
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CHP	Combined Heat and Power Generation
CL	Clarification Request
CM	Combined Margin
CNTIC	China National Technical Imp. & Exp. Corp.
CO ₂	Carbon Dioxide
Defra	Department for Environment, Food and Rural Affairs
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
DRC	Development and Reform Commission
EB	Executive Board
EGC	Levelized Electric Generation Cost
ECPG	East China Power Grid
EIA	Environmental Impact Assessment
EPB	Environmental Protection Bureau
ER	Emission Reduction
ERPA	Emission Reduction Purchase Agreement
FAR	Forward Action Request
FSR	Feasibility Study Report
GCCC	Green Capital Consulting Company
GE	General Electric
GHG	Greenhouse Gas
GWh	Giga Watt Hours
GWP	Global Warming Potential
HEDI	Hebei Electric Design Institute
HNNJJ	Huaneng Nanjing Jinling Power Generation Co., Ltd.
I	Interview
IETA	International Emissions Trading Association
IM	Interim Measures for Operation and Management of CDM projects
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
kW	Kilo Watt
kWh	Kilo Watt Hours
L	Leakage
LNG	Liquefied Natural Gas
LoA	Letter of Approval
LoI	Letter of Intent
MoV	Means of Verification
MR	Management Representative
MW	Mega Watt
MWh	Mega Watt Hours

NC ₄	National Coordination Committee on Climate Change
NCV	Net Calorific Value
NDRC	National Development and Reform Commission
NG	Natural Gas
NGCC	Natural Gas Combined Cycle
NGO	Non Government Organisation
NO _x	Nitrogen Oxides
NPV	Net Present Value
O&M	Operation & Maintenance
ODA	Official Development Assistance
OM	Operating Margin
OSV	On Site Visit
PC	Gaisi Peony Carbon Capital s.a.r.l
PDD	Project Design Document
PDR	Preliminary Design Report
PE	Project Emission
SA	Sensitivity Analysis
SIIC	Supplier Information to Client
SO ₂	Sulphur Dioxide
STHS	Stakeholder Survey
t	Tonne
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added Tax
VVM	Validation & Verification Manual

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Appendix A: Validation Protocol

Appendix B: Certificates of Competence

1 INTRODUCTION

Gaisi Peony Carbon Capital s.a.r.l (PC) has commissioned the DOE TÜV Rheinland Japan Ltd. to perform a validation of the CDM Project Activity “Nanjing Jinling Grid Connected Natural Gas Combined Cycle Power Plant Project” (hereafter called “the project”) in P. R. China. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. The term “UNFCCC criteria” refers to Article 12 of the Kyoto Protocol, the CDM modalities and procedures or the simplified modalities and procedures for small-scale CDM project activities (as applicable), and the subsequent decisions by the CDM Executive Board.

1.1 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).

1.2 Scope

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

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

2 METHODOLOGY

The validation consists of the following three phases:

- I a desk review of the project design documents
- II on-site visit and 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.

2.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation:

/1/	CDM Validation and Verification Manual (Version 01) EB44 Annex 3
/2/	UNFCCC, AM0029/Version 03, "Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas", EB39
/2.1/	UNFCCC, Guidelines for Completing the Project Design Document (CDM-PDD) And the Proposed New Baseline And Monitoring Methodologies (CDM-NM), Version 05 http://cdm.unfccc.int/Reference/Guidclarif/pdd/index.html
/2.2/	UNFCCC, Glossary of CDM terms http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM_v04.pdf
/3/	UNFCCC, "Tool for the demonstration and assessment of additionality", Version 05.2, EB39
/3.1/	UNFCCC, "Guidance on the assessment of investment analysis", Version 02, EB41
/3.2/	UNFCCC, "Guidance on the assessment of investment analysis", Version 03.1, EB51
/4/	UNFCCC, "Tool to calculate the emission factor for an electricity system", Version 01.1, EB35
/5/	Project Design Document (PDD), version 01, September 2006
/6/	Project Design Document (PDD), version 06.4 dated 21 st April 2010
/7/	The National Development and Reform Commission (NDRC) of The People's Republic of China (i.e. China DNA), Letter of Approval (Ref no.: FaGaiQiHou [2007](1085)), 22 nd May 2007
/8/	Department for Environment, Food and Rural Affairs (Defra) (i.e. UK DNA), Letter of Approval (Ref no.: GPCC/2/2007), 12 th December 2007
/9/	Credit Suisse International, Letter for withdrawal as project participant from the Nanjing NGCC Project, 25 th November 2008
/10/	Southern China Electric Power Design Institute & Jiangsu Provincial Electric Power Design Institute, Feasibility Study Report (FSR), June 2003

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/12/	National Development and Reform Commission, Approval of FSR (for final design of 2 sets of 390MW generation units) (Ref no. FGNY[2005]1760), 16 th September 2005
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/15/	Bank of Communications, Loan contract (3 rd December 2005); & its loan release receipt records
/16/	China Development Bank (Jiangsu Branch), Loan contract (16 th May 2006); & its loan release receipt records
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/21/	China Huaneng Group, Project initial design approval document for Huaneng Jinling Power generation plant (Ref no. HNJ[2006]380), 10 th August 2006
/22/	Ministry of Water Resources, Water extraction permit (Ref no.: ZS[2003]02003), 18 th February 2003
/23/	Nanjing Planning Bureau, Construction of the land usage planning permit, (Ref no. NGCDYD[2003]6541), 16 th October 2003
/24/	Ministry of Land and Resources office, About Huaneng Jinling Power Generation plant 2X350MW Combined Cycle power generation project of the construction land usage pre-assessment comment and reply (Ref no. GTZTH[2004]420), 2 nd September 2004
/25/	Bank of China, Commitment of loan provision (Ref no.: ZYSH[2003]1428), 29 th October 2003
/26/	Bank of Communications, Loan contract. Financial closure is achieved since adequate debt financing was secured to comply with the NDRC approval document and to meet the investment requirements of the Project, 3 rd

	December 2005
/27/	Huaneng Nanjing Jinling Power Generation Co., Ltd., Cooperate Business registration license (No.: 320113000200608070069), 7 th August 2006 <i>(note: company established on 2nd February 2005)</i>
/28/	KPMG, Financial audit report (Fiscal Year 2008) (Ref. no.: KPMG-A(2009)AR No.0318), 13 th March 2009
/29/	Huaneng Nanjing Jinling Power Generation Co., Ltd., Jiangsu Power Company, Grid connection agreement (Ref no.: SGSHZ [2005]002), September 2005
/30/	Jiangsu Power Company & Huaneng Nanjing Jinling Power Generation Co., Ltd., Power Purchase Agreement (Agreement no.:2006SD1102010171), November 2006
/31/	Huaneng Nanjing Jinling Power Generation Co., Ltd., Grid-in line connection diagram
/32/	Jiangsu Number three Electrical Power Construction & Engineering Corporation and Huaneng Nanjing Power Generation Co., Ltd., Civil construction contract (Contract no.: 2004025), 25 th June 2005 <i>(note: considered as the project starting date)</i>
/33/	Huaneng Power International INC., CNTIC, HPEC & GE, Gas turbine power plant equipment contract for Jinling Project (Contract no.: HMR-24002-002CE/04US01GTA01XC0017), 3 rd December 2004 <i>(note: contract not yet effective at that time being)</i>
/34/	Huaneng Power International INC., CNTIC, HPEC & GE, Contract amendment No.1 to Contract# HMR-24002-002CE/04US01GTA01XC0017, (to alter scope of supply of project from three (3) units to two (2) units, 26 th April 2005 <i>(note: contract not yet effective at that time being)</i>
/35/	China National Technical Imp. & Exp. Corp. (CNTIC) (as agent of Huaneng Consortium), Formal notice to the equipment purchase agreement being effective (Notice ref no.: (2005) CNTIC P2 17/160), 30 th September 2005 <i>(note: considered as effective date of equipment contract /33//34/ above)</i>
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/37/	China PetroNatural Gas Co., Ltd., and Huaneng Nanjing Power Generation Co., Ltd., Natural gas supply agreement (Agreement no.: 0100-8031-0022), 29 th December 2004
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/39/	Huaneng Nanjing Jinling Power Generation Co., Ltd. & GE, Maintenance service contract, 23 rd November 2007
/40/	Black & Veatch, Project site plan (with indication of all natural gas pipelines), 7 th February 2005
/41/	Huaneng Nanjing Jinling Power Generation Co., Ltd., Organization chart
/42/	Huaneng Nanjing Jinling Power Generation Co., Ltd., Preparation meeting for upcoming project construction commencement, 10 th May 2005
/43/	Huaneng Nanjing Jinling Power Generation Co., Ltd., Directorial meeting minutes on CDM consideration, 15 th June 2005
/44/	Huaneng Nanjing Jinling Power Generation Co., Ltd., Progress meeting mentioning about pushing for CDM application progress, 3 rd July 2005
/45/	Huaneng Nanjing Jinling Power Generation Co., Ltd., Progress meeting mentioning about the decision to engage CDM consultant, 27 th July 2005
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/48/	Endesa, Offer for CER purchase, 10 th October 2006
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/107/	Green Capital, Presentation material for "Potential analysis of CDM development for Huaneng Group", 15 th December 2004
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2.2 Follow-up Interviews with Project Stakeholders

The following table identifies the personnel who have been interviewed and/or provided additional information to the presented documentation:

	Date	Name	Organization	Title
/i/	2006-12-05	Mr. Zhang Qian	Nanjing Municipal Development & Reform Commission	Vice Director of Transportation and Energy Division
/ii/	2009-07-07 (Re-visit)	Mr. Wan Yong		Officer
/iii/	2006-12-05	Mr. Jiang Jiping	Nanjing Environment Protection Bureau	Deputy Chief
	2009-07-07 (Re-visit)	Mr. Wang Dongyin		Officer
/v/	2009-07-07 (Re-visit)	Mr. Li Jianbo	Huaneng Power International (Jiangsu Branch)	Manager
/vi/	2006-12-05	Mr. Qiu Jianliang		Deputy Chief
/vii/	2009-07-07 (Re-visit)	Ms. Yuan Qing		Deputy Financial Director
/viii/	2009-07-07 (Re-visit)	Mr. Wan Yong	Huaneng Nanjing Jinling Power Generation Co., Ltd	Deputy General Manager (i.e. Management Representative)
/ix/	2006-12-05	Mr. Chen Shilin		Chief Engineer
/x/	2006-12-05	Ms. Yuan Qing		Director (General Affairs Dept.)
/xi/	2009-07-07 (Re-visit)	Mr. Guan Zhilong		Deputy Director (Dept. of Scheming)
/xii/	2009-07-07 (Re-visit)	Mr. Shao Rongguo		Assistant General Manager (Dept. of Scheming)
/xiii/	2006-12-05	Mr. Liang Wenlong	Jiangsu Electric Power Company	Senior Engineer
/xiv/	2009-07-07 (Re-visit)	Mr. Chen Guonian		Director (Production & Tech. Dept.)
/xv/	2006-12-05	Ms. Zhao Xiaolin	Administrative Committee of Nanjing QiXia Economic & Technological Development Zone	Vice Director
/xvi/	2006-12-05	Ms. Chen Yuzhen	-	Farmer
/xvii/	2006-12-05	Ms. Yan Changliang	-	Farmer
/xviii/	2009-07-07 (Re-visit)	Ms. Ge Guangxia	Guangmingxing village	Farmer
/xix/	2009-07-07	Ms. Ma Jifang	Donghua village	Farmer

	(Re-visit)			
/xx/	2009-07-07 (Re-visit)	Ms. Zhang Yingchun	Xihua village	Farmer
/xxi/	2006-12-05	Mr. Che Jinlou	Nanjing Qixia Zone Xihua local government	Secretary of Communist Party
/xxii/	2006-12-05	Mr. Liu Xiaoqing	Nanjing Xihua Zone Property	General Manager
/xxiii/	2009-07-07 (Re-visit)	Mr. Li Zhe	China Development Bank (Jiangsu Provincial Branch)	Manager
/xxiv/	2006-12-05	Ms. Huang Jinfeng	Green Capital Consultant Company	Project Manager
/xxv/	2009-07-07 (Re-visit)	Ms. Cecilia Bullock	Gaisi Peony Carbon Capital s.a.r.l	Project Manager
/xxvi/	2009-07-07 (Re-visit)	Mr. Yang Qi		Technical Manager
/xxvii/	2009-07-07 (Re-visit)	Mr. Eric Li		Project Analyst

Table 1 Interview topics

	Date	Organization	Topic
/1/	5 th December 2006 to 6 th December 2006 <u>(Re-visit)</u> 6 th July 2009 to 7 th July 2009	Huaneng Nanjing Jinling Power Generation Co., Ltd. (HNNJJ) (Project participant)	➤ Project design ➤ Project related legal issues ➤ Project & CDM development history ➤ Technical equipment ➤ Sustainable development issues ➤ Additionality ➤ Crediting period ➤ Monitoring plan ➤ Training history ➤ Management system ➤ Environmental impacts ➤ Stakeholder process ➤ Approval by the host country
/2/	5 th December 2006 to 6 th December 2006 <u>(Re-visit)</u> 6 th July 2009 to 7 th July 2009	Green Capital Consulting Company (GCCC) (CDM Consultant) Gaisi Peony Carbon Capital s.a.r.l (PC) (as Buyer / CDM Consultant)	➤ Project design ➤ Technical equipment ➤ Sustainable development issues ➤ Baseline determination ➤ Additionality ➤ Crediting period ➤ Monitoring plan ➤ Management system ➤ Environmental impacts ➤ Stakeholder process ➤ Approval by the host country
/3/	5 th December 2006 to 6 th December 2006 <u>(Re-visit)</u> 6 th July 2009 to 7 th July 2009	Nanjing / Jinling Municipality & Local Community	➤ Project design ➤ Project related legal issues ➤ Project status ➤ Sustainable development issues ➤ Environmental impacts ➤ Stakeholder process ➤ Issues affecting the local community ➤ Approval by the local governments

2.3 Resolution of Outstanding Issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to TÜV Rheinland's 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 this project is enclosed in Appendix A to this report.

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

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

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

A revised version of the PDD, version 06.4 dated 21st April 2010, has been submitted to the validation team for final validation, which is revised based on the first validation report and the issued corrective action requests and clarification requests. The major changes include: project location more accurate; starting dates of project activity & crediting period amended; renewable crediting period chosen; project history & CDM development history included; baseline discussion revised; sensitivity analysis discussion revised; monitoring plan revised; background information of stakeholder questionnaire, etc.

Validation Protocol Table 1: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements in Table 1 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. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a corrective action request (CAR) due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 1	Summary of project owner response	Validation conclusion
If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.	Reference to the checklist question number in Table 1 where the CAR or CL is explained.	The responses given by the project participants during the communications with the validation team should be summarised in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 1, under "Final Conclusion".

Figure 1. Validation protocol tables

2.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project. The technical review was performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for CDM validation and verification.

2.5 Validation Team

Role	Full Name	Appointed for Sectoral Scopes	Affiliation
Team Leader	Wilfred Chan	1, 6, 13	TÜV Rheinland Hong Kong Ltd.
Team Member	Waikwok Wong ¹	1, 4	TÜV Rheinland Hong Kong Ltd.
Trainee / Sectoral expert	Xin He ²	N/A	TÜV Rheinland (China) Ltd.
Technical Reviewer	Dr. Manfred Brinkmann	1, 3, 4, 5, 6, 10, 11, 12, 13	TÜV Rheinland Japan Ltd.

3 VALIDATION FINDINGS

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

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation.

3.1 Approval and Participation

The project participants are Huaneng Nanjing Jinling Power Generation Co., Ltd. (HNNJJ) from P.R. China, and Gaisi Peony Carbon Capital s.a.r.l (PC) from United Kingdom of Great Britain and Northern Ireland (UK), where the host party and Annex I country meet all relevant participation requirements in CDM.

¹ Wong participated in the validation until 30th January 2009

² He participated in the validation since 1st June 2009

The Letter of Approval (LoA) /7/ (Ref no.: FaGaiQiHou[2007](1085)) has been issued by the DNA of P.R. China – National Development & Reform Commission (NDRC) on 22nd May 2007 for authorizing HNNJJ as project participant and confirming that the project contributes to China's sustainable development.

The proposed project is a bilateral CDM-project, with UK identified as the Annex I party. The LoA from DNA of UK, i.e. Department for Environment, Food and Rural Affairs (Defra) /8/ (Ref no.: GPCC/2/2007) has also been issued on 12th December 2007.

It is also understood and indicated in the China's LoA /7/, & the Letter of Intent for CER purchase /53/, that Credit Suisse International was once indicated as one of the project participants in the proposed project. The validation team has checked against the official letter issued by Credit Suisse International /9/ for her voluntary withdrawal from the proposed project.

The below table summarizes the project participant and party involved.

Project participant	Huaneng Nanjing Jinling Power Generation Co., Ltd.	Gaisi Peony Carbon Capital s.a.r.l
Parties involved	P.R. China (Host)	United Kingdom (Annex 1 country)
APPROVAL		
LoA received	Yes	Yes
Date of LoA	2007-05-18	2007-12-12
Reference to document	FaGaiQiHou[2007](1085)	GPCC/2/2007
LoA received from	project participant	project participant
Validation of authenticity	Yes (as confirmed through official DNA homepage ³), i.e. National Development and Reform Commission (NDRC)	Yes (as confirmed through official DNA homepage ⁴) i.e. Department for Environment, Food and Rural Affairs (Defra)
Validity of LoA	Yes	Yes
PARTICIPATION		
Party is party to Kyoto Protocol	Yes	Yes
Voluntary participation	Yes	Yes

³ http://cdm.ccchina.gov.cn/website/CDM/pdf/Item_new/Item_new838.pdf (**verified by validation team)

⁴ <http://www.defra.gov.uk/environment/climatechange/internat/kyotomech/documents/cdm-dna-approvals290808.pdf> (**verified by validation team)

Diversion of official development aid towards host country	No	No
Project contribution to SD	Yes	Yes

According to Annex 2 of the PDD, the project does not receive any public funding. The validation did not reveal any information indicating that the project can be seen as a diversion of official development assistance (ODA) funding towards China through documents review, including company regulations /27/, project financial reports certified by qualified financial audit firm (i.e. KPMG) /28/; capital construction examination report (which is the audit report of expenditure during project construction) prepared by China Audit Certified Public Accountant) /20/; and through on-site interview with the representatives from various stakeholders including management representative (MR) /vii/ and deputy financial director /vi/ of project owner, representatives from bank /xxiii/ & relevant government authority /i, ii/ (please refer to Section 2.2. above for on-site interviewee list). It is validated and confirmed that there is no any foreign aid, fund, favourable on-grid tariff, nor support to the proposed project. While the project development is 100% private-invested, the local government does not (and shall not) involve anyhow in project finance, operation, nor management, all along the project lifetime, as advised by local DRC /i, ii/. It is confirmed by the same local government representatives that the government shall not subsidize nor take over the power plant for operation as government facilities, even if the project owner faces any financial difficulty in future. Thus, the proposed project is not a “business-as-usual” scenario.

As reported by the MR of the project owner, part of the project funding would be raised from internal accrual and loans, while the remainder to be raised from the bank. The project static investment was reported in the PDD & <Supplement to FSR> /11/ to be 2,465.80 million RMB. The registered capital of HNNJJ is 582 million RMB /27/, while the remainder would be raised from the bank. The validation team has reviewed the project financial report (of Fiscal Year 2008) /28/, which is prepared by the certified financial audit firm (viz. KPMG), and confirmed that the registered capital was raised by three companies (viz. Huaneng Power International (60%), Jiangsu Guoxin Asset Management Group (30%) & Nanjing City Investment Co. Ltd. (10%)), and all capital is readily available.

The validation team also validated the project loan contracts & the corresponding loan release receipt records from (i) Bank of Communications dated 3rd December 2005, (ii) China Merchants Bank dated 16th May 2006, and (iii) China Development Bank dated 16th May 2006 (i.e. /15, 16, 17/). Incorporated with the registered capital of HNNJJ abovementioned, it can reasonably be summarized that there is no indication of any capital received from ODA funding or any other form of financial subsidy, which is in line with the information re-confirmed by the interviewed government officials /i, ii/ and relevant bank representative /xxiii/. The same could also be cross-checked with the capital construction examination report /20/, which certified that the project expenditure is all raised from self-capital (equity) & bank loan, but not any other form of funding or subsidy.

3.2 Project Design Document

The Project Design Document (PDD) is based on the currently valid PDD template and is correctly completed in accordance with the applicable guidance document /2.1/.

3.3 Project Description

The “Nanjing Jinling Grid Connected Natural Gas Combined Cycle Power Plant Project” comprises the construction and operation of a new natural gas fired grid-connected electricity generation plant in Qixia district of Nanjing City, Jiangsu Province of P.R. China, with a total capacity of 780MW (i.e. 2 x 390MW). The project owner is Huaneng Nanjing Jinling Power Generation Co., Ltd. (HNNJJ). The geographical coordinate of the power plant is East Longitude 119°00'45” and North Latitude 32°10'17”. The coordinates are verified by the validation team by checking against the (i) public map, i.e. google-earth, (ii) EIA project location map, and (iii) on-site observation using GPS device.

The purpose of the power plant is to balance the high peak electricity demand of Nanjing City and to enable an environmentally-friendly city development. A natural gas volume of approximately 576 million m³ is supplied annually by gas pipeline from the gas fields in the Chadamu basin of Qinghai, Tarim basin of Xinjiang, and Shangganning region in the western part of China. The proposed project comprises 2 units of 390MW rated output gas-steam combined cycle generation technology (unit code: GE-109FA), and will serve principally as an electricity peak regulation plant, responsible for operating at the peak load and middle load. The technology and equipments of the project are supplied by foreign US manufacturers (viz. General Electric (GE)). The total installed capacity is 780MW and the net power supply is 2,716,000 MWh per year. The annual utilization hour for power generation is 3,500 hours. The estimation of power generation is in accordance with the <Supplement to FSR> /11/. The electricity generated from the proposed project is expected to substitute the power from Eastern China Power Grid (ECPG) which is mainly composed of fossil fuel-fired power plants. The GHG emission reduction of the proposed project will thus be achieved through the use of natural gas to generate electricity, which is a less GHG intensive fossil fuel. The total estimated GHG reduction is expected to be 1,044,328 tCO_{2e} per annum over the next 7 years of renewable crediting period.

The applied NGCC technology (code: GE-109FA) is supplied by the US manufacturer (GE). The technical detail is summarized below and has been checked against the equipment purchase contract /33/, equipment operation manual /38/, and physical inspection during on-site visit as valid:-

Equipment	Qt.	Technical Parameters	Manufacturer
Gas turbine	2	Model: PG-9351FA Fuel type: Natural Gas Capacity: 255.6 MW Firing temperature: 1,326.7 °C Rotational speed: 3,000 rpm	GE-Harbin Power Equipment Company
Heat Recovery	2	Model: Q2384/605-286(42.7)-	NEM-Wuhan Boiler

Steam Generator (HRSG)		10(0.40)/566.5(296.5) High pressure steam volume: 286.1 t/h Reheated steam volume: 314.2 t/h Low pressure volume: 42.7 t/h	Works
Steam turbine	2	Model: D10 Capacity: 141 MW Rotational speed: 3,000 rpm	GE-Harbin Power Equipment Company
Electricity Generator	2	Model: 390H Capacity: 397.8 MW Rated voltage: 19 kV Power factor: 0.85	GE-Harbin Power Equipment Company

A “Grid connection agreement” /29/ for connection of local power grid with the power generation system of the proposed project, and “Power purchase agreement” /30/ for the purchase arrangement of the generated electricity, have been signed between the project owner and the provincial power company in September 2005 & November 2006 respectively. As advised by the MR from HNNJJ /vii/, all the electricity being generated by the proposed project will be purchased by the grid power supply company, and it shall form the only income source (except for the potential CDM income) to the project owner.

The CER buyer, i.e. Gaisi Peony Carbon Capital, S.a.r.l. (PC) & Credit Suisse International, have signed the Letter of Intent for CER purchase /53/ with the project owner on 28th March 2007. The document is reviewed and validated by the validation team, and has been confirmed to be an effective document.

(Note: Credit Suisse International has at last claimed voluntary withdrawal from the proposed project, see Section 3.1 above.)

The proposed technology was approved as part of the FSR /10/ in June 2003 and the project design engineering is considered appropriate. The adopted technology reflects a current good practice and is deemed likely to last over the crediting period. The FSR was jointly prepared by the Southern China Electric Power Design Institute and Jiangsu Provincial Electric Power Design Institute. This original FSR was prepared on the basis of project design of 3x390MW capacity. After the project owner further assessed and considered the commercial risk being too high for such project investment, the original FSR was further supplemented by the <Supplement to FSR> /11/, which was to reduce the generation sets of 390MW capacity from three (3) to the currently adopted two (2) units. The <Supplement to FSR> was prepared by the Hebei Electric Design Institute (HEDI) on 19th April 2005, and the whole FSR (for final design of 2 sets of 390MW generation units) was approved by NDRC on 16th September 2005 /12/. HEDI attains Class I in both engineering design qualification (code: 030001-sj) and engineering investigation qualification (code: 030001-kj) granted by the State, and is a company specialized in new energy engineering consultation and industrial analysis.

During the OSV with project owner /viii/, it was understood that the project owner is responsible for organizing the necessary technical training for the operation, maintenance

and monitoring of the power station. The Operation & Maintenance Manual /38/ are jointly prepared by the turbine manufacturer (GE) and HNNJJ, and are reviewed by the validation team. The Operation and Maintenance Manuals are considered sufficient to ensure proper project operation and monitoring, since the manuals were prepared by the gas turbine manufacturer, who is also responsible to deliver relevant training. It was learnt during OSV that operational staff with relevant professional qualification and education background were employed for the power plant operation. To further strengthen, the operating staff has been trained at USA for three weeks and also on-site training by specialists from GE was provided. Also the technical staff members of the major facilities have obtained relevant qualifications issued by the General Administration of Quality Supervision Inspection and Quarantine of the P.R. China /69, 70/.

Regarding the CDM-specific operation and monitoring, the project owner has engaged the CDM consultant to provide necessary related trainings to their operational staff, and shall be started before the project being registered as a CDM project activity (tentatively scheduled in December 2009). Detailed training plan and programme /76/ is prepared and has been checked by the validation team to be valid.

As reported by HNNJJ, the physical civil construction of the proposed project has been commenced on 28th June 2005. The main construction works of the proposed project included building of powerhouse, transformer stations and installation of gas turbines and power generating units. As observed during OSV, the entire project construction has been completed and the power plant has been commissioned for power generation since December 2006 for the 1st generation unit; and March 2007 for also the 2nd generation unit.

According to the revised PDD, a renewable crediting period of 7 years is selected. The starting date of project activity is 25th June 2005 (i.e. signing date of civil construction contract with Jiangsu Number three Electrical Power Construction & Engineering Corporation) /32/, which is confirmed by the validation team to be the earliest of the dates at which the implementation or construction or real action of the project activity began in accordance with the Glossary of CDM term /2.2/. The starting date of crediting period is 1st January 2010, or the date of registration as CDM project activity (whichever later), and the expected operational lifetime of the project activity is 20 years (plus 2 years of construction period). For detailed discussion on CDM consideration, please refer to Section 3.5.1. below.

The critical project description milestones from the PDD are thus tabulated as follows:

Starting date of project	Expected project operational lifetime	Crediting period
25 th June 2005 (i.e. signing date of main civil construction contract) /32/	20 years	3 x 7 years (renewable) - starting 1 st January 2010 (<i>or the date of registration as CDM project activity (whichever later)</i>)

In summary, through the validation by means of document review, information searching, on-site observation, stakeholders' interview, etc., the validation team considered that the project

participants could sufficiently demonstrate the accuracy and completeness of project description.

3.4 Baseline and Monitoring Methodology

3.4.1 Applicability of the selected methodology to the project activity

The project applies the approved baseline methodology for CDM project activity – AM0029/Version 03 “Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas”, which is available to be applied since EB39. The applied methodology also uses the build margin (BM) and operating margin (OM) approach as specified in “Tool to calculate emission factor for an electricity system” (Version 01.1), and makes reference to the latest approved version of the “Tool for the demonstration and assessment of additionality” (Version 05.2).

Applicability criteria for the baseline methodology are assessed by the validation team by means of document review (e.g. gas supply contract, etc), literature review (e.g. analysis of local condition on NG supply & demand, etc), and on-site interview with local government officials (incl. representatives from local DRC, power company, bank). It is agreed in the validation team’s opinion that the project activity fully met the criteria as described below:

- The project activity is the construction and operation of a new natural gas fired grid-connected electricity generation plant, which has been confirmed by the validation team through on-site interview with the local DRC /i, ii/. According to the project owner, there is no any other fuel used for plant operation other than natural gas. During OSV, the validation team was able to further confirm with this by checking the equipment drawings in the operation manual /38/, project site plan (with indication of all NG pipelines) /40/ and physical inspection to the plant equipments (incl. both the main gas turbines & the start-up boiler), confirming that there is no such design for other auxiliary fuel inlet ports, except the one clearly indicated as “natural gas inlet”. Besides, the validation team did not reveal any storage of other fuel in project location;
- The geographic/physical boundaries of the baseline grid (ECPG) can be clearly identified and information on the characteristics of the grid is published by the DNA of China /61/, which is publicly available;
- The NG is sufficiently available in the region and country. Use of NG by the proposed project shall not constrain the NG use of any other comparable users, and would not thus lead to any possible leakage. The discussion is as below:-
 - The estimated annual NG consumption of the proposed project of 576 million m³ occupies only a small portion of the NG supply to the Jiangsu region; and to the Yangtze Delta Region (which includes Jiangsu, Shanghai & Zhejiang Regions). The validation team has checked against public information from Jeifang Daily /83/ & 21st Century Economic /84/; and realized that up to Year 2008, the Line 1 of “West-East Gas Pipeline” supplies 5.7 billion m³ of NG to Jiangsu Province annually. NG consumption of the proposed project thus occupies only about

10.11% of the total supply. In addition, it is worthy to realize that additional gas pipelines are under construction (i.e. Line 2 of “West-East Gas Pipeline” & “Sichuan-East Pipeline”) and the annual NG supply to Jiangsu region shall further increase very soon to 9.65 billion m³ by 2010, making the NG consumption of the proposed project occupies only 5.97% of the total supply; To further discuss the influence of the gas consumption by the proposed project to the gas supply condition in Yangtze Delta Region, the validation team is able to confirm that the project’s demand accounts only for 2.57% of NG availability in 2010 (i.e. 22,400 million m³); and 1.44% in 2015 (i.e. 40,000 million m³);

- The validation team is able to confirm by checking the NG supply agreement /37/ signed by the project owner with China PetroNatural Gas Co., Ltd. (PetroChina, who owns the “West-East Gas Pipeline”) on 29th December 2004, which is a take-or-pay agreement to guarantees a 20-year NG supply of annual amount of 541 million m³ to the proposed project. Any volumes in excess of this take-or-pay amount will be purchased and paid for on a volumetric basis as required by HNNJJ;
- As advised by the local DRC /i, ii/ & power company /xiii, xiv/ during on-site interview, it is understood that the use of NG is prioritized for those “priority users” (which includes residential users, public service facilities, etc.) in China, which is in accordance to the state policy released by NDRC in August 2007 on the strategy of NG utilization /92/. As categorized to be a “permitted user” according to the said policy, the proposed project is placed below the “priority users”. The validation team has also reviewed an announcement made by the Nanjing City Government during a press conference in November 2007, where it was reported that full efforts would be made to ensure adequate NG supply to the city /85/. According to the announcement, a seasonal pattern is noted in the NG consumption, with consumption in winter 2 to 3 times higher than in summer. It is the government’s management decision that in the event that the NG supply is not sufficient, increased supply from other sources such as Liquefied Natural Gas (LNG) will be considered, also supply to industrial users will be temporarily suspended and priority will always be given to residential users. The validation team can also check against the signed NG supply agreement /37/ that specific provisions were included in the contract (in Para. 20.5) for guaranteeing the gas supply to the proposed project would be suspended in favour of priority users. The priority of gas supply is always given to residential users, while the industrial and power-plants users are put in lower priority. Considering that the power plant will be used to balancing peak electricity load in summer and hence would be most active in summer only, where the NG supply is less in demand comparing with winter times, the impact of the proposed project to the NG consumption is not considered significant. Therefore, it is convincingly believed that it has been covered by the state policy and local government management policy that the use of NG by the proposed project shall not displace the NG that would otherwise be used elsewhere;
- The validation team could also verify against the development plan released by the Jiangsu provincial government /93/ in August 2007, and realize that development of a number of NGCC projects in Jiangsu region have already been

planned and are currently under approval process. This matter of fact can further be supported by checking on the <Introduction to the development status of gas turbine power generation project and follow-up services and spare parts procurement> /82/ issued by CNTIC in 2006, which clearly demonstrates that there are other NG fired power plants under development in Jiangsu Province. This readily demonstrates that the developments of other NG power generation projects are not constrained by the use of NG by the proposed project.

The overall expected average annual emission reduction for the proposed project is 1,044,328 tCO₂e. The greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed CDM project activity are the project emissions due to NG combustion for (i) power generation by the main gas-steam turbines and (ii) startup purpose by the start-up boiler which is designed to have NG as the only fuel source. The NG consumption is addressed by the applied methodology and shall be duly monitored. The validation team did not observe any other GHG-emitting facility during OSV. It is therefore reasonably not expected to have any other GHG emissions to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology. Please refer to Section 3.4.4 below for detailed discussion.

[Note: In response to the Request for Review, the following part of Section 3.4.1 has been modified and was supplemented to reflect the realistic & practical project situation to cover the concerns raised by the EB to further substantiate how the validation team considers the applicability of the methodology, in particular that the implementation of the project activity will not limit natural gas (NG) based power capacity additions in region and that there is no diversion of NG from other projects in the region.]

As per AM0029, version 3, the criteria of applicability of the methodology are as follows:-

- ❖ *The project activity is the construction and operation of a new natural gas fired grid-connected electricity generation plant;*
- ❖ *The geographical/physical boundaries of the baseline grid can be clearly identified and information pertaining to the grid and estimating baseline emissions is publicly available;*
- ❖ *Natural gas is sufficiently available in the region or country, e.g. future natural gas based power capacity additions, comparable in size to the project activity, are not constrained by the use of natural gas in the project activity.*

Applicability criteria for the baseline methodology have been assessed by the validation team by means of document review (e.g. gas supply contract, etc), literature review (e.g. analysis of local condition on NG supply & demand, etc), and on-site interviews with local government officials (incl. representatives from the local DRC, power company, bank). It is agreed in the validation team's opinion that the project activity fully meets the criteria as described below:-

➤ **The project activity is the construction and operation of a new natural gas fired grid-connected electricity generation plant**

The project activity is the construction and operation of a new natural gas fired grid-connected electricity generation plant, which has been confirmed by the validation team through on-site interviews with the local DRC /i, ii/. It has also been re-confirmed by cross-checking the Approval for project implementation issued by the NDRC on 16th September 2005 /Ref. 12/.

Furthermore, according to the project owner, no other fuel is used for plant operation other than natural gas. During OSV, the validation team conducted a cross-check of the equipment drawings in the operation manual /38/, project site plan (with indication of all NG pipelines) /40/ and physical inspection of the plant equipments (incl. both the main gas turbines & the start-up boiler), and further confirmed that there is no such design for other auxiliary fuel inlet ports, except the one clearly indicated as “natural gas inlet”. The validation team did not reveal any storage of other fuel at the project location.

➤ **The geographical/physical boundaries of the baseline grid can be clearly identified and information pertaining to the grid and estimating baseline emissions is publicly available**

By cross-checking the <Supplement to FSR> /Ref. 11/ and the Power Purchase Agreement /Ref. 30/ signed by the project owner with the Jiangsu Power Company, it can be confirmed that the proposed project is to supply electricity to the Jiangsu Power Grid, which itself is a sub-grid of the East China Power Grid (ECPG). As set out in the publicly available announcement by DNA of China /Ref. N6/, the geographic/physical boundaries of the ECPG (as the baseline grid) can be clearly identified to include the Jiangsu, Zhejiang, Fujian, Anhui and Shanghai Grids. The publicly available announcement also includes information pertaining to the grid for estimating the baseline emissions.

➤ **Natural gas is sufficiently available in the region or country, e.g. future natural gas based power capacity additions, comparable in size to the project activity, are not constrained by the use of natural gas in the project activity.**

The validation team confirms that the NG supply is sufficiently available in the Yangtze Delta region of China which is where the project activity is located. Use of NG by the proposed project shall not constrain the NG use of any other comparable users. The main justification is due to the following:-

- 1) the availability of NG infrastructure, i.e. large national and trans-national infrastructure projects currently in China, providing sufficient capacity to transport NG around the country; as well as to import NG via sea and overland;

- 2) a net balance of NG supply and demand in the Yangtze Delta region where the proposed project is located; and
- 3) the observation of many NGCC power plants similar to the proposed project in the region entering the operation stage, and more NGCC power plants under construction or in the planning approval process.

The detailed discussions on the above key points are as follows:-

1) Infrastructure Build

The validation team notes from referring to the International Energy Agency (IEA) Working Paper titled <Natural Gas in China: Market Evolution and Strategy> /Ref. N9/ p.9, that it is the *Chinese government's policy to promote NG use in order to improve energy diversification and energy efficiency, and as a solution to environmental problems*. It is observed that under the 11th Five-Year Plan the government set the target of raising the NG use to 10% of the energy mix by 2010, comparing with approximately 3.5% in 2007.

At a macro level, in order to achieve the above target, it is noted that very large additions to the NG infrastructure have been put in place across China in various areas to considerably increase access to NG and this has improved its capacity to transfer large volumes of gas around China. The main three key areas are as follows:-

- ❖ *domestic NG pipeline networks to interconnect gas producing and gas consuming regions;*
- ❖ *LNG terminals for importation of gas by ship; &*
- ❖ *trans-national gas pipelines connecting China to Central Asia*

The validation team is able to cross-check with relevant reference sources (as quoted in the below sections) to re-confirm the above-mentioned additions to the NG infrastructure. It covers large new additions being built by the three main Chinese oil and gas companies, Petrochina, Sinopec and CNOOC. It should be noted that some of this additional capacity came on line in recent months and is now available to supply gas to the Yangtze Delta Region, which is located mid-way along the coast of China and includes Shanghai, Zhejiang and Jiangsu Province where the Project is located.

- Domestic NG pipeline networks

The validation team notes from referring to the same IEA Working Paper /Ref. N9/ p.6 & 16, that in 2007 the IEA estimated that China's reserves from identified gas fields amounted to around 5,000 bcm, which means that the reserve/production ratio is approximately 47. The reserves are concentrated in three major gas-producing basins – the Tarim Basin, the Ordos Basin and the Sichuan Basin – representing more than half of China's total proven reserves. These three areas are in the interior of China far from the more densely populated coastal regions, as below:-

- Tarim (in the extreme North-West region of Xinjiang)
- Ordos (across the northern Chinese provinces of Shaanxi, Shanxi and Inner Mongolia)
- Sichuan (in the South-west)

Until the late 1990s, the use of NG was limited in China due to the lack of NG infrastructure. However since then, several large gas pipelines have been put in place between the Ordos Basin and Beijing (Shaan-Jing pipeline operational from 1997, and upgraded with a second line of 12 bcm capacity in 2005); and the Tarim Basin & the Yangtze Delta Region (the West-East pipeline, which was completed in 2004 with a capacity of 12 bcm).

Further to that, as revealed from the IEA Working Paper /Ref. N9/ p. 7 & 8, this infrastructure has been further upgraded recently with significant additional capacity, as follows:

- In 2008/9, the West-East pipeline was upgraded from 12 bcm capacity to 17 bcm capacity by added compression;
- It is noted from the article at Gulf Oil & Gas's webpage /Ref. N10/, titled "*Second West-East Gas Pipeline Commercial Operation – Pipe lines installation*", that on 31st December 2009 the western section of the second West-East gas pipeline became operational. As per IEA Working Paper /Ref. N9/ p. 8, Petrochina started to build this pipeline in February 2008 and its total length of 4,843 km will connect the Yangtze Delta and Southern China to the Tarim gas field in China's north-west. Its planned total capacity is 30 bcm. As further described below, this pipeline is significant for China because it was recently connected to the Central Asia – China pipeline and has started to deliver natural gas from Turkmenistan to the Yangtze Delta.
- As per IEA Working Paper /Ref. N9/ p. 8, Sinopec is also building another two inter-regional pipelines from Sichuan to the Yangtze Delta and to Guangdong. (i.e. the Sichuan-East pipeline to be discussed in more detail in the following section.)

- LNG Terminals for import of gas by ship

The validation team notes from referring to the IEA Working Paper /Ref. N9/ p. 8 & 9, that in 2006 China took its first step into the international markets with the completion of its first re-gasification terminal in Guangdong in the southern region of the Pearl River Delta.

As shown in the table below, sourced from the IEA Working Paper /Ref. N9/, China's main oil and gas companies have embarked on a program to construct a series of LNG terminals along the coast of China. It is worth-noting that, as per the public online announcement from the Oil China Net /Ref. N11/, the LNG terminal in Shanghai, which is located close to the proposed project, became operational on 20th September 2009 and has a capacity of 4.12 bcm.

	Year of Operation	Location	Capacity (mt)	Capacity (bcm) ⁵
Existing	2006	Guangdong	3.7	5.0
	2008	Fujian	2.6	3.5
	2009	Shanghai	3.0	4.1
	Total Existing		9.3	12.6
Under Construction	2011	Jiangsu Rudong	3.5	4.8
	2011	Dalian	3.5	4.8
	2011	Guangdong ⁶	2.0	2.7
	Total Under Construction		9.0	12.3
Approved	N/A	Zhejiang Ningbo	3.0	4.1
	N/A	Qingdao	3.0	4.1
Planned	N/A	Zhuhai	3.5	4.8
	N/A	Shenzhen	3.5	4.8
	N/A	Caofeidian	3.5	4.8
	N/A	Hainan	N/A	
	Total Existing and Planned		34.8	47.5

** Source: IEA Working Paper, "Natural Gas in China: Market Evolution and Strategy" /Ref. N9/, page 9

As reflected from the IEA Working Paper /Ref. N9/ & some other reference sources individually validated & quoted /Ref. N12 to N14/ (also as footnotes below), it can be noted that besides constructing the LNG terminals, China's three major oil and gas companies have at the same time entered into agreements to purchase LNG from several sources, as follows:-

Supply Source	Volume pa (mt)	Volume pa (bcm)	Term	Signing Date	Buyer	Destination Terminal
Australia NWS	3.3	4.6	25	Dec-03	CNOOC	Guangdong
Malaysia Tiga	3	4.2	25	Jul-06	CNOOC	Shanghai
Indonesia Tangguh	2.6	3.5	25	Sep-06	CNOOC	Fujian
Qatar Gas IV	3	4.2	25	Apr-08	Petrochina	Jiangsu
Qatar Gas II	2	2.7	25	Jun-08	CNOOC	Multiple
Shell	2	2.7	20	Nov-08	Petrochina	Dalian
Total (Portfolio)	1	1.4	15	Jan-09	CNOOC	Multiple
ExxonMobil	2	2.7	20	Mar-09	Petrochina	N/A
Australia QC LNG	3.6	4.9	20	May-09	CNOOC	N/A
ExxonMobil ⁷	2.25	3.1	20	Aug-09	Petrochina	N/A

⁵ Conversion factor between 'million tons' (mt) of LNG and 'billion cubic metres' (bcm) of Natural Gas is 1.36 – see <http://www.bp.com/extendedsectiongenericarticle.do?categoryId=9023800&contentId=7044894>

⁶ The second Guangdong project is an extension of existing facilities – IEA Working Paper /Ref. N9/, page 9

⁷ ExxonMobil homepage, "ExxonMobil and PetroChina announce Gorgon LNG supply agreement" /Ref. N12/, http://www.exxonmobil.com/Australia-English/PA/news_release_20080818.aspx;

ExxonMobil ⁸	2	2.7	20	Nov-09	SinoPec	Shandong
Qatar Gas ⁹	3	4.2	N/A	Nov-09	CNOOC	N/A
Total	29.75	40.9				

*** Source: IEA Working Paper, "Natural Gas in China: Market Evolution and Strategy" /Ref. N9/, page 18*

- Trans-national gas pipelines connecting China to Central Asia

The validation team notes from referring to the IEA Working Paper /Ref. N9/, that in addition to the increase in port facilities and domestic pipeline capacity as mentioned above, China is also building a pipeline network to access natural gas across its land borders. The most important of these trans-national pipelines are:

- Central Asia – China Pipeline: As per IEA Working Paper /Ref. N9/ p. 18, this pipeline first became operational on 14th December 2009. In July 2007, Petrochina and Turkmenistan signed a 30-year sale and purchase contract for 30 bcm of natural gas per annum, which was subsequently increased to 40 bcm. China also agreed to extend a \$3 billion loan to Turkmenistan to develop the South Yolotan gas field and began construction of the Central Asia – China Pipeline, which connects the Turkmenistan gas fields to China's second West-East gas pipeline described above. The Central Asia – China pipeline became operational on 14th December 2009, and the first section of the second West-East pipeline became operational on 31st December 2009 and already has been connected to the Shaan-Jing pipeline in the north. As reflected in the BP reports on proved NG reserves through its webpage /Ref. N15/, the proven reserves in Turkmenistan are around 7,940 bcm, ranking Turkmenistan as the fourth largest gas holder in the world following Russia, Iran and Qatar;
- Kazakhstan – As per IEA Working Paper /Ref. N9/ p. 19, in November 2008, Petrochina and Kazmunaigaz signed an agreement to construct another gas pipeline from the Aktyubinsk gas fields to be connected to the Central Asia – China pipeline; and,
- China – Myanmar Pipeline: As per IEA Working Paper /Ref. N9/ p. 19, in December 2008, China and Myanmar signed a sales and purchase agreement for 10 bcm of natural gas with a planned 1,000 km pipeline.

As demonstrated and verified above on the discussion of the domestic natural gas pipelines, LNG terminals and transnational pipelines, it is obvious that China has already established the infrastructure to access huge reserves of gas and transfer it around China.

⁸ People's Daily Online, "Sinopec to buy LNG from ExxonMobil" /Ref. N13/, <http://english.peopledaily.com.cn/90001/90778/90861/6804113.html>;

⁹ China Daily, "CNOOC buys more LNG from Qatar" /Ref. N14/, http://www.chinadaily.com.cn/bizchina/2009-11/14/content_8971291.htm

2) Net balance of NG supply and demand in the Yangtse Delta region where the project is located

Upon verifying that at a macro level the NG supply and its logistic capacity are considered sufficient and capable to transport NG around the country, at the local level it is also demonstrated below that NG is sufficiently available in the region where the project activity is located.

The gas supply demand balance as set out in the PDD is as follows:-

Unit: million m ³	2005	2010	2015
Natural Gas Supply Capacity	8,670	22,400	40,000
Natural Gas Demand	3,460	20,100	35,800

Since publication of the PDD additional sources of supply and demand have come on-stream. The following analysis of the balance of supply and demand in the Yangtze Delta region has been verified by the validation team based on the most up-to-date published figures, as individually validated & referenced /Ref. N16 to N37/. By referring to these most recent data, it can support the conclusions made in the PDD that there is sufficient supply of natural gas in the region to meet local demands.

-- to be continued in next page --

- ***NG supply in the Yangtze Delta region***

Table: Natural Gas Supply in Yangtze Delta Region (Unit: billion Nm ³ /a)													
Province	Natural Gas Source	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Jiangsu	West-East Pipeline I (1)	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
	West-East Pipeline II (1)	0	0	0	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	West-East Pipeline III (1)	0	0	0	0	0	0	0	0	0	0	0	0
	Sichuan-East Pipeline (2)	0	1.645	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35
	Jiangsu Rudong LNG Phase I (3)	0	0	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
	Rudong LNG Phase II (3)	0	0	0	0	0	0	0	0	0	0	0	0
	Jiangsu Yancheng LNG Program (4)	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total 1	5.7	7.345	12.85	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.45
Shanghai	West-East Pipeline I (1)	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37
	West-East Pipeline II (1)	0	0	0	2	2	2	2	2	2	2	2	2
	West-East Pipeline III (1)	0	0	0	0	0	0	0	0	0	0	0	0
	Sichuan-East Pipeline (2)	0	1.33	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
	Shanghai LNG Program (5)	1.03	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12
	East Sea Oil Gas (6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Sub-total 2	4	8.42	8.99	10.99	10.99	10.99	10.99	10.99	10.99	10.99	10.99	10.99
Zhejiang	West-East Pipeline I (1)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	West-East Pipeline II (1)	0	0	5	10	10	10	10	10	10	10	10	10
	West-East Pipeline III (1)	0	0	0	0	0	0	0	0	0	0	0	0
	Sichuan-East Pipeline (2)	0	1.35	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85
	Zhejiang LNG Project (7)	0	0	0	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	Zhejiang Wenzhou LNG Project (8)	0	0	0	0	0	0	0	0	0	0	0	0
	East Sea Oil Gas (6)	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
	Sub-total 3	2.95	4.3	8.65	17.85	17.85	17.85	17.85	17.85	17.85	17.85	17.85	19.00
Total Yangtze Region		12.65	20.07	30.49	43.29	43.29	43.29	43.29	43.29	43.29	43.29	43.29	44.44

The validation team confirms the above NG supply data by verifying the corresponding reference sources for the individual pipeline, as detailed below:-

- (1) **West-East Gas Pipeline** – The West-East gas pipeline runs from three large gas fields in the western part of China across to the east coast at Shanghai. It comprises three lines:-
 - **West-East Pipeline I** – As per IEA Working Paper /Ref. N9/ p. 7, the pipeline commenced operation in October 2004 with a capacity of 12 bcm, and rose to 17 bcm by added compression. By referring to /Ref. N16, N17 & N18/ respectively, the validation team confirms that West-East Pipeline I supplies annually 5.7 bcm of NG to Jiangsu, 1.8 bcm to Zhejiang, and 2.37 bcm to Shanghai. In addition, as announced by the Xinjiang Uygur Autonomous Region Statistic Bureau /Ref. N19/, it has been forecasted that similar levels of supply for the West-East Pipeline Project can be maintained in the following years.

- **West-East Pipeline II** – As per the same article from Gulf Oil & Gas's webpage mentioned above /Ref. N11/, the western segment of this pipeline connecting Xinjiang to Gansu was completed in December 2009, and after a 20-days preparation for pressure boosting the first gas was pumped in January 2010. It is reported by the Zhejiang News /Ref. N20/ & Xinhua Net /Ref. N21/ respectively, that the second phase of construction, connecting the West-East pipeline across to China's east coast is expected to connect to Zhejiang by mid 2011, and across to Shanghai and Jiangsu by the end of 2011. The pipeline will supply Zhejiang with 5 bcm in 2011 /Ref. N20/, and 10 bcm from 2012 onwards /Ref. N20/, and 1.6 bcm to Jiangsu /Ref. N22/ and 2.0 bcm to Shanghai /Ref. N23/ annually.
 - **West-East Pipeline III** – It is noted from the Jinhua News /Ref. N24/, that the Pipeline III is currently in the initial planning stages, and has not yet applied to the NDRC for approval. For demonstration of a conservative approach in the analysis, the supply of gas from this pipeline is discounted to zero.
- (2) **Sichuan-East gas pipeline** – The pipeline reaches from the Puguang gas field in Sichuan Province. As confirmed through cross-checking with the article from Pipe China Net & Jingjiao News respectively /Ref. N25 & N26/, it is noted that as of completion in 2009, the pipeline will supply 6.1 bcm of gas to the Yangtze Delta region, of which 2.35 bcm is allocated for Jiangsu /Ref. N25/, 1.9 bcm for Shanghai /Ref. N25/ and 1.85 bcm for Zhejiang from 2011 onwards /Ref. N26/. For 2010, Zhejiang will receive 1.35 bcm /Ref. N26/, and for the sake of conservativeness, the gas volumes for Jiangsu and Shanghai for 2010 (since the estimate data is not publicly available) have been similarly discounted by 30%, as 1.645 bcm & 1.33 bcm respectively
- (3) **Jiangsu Rudong LNG Project** – The project will be constructed in two phases, and comprises a manmade island, LNG receiving station, dock, benthal pipeline and trunk pipeline:
- **Phase I** – as reported by the China Investment Information Net /Ref. N27/, the Phase I project is expected to be commissioned by end of 2010; and it is also noted from the webpage of Jiangsu People's Government /Ref. N28/, that the Phase I project has the capacity to supply 4.8 bcm to Jiangsu Province annually;
 - **Phase II** – as reported by the Jianghai News /Ref. N29/, that when completed the Phase II project will have the capacity to supply 8.7 bcm of NG to Jiangsu Province annually. Nonetheless, as the Phase II project is currently still under construction, and is expected to be fully completed only by 2014. For the sake of demonstrating a conservative approach, the natural gas supply from this source is taken as zero in the analysis.

- (4) **Jiangsu Yancheng LNG Project** – As revealed in the Yancheng DRC homepage /Ref. N30/, the project includes an affiliated gas-fired power plant, but is yet to obtain approval from the NDRC. Therefore, for the sake of conservativeness, supply from this project has been discounted to zero in the analysis.
- (5) **Shanghai LNG Program Phase 1** – As revealed in the same article from Gulf Oil & Gas's webpage /Ref. N11/ mentioned above, this project is jointly owned by Shenergy and CNOOC Gas and Power. Construction has completed and the first shipment of LNG was delivered in September 2009 from Malaysia. CNOOC has signed a 25-year contract with a Malaysian supplier for the import of 4.12 bcm per annum through this terminal.
- (6) **East Sea Oil Gas** – As reported by the Vice General Manager of Shanghai Natural Gas Network Company in an interview programme at CCTV /Ref. N31/, this is a project which has transferred gas from the Pinghu gas field to Shanghai through a subsea pipeline since 1999. The pipeline supplies Shanghai with a total volume of 0.6 bcm of natural gas per annum. As it is revealed from the China Energy Net, article "Current Situation and Prospect for NG Utilization in Zhejiang Province" /Ref. N32/, that the pipeline supplies also 1.15 bcm of NG to Zhejiang per year.
- (7) **Zhejiang LNG Project** – This project is located in Ningbo City, which commenced construction on 18th December 2009, and which is expected to come into operation by end of 2012. As reported from the Ningbo City Financial Bureau through its homepage /Ref. N33/, the annual capacity of this project is expected to be 4.2 bcm per year, with its Phase II expanding the capacity to 8.4 bcm per year. However, as noted from the Ningbo News /Ref. N34/, the construction of Phase II project will not start until 2017. Again, for the sake of conservativeness, the supply from the Phase II project is not included in the analysis.
- (8) **Zhejiang Wenzhou LNG Project** – As noted from the Guoyuan Resource Net /Ref. N35/, this project is still in the planning stages and has yet to receive approvals. Therefore, for the sake of conservativeness the values are discounted to zero in the analysis.

- NG demand in the Yangtze Delta region

With regard to the NG demand in the Yangtze Delta, the validation team can confirm by cross-checking against the China Energy Statistical Yearbook 2008 /Ref. N36/, that the NG consumption for Shanghai, Jiangsu and Zhejiang in 2007 was 2.778 bcm, 4.458 bcm, and 1.809 bcm respectively, resulting in a total actual consumption of 9.045 bcm.

In order to estimate the future demand for NG in the Yangtze Delta Region, a growth rate of 13% (with the figure of 2007 consumption, i.e. 9.045 bcm as base factor) has been adopted. The validation team is able to refer the 2007 Report for Energy Development of China /Ref. N37/, and observes that the average growth rate of NG demand for China is expected to be

in the range of 11-13% for the next 15 years. The validation team thus agrees that the growth rate of 13% (i.e. upper value within the range) being applied in the estimation is reasonable and conservative, with the calculation result as follows:-

Table: Natural Gas Demand in Yangtze Delta Region (Unit: billion Nm³/a)

Yangtze Delta Region	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Demand	11.55	13.05	14.75	16.66	18.83	21.28	24.05	27.17	30.70	34.70	39.21	44.30

By comparing of the above verified figures of supply and demand, which also incorporate the newly updated gas supply figures, the validation team can thus conclude that it is convincing to have said that the supply of NG in the Yangtze Delta region can meet the demand. A comparison of the total supply against the total demand is set out in the table below for quick reference:-

Table: Natural Gas Supply and Demand Balance in Yangtze Delta Region (Unit: billion Nm³/a)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Supply	12.65	20.07	30.49	43.29	43.29	43.29	43.29	43.29	43.29	43.29	43.29	44.44
Demand	11.55	13.05	14.75	16.66	18.83	21.28	24.05	27.17	30.70	34.70	39.21	44.30
Balance	1.10	7.01	15.74	26.63	24.46	22.01	19.24	16.12	12.59	8.59	4.08	0.14

3) Observation of newly-constructed or planned NGCC power plants similar to the proposed project in the region

As the supply of natural gas to the Yangtze Delta region has increased, so too have the number of NGCC power plants being constructed. The validation team has validated the information in the two tables below, which show the existing natural gas-fired power plants in the Yangtze Delta region and planned capacity additions after the operation of the proposed project in Yangtze Delta.

Table a5 below shows the NGCC plants that were planned and put into operation in the period 2004-2006 when the proposed project was under development. This demonstrates that at the time the proposed project was being planned and constructed, there were already several other projects under development, so the validation team agrees that there is no evidence that the construction of the proposed project constrained other similar projects:-

Table a5 – NGCC power plants that have already been constructed in Yangtze Delta region

Region	Name of projects	MW	Status	Validation remarks
Jiangsu	Jiangsu Zhangjiagang NGCC power plant	2*390	Registered as CDM project	CDM Ref no. (2439)
	Jiangsu Wangting NGCC power plant	2*390	Registered as CDM project	CDM Ref no. (2383)
	Jiangsu Qishuyan NGCC power plant	2*390	Registered as CDM project	CDM Ref no. (2382)
Shanghai	Shanghai Baoshan NGCC power plant	3*400	Registered as CDM project	CDM Ref no. (1381)
	Shanghai Jinshan Grid Connected Natural Gas Combined Cycle Power Generation Project	2*390	Under CDM development	GSP link ¹⁰
Zhejiang	Zhejiang Zhenjiang Natural Gas Power Generation Co.	2*390	Registered as CDM project	CDM Ref no. (1344)
	Xiaoshan Gas Power Plant of Zhengjiang	2*390	Registered as CDM project	CDM Ref no. (1343)
	Yuyao Natural Gas Power Plant of China Energy Group	2*390	Registered as CDM project	CDM Ref no. (1227)
	Hangzhou Banshan Natural Gas Power Plant	3*390	Under CDM development	GSP link ¹¹

Additional natural gas fired power plants that have been planned and approved subsequent to the development of the project activity are set out below in Table a6. It is particularly noted that these planned projects listed below are not included in the common practice analysis as they have not commenced their project operation (as indicated at the column “Status” below), which the validation team agrees complies with the “Tool for the demonstration and assessment of additionality”, where it stipulates that the common practice analysis is confined to the range of similar projects that are operational.

Table a6 – NGCC power plants that are planned or already under construction in Yangtze Delta region

Region	Name of new project	MW	Status	Validation remarks
Jiangsu	Jiangsu Nantong Rudong LNG Power plant	6*390	Awaiting final approval	Project status & installed capacity confirmed by referring to the “Master Development Plan of Jiangsu Province” /Ref. N38/; & plant facilities introduction published in the homepage of the Industrial Estate where the project locates /Ref. N39/
	Jiangsu	n/a	Being planned	Project status confirmed by referring to the “Master Development Plan of Jiangsu Province” /Ref. N38/

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¹⁰ <http://cdm.unfccc.int/Projects/Validation/DB/764RAE5VWNZHR8IQ6TUWU8XBJTF46N/view.html>

¹¹ <http://cdm.unfccc.int/Projects/Validation/DB/UBC45FBRIH0FBMTEZ0VDFF3UJU75KM/view.html>

	LNG power plant			
	Jiangsu Yancheng LNG power plant	8*300	Awaiting final approval	Project status & installed capacity confirmed by referring to the Yancheng DRC homepage /Ref. N30/
Zhejiang	Zhejiang Ningbo Beilun 1 st LNG power plant	4*390	Expected to be operating by end of 2010	Project status & installed capacity confirmed by referring to China Ningbo Net /Ref. N40/
	Shanghai Minhang NGCC power plant	2*350	Awaiting final approval	Project status & installed capacity confirmed by referring to the project owner's public announcement for intended project development /Ref. N41/
Shanghai	Shanghai Lingang LNG Power Plant Phase I	4*350	Approved by NDRC, construction started on 18 th June 2009	Project status & installed capacity confirmed by referring to the project owners' joint public announcement for intended project development /Ref. N41/; and construction status confirmed by referring to Lingang News homepage /Ref. N42/

It is well demonstrated from the above that there is continued investment in, and construction of, natural gas-fired power generating infrastructure in the Yangtze Delta Region, which can further confirm the sufficient supply of natural gas and that the project activity has not resulted in any diversion of natural gas from other projects in the region.

In summary, as has been demonstrated above for the justification and the corresponding means of validation, the validation team confirms that the proposed project meets the applicability requirements for the baseline methodology AM0029 (version 03). In particular, with regard to the EB's concerns on the availability of NG in the region, it has also been convincingly demonstrated that the supply of natural gas – at the local Yangtze Delta Region level is sufficient, and, due to large national and trans-national infrastructure construction, there is sufficient capacity to transport natural gas around the country, as well as to import natural gas via sea and overland. Therefore, the implementation of the project activity will not limit natural gas based power capacity additions in the region, and there will be no diversion of natural gas from other projects in the region.

In summary, by comparing the proposed project situations with the actual text of AM0029/Version 03, the validation team considers that the project participant has correctly applied the approved methodology for the proposed project activity.

3.4.2 Project Boundary

During OSV, the validation team has observed physically that the NGCC power generation plant is in operation. All the project construction works was completed. The validation team has also checked the relevant project site plan /40/, engineering drawings & technical manuals /38/, turbines assembly from the assigned manufacturer as described in PDD.

According to approved methodology AM0029/Version 03, the project boundary is clearly defined as the physical, geographical site of the power generation source, i.e. the NGCC

power generation plant to ECPG. The ECPG includes the Shanghai, Jiangsu, Zhejiang, Anhui, and Fujian Power Grid, according to the information announced by NDRC /61/. There are no significant transmission constraints between the power plants of the ECPG.

The system boundary and the selected sources and gases are justified transparently and are presented as below:

	GHGs involved	Description
Baseline emissions	CO ₂	Major emission source
Project emissions	CO ₂	Major emission source On-site NG combustion due to proposed project operation. No use of auxiliary fuel was observed during OSV, which is in line with the project engineering design
Leakage	CO ₂ / CH ₄	No LNG was used in the proposed project activity, no leakage emission was thus identified in principle. However, considering the fact that LNG is to be consumed to meet the future local NG market demand in Jiangsu region from the year of 2011 as described in Section B.2 of PDD, calculation of leakage emission due to the use of LNG is included for conservative estimation approach. Please refer to Section 3.4.4. for detailed discussion

3.4.3 Baseline Identification

As per AM0029/Version 03, the identification of alternative baseline scenarios should include all possible realistic and credible alternatives that provide outputs or service comparable with the proposed CDM project activity. It is illustrated in the PDD that the baseline scenario is selected from evaluation of alternatives. A numbers of plausible alternatives to the project activity have been identified as follows:-

- Alternative 1 – The project activity not implemented as a CDM project;
- Alternative 2 – Power generation using natural gas, but technologies other than the project activity;
- Alternative 3 – Power generation technologies using energy sources other than natural gas; and
- Alternative 4 – Import of electricity from connected grids, including the possibility of new interconnections;

These alternatives are described in a transparent manner in the PDD. The validation team has verified the justification for the barriers faced by the alternatives and is described as follows:-

- Alternative 1 – Alternative 1 has been identified and investigated as a potential baseline scenario. A benchmark investment analysis has been carried out and presented in the PDD as described in “Step 1” of the additionality assessment presented in the PDD. The validation team has checked up with the IRR calculation and observed that the benchmark analysis has resulted in a Project IRR of 6.54% if the proposed project is implemented without CDM income. While the benchmark IRR for China power industry is 8.0%, according to the authoritative financial analysis reference – “Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects” /94/ promulgated by the State Power Corporation on 10th September 2002, the project could not demonstrate its financial attractiveness to potential investor without the incentives from CDM. Please refer to Section 3.5.3 below for details.
- Alternative 1 is thus not considered as a plausible alternative baseline.
- Alternative 2 – Through reviewing relevant literature /98/ & technology performance summary /99/, the validation team confirms that other technologies using natural gas such as the single-cycle technology would typically not render the same type of service and prove even less economical due to inferior energy efficiencies (only up to 38%-39.5% efficiency /98/, as compared to 56.7% efficiency with the currently adopted combined-cycle technology /99/).
- Alternative 2 is thus not considered as a plausible alternative baseline.
- Alternative 3 – Based on the fact that the project will be used as (seasonal) peak regulation plant, it is considered that all identified alternative baseline scenarios in Alternative 3, except the sub-critical or super-critical coal-fired power plants, would not be suitable to achieve similar energy efficiency or provide similar peak load balancing ability as the proposed CDM project activity. This is in line with the “Tool for the demonstration and assessment of additionality”, which has stated that the project proponent should “identify realistic and credible alternative(s) available to the project participants or similar project developers that provide outputs or services comparable with the proposed CDM project activity”. The validation team hence accepts that hydropower, wind power, solar power and biomass power plants technologies are not further considered plausible baseline scenarios in the PDD.
- Alternative 3, except the sub-critical or super-critical coal-fired power plants, is thus also not feasible.
- Alternative 4 – Having reviewed the revised PDD and the source documents quoted therein (with their sources and correctness confirmed) (including connection network of different power grids, Jiangsu provincial government’s development plan, etc), the validation team confirms that the regional grid connected to the ECPG (identified as connected to the Central China Power Grid (CCPG) only) are unable to provide an equivalent amount of electricity comparable to the project due to the lack of surplus peak load electricity from the connected grid (i.e. CCPG). In addition, the substantially higher grid tariff of purchasing power in ECPG, including power imported from connected grid (i.e. CCPG, over RMB 0.5

Yuan/kWh in 2005), comparing with the levelized electricity generation cost (EGC) of the sub-critical coal-fired power plant as reported below (i.e. RMB 0.2382 Yuan/kWh), further confirms that this alternative 4 is not financially attractive.

In summary, the sub-critical or super-critical coal-fired power plants have been evaluated by the validation team and found suitable for similar peak-regulating function in China /79/. The selection of the sub-critical or super-critical coal-fired power plants has been further supported by the results of survey on the newly built thermal power projects during the 10th Five-Year Plan of China (i.e. 2000-2005). Moreover, according to <China Energy Savings Technology Policy Commitments> which is issued by NDRC and Ministry of Science and Technology, newly-built oil-fired power plants are strictly prohibited, and hence this technology is also not further considered.

The validation team therefore concludes and accepts that only scenarios described in Alternative 3 – i.e. 600MW sub-critical or super-critical coal-fired power plant can be selected as a valid and plausible baseline scenario, since other technological alternatives cannot provide services comparable with the project activity.

Finally for Alternative 3 the PDD selects the 600MW sub-critical and super-critical coal-fired power plants as the other plausible alternative, which is reasonable according to the performance of the quoted power plant. A comparison using levelized electricity generation cost (EGC) as financial indicator has subsequently been carried out in accordance with the methodology, and found that the proposed project activity has a substantially higher EGC (0.3509 RMB/kWh) than the 600MW sub-critical or super-critical coal-fired power plant (0.2382 and 0.2548 RMB/kWh), even with reasonable variations of the fuel expenditure and load factors of +/- 10%.

Details regarding how the validation team has validated the assumptions used in the EGC are presented as follows:

(a) Levelized electricity generation cost (EGC)

The validation team has reviewed the approach adopted for the calculation of EGC, and confirmed that it is carried out in accordance with Section 2 of the applied methodology AM0029/Version 03, and are based on the “Cost Estimation Methodology” under Appendix 5 of the “Projected Costs of Generating Electricity – 2005 Update” published by NEA, IEA and OECD /97/. It is therefore considered that the method used for the EGC calculations are acceptable.

The validation team has reviewed the sources of the input values used for the EGC calculations of proposed alternative baseline scenarios, viz the 600MW sub-critical and super-critical coal-fired power plants, and confirmed that they are based on the “Thermal Power Engineering Design Reference Cost Index” /59/, which was issued by the State Power Corporation and is commonly used by the China Power Industry for cost estimation.

The input values for the EGC calculation in this project were based on the <Supplement to FSR> /11/, the <Supplement to FSR> was prepared by the Hebei Electric Design Institute, which was granted Class I by the government for both engineering design qualification (code: 030001-sj) and engineering investigation qualification (code: 030001-kj) in the power industry field. The whole FSR (for the final design of 2 sets of 390MW generation units) was approved by NDRC on 16th September 2005 /12/. It can thus be concluded that, the <Supplement to FSR> has been the basis of the decision to proceed with the investment in the project, and that the applied parameters are valid and plausible at the time of the investment decision.

Furthermore, in order to confirm that the key input values used in the EGC comparison are representative and conservative, the validation team has reviewed the following elements within the EGC calculation:

$$EGC = \frac{\sum_t [(I_t + M_t + F_t)(1+r)^{-t}]}{\sum_t [E_t(1+r)^{-t}]}$$

I_t : Capital expenditure in the year t.

M_t : Operation and maintenance expenditures in the year t.

F_t : Fuel expenditure in the year t.

E_t : Electricity generation in the year t.

r : Discount rate.

- (i) I_t : Capital expenditure in the year t. The investment cost of the proposed project is referenced to the <Supplement to FSR> and is reported to be 3,161 RMB/kW. This value was verified by the validation team to be correctly calculated from the capital investment and installed power, respectively. The validation team has further reviewed the investment costs of super-critical plant in China¹². The source shows that the specific investment costs for super-critical plants in China are equivalent to 3,750RMB/kW (i.e. 500 USD/kW). This is lower than the 3,919 RMB/kW assumed in the PDD for the same baseline alternative. With the unit investment of sub-critical plants lower than that for super-critical plants (please refer to footnote 41 in the PDD), this shows that the investment costs quoted in the PDD for the alternative are even more conservative;
- (ii) M_t : Operation and maintenance expenditures in the year t. The validation team has reviewed the sources of information for the input values for calculation of maintenance expenditures for the baseline alternatives, and confirmed that the sources are based

¹² Financing Capture Ready: Issuing Tradable Capture Option (Page 8). by LIANG Xi1, REINER David, GIBBINS Jon, LI Jia
<http://www.electricitypolicy.org.uk/pubs/wp/eprg0728.pdf>

on "Thermal Power Engineering Design Reference Cost Index" /59/. The input values for the project are based on the approved <Supplement to FSR> /11/ and are confirmed to correspond to the "Thermal Power Engineering Design Reference Cost Index" /59/.

- (iii) F_t : Fuel expenditure in the year t . The validation team has reviewed the sources of information for the input values for calculation of fuel expenditures for the baseline alternatives, which consists of fuel consumption and fuel price, and confirmed that the sources are based on "Thermal Power Engineering Design Reference Cost Index" /59/ and the data published by the DNA¹³. The input values for the fuel expenditures for the project are based on the approved <Supplement to FSR> /11/ and are confirmed by the validation team to be valid. These quoted values are conservative as compared with the values presented in the "Thermal Power Engineering Design Reference Cost Index" /59/.
- (iv) E_t : Electricity generation in the year t . Furthermore, the validation team reviewed the values for operating hours adopted in the PDD for the 600MW sub-critical and super-critical coal-fired power plants. In contrast to the proposed project activity, the indicated annual operating hours (3,500 hrs/annum) are not representative for these referenced plants, which would typically be operated at ca. 5,000 hrs/annum according to the "design index" /59/. Nonetheless, it is understood that the former value is selected for consistency with the project activity in the sense of comparing a comparable output of approx. 3,000,000 MWh per annum among the various alternatives (i.e. $1 \times 600\text{MW} \times 5,000\text{hrs}$ vs. $2 \times 390\text{MW} \times 3,500\text{hrs}$). The validation team considers the approach respects the principle of "provide outputs or service comparable with the proposed CDM project activity" for identification of baseline alternatives stipulated in AM0029/Version 03. It is also deemed conservative (i.e. 3,500 hrs/annum compared to 5,000 hrs/annum), because their specific generation cost would be even lower if the number of operating hours (and thus the electricity generation) increased. The above assumptions, including the sources of references, the validity of input values and the associated EGC calculations are assessed by the validation team and confirmed to be valid.
- (v) r : Discount rate. The validation team has reviewed the EGC calculations worksheet and confirmed that a discount rate of 8% is adopted for the EGC calculations across the alternatives and the proposed project itself. Based on the understanding that an IRR rate of 8% is accepted for the power industry in China (discussed in the "benchmark analysis" below), the validation team thus accept the applied discount rate to be valid.

The levelized electricity generation costs for all the three plausible baseline scenario alternatives based on comparable output were calculated and presented in PDD. It is found that the proposed project activity without CDM revenue has a relatively higher EGC (RMB

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¹³ "The Baseline Emission Factors of China Grids" Issued by the Chinese DNA, <http://cdm.ccchina.gov.cn/web/main.asp?ColumnId=25>

0.3509 Yuan/kWh) than the 600MW subcritical or super-critical coal-fired power plant (RMB 0.2382 and 0.2548 Yuan/kWh respectively), even with reasonable variations of the fuel price and annual generation hours of +/-10%.

Table 3-1 Levelized electricity generation cost (LEGC)

	<u>Alternatives</u>	<u>EGC</u>
1	The Proposed Project	0.3509
2	600MW sub-critical plant	0.2382
3	600MW super-critical plant	0.2548

** LEGC excel spreadsheet /57/ is verified by the validation team to be precise.

In addition, the validation team could validate through the additional comparison based on an equal operating hours of 3,500hrs by all the three plausible baseline scenario alternatives to confirm the robustness of Levelized Cost Analysis. It gives the same order of LEGC among the three alternatives as below:-

Table 3-2 Levelized electricity generation cost (LEGC) – 3,500hrs

	<u>Alternatives</u>	<u>EGC</u>
1	<i>The Proposed Project</i>	<i>0.3509</i>
2	600MW sub-critical plant	0.2741
3	600MW super-critical plant	0.2975

** The other LEGC excel spreadsheet (with 3,500hrs) /57.1/ is verified by the validation team to be precise.

The results therefore show that the 600MW sub-critical coal-fired power plant is the most economically attractive baseline scenario, and that the development of the proposed project activity without CDM revenue is not financially attractive compared to the selected alternative.

The validation team has checked the following in according to the latest version of Approved CDM Validation and Verification Manual /1/, and the results are tabulated as follows. The details can be referred to Appendix A.

The approved baseline methodology applicable to the project - explicit criteria - implicit criteria (e.g. available scenarios, applicability of formulas for BE/PE/LE calculations)	☒ Yes ☐ No	The selected AM0029/Version 03 is demonstrated to be applicable to the proposed project in Section 3.4.1 above.
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PDD includes all assumptions and data used by project participants	☒ Yes ☐ No	As per AM0029/Version 03
All the references and documents used are relevant for establishing the baseline scenario	☒ Yes ☐ No	All references / documents used are confirmed to be factual statements, which are essential for establishing the baseline scenario according to the AM0029/Version 03 requirements
All the references and documents used are correctly quoted and conservatively interpreted in the PDD	☒ Yes ☐ No	All footnote references / documents used are available for validation team to confirm the justifications made
All relevant policies / regulations considered are listed in the PDD	☒ Yes ☐ No	Relevant state, provincial, and local policies/regulations in NG supply have been taken into account in PDD
Identified potential baseline scenarios reasonably represent what would/could occur in the absence of the proposed project activity	☒ Yes ☐ No	The identification of potential baseline scenarios follows the procedures stipulated in AM0029/Version 03, The identification includes all possible, realistic and credible alternatives that provide outputs or services comparable with the proposed CDM project activity.
The baseline scenario selection is appropriate and determined according to the methodology	☒ Yes ☐ No	As per identification procedures stipulated in AM0029/Version 03
The approved methodology used is applicable to the identified baseline scenario	☒ Yes ☐ No	The selected AM0029/Version 03 is demonstrated to be applicable to the proposed project in Section 3.4.1 above.

[Note: In response to the Request for Review, the following part of Section 3.4.3 has been modified and was supplemented to reflect the realistic & practical project situation to cover the concerns raised by the EB to further substantiate how the validation team considers the suitability of the input values applied in the calculation of the levelised cost of electricity production of each plausible alternative and IRR analysis in line with paragraph 109 of VVM. In doing so, the validation team shall also confirm why sensitivity analysis is not conducted on all other parameters of the levelised cost of electricity production such as annual operation hour and electricity tariff.]

During the validation process, the validation team has verified the accuracy of the financial calculations carried out for the investment analysis by cross-checking the applied financial indicators against the corresponding reference sources as individually presented in the VR S.3.5.3, all of which are all considered authoritative. These sources included the following:-

- the project FSR /Ref. 10,
- the Supplement to FSR /Ref. 11/,
- project financial & baseline scenario calculation spreadsheets /Ref. 55 & 57/ (both in computation files with calculation formula transparently traceable),
- company regulations /Ref. 27/,
- project financial report /Ref. 28/,
- capital construction examination report /Ref. 20/,
- bank loan records /Ref. 15 – 17/,
- key equipment purchase contracts /Ref. 33 – 35/,
- key construction contracts /Ref. 32/,
- authorities' relevant approval or guidance documents /Ref. 10 – 14/,
- benchmark reference /Ref. 94 – 95/,
- financial assessment guideline /Ref. 3.1/, and
- on-site observation & on-site interviews with local DRC representatives (Mr. Zhang Qian /i/; & Mr. Wan Yong /ii/) who have been participating in the project application, assessment & approval process for project implementation.

The validation of the above reveals that the applied input values in the financial analysis are valid and fulfil the VVM paragraph 109 requirements. Furthermore, by methods of validation of each input parameter applied in the financial analysis, and the document/references reviewed were presented along with the validation remarks in the VR (Ver04.3, p.33-36, p.49-53). As has been set out in the VR (Ver04.3), the details of how the financial calculation and the parameters used have been validated and it has been confirmed that the underlying assumptions are appropriate and the financial calculation as reflected in IRR analysis, are correct.

Nonetheless, the validation team would still like to take this opportunity to make the justification/presentation even clearer to address the EB's concerns on the various aspects below:-

- *Why the sensitivity analysis is not conducted on all other parameters of the levelised cost of electricity production such as annual operation hour and electricity tariff;*
- *Suitability of input values in LEGC of each alternative; &*
- *Suitability of input values in IRR analysis.*

➤ **Why sensitivity analysis is not conducted on all other parameters of the levelised cost of electricity production such as annual operation hour and electricity tariff**

The formula¹⁴ applied in the PDD /Ref. 97/ to calculate the levelised electricity generation cost (LEGC) of various alternatives is as follows:-

$$LEGC = \frac{\sum_t [(I_t + M_t + F_t)(1+r)^{-t}]}{\sum_t [E_t(1+r)^{-t}]}$$

where

LEGC: Average lifetime levelised electricity generation cost per KWh.
 It: Capital expenditure in the year t.
 Mt: Operation and maintenance expenditures in the year t.
 Ft: Fuel expenditure in the year t.
 Et: Electricity generation in the year t.
 R: Discount rate.

The validation team firstly confirms that the formula is correctly applied as per its definition¹⁵:-

“...is a cost of generating energy (usually electricity) for a particular system. It is an economic assessment of the cost the energy-generating system including all the costs over its lifetime: initial investment, operations and maintenance, cost of fuel, cost of capital...”

The PP has hence performed a sensitivity analysis for all alternatives identified from the outcome of Step 1 “Identify plausible baseline scenarios“, as per the applied AM0029, version 3, so as to confirm that the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions. Of those elements in determining the LEGC, two parameters were selected for conducting the sensitivity analysis, i.e. the fuel cost and the load factor, which follows the recommendation stipulated in the methodology.

To be in line with the description set out above in the formula, these two selected parameters can be by definition understood as (or as an element of) the LEGC, as below:-

❖ Fuel cost → Ft = Fuel expenditure in the year t.
 ❖ Load Factor¹⁶ → Et = Electricity generation in the year t.

The validation team refers to the EB Guidelines on the Assessment of Investment Analysis¹⁷ /Ref. 3.2/ regarding sensitivity analysis, which states “only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation...”. As clearly reflected in the baseline

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¹⁴ Appendix 5 of Projected Costs of Generating Electricity-2005 Update, International Energy Agency,
<http://www.iea.org/textbase/nppdf/free/2005/ElecCost.pdf>

¹⁵ http://en.wikipedia.org/wiki/Levelised_energy_cost

¹⁶ http://en.wikipedia.org/wiki/Capacity_factor

¹⁷ http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf

scenario calculation spreadsheet /Ref. 57/, the fuel cost (F_t) of the project activity accounts for 70.69% of the total project cost (i.e. approx. 1,180 out of 1,669 million RMB), which is more than 20% and it has thus been considered a key parameter to be selected and included in the sensitivity analysis. With regard to the electricity generation (E_t), it has also been considered a key parameter in determining the LEGC (in another form as Load Factor). Thus, it is confirmed that the key parameters selected are appropriate and have been duly covered in the sensitivity analysis.

In contrast, the following few elements of LEGC were not included in the analysis:-

- ❖ I_t *Capital expenditure in the year t .*
- ❖ M_t *Operation and maintenance expenditures in the year t .*
- ❖ R *Discount rate*

The validation team refers to the same calculation spreadsheet /Ref. 57/, and observes that the capital expenditure (I_t) and operation and maintenance expenditure (M_t) account for only 14.77% & 14.54% respectively of the total project cost (i.e. approx. 246.58 & 242.73 out of 1,669 million RMB), both less than 20%. In addition, the investment cost was firmly predictable, and expected not readily to go beyond the 20%. Therefore, the validation team agrees that it is reasonably justified for these two parameters not to be included in the sensitivity analysis. Besides, for the discount rate (R), the value is sourced directly from the benchmark reference as a fixed value, and it is therefore also considered reasonable not to include as a factor for the sensitivity analysis.

Furthermore, to focus on the EB's concerns on why **electricity tariff & annual operation hours** are not included in the sensitivity analysis when determining the LEGC, the validation team understands that the calculation of LEGC aims to determine the **cost** of each unit of electricity generated. In view of that, as the electricity tariff is a factor which only poses influence on the project revenue, it is not an element of the LEGC, and thus it is reasonable for it not to be included in the sensitivity analysis on LEGC.

With regard to the annual operation hours, the parameter is actually directly-linked (in direct ratio) with the electricity generation (E_t , and hence Load Factor, i.e. another equivalent parameter already included as explained above). The validation team thus considers that the impact of annual operation hour has already been covered in the analysis. Nonetheless, the validation team agrees that these two parameters would have a significant impact to the IRR financial analysis, and re-confirms that they both have been covered in the sensitivity analysis of IRR analysis. For details, please refer to the VR S.3.5.3.

In order to give a clearer picture for demonstrating the robustness of the LEGC sensitivity analysis, the PP has conducted again the sensitivity analysis, and has also included those parameters which were originally not included. The results are shown below:-

- ❖ F_t *Fuel expenditure in the year t .*
- ❖ *Load Factor (thus E_t)* *Electricity generation in the year t .*
- ❖ I_t *Capital expenditure in the year t .*
- ❖ M_t *Operation and maintenance expenditures in the year t .*

Type	EGC	Load Factor (Et)				Fuel Cost (Ft)			
		-10%	-5%	5%	10%	-10%	-5%	5%	10%
600MW Sub critical Plant	0.2382	0.2473	0.2425	0.2343	0.2308	0.2268	0.2325	0.2440	0.2497
600MW super critical Plant	0.2548	0.2657	0.2600	0.2502	0.2459	0.2438	0.2493	0.2603	0.2658
The Proposed Project	0.3509	0.3613	0.3559	0.3465	0.3424	0.3296	0.3403	0.3616	0.3722
Type	EGC	Capital Investment (It)				Maintenance Costs (Mt)			
		-10%	-5%	5%	10%	-10%	-5%	5%	10%
600MW Sub critical Plant	0.2382	0.2300	0.2341	0.2423	0.2464	0.2341	0.2361	0.2403	0.2424
600MW super critical Plant	0.2548	0.2451	0.2499	0.2597	0.2646	0.2501	0.2525	0.2572	0.2596
The Proposed Project	0.3509	0.3415	0.3462	0.3556	0.3603	0.3465	0.3487	0.3531	0.3553

The validation team has cross-checked against the calculation spreadsheet /Ref. 57/, and it can be confirmed that the above result is not affected even after inclusion of other elements of LEGC in the sensitivity analysis. The LEGC of Alternative 2 remains the lowest among the various alternatives, and hence the validation team confirms that it remains selected as the baseline scenario.

➤ **Suitability of input values in LEGC of each alternative**

The validation team has verified that the input values applied in the LEGC of each alternative are valid by cross-checking the following corresponding reference sources:-

	Alternative	Source of reference for input values applied in LEGC	Ref. no.
1	The proposed project not implemented as a CDM project	Hebei Electric Design Institute, <Supplement to FSR>	/Ref. 11/
2	600MW sub-critical coal-fired power plant	China Institute of Power Planning and Design, <Thermal Power Engineering Design Reference Cost Index (2005 Edition)>	/Ref. 59/
		Power Safety Net, <Thermal power technology & its development> ¹⁸	/Ref. 88/
		NDRC, Notification for Determining Baseline Emission Factor of Regional Grid of China	/Ref. N6/
3	600MW super-critical coal-fired	China Institute of Power Planning and Design, <Thermal Power Engineering Design Reference Cost	/Ref. 59/

¹⁸ <http://www.powersafety.com.cn/default/Article/tech/hdjs/200805/39763.html>

power plant	Index (2005 Edition)>	
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All these reference sources listed above are considered authoritative, being either issued by third-party design institutes, relevant government authorities, or announced in public website of power industry. The validation team therefore considers it credible to adopt the data and parameters given therein for the LEGC determination.

As per AM0029, version3, the alternative scenarios *need not consist solely of power plants of the same capacity, load factor and operational characteristics, but should deliver similar services*. The three alternative scenarios identified in PDD could provide similar service by generating comparable peak power (i.e. 2,800,000MWh/a) in terms of methodology requirements despite different load factors among the scenarios. The validation team is able to verify the parameters and the associated applied input values of each identified alternative in the LEGC analysis individually, by cross-checking against the corresponding reference source.

i) For Alternative 1, i.e. the proposed project not implemented as a CDM project

It is observed that the data used to calculate the LEGC for the proposed project were taken from the <Supplement to FSR> /Ref. 11/, which is confirmed to be the same set of data used for the IRR calculation, as set out in PDD. The suitability of these input values shall be discussed below in the next section “*Suitability of input values in IRR analysis*” in VR S.3.5.3 below.

The LEGC of the proposed project is then compared with the <Thermal Power Engineering Design Reference Cost Index (2005 Edition)> /Ref. 59/ to see whether the input values were applied comparably (see **Table a1** below). To further confirm the continued suitability of the input values applied, the latest edition of the <Cost Index (2008 Edition)> /Ref. N7/ is also included for comparison.

Table a1 – Cross-checking of the calculation of levelized cost for Alternative 1

Item	Unit	Alternative 1 – the proposed project	<Referenced Cost Index 2005 level> /Ref. 59/	<Referenced Cost Index 2008 level> /Ref. N7/
Investment	RMB/KW	3,161	3,060	3,222
Annual operation hours	H	3,500	3,500	3,500
Water expenditure	RMB/MWh	0.5	1	0.5
Material expenditure	RMB/MWh	8.5	8	8
Maintenance cost rate	%	2.5%	2.5%	2.5%
Other expenditure	RMB/MWh	11	12	12
Pollution discharge fees	RMB per unit	-	-	-
Number of staff		80	120	100
Salary and welfare	RMB/year/person	64,200	80,000	80,000
Fuel consumption rate	m ³ /kWh (g standard coal/kWh)	0.2058	0.2120	0.2120
Fuel price	RMB/m ³ gas	1.10 (In VAT)	1.30(In VAT)	2.05(In VAT)

Desulfurization expenditure	RMB/ton coal	-	-	-
Discount rate	-	8%	8%	8%
Technical Lifetime	Years	20	20	20
Construction period	Years	3	3	3
Levelized cost	RMB/kWh	0.3509	0.3859	0.5399

In the <Cost Index (2005 Edition)> (p.212), it states that the guidance unit investment of the same type of facility should be 3,060 RMB/kW, resulting with a LEGC of 0.3859 RMB/kWh. This is higher than that of the proposed project of 0.3509 RMB/kWh. The validation team thus considers the input values applied for calculating the LEGC for the proposed project (Alternative 1) are reasonable and conservative.

ii) For Alternative 2, i.e. 600MW sub-critical coal-fired power plant

The validation team confirms that almost all the data used to calculate the LEGC for Alternative 2 are directly referenced to the <Cost Index (2005 Edition)> (see **Table a2** below), with the exception of the unit investment and unit fuel consumption rate, since the <Cost Index (2005 Edition)> specifies only these 2 values for 300MW sub-critical coal-fired power plant. In order to apply the relevant data in a more precise manner for the analysis, these 2 values for the 600MW sub-critical coal-fired power plant have been sourced respectively from public-available research report /Ref. 88/ and Chinese NDRC announcement notice /Ref. N6/, where the unit investment is confirmed to be correctly applied as 3,723 RMB/kW, and the unit fuel consumption rate as 336.66 g standard coal/kWh. (Note: Similar to Alternative 1 above, <Cost Index (2008 Edition)> is also included here)

Table a2 – Cross-checking of the calculation of levelized cost for Alternative 2

Item	Unit	Alternative 2 – 600MW sub-critical coal fired power plant	<Referenced Cost Index 2005 level> /Ref. 59/	<Referenced Cost Index 2008 level> /Ref. N7/
Investment	RMB/KW	3,723 ¹⁹	4,596	3,809
Annual operation hours	H	5,000	5,000	5,000
Water expenditure	RMB/MWh	1	1	0.5
Material expenditure	RMB/MWh	5	5	5
Maintenance cost rate	%	2.5%	2.5%	2.5%
Other expenditure	RMB/MWh	10	10	10
Pollution discharge fees	RMB per unit	3,130,000	3,130,000	3,130,000
Number of staff		234	234	234
Salary and welfare	RMB/year/person	80,000	80,000	80,000
Fuel consumption rate	g standard coal/kWh	336.66 ²⁰	315	329.94 ²¹

¹⁹ The unit investment for super critical units is commonly 3%~10% higher than sub-critical units. In the PDD, the unit investment of 600MW sub-critical units is assumed as 95% of super critical units, which is reasonable.

²⁰ <http://www.powersafety.com.cn/default/Article/tech/hdjs/200805/39763.html>

²¹ <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1051.pdf>

²¹ <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/2008/20081231101111351.pdf>

Fuel price	RMB/m ³ gas RMB/ton coal	430(In. VAT)	430(In. VAT)	640(In VAT)
Desulfurization expenditure	RMB/ton coal	3.64	3.64	3.64
Discount rate	-	8%	8%	8%
Technical Lifetime	Years	20	20	20
Construction period	Years	3	3	3
Levelized cost	RMB/kWh	0.2382	0.2501	0.2945

In the <Cost Index (2005 Edition)> (p.4), it states that the guidance unit investment of the same type of facility is 4,596 RMB/kW, resulting in a LEGC of 0.2501 RMB/kWh. This is higher than that of Alternative 2 of 0.2382 RMB/kWh.

As the <Cost Index (2005 Edition)> only specifies the guidance data for 300MW facility, it is also logical that the LEGC of Alternative 2, being a 600MW facility, shall be lower than the one of 300MW facility. The validation team thus considers the input values applied for calculating the LEGC for the Alternative 2 being reasonable and conservative. This is consistent with all 19 registered NGCC CDM projects using AM0029 in China.

iii) For Alternative 3, i.e. 600MW super-critical coal-fired power plant

The validation team confirms that all the data used to calculate the LEGC for Alternative 3 are directly referenced to the <Cost Index (2005 Edition)> (see **Table a3** below). (Note: Similar to Alternative 1 & 2 above, <Cost Index (2008 Edition)> is also included here)

Table a3 – Cross-checking of the calculation of levelized cost for Alternative 3

Item	Unit	Alternative 3 – 600MW super- critical coal fired power plant	<Referenced Cost Index 2005 level> /Ref. 59/	<Referenced Cost Index 2008 level> /Ref. N7/
Investment	RMB/KW	3,919	3,919	3,724
Annual operation hours	H	5,000	5,000	5,000
Water expenditure	RMB/MWh	1	1	0.5
Material expenditure	RMB/MWh	5	5	5
Maintenance cost rate	%	2.5%	2.5%	2.5%
Other expenditure	RMB/MWh	10	10	10
Pollution discharge fees	RMB per unit	5,680,000	5,680,000	5,680,000
Number of staff		247	247	247
Salary and welfare	RMB/year/person	80,000	80,000	80,000
Fuel consumption rate	g standard coal/kWh	299	299	299
Fuel price	RMB/m ³ gas RMB/ton coal	430(In VAT)	430(In VAT)	640(In VAT)
Desulfurization expenditure	RMB/ton coal	3.64	3.64	3.64
Discount rate	-	8%	8%	8%
Technical Lifetime	Years	20	20	20
Construction period	Years	4	4	4
Levelized cost	RMB/kWh	0.2548	0.2548	0.3021

In the <Cost Index (2005 Edition)> (p.97), it states that the guidance unit investment of the same type of facility is 3,919 RMB/kW, resulting in a LEGC of 0.2548 RMB/kWh. This is identical to that of Alternative 3. The validation team thus considers the input values applied for calculating the LEGC for the Alternative 3 being suitable.

By cross-checking the values used in the calculation of the LEGC of each alternative against its corresponding reference sources, the validation team confirms the suitability of all of the input values applied in the LEGC calculation. The calculation results (see **Table a4** below) show that the Alternative 2 (i.e. 600MW sub-critical coal-fired power plant) is the most economically attractive baseline scenario.

Table a4 – Summary of Levelised Cost Analysis among various alternative scenarios

Item	Unit	Alternative 1 – the proposed project	Alternative 2 – 600MW sub-critical coal fired power plant	Alternative 3 – 600MW super-critical coal fired power plant
Levelized cost	RMB/kWh	0.3509	0.2382	0.2548

In summary, the baseline determination is considered by the validation team to be transparent and reasonable.

3.4.4 GHG Emission Reductions

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

As per AM0029/Version 03, the project participant correctly applies the latest version of “Tool to calculate the emission factor for an electricity system” (Version 01.1) approved by the EB to demonstrate the calculation of emission factor for the electricity system.

According to the applied methodology AM0029/Version 03 and the “Tool to calculate the emission factor for an electricity system”/Version 01.1, the emission reduction (ER_y) by the project activity during the crediting period is the difference between the baseline emissions (BE_y), project emissions (PE_y) and emissions arising from leakage (L_y), which is expressed as follows:

$$ER_y = BE_y - PE_y - L_y$$

The *ex-ante* estimation of emission reductions is based on the most recent data available at the time of submission of the PDD to the DOE for validation, i.e. the time for global stakeholder consultation. The estimation of net electricity generation, relevant baseline emissions, project emissions and leakage emissions of the project, were reasonably and transparently carried out.

As per AM0029/Version 03, baseline emissions are calculated by multiplying the electricity generated in the project plant with a baseline emission factor. In order to address the considerable uncertainty (i.e. relating to which type of other power generation is substituted by the power generation of the project plant) in a conservative manner, the lowest emission factor among the following three options is used:-

- Option 1 The build margin, calculated according to “Tool to calculate the emission factor for an electricity system”; and
- Option 2 The combined margin, calculated according to “Tool to calculate the emission factor for an electricity system”, using a 50/50 OM/BM weight; and
- Option 3 The emission factor of the technology (and fuel) identified as the most likely baseline scenario under “Identification of the baseline scenario” above

A default weight for the project activity using a 50/50 OM/BM weight is adopted for the Option 1 & Option 2 calculation for the first crediting period; and 25/75 OM/BM weight for the second and third period according to “Tool to calculate the emission factor for an electricity system/Version 01.1”. For the calculation of the OM emission factor, simple OM emission factor calculation method was chosen because the low cost must run projects constitute less than 50% of the total grid generation and data was not available for applying the dispatch data analysis. The average emission factor for the grid for each fuel type was calculated *ex-ante* based on a 5-year full generation-weighted average of the most recent statistics available (data available from 2001 to 2004 derived from China Electric Power Yearbooks and China Energy Statistical Yearbooks /65, 64/ at the time of PDD submission in October 2006). Because plant specific fuel consumption and electricity generation data was not publicly available in China, a deviation of the baseline methodology of AM0005 (later replaced by ACM0002) approved by the EB (as detailed in the PDD) was adopted for using relevant emission data published by the DNA of P.R. China, i.e. the best available information at the time of PDD submission of DOE.

According to the PDD, the BM emission factor was calculated to be 0.8030 tCO₂e/MWh (Option 1) and the simple OM emission factor was calculated to be 0.9588 tCO₂e/MWh, resulting the CM was 0.8809 tCO₂e/MWh (Option 2).

As per Section B.4 of PDD, which is validated above, the most likely baseline scenario is identified as the “construction of a 600MW sub-critical coal-fired power generation plant” (please refer to Section 3.4.3. above for detailed discussion). Emission factor of the technology identified as the most likely baseline scenario was calculated to be 0.9322 tCO₂e/MWh (Option 3).

According to AM0029/Version 03, the lowest emission factor among the three options should be used. Thus, Option 1 of 0.8030 tCO₂e/MWh is adopted. Where the estimated net annual grid-in electricity to ECPG is 2,716,000 MWh, the baseline emissions for the proposed project is therefore 2,180,948 tCO₂e per year.

[Note: In response to the Request for Review, the following part of Section 3.4.4 has been modified and was supplemented to reflect the realistic & practical project situation to cover the concerns raised by the EB to further substantiate how the validation team validate the energy efficiency of the technology in the baseline (η_{BL}).]

Energy efficiency of the technology in the baseline (η_{BL}) as **36.53%**

The validation team has confirmed the parameter by cross-checking the official Notification for Determining Baseline Emission Factor of Regional Grid of China /Ref.N6/ (p.4), which was first issued by the China DNA in Aug-2006 through its webpage. However, it was subsequently updated in Dec-2006 as it now appears on the web²². Nonetheless, the validation team is able to confirm that the relevant figures (i.e. energy efficiencies of different power technologies) were not revised in that update, and thus the applied value of 36.53% is considered the best available information during the time the PDD was published for GSP in Oct-2006.

As per AM0029, version 3, in order to address in a conservative manner the uncertainty relating to which type of other power generation is substituted by the power generation of the project plant, the PP shall use for $EF_{BL,CO2,y}$ the lowest emission factor among the three options stipulated in AM0029, version 3. The relevant parameter (i.e. η_{BL}) is used in Option 3 to calculate the emission factor of the technology (and fuel) identified as the most likely baseline scenario under the PDD Section "Identification of the baseline scenario", and calculated as follows:-

$$EF_{BL,CO2,option3} = \frac{COEF_{BL}}{\eta_{BL}} \times 3.6GJ / MWh$$

As referring to the PDD, the identified baseline scenario is "*the construction of a new 600MW sub-critical coal-fired power plant*", the energy efficiency of the technology in the baseline (η_{BL}) is thus confirmed to be **36.53%**, which is transparently referable to p.4 of the source reference /Ref.N6/.

For project emission calculation, according to the project owner /viii/ there is no any other fuel used for plant operation other than natural gas. During OSV, the validation team was able to further confirm by checking the equipment drawings & operation manual /38/ and physical inspection to the plant equipments (incl. both the main gas turbines & the start-up boiler), confirming that there is no such design for other auxiliary fuel inlet ports, except the one clearly indicated as "natural gas inlet". Besides, the validation team did not reveal any

²² NDRC, Notification for Determining Baseline Emission Factor of Regional Grid of China (<http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1051.pdf>)

storage of other fuel in the project location. Thus, the project emissions were calculated by the total volume of NG combusted in the project plant, multiplied by the CO₂ emission coefficient of NG. In Section B.6.1 of the PDD, the CO₂ emission coefficient was calculated from the Net Calorific Value (NCV) of NG, CO₂ emission factor per unit of NG, and the oxidation factor of NG. These data were adopted from the national data updated by the Chinese DNA, <Supplement to FSR>, and IPCC 2006 default. The project emission was calculated to be 1,136,620 tCO₂e per year. The validation team considers the values were reasonably applied in the calculation.

[Note: In response to the Request for Review, the following part of Section 3.4.4 has been modified and was supplemented to reflect the realistic & practical project situation to cover the concerns raised by the EB to further substantiate how the validation team validate that the applied value of emission factor of NG is consistent between PDD and the spread sheets.]

The validation team confirms that the applied value of emission factor of NG is actually consistent between PDD and the spreadsheets /Ref. 56/. The reason why the two values appear to be different is due to the unit presentation. The value is presented in PDD in **0.0561 tCO₂/GJ**, while in spreadsheets (i.e. /Ref. 56/, cell D8) in **0.0153 tC/GJ**. The conversion is as below:-

In spreadsheets	In PDD
0.0153 tC/GJ * 44/12	0.0561 tCO₂/GJ

For leakage calculation, the validation team is able to confirm through physical inspection & interview with project owner during OSV that only NG is used as the only fuel source in the project activity. No LNG is used in the proposed project activity, and thus no leakage emission is taken into account in principle.

However, as described in Section B.2 of PDD, considering the fact that LNG is to be consumed to meet the future local NG market demand in Jiangsu region from the year of 2011, calculation of leakage emission due to the use of LNG is included for conservative estimation approach.

As per AM0029/Version 03, the leakage emissions were calculated by adding up the fugitive upstream CH₄ emissions and CO₂ emissions from LNG. The validation team hence checked the leakage calculation presented in Annex 3 of the PDD and confirms that the fugitive upstream CH₄ emissions was calculated (in the revised PDD, which is validated as shown below) to be -176,579 tCO₂e per year, and the CO₂ emissions from LNG to be 121,563 tCO₂e per year. Where total net leakage effects are negative (L_y<0), according to AM0029/Version 03, the L_y should thus assume 0.

[Note: In response to the Request for Review, the following part of Section 3.4.4 has been modified and was supplemented to reflect the realistic & practical project situation to cover the concerns raised by the EB to further substantiate how the validation team validate the Leakage, in particular baseline emission factor for upstream fugitive methane emissions ($EF_{BL,upstream,CH4}$).]

Leakage, in particular baseline emission factor for upstream fugitive methane emissions ($EF_{BL,upstream,CH4}$) – The validation team confirms the Leakage calculation detailed in PDD by referring to the procedure stipulated in the applied methodology AM0029, version 3, to be correct.

As per AM0029, version 3, leakage emissions should be calculated as follows:-

$$LE_y = LE_{CH4,y} + LE_{LNG,CO2,y}$$

where:

LE_y : = Leakage emissions during the year y in tCO₂e;
 $LE_{CH4,y}$: = Leakage emissions due to fugitive upstream CH₄ emissions in the year y in t CO₂e;
 $LE_{LNG,CO2,y}$: = Leakage emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system during the year y in t CO₂e

Fugitive methane emission ($LE_{CH4,y}$)

As per AM0029, version 3, for the purpose of estimating fugitive CH₄ emissions, project participants should multiply the quantity of natural gas consumed by the project in year y with an emission factor for fugitive CH₄ emissions ($EF_{NG,upstream,CH4}$) from natural gas consumption and subtract the emissions occurring from fossil fuels used in the absence of the project activity, as follows:-

$$LE_{CH4,y} = \left(FC_y \times NCV_y \times EF_{NG,upstream,CH4} - EG_{PJ,y} \times EF_{BL,upstream,CH4} \right) \times GWP_{CH4}$$

where:

FC_y : = Quantity of natural gas combusted in the project plant during the year y in m³ [Validation opinion: The value of **576,240,000m³**, as referable to the <Supplement to FSR>, is correctly adopted.];
 $NCV_{NG,y}$: = Average net calorific value of the natural gas combusted during the year y in GJ/m³ [Validation opinion: The value of **0.03516GJ/m³**, as referable to the <Supplement to FSR>, is correctly adopted.];
 $EF_{NG,upstream,y}$: = Emission factor for upstream fugitive methane emissions of natural gas from production, transportation, distribution, and, in the case of LNG, liquefaction, transportation, re-gasification and compression into a transmission or distribution system, in tCH₄ per GJ fuel supplied to final consumers. [Validation opinion: The default value of **296 tCH₄/PJ**, i.e. **0.000296tCH₄/GJ**, for the category "Other oil exporting countries / Rest of world" as per Table 2 in AM0029, version 3, is correctly adopted.]
 $EG_{PJ,y}$: = Electricity generation in the project plant during the year in MWh. [Validation opinion: The value of **2,716,000MWh**, as referable to the <Supplement to FSR>, is correctly adopted.];
 $EF_{BL,upstream,CH4}$: = Emission factor for upstream fugitive methane emissions occurring in the absence of the project activity in tCH₄ per MWh electricity generation in the project plant. [Validation

opinion: The value adopted is **0.005304 tCH₄/MWh**, which is considered by the validation team to be correct. Please refer to the next paragraph for detailed validation of its calculation.];

GWP_{CH_4} : = Global warming potential of methane valid for the relevant commitment period. [Validation opinion: The default value of **21**, as per IPCC default, is correctly adopted.]

Further to the above, in particular addressing the EB's concern regarding the emission factor for upstream fugitive CH₄ emissions occurring in the absence of the project activity (i.e. $EF_{BL,upstream,CH_4}$) in tCH₄ per MWh electricity generation in the project plant, the validation team confirms that the figure has been calculated consistent with the baseline emission factor (EF_{BL,CO_2}) as set out in step 2 of the PDD. As demonstrated in PDD, the lowest baseline emission factor (EF_{BL,CO_2}) among the three options is Option 1, i.e. the Build Margin calculated according to "Tool to calculate the emission factor for an electricity system", therefore the $EF_{BL,upstream,CH_4}$ in this project has been correctly calculated as follows:-

$$EF_{BL,upstream,CH_4} = \frac{\sum_j FF_{j,k} \times EF_{k,upstream,CH_4}}{\sum_j EG_j}$$

where:

j = Plants included in the build margins;

$FF_{j,k}$ = Amount of fuel k (a coal or oil type) combusted in power plant j included in the build margin;

$EF_{k,upstream,CH_4}$ = Emission factor for upstream fugitive methane emissions from production of the fuel type k (a coal) in t CH₄ per MJ fuel produced

The validation team can also confirm by checking the method of calculating BM emission factor taken by the Chinese DNA, the calculation formula for the $EF_{BL,upstream,CH_4}$ could be converted to:-

$$EF_{BL,upstream,CH_4} = \frac{CAP_{Thermal}}{CAP_{Total}} \times EF_{Thermal,upstream,CH_4}$$

$$EF_{Thermal} = \lambda_{Coal} \times EF_{Coal,upstream,CH_4} + \lambda_{Oil} \times EF_{Oil,upstream,CH_4} + \lambda_{Gas} \times EF_{Gas,upstream,CH_4}$$

where

$EF_{Coal,upstream,CH_4}$ = Emission factor for upstream fugitive methane emissions from production of coal [Validation opinion: It is indicated from a "Workshop of coal mine safety management" /Ref. N43/, that more than 95% of the coal production in China is produced by underground mining, therefore the $EF_{coal,upstream,CH_4}$ is correctly assumed to be the default value of 13.4 tCH₄ / kt coal as per Table 2 in AM0029, version 3. It is also noted that in this case of coal the emission factor is provided based on a mass unit, which must be converted in to an energy unit, taking into account the net calorific value of the coal, as set out in AM0029, version 3. According to the data issued by Chinese DNA, the best technology for coal-fired power plant is the domestic sub-critical 600MW coal-fired power unit with the fuel consumption of 336.66g standard coal /kWh. In addition, it is also confirmed by checking the China Energy Statistics Yearbook 2006 (p.287), that the net caloric value of standard coal is 1.4 times of the one of raw coal, i.e. the consumption of raw coal emits 1.4 times of the standard coal. Thus:- $EF_{coal,upstream,CH_4} = 13.4 / 1000 \times 0.33666 \times 1.4 = 0.006315$ tCH₄ / MWh]

$EF_{Gas,upstream,CH_4}$ = Emission factor for upstream fugitive methane emissions from production of natural gas. [Validation opinion: The default value of **296 tCH₄/PJ**, for the category “Other oil exporting countries / Rest of world”, as per Table 2 in AM0029, version 3, is correctly adopted.]

$EF_{Oil,upstream,CH_4}$ = Emission factor for upstream fugitive methane emissions from production of oil. [Validation opinion: The default value of **4.1 tCH₄/PJ**, as per Table 2 in AM0029, version 3, is correctly adopted.]

The data of Year 2005 given by Chinese DNA, as the best available information, is correctly adopted for λ , as below:-

$$\lambda_{Coal} = 96.16\%, \lambda_{Oil} = 3.36\%, \lambda_{Gas} = 0.48\%$$

Based on the formula above, the $EF_{Thermal, upstream, CH_4}$ is correctly calculated in PDD as below:-

$$\begin{aligned} &= [96.16\% \times 0.006315] + [3.36\% \times 0.0000041/3.6] + [0.48\% \times 0.000296/3.6] \\ &= 0.00607 \text{ tCH}_4/\text{MWh} \end{aligned}$$

Therefore, the validation team can confirm the calculation of $EF_{BL,upstream,CH_4}$ is correctly calculated in the PDD, as below:-

$$EF_{BL,upstream,CH_4} = \frac{CAP_{Thermal}}{CAP_{Total}} \times EF_{Thermal,upstream,CH_4}$$

where

$\frac{CAP_{Thermal}}{CAP_{Total}}$ is confirmed by the validation team to be 87.39% according to the data released by the Chinese DNA, for the proportion of fuel-fired power plants in the recently built installed capacity of ECG during 2002–2004

$$EF_{BL,upstream,CH_4} = 87.39\% \times 0.00607 \text{ tCH}_4/\text{MWh} = \mathbf{-0.005304 \text{ tCH}_4/\text{MWh}}$$

Therefore, based on the formula above, the leakage emissions due to fugitive CH₄ emission ($LE_{CH_4,y}$) has been correctly calculated in PDD as below:-

$$LE_{CH_4,y} = \left(FC_y \times NCV_y \times EF_{NG,upstream,CH_4} - EG_{PJ,y} \times EF_{BL,upstream,CH_4} \right) \times GWP_{CH_4}$$

$$LE_{CH_4} = \{ [576,240,000 \text{ m}^3 \times 0.03516 \text{ GJ/m}^3 \times 0.000296 \text{ tCH}_4/\text{GJ}] - [2,716,000 \text{ MWh} \times 0.005304 \text{ tCH}_4/\text{MWh}] \} \times 21$$

$$LE_{CH_4} = \mathbf{-176,579 \text{ tCO}_2\text{e}}$$

CO2 emissions from LNG ($LE_{LNG,CO2,y}$)

As demonstrated in PDD and explained in VR, the validation team is able to confirm through physical inspection & interview with project owner during OSV that only NG is used as the sole fuel source in the project activity. No LNG is used in the proposed project activity, and thus no leakage emission is taken into account in principle.

However, as described in Section B.2 of PDD, considering the fact that LNG is to be consumed to meet the future local NG market demand in Jiangsu region from the year of 2011, calculation of leakage emission due to the use of LNG is included for conservative estimation approach.

As per AM0029, version 3, where applicable, CO2 emissions from fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system ($LE_{LNG,CO2,y}$) should be estimated by multiplying the quantity of natural gas combusted in the project with an appropriate emission factor, as follows:-

$$LE_{LNG,CO2,y} = FC_{LNG,y} \cdot EF_{CO2,upstream,LNG}$$

where:

$LE_{LNG,CO2,y}$: = Leakage emissions due to fossil fuel combustion / electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system during the year y in t CO₂e;

$FC_{LNG,y}$: = Quantity of LNG combusted in the project plant during the year y in m³. [Validation opinion: The value of **576,240,000m³**, as referable to the <Supplement to FSR> as the total volume of gas consumed by the project activity, is correctly adopted.];

$EF_{CO2,upstream,LNG}$: = Emission factor for upstream CO₂ emissions due to fossil fuel combustion / electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system. The default value of 6tCO₂/TJ, as defined by AM0029, is adopted. [Validation opinion: Since the data of $EF_{CO2,upstream,LNG}$ is not available, as per AM0029, version 3, the default value of **6 tCO₂/TJ** is correctly adopted.]

Therefore, based on the formula above, the leakage emissions due to CO₂ emissions from LNG ($LE_{LNG,CO2,y}$) has been correctly calculated in PDD as below:-

$$LE_{LNG,CO2,y} = \{ [576,240,000 \text{ m}^3 \times 0.03516 \text{ GJ/m}^3 \times 0.006 \text{ tCO}_2/\text{GJ}$$

$$LE_{LNG,CO2,y} = \mathbf{121,563 \text{ tCO}_2\text{e}}$$

The total net leakage is therefore calculated to be:-

$$LE_y = LE_{CH4,y} + LE_{LNG,CO2,y}$$

$$\begin{aligned}
 &= 121,563 - 176,579 \\
 &= -55,016 \text{ tCO}_2\text{e}
 \end{aligned}$$

As the total net leakage effects are negative ($LE_y < 0$), it is therefore confirmed by the validation team to be correctly assumed as $LE_y = 0$, which is in accordance with the AM0029, version 3, as demonstrated in the PDD.

In summary, the emission reductions due to the project activity were estimated *ex-ante* to be 1,044,328 tCO₂e per year. The validation team considers the emission reduction calculation was transparently carried out.

The validation team has checked the calculation in Annex 3 Baseline Information from PDD and validated that the calculation is based on the requirement in “Tool to calculate the emission factor for an electricity system/Version 01.1”. The validation team has verified the parameters applied in the baseline information according to the data source, i.e. China Electric Power Yearbooks and China Energy Statistical Yearbooks 2003-2005, 2006 IPCC Guideline for National Greenhouse Gas Inventories, Volume 2. Preciseness of the used data was verified by the validation team.

All assumptions made for estimating GHG are listed in the PDD	☒ Yes ☐ No	See PDD Section B.6., assumptions were made for ex-ante GHG emission reductions
All data used by project participants are listed in the PDD	☒ Yes ☐ No	See PDD Annex 3, all data such as GHG emission, local power generation used by the PPs are listed transparently.
Their references and sources are also listed in the PDD	☒ Yes ☐ No	See PDD Annex 3, all data from public sources, such as Chinese Yearbooks, statistics from Chinese DNA are listed
Formulas, parameters, values are complete, accurate, transparent and conservative	☒ Yes ☐ No	See PDD Annex 3, spreadsheet is checked to confirm the accuracy, transparency, and conservativeness.
All the references and documents used are correctly quoted and conservatively interpreted in the PDD	☒ Yes ☐ No	See PDD Annex 3
Methodology has been applied correctly to calculate project emissions, baseline emissions, leakage emissions and emission reductions	☒ Yes ☐ No	The selected AM0029/Version 03 & its linked “Tool to calculate the emission factor for an electricity system/Ver01.1”

		are correctly applied to calculate the project emissions, baseline emissions, leakage and emission reductions.
All the emissions of baseline emissions can be replicated using information provided in the PDD	☒ Yes ☐ No	Calculation spreadsheet with transparent and replicable formula is available for validation team's checking

3.5 Additionality

According to the PDD, the project proponent has correctly applied the "Tool for the demonstration and assessment of additionality" (Version 05.2) approved by the EB to demonstrate the additionality of the proposed project in accordance with AM0029/Version 03.

3.5.1 CDM consideration

The validation team noticed that the project proponent (i.e. China Huaneng Group – the mother company of HNNJJ) has considered the incentives from CDM way before the proposed project starts.

The Huaneng Group has been widely recognized as one of the forerunners in the CDM development in China. As early as in Year 2004, the Huaneng Group actively participated in CDM capacity building initiatives. Of which, the most significant one was organized by the World Bank together with China's Ministry of Science and Technology (MOST) and the German and Swiss Governments. It is realized that the World Bank undertook an in-depth study of CDM potential in China, which is commonly referable to its study report released in June 2004, viz. "*Clean Development Mechanism: Taking a Proactive and Sustainable Approach*" /108/. In the study report /108/, six project cases have been identified as case studies for design of new CDM methodologies. One identified project is indeed a project under Huaneng Group (viz. Huaneng's Qinbei Supercritical Coal Fired Power Project); and another involving NGCC plant in Beijing district. It is thus an important demonstration of the knowledge that Huaneng as a group had acquired to develop its understanding of the incentives from the CDM at an early stage.

Subsequently, the Huaneng Group has successfully submitted the first wave of wind power projects for registration with UNFCCC in mid-2006. During OSV, the validation team acknowledged from the representative of Huaneng Group /v/ that they have learnt more during the CDM Workshop in December 2004 about the potential CDM development in their on-list projects /107/. They then profoundly studied the carbon assets for individual projects, including natural gas fired power generation, and considered them highly capable to meet all the CDM requirements. Rounds of detailed discussions had also been made thereafter between the project proponent & CDM consultants, in which the affirmative conclusions even braced up the project proponent's confidence on the project's CDM implementation.

In addition, the validation team has also carried out a search about the status of the project

proponent, and found that a statement was made in December 2004 about the Huaneng Group's intention to make use of CDM as incentives to develop a range of renewable energy projects²³. This further confirms that the project proponent has generally considered the incentives from the CDM in a fairly early stage.

To further study the project-specific CDM consideration by the project proponent, the validation team has assessed the project development and the corresponding CDM consideration scenario according to the document review and on-site interview with project participants and stakeholders. In summary, the project timeline is tabulated as follows for detailed project implementation and project CDM development.

Date	Project Milestone	Reviewed Documents
11 th Jun 2003	EIA approval by Ministry of Environmental Protection (SEPA)	EIA Approval /13/
3 rd Dec 2004	Initiated Equipment Purchase Contract (gas turbine) among Huaneng (Buyer) Consortium & GE (Supplier) Consortium	Gas turbine purchase contract /33/
<i>[Note: The validation team confirms this contract was not formally signed, and there were conditional provisions in the contract clearly indicating that the document only came valid upon receipt of written notice from Huaneng Consortium to confirm that all preconditions have been satisfied, incl. receipt of all government approval documents.</i> <i>Thus, this is agreed NOT to be the project starting date]</i>		
29 th Dec 2004	Signed natural gas supply agreement with China PetroNatural Gas Co., Ltd.	NG supply contract /37/
<i>[Note: The validation team confirms that there were terms in the agreement indicating that the document would become effective only after the NG buyer (i.e. HNNJJ) give notice of fulfilment of certain conditions, incl. receipt of all approvals required for project operation.</i> <i>Thus, this is agreed NOT to be the project starting date]</i>		
19 th April 2005	Hebei Electric Design Institute released the <Supplement to FSR> to reduce generating sets of 390MW from three (3) units to two (2) units, in considering the commercial risk management	<Supplement to FSR> /11/
<i>[Note: This <Supplement to FSR>, in which it studies the finally-adopted design of 2x390MW capacity, is thus the key document to be referenced for the project financial analysis</i>		
26 th April 2005	Contract amendment No.1 to Equipment Purchase	Contract
Version No.: 06.1		Page 72

²³ <http://www.co2-china.com/club/show.asp?id=806>

Contract		amendment No.1 /34/
<i>[Note: This is to alter scope of supply of project from three (3) units to two (2) units, following the design change from <Supplement to FSR> for capacity reduction from 3 to 2 generating units. The validation team confirms that the contract is formally signed, but still it can be noted from the contract for the same conditional provisions with the contract dated 3rd Dec 2004.</i> <i>Thus, this is agreed NOT to be the project starting date]</i>		
10 th May 2005	Discussed preparation for the upcoming project construction commencement	HNNJJ, preparation meeting minutes /42/
<i>[Note: In this meeting, the Manager (Mr. Li Jianbo /v/) discussed about the financial difficulties (i.e. expected the IRR not reaching benchmark), and requested the management team to prepare CDM development plan for Director Board's approval.]</i>		
15 th Jun 2005	Discussed project CDM application in Director Board meeting of the project owner (HNNJJ)	HNNJJ, Directorial meeting minutes /43/
<i>[Note: After reviewing CDM development plan following the board meeting on 10th May 2005, it was formally decided in this director board meeting that the project is to be implemented along with CDM application.</i> <i>It's thus the validation team opinion that the CDM consideration has been a decisive factor for the project owner to proceed with project implementation.]</i>		
25 th Jun 2005	Signed civil construction contract with Jiangsu Number three Electrical Power Construction & Engineering Corporation	Construction contract /32/
<i>[Note: This civil construction contract is a binding one to the project owner. This is identified in the PDD, and is agreed by the validation team as the project starting date according to the Glossary of CDM term, which is the earliest date at which implementation or construction or real action of the project activity began.</i> <u>Thus, this is agreed to be the project starting date]</u>		
28 th Jun 2005	Project civil construction started	--
3 rd Jul 2005	Progress meeting mentioning the management decision to make reference to the fellow subsidy company's CDM application experience (i.e. Shanghai Baoshan NGCC project; started CDM application in Feb 2005) for pushing its own CDM development	Progress meeting minutes /44/
27 th Jul 2005	Progress meeting mentioning the management decision to engage the same CDM consultant employed by the fellow subsidy company	Progress meeting minutes /45/

	abovementioned	
Sept 2005	Signed grid connection agreement with Jiangsu Power Company	Grid connection agreement /29/
16 th Sept 2005	FSR (with final design initiated in the <Supplement to FSR>) being approval by NDRC	FSR Approval /12/
30 th Sept 2005	Formal notice to announce the contract dated 3 rd Dec 2004 became effective	Formal notice released by Huaneng Consortium /35/
<i>[Note: This notice demonstrates Huaneng (Buyer) Consortium, through its import agent, CNTIC, to release formal notice to inform GE (Supplier) Consortium for notifying the satisfaction of all preconditions in the equipment purchase contract dated 3rd Dec 2004, and the contract became binding to all signing parties.]</i>		
11 th Nov 2005	Meeting in Beijing of CDM experience sharing among subsidiaries of Huaneng Group, for expediting the practical CDM implementation at project-specific level	On-site interview with representatives of Huaneng Group
28 th Mar 2006	Project civil construction completed	--
22 nd Jun 2006	Signed CDM service contract with (previous) CDM consultant, viz Green Capital Consulting Company	CDM service contract /46/
30 th Jun 2006	Generators in place	--
23 rd Jul 2006	Gas turbines in place	--
20 th Sept 2006	Green Capital (on behalf of the project owner) sent "Letter of Invitation" to the selected potential CER.1 buyers for bidding proposals	Letter of Invitation to Endesa for bidding proposal /47/
10 th Oct 2006	Endesa submitted the bidding proposal, and be selected as the winning proposal	Offer for CER purchase /48/ Correspondence emails between Endesa and Green Capital (as CDM consultant at that time being) /48.1/
24 th Oct 2006	Signed CDM validation contract with TÜV Rheinland Japan Ltd. (DOE)	CDM Validation contract /54/
28 th Oct to	PDD publication on UNFCCC webpage	UNFCCC

26 th Nov 2006		webpage
Nov 2006	HRSBs & Steam turbines in place	--
Nov 2006	Signed power purchase agreement with Jiangsu Power Company	Power purchase agreement /30/
Dec 2006	1 st power generation unit put into commercial operation	Power generation records /102/
5 th to 6 th Dec 2006	On-site visit by DOE with stakeholder interviews	--
15 th Jan 2007	Applied to NDRC (China DNA) for CDM application (i.e. Host Country Approval)	Application letter to NDRC for CDM application /50/
5 th Feb 2007	Invitation from NDRC to project review committee meeting in Beijing for Host Country Approval	Invitation notice /51/
9 th Feb 2007	NDRC project review committee meeting in Beijing for Host Country Approval; Nanjing NGCC project was included	Project assessment agenda/list /52/
Mar 2007	2 nd power generation unit put into commercial operation	Power generation records /102/
28 th Mar 2007	Signed Letter of Intent for CER purchase among PC, Credit Suisse & HPI	Letter of Intent for CER purchase /53/
22 nd May 2007	LoA received from China DNA	China LoA /7/
23 rd Nov 2007	Signed maintenance service contract with GE	Maintenance service contract /39/
12 th Dec 2007	LoA received from UK DNA	UK LoA /8/
13 th to 23 rd Feb 2008	Discussion between CER buyer & CDM consultant on validation progress of the Nanjing NGCC project	Correspondence emails between Green Capital & Peony Capital /104/
27 th Aug 2008	Signed contract between Peony Capital and Perenia Carbon Pty for third party review of Nanjing PDD	Service contract /105/
25 th Nov 2008	Credit Suisse withdrew from the proposed project as CER buyer	Letter of withdrawal from Credit Suisse /9/

28 th Apr 2009	HPI issues Letter of Authorization for Peony Capital to assume responsibility for preparation of the PDD	HPI's Letter of authorization /106/
8 th May 2009	Signed CDM validation (supplementary) contract with TÜV Rheinland Japan Ltd. (DOE)	CDM Validation contract /100/
6 th to 7 th Jul 2009	Re-visit by DOE with stakeholder interviews	--

[Note: This re-visit is for further clarification on various aspects, incl. discussions on applicability of baseline methodology, baseline alternative scenario, early CDM consideration, etc...]

From the above project development history and the corresponding verification of relevant evidence information by the validation team, it is confirmed that the CDM incentive was generally considered as early as in 2004 since the Huaneng Group foreran the CDM development in China. The potential CDM development of NGCC project type was actively studied by the Huaneng Group since then /107/.

To a project-specific level, it can be noted that since 2004, in view of the opened status of government approval processes & consideration of its own commercial risk assessment the proposed project has entered into a difficult position for not able to enter a real project implementation. The situation was not changed until April 2005 the project design was changed from 3x390MW to 2x390MW according to the <Supplement to FSR> /11/. Thereafter the project owner further internally discussed the CDM development plan for the director board's consideration. Directorial decision was then made on 15th June 2005 to confirm the project implementation along with CDM application, so as to improve the project financial performance /43/. The validation team thus confirms that the CDM consideration was made prior to the project starting date on 25th June 2005 (i.e. signing date of civil construction contract) /32/.

Since the project started in June 2005, under the mother company's pressure the project owner had several rounds of experience sharing meetings with other subsidiaries of Huaneng Group to expedite the practical CDM implementation at project-specific level. After the (previous) CDM consultant was engaged in June 2006 /46/, the project owner further speeded up the practical implementation including sourcing of CER buyers, and then moved to source DOE for validation service /54/. It is also understood by the validation team that the project owner & its CDM consultant have altogether spent quite a long period of time to resolve the CARs/CLs raised by the validation team during the 1st on-site visit in December 2006, as well as to update the PDD according to the updated applied methodology (AM0029). The CDM development was rapidly carried out until end of 2007, whereas by then there were disputes arose between the original CDM consultant and the PPs. The project CDM development progress was however not ceased. The discussion on project progress was on-going with the lead of the CER buyer & CDM consultant in early 2008 /104/. And until mid-2008, the PPs have engaged another CDM professional (viz. Perenia Carbon Pty) to provide 3rd party review of the Nanjing PDD /105/; and communicated with the validation team on how to progress the project to secure the CDM status. In April 2009, HPI officially

issued a Letter of Authorization for Peony Capital to assume responsibility for the PDD preparation, validation process and submitting for project registration request /106/. Following that, a supplementary validation contract was signed in May 2009 with DOE /100/; and hence a re-visit for project clarification took place in July 2009.

In view of the project's entire CDM development process, continuing and real actions taken by the PP to secure the CDM status in parallel with its project implementation were thus confirmed by the validation team.

In summary, the validation team confirms that the proposed project has sufficiently demonstrated its full compliance with the requirements stipulated in EB41, Annex 46 – Guidance on the Demonstration and Assessment of Prior Consideration of the CDM.

Starting date of project	Justification of and evidences (references) on the starting date of project	Date of CDM consideration
25 th June 2005	- Signing date of civil construction contract (Evidence /32/: Jiangsu Number three Electrical Power Construction & Engineering Corporation and Huaneng Nanjing Power Generation Co., Ltd., Civil construction contract (Contract no.: 2004025), 25th June 2005) In accordance with the Glossary of CDM term, the validation team confirms the claimed to be the project starting date.	15th June 2005 (Evidence /43/: HNNJJ, Directorial meeting minutes)

[Note: In response to the Request for Review, the following part of Section 3.5.1 has been modified and was supplemented to reflect the realistic & practical project situation to cover the concerns raised by the EB to further substantiate the suitability of the start date of the project activity as per the 'Glossary of CDM terms', given that several contracts have been signed before the stated start date.]

As per the Glossary of CDM terms (version 05), the starting date of a CDM project activity is *the earliest date at which either the implementation or construction or real action of a project activity begins.*

According to the Glossary, the start date shall be *considered to be the date on which the PP has committed to expenditures related to the implementation or related to the construction of the project activity. This, for example, can be the date on which contracts have been signed for equipment or construction/operation services required for the project activity. Minor pre-project expenses, e.g. the contracting of services /payment of fees for feasibility studies or preliminary surveys, should not be considered in the determination of the start date as they do not necessarily indicate the commencement of implementation of the project.*

For the proposed project, the validation team agreed with the identification of start date as 25th June 2005, as stated in the PDD & VR, which is the date the civil construction contract was signed with the contractor /Ref.32/.

During the validation process, several more contracts, as mentioned by the EB, have also been identified and reviewed, as follows:-

- *Equipment Purchase Contract (gas turbine), dated 3rd December 2004, /Ref.33/;*
- *Natural Gas supply agreement, dated 29th December 2004, /Ref.37/;*
- *Contract amendment No.1 to Equipment Purchase Contract, dated 26th April 2005, /Ref.34/;*
- *Civil Construction Contract, dated 25th June 2005, /Ref.32/*

As explained in the previously submitted VR (Ver04.3, dated 29th September 2009), those contracts signed before 25th June 2005 were all signed with conditional provisions which means none of them could be considered a binding nor finalized contract. The conditional provisions of these contracts have been summarized and further substantiated as below:-

Date	Contract Item	Reference
3 rd Dec 2004	Equipment Purchase Contract (gas turbine) among Huaneng (Buyer) Consortium & GE (Supplier) Consortium	/Ref.33/
26 th Apr 2005	Contract amendment No.1 to Equipment Purchase Contract	/Ref.34/
Validation team's opinion – The validation team confirms through document review that this Equipment Purchase Contract /Ref.33/ contained conditional provisions. Clause 6 clearly indicates that <i>the contract only came effective upon the date when all the following conditions are fulfilled:</i> (1) <i>signing of Contract by the authorized representatives of both Parties (including all members of both Parties);</i> (2) <i>The Buyer's receipt of the Performance Security furnished by the Seller according to the Contract;</i> (3) <i>Obtaining approval and/or registration from the relevant authorities of both countries;</i> <i>The Buyer shall notify the Seller of the Effective Date of the Contract in written form.</i> The above conditions were not affected in the contract amendment on 26th April 2005 /Ref.34/. Thus, the Equipment Purchase Contract /Ref.33/ was not effective until receipt of written notice on 30th September 2005 /Ref.35/ from the Buyer (i.e. Huaneng Consortium, through its import agent (CNTIC)) confirming that all preconditions had been satisfied. Those preconditions included the receipt of all government approval documents (i.e. FSR approval by relevant authority (the NDRC) for project implementation). The validation team can further confirm that the above contracts cannot be deemed effective by reference to also the Contract Law of P.R. China. In Article 45 /Ref.N1/, it states that <i>"the Parties to a Contract may stipulate conditions to the effectiveness of a contract. Contracts which contain conditions on the effectiveness of the contract become binding only on satisfaction of such conditions"</i>.		

Date	Contract Item	Reference
29 th Dec 2004	Natural gas supply agreement with China PetroNatural Gas Co., Ltd.	/Ref.37/
Validation team's opinion – There was also a precondition in the Gas Supply agreement /Ref.37/ (i.e. Clause 11-a-ii) indicating pre-conditions the contract taking effect, as follows:- 11. <i>Pre-conditions to Gas Supply</i> (a) <i>Pre-conditions fulfilled by the Buyer</i> (ii) <i>Buyer shall have obtained a complete set of all government approval necessary for Buyer to meet its obligations under this contract, such approvals to be in a form acceptable to Seller, and Buyer shall supply to Seller in a form acceptable to Seller a written notice that Buyer has obtained such complete set of necessary government approvals.</i> Similar to the Equipment Purchase Contract /Ref.33/ discussed above, in order for the Gas Supply Agreement /Ref. 37/ to be effected, the Buyer must also receive all relevant government approvals and release a written notice to the Seller giving official notice of fulfillment of those pre-conditions. The Gas Supply agreement /Ref.37/ was therefore not effective until the project approval had been obtained from the NDRC. The project approval was issued on 16th September 2005 /Ref.12/. Likewise, the validation team confirms through checking the Contract Law /Ref. N1/, that the Gas Supply agreement /Ref.37/ cannot be considered effective on its signing date, i.e. 29th December 2004, as the pre-conditions were not satisfied at that time being.		

Furthermore, the validation team also refers to some other regulations governing the construction of power plants in China, proving that the commitments to expenditure for equipment or material supply on infrastructure and power projects cannot be realized until the FSR has been approved by the NDRC. The relevant regulations are as below:-

- *NDRC, Notice on Strict Implementation of Approval Procedures for Basic Construction Projects (Document [1999] 693), 29th July 1999, /Ref.N2/*
 - ❖ *This regulation requires that all basic infrastructure projects must prepare feasibility study reports for review and approval by the NDRC. In particular, Article 3 of the regulations stipulates that:*

“All enterprises...must strictly implement national regulations and only after approval of the project Feasibility Study Report by the relevant departments can formal contracts be signed for equipment purchase or material supply, and before the approval of the Feasibility Study Report effective contracts may not be entered into.”
- *China Electricity Council, Notice on Strictly Implementing State Regulations on Power Plant Projects, 7th December 2001, /Ref.N3/*
 - ❖ *Paragraph 4 of this regulation stipulates that for all power plant projects in China, the selection of equipment and project design can only be finalised after approval of the Feasibility Study Report by all of the relevant government departments, which includes the NDRC.*
- *China's State Council, Decision of the State Council on Reform of the Investment System (Document [2004] 20), 16th July 2004, /Ref.N4/*
 - ❖ *Section 3.4 of this decision requires that all relevant construction projects submit a Project Proposal Document and Feasibility Study Report for government approval. In Section 5.2.1 of the attachment to the decision, it states specifically that:*

"thermal power plant projects need to be approved by State Council's relevant department which is responsible for investment approval (NDRC)."

- NDRC, *Interim Procedures for Examination and Approval of Enterprises' Investment Projects*, 15th September 2004, /Ref.N5/
 - ❖ Article 2 refers to the attachment to the document in the paragraph above, thereby confirming that the regulation applies to thermal power plants.
 - ❖ Article 22 states that for projects that have not been properly approved, local government organizations should not proceed with necessary applications for land use and construction, and financial institutions should not release loans for such projects.
 - ❖ Article 27 states that for those projects that have started construction prior to proper approval, the construction shall be halted and legal action shall be taken against the responsible persons.

Based on this review of the contractual conditions & relevant government regulations, the validation team confirmed that the PP has come to its commitment to expenditures related to the implementation or related to the construction of the project activity only after signing the Civil Construction Contract on 25th June 2005, which is an unconditional contract involving a clear financial commitment. Hence, the project starting date as 25th June 2005 is considered suitable.

[Note: In response to the Request for Clarification, the following part of Section 3.5.1 has been modified and was supplemented to reflect the realistic & practical project situation to cover the concerns raised by the EB to further substantiate the suitability of the start date of the project activity as per the 'Glossary of CDM terms', given that several contracts have been signed before the stated start date, and it is not clear how the validation team has validated the civil construction contract to be a legal and effective contract, given that it was signed before the approval of the FSR by the government.]

In response to the review question, the validation team has again (i) checked the definition of the Start Date in the CDM Glossary of Terms, (ii) reviewed the dates and contents of the key contracts mentioned above and the treatment of conditional contracts in other registered CDM projects and (iii) summarized the relevant parts of Chinese legislation and planning regulations and considered their application to the contracts as set out below.

After further consideration of the Request for Clarification, and review of specific legal advice prepared for the PPs by both PRC and international lawyers regarding the effectiveness of the various contracts mentioned above, the validation team reaffirms its prior conclusion that the Start Date should be 25th June, 2005.

Definition of Start Date: The Glossary of CDM Terms defines a project start date as follows:

"The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project begins....In light of the above definition, the start date shall be considered to be the date on which the Project Participant has committed to expenditures related to the implementation or related to the construction of the project activity. This, for example, can be the date on which the contracts have been signed for equipment or construction/operation services required for the project activity. Minor pre-project expenses, e.g.: the contracting of services/payment of fees for feasibility studies or preliminary surveys, should not be considered in the determination of the start date as they do not necessarily indicate the commencement of the project."

Suitability of the Start Date: The validation team has reviewed the three key contracts (and the contract amendment) mentioned in the Request for Clarification as follows:

- *Gas Turbine Purchase Contract, 3rd December, 2004, (Ref. /33/),*
- *NG Supply Contract, 29th December, 2004, (Ref. /37/),*
- *Amendment Contract to Gas Turbine Purchase Contract, 26th April, 2005, (Ref. /34/),*
- *Civil Construction Contract, 25th June, 2005 (Ref. /32/)*

As explained in detail in the Response to “Request for Review” dated 3rd March, 2010, the Gas Turbine Purchase Contract /33/, its subsequent Amendment /37/ and the NG Supply Contract /34/ contained pre-conditions which mean that the PP did not commit to expenditures under the contract until after the NDRC approval was received on 16th September, 2005 and the PP had confirmed the effectiveness of the contract to the supplier in written form.

Since the Initial Response submitted in the context of the Request for Review, the understanding of these contracts has been further confirmed by engaging independent legal advice from two leading law firms, one which is a leading PRC law firm, and another which is one of the largest leading global law firms. Details of the law firms and their advices are as follows:

- **Fangda Partners LP** is a leading PRC law firm with offices in Beijing, Shanghai and Shenzhen, and is authorized to practice law by the PRC Ministry of Justice. Fangda has confirmed that the Equipment Contract and its Amendment, and the Gas Purchasing Contracts did not create any financial obligations for the PP until after the NDRC approval in September 2005. It /N44/ states that:

“Upon my review of the above documents and based on my understanding of the PRC laws and regulations, I conclude that:

- (a) the buyer’s obligation to pay the seller for the natural gas under the Gas Purchase Agreement was not triggered before the NDRC Approval was granted in September 2005; and*
- (b) the buyer’s obligation to pay the seller for the equipments under the Equipment Contract was not triggered before the NDRC Approval was granted in September 2005.”*

- **Baker and McKenzie** is one of the largest law firms in the world. It has also reviewed the Gas Turbine Purchase Contract, its Amendment and the NG Supply Contract and concurs with the view above that the contracts do not create any obligation for the Project until after the NDRC approval. Its legal advice /N45/ states that:

“On the basis of the foregoing... we are of the opinion that:

- (a) the rights and obligations of the buyer and seller with respect to the supply of natural gas under the Natural Gas Purchase Agreement did not become effective before 16 September 2005, which is the date of the NDRC Approval;*
- (b) the Power Plant Equipment Contract did not become effective before 16 September 2005, which is the date of the NDRC Approval;”*

The validation team has confirmed the authenticity of the legal opinions, relevance of quoted passages and correct referencing therein.

These independent judgements by legal experts confirm that the dates of signing either of these conditional contracts cannot constitute the Start Date for the project because they did not commit the PP to any expenditures.

This approach is considered by the validation team to be consistent with the CDM Glossary of Terms. It is also worthy of note that this approach is consistent with the approach in eight out of the nineteen registered CDM projects in China that use AM0029 and which had signed conditional contracts before their respective Start Dates. These projects are set out in the table below, which shows the date of signature of conditional contracts and the subsequent Start Date for each of these Projects as stated on the UNFCCC website. The validation team agrees that the table can also be taken as a supporting evidence that it is not uncommon in China to sign conditional contracts. It is also the validation team's understanding that this type of conditional signing often takes place at ceremonies that may coincide with visits by foreign or local dignitaries, or the completion of other important projects in the locality.

The other CDM Projects which signed conditional contracts before their respective Start Dates are as follows:

CDM Ref	Project Name	Date of Conditional Contract	Subject of Conditional Contract	Validated Start Date
1373	Beijing Number Three Thermal Power Plant	6-Mar-04	Equipment Purchase	18-Mar-05
1381	Shanghai Baoshan NGCC Power Plant	10-Oct-04	Equipment Purchase	28-Feb-05
1859	Fujian Putain LNG Power Plant	20-Aug-05	Gas Purchase	15-Mar-06
1884	Guangdong Huizhou LNG Power Plant	5-Apr-04	Gas Purchase	23-Sep-04
1898	Fujian Jinjiang LNG Power Plant	20-Aug-05	Gas Purchase	19-Oct-06
1915	Guangdong Shenzhen Qianwan LNG Plant	1-Mar-03	Equipment Purchase	18-Aug-04
		30-Apr-04	Gas Purchase	
2344	Zhumadian NGCC Power Plant	12-Oct-04	Equipment Purchase	6-Jun-05
2439	Zhangjiagang NGCC Plant	3-Jun-03	Equipment Purchase	29-Dec-04

Effectiveness of the Civil Construction Contract /32/: The Request for Clarification has also asked to justify whether the civil construction contract /32/ is a legal and effective contract, given that it was signed before the approval of the FSR by the government. The Request for Clarification also refers to the following NDRC regulations:

- I. *Notice on Strict Implementation of Approval Procedures for Basic Construction Projects [1999] 693 (the "Approval Procedure Notice") (N2/), and,*
- II. *Interim Procedures for Examination and Approval of Enterprises Investment Projects [2004] 19 (the "Approval Measures") (/N5/).*

According to Article 3 of the Approval Procedure Notice /N2/:

"All enterprises...must strictly implement national regulations and only after approval of the project Feasibility Study Report by the relevant departments can formal contracts be signed for equipment purchase or material supply, and before the approval of the Feasibility Study Report effective contracts may not be entered into."

This Article clearly states that formal contracts for equipment purchase and material supply cannot be signed prior to the NDRC approval, but in contrast to equipment purchase and material supply contracts, it does not address Construction Contracts. We made the most

conservative interpretation of this Article during the validation process when choosing the start date and considered that Article 3 did not make the signed Civil Construction Contract ineffective or void nor was it subject to preconditions. Since the Construction Contract /32/ was valid and effective as at the date of signing (25th June 2005), the PP determined this to be the Start Date, and the validation team concurs that this is the earliest date at which irrevocable and real action towards project implementation occurred.

This view that the “Approval Procedure Notice” and the “Approval Measures” do not invalidate the Civil Construction Contract has subsequently been confirmed by both Fangda Partners and Baker and McKenzie – the two independent law firms described above (/N45/ & /N46/ respectively).

In its opinion, Fangda Partners stated that:

“Upon my review of these regulations [Approval Procedure Notice and Approval Measures], I am of the opinion that neither of them shall invalidate a construction contract that is duly concluded by the parties under Chinese law”.

This view is reaffirmed by Baker and McKenzie who state that...

“(c) Neither Article 3 of the Approval Procedure Notice nor Articles 22 and 27 of the Approval Measures apply to render the Civil Construction Contract void or affect its effectiveness, and there are no specific provisions in the Civil Construction Contract which require NDRC Approval prior to its effectiveness.”

Both of these opinions reaffirm the conclusion that 25th June 2005 is the correct Start Date for the Project.

It is also worth noting that according to Articles 22 and 27 of the Approval Measures, a project which does not first go through the required process of obtaining various government approvals, or omits any important steps along the process may face serious consequences, including the need for rectification, fines or in serious cases complete shut down. Similar sanctions are available in respect of a breach of Article 3 of the Approval Procedure Notice (/N45/).

There are many examples of the Chinese government carrying out such administrative penalties against those projects. For example, as reflected by the China Review News Online, in July 2005 the NDRC, together with the Ministry of Land and Resources, Ministry of Water and the Environmental Protection Bureau, ordered the suspension of construction of 32 power plants, totaling 17GW of installed capacity²⁴ (/N47/). The project activity, in contrast, did not experience any form of administrative penalties by the NDRC. Construction was completed smoothly in December 2006, when the first unit was commissioned.

This provides further support to the conclusion that the Civil Construction Contract /32/ was valid on signing, and that the correct Start Date for the Project is therefore 25th June 2005.

²⁴ China Review News, “China faces another round of electricity oversupply due to the construction of unapproved power plants”, <http://www.chinareviewnews.com/doc/1002/7/6/4/100276402.html?coluid=10&kindid=253&docid=100276402&mdate=0911123624>
- see VR Ref./N47/

Conclusion

On the basis of careful review of the contents of the key contracts, along with the formal opinion of two independent law firms, it can be confirmed and agreed by the validation team that:

- the Gas Turbine Purchase Contract /33/, its subsequent Amendment /37/ and the NG Supply Contract /34/ contained pre-conditions which meant that the PP did not commit to expenditures under the contract until after the NDRC approval was received on 16th September, 2005 and the PP had confirmed the effectiveness of the contract to the supplier in written form;
- neither the Approval Procedure Notice /N2/ nor the Approval Measures /N5/ impact on the legality or effectiveness of the Civil Construction Contract /32/;
- the Civil Construction Contract /32/ did not include pre-conditions which required the NDRC approval prior to becoming effective; and
- the Project construction and operation has proceeded smoothly without any government administrative penalties.

Therefore, as per the Glossary of CDM Terms, the validation team can reconfirm the prior conclusion that the Start Date of the project activity is 25th June, 2005, which is the date of signing of the Civil Construction Contract /32/.

[Note: In response to the Request for Clarification, the validation team is also requested to mention when the: (a) first payment related to this project; and (b) the first payment corresponding to the three contracts (gas turbine purchase contract and amendment contract , NG supply contract, civil construction contract) was made by the PP. In doing this the validation team shall provide credible evidences.]

In response to the review question, in order to demonstrate the first payments related to the project and those under the gas turbine purchase agreement, NG supply contract and civil construction contract, the validation team has reviewed in detail the payment records, invoices and receipts of the project owner, as well as each of the relevant payment provisions in the contracts listed above. The validation team has also reviewed the documents surrounding the establishment of the project bank account.

Each of the payments has been cross-checked with the establishment of the project owner and the respective contract, the details of which are set out below, and it can be confirmed by the validation team that none of these payments has any impact on the suitability of the start-date for the project.

(a) First Payments related to the Project

The Chinese PP was established on 2nd February, 2005 when it was issued a temporary business license with a term of one year only and business scope for preparatory work only (see /27/). The business license shows the following details:

Name: Huaneng Nanjing Natural Gas Power Generation Co., Limited
 Number: 3201131003070
 Date of Establishment: 2nd February, 2005
 Expiry: 1st February, 2006
 Scope of Activity: Preparation for Power Plant (with the specific scope of business to be decided only after formal approval of the project.)

Following receipt of the business license, the project owner applied to open a bank account with China Merchants Bank, Nanjing Branch, Gulou Sub-Branch on 3rd February, 2005. On 5th February, 2005, the bank agreed to open the account, with the bank account number [xxxxx30813xxxxxxx] (/N48/).

On 5th February, 2005, the first payments were made from that account, which are counter-checked against the Bank Slips (/N49/). These payments were as follows:

Date	Description	Payee	Amount (RMB)	Evidence
5-Feb-05	Purchase of computers	Nanjing Meicheng Digital Information System Co. Ltd.	20,430	/N49/
5-Feb-05	Purchase of digital equipment	Nanjing Yongneng Digital Technology Co. Ltd.	5,000	/N49/
5-Feb-05	Rental of projectors	Nanjing Qiangjing Electronic Products Co.	8,510	/N49/
5-Feb-05	Purchase of printers	Nanjing Futeng Electronic Devices Co. Ltd.	14,400	/N49/
	Total		48,340	

Direct confirmation of the opening of the bank account, the account number and the date of first payment has been obtained from the bank (/N50/).

(b) First Payment related to Gas Turbine Purchase Contract /33/, the Gas Supply Contract / 37/ and the Construction Contract /32/

i) Gas Turbine Purchase Contract /33/

The Gas Turbine Purchase Contract /33/ and the Amendment Number One /34/ (the "Equipment Contract" both referred to the above), provided for the supply of equipment and services by two suppliers, namely the General Electric Company ("GE") and Harbin Power Equipment Company ("HPEC").

The contract provided for advance payments after the effectiveness of the Equipment Contract, and these payments were made in accordance with the contract, as set out in the table below:

Date	Description	Payee	Amount (RMB)	Evidence
	10% of Gas Turbine	GE	US\$ 4,182,107	/N50/
	10% of Equipment Other than Gas Turbine	GE	US\$ 301,209	/N50/
26-Oct-05	Total		US\$ 4,483,316 (eq. RMB 36,314,859.6)	/N50/ & /N51/
	10% of Gas Turbine	HPEC	RMB 30,670,808	/N50/
	10% of Equipment Other than Gas Turbine	HPEC	RMB 29,835,956	/N50/

	10% of Technical Service	HPEC	RMB 147,264	/N50/
3-Nov-05	Total		RMB 60,654,028	/N50/ & /N54/

The amounts of the advance payments made to GE have been cross checked by the validation team and confirmed with the extract of the Equipment Contract (/N51/) and the Notification of Advance Payments from the PP's Import Agent, CNTIEC (/N52/). The total amount and the date of the payment have also been cross checked and confirmed with the payment voucher (/N53/).

The amounts of the advance payment to HPEC have been cross checked and confirmed with the extract of the Equipment Contract (/N51/) and the total amount and the date has been cross checked and confirmed with the receipt from HPEC (/N54/).

ii) NG Supply Contract /37/

The gas is supplied to the Project under the terms of the NG Supply Contract /37/ referred to the above, which is a take or pay contract. This NG Supply Contract specifies that an 'Initial Advance Payment' should be made ten days before the 'Trial Operation Date' (/N55/).

The turbines were inspected by Jiangsu Special Equipment Safety Inspection Academy and Nanjing Boiler Pressure Container Inspection Center on 24th November, 2006 – see /66/ & /67/ and the Project issued a Notice of Plan for Gas Usage During Trial Operation (Document [2006] 26, see /N56/) on 7th December, 2006. This document noted that the Project would need gas supply for trial operation on 9th December, 2006. This is consistent with the Project Timeline (see VR Version 05, page 30), which noted that the plant was first put into operation in December 2006.

On 12th December, 2006, the Project transferred RMB 1,600,000 to PetroChina for Advance Payment for Trial Operation Period (/N57/).

iii) Construction Contract /32/

The project was constructed according to the Civil Construction Contract /32/ that was signed on 25th June, 2005 (and referred to the above). According to the Civil Construction Contract /32/, 5% of the contract value should be paid by the project owner as advance payment in ten days of the Contract becoming effective (/N58/).

On 13th July 2005, the Construction Company issued a receipt to the Project for RMB 4,000,000 advance payment (/N59/). This amount constitutes 5% of the Construction Contract amount, and represents the first payment under the Contract.

Conclusion

In summary, (a) the first payment related to this project; and (b) the first payment corresponding to the three contracts (gas turbine purchase contract /33/ and amendment contract /34/, NG supply contract /37/, civil construction contract /32/) are as follows:

Milestone	Date	Amount
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First payment related to this project	5 th February 2005	RMB 48,340
First payment corresponding to the Gas Turbine Purchase Contract	26 th October 2005	USD 4,483,316
First payment corresponding to the NG Supply Contract	12 th December 2006	RMB 1,600,000
First payment corresponding to the Civil Construction Contract	13 th July 2005	RMB 4,000,000

In accordance with the Glossary of CDM Terms definition of the Start Date, these payments confirm the following:

- there were no payments related to the Gas Turbine Equipment Purchase Contract and NG Supply Contract until after the pre-conditions had been met on 16th September 2005;
- there were no payments related to the Civil Construction Contract until after its signing on 25th June, 2005;
- the first payments related to the project constitute minor pre-project expenses and the Project's business license at the time restricted the activities to preparatory work only.

3.5.2 Alternatives

There are four alternatives identified in PDD and has been discussed in detail in Section 3.4.3 of this report. The validation team considered the identification of those four alternatives complete and realistic according to the approved methodology AM0029/Version 03.

3.5.3 Investment analysis

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

The validation team is also able to check up with the applied economic analysis reference for the China power sector, i.e. <Economic Assessment of Electric Engineering Retrofit Projects> issued by the State Power Company (Generation and Transmission Operation Department) in 2003 /94/. The financial benchmark IRR of the Chinese electricity industry from the benchmark reference is 8.0% (after tax). It applies to the China power companies for power generation and transmission projects as stated in section 1.15. According to section 1.11, the economic benchmark is regulated as 8%, and this is thus deemed an appropriate benchmark reference for the project activity. In addition, the benchmark reference document has been commonly adopted for financial evaluation of power projects for the approved renewable power CDM projects in China.

The validation team also reviewed the benchmark reference from the <Economic Evaluation Method and Parameters for Construction Projects> (Version 3); promulgated by the NDRC and Ministry of Construction on 3rd July 2006 /95/, which was applied as the benchmark reference in the <Supplement to FSR>. This reference also adopts the financial benchmark

IRR of the Chinese power industry as 8%. The <Supplement to FSR> was prepared by the Hebei Electric Design Institute, which was granted Class I by the government for both engineering design qualification (code: 030001-sj) and engineering investigation qualification (code: 030001-kj) in the power industry field. The whole FSR (for the final design of 2 sets of 390MW generation units) was approved by NDRC on 16th September 2005 /12/. Thus, it can be concluded that the application of the industrial benchmark of 8% for the project activity in PDD is valid and plausible.

The selected financial parameters (input values) for IRR calculation were checked by the validation team against the source reference documents to be valid. The calculation procedure in IRR spreadsheet is also verified by the validation team, which is calculated in accordance with the applied benchmark reference and is confirmed sound and reasonable. It is reflected from the benchmark analysis that, without the revenue from CDM, the project IRR would be 6.54%, which is below the benchmark of 8.0% in China for power sector industry, as defined within the <Economic Assessment of Electric Engineering Retrofit Projects> /94/. Hence, the validation team concurred that the project cannot be considered as financially viable in the absence of CDM benefits, and Alternative 1 is not deemed a likely baseline scenario.

The IRR of the total investment of the proposed project would be improved in consideration of CERs revenue, where IRR of 11.46% shall be expected.

The following is an excerpt extracted from the <Supplement to FSR> /11/ and presents the guideline documents referenced in the investment analysis which demonstrates that the inputs values adopted for the investment analysis are in accordance with appropriate guidelines and best available market information:

1. *《Power Engineering Construction Calculation》* ;
2. *《Basic Construction Budget Management Rules and Instruction for Power Industry》* ;
3. *《Price Reference for Common Equipment for China Power Industry》* ; & etc...

According to the requirements set out in EB38 meeting, where in the case that the project participant relies on values from FSR that are approved by national authorities for proposed project activities, the DOE validation team has to ensure the following:-

- (a) *The FSR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed.*

Validation team's justification – The validation team considers that the period of time between the finalization of the <Supplement to FSR> (i.e. April 2005) and the investment decision (15th June 2005; by confirmation of director board meeting for formal decision to project implementation) is sufficiently short (as short as within 3 months) that it is unlikely in the context of the underlying project activity that the input values would have materially changed.

(b) The values used in the PDD and associated annexes are fully consistent with the FSR, and where inconsistencies occur the DOE should validate the appropriateness of the values.

Validation team's justification – The validation team is able to confirm that the input values used in the PDD and associated annexes are fully consistent with the <Supplement to FSR>, and has confirmed that the calculation is correct and reproducible. Details on how the appropriateness of key financial input values and the IRR calculation being independently validated by the validation team can be referred to validation tables below.

(c) On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision.

Validation team's justification – The validation team is able to confirm by cross-checking, reviewing reference sources (e.g. main equipments purchase contracts /33-35/, local authorities' relevant approval or documents /10-14/, bank loan records /15-17/, financial audit reports /20, 28/, benchmark reference /94-95/, financial assessment guideline /3.1/, engineering design cost index /59/, etc), on-site observation, expertise interview, etc, that the input values from the <Supplement to FSR> are valid and applicable at the time of making the investment decision in June 2005.

[Note: In response to the Request for Review, further to Section 3.4.3 above, the following part of VR has also been modified and was supplemented to reflect the realistic & practical project situation to cover the concerns raised by the EB to further substantiate how the validation team considers the suitability of the input values applied in the IRR analysis.]

➤ **Suitability of input values in IRR analysis**

In accordance with the "Guidance on the Assessment of Investment Analysis" (Version 02) /3.1/ from UNFCCC EB41 Report Annex 45 (& Version 03.1 /Ref. 3.2/ from UNFCCC EB51 Report Annex 58 during the "Request for Review" stage), the validation team has independently checked the following critical project and financial input values for the IRR calculation as investment analysis basis. As explained in the paragraphs above, the <Supplement to FSR> /Ref. 11/ has been the reference source for the input values applied in the IRR analysis. It is considered to be authoritative and complies with the regulations in China, whereby any approval from government authorities for project implementation is based on the finalization of project design and its linked financial estimates as presented in the FSR (and <Supplement to FSR> in this case for the proposed project activity).

Details on how the values derived from the <Supplement to FSR> have been assessed by the validation team is presented and tabulated below to clearly demonstrate the confirmation of their suitability and reliability:-

Item applied in financial analysis	Data & Source	Validation remarks on input values based on cross-checking or other appropriate manner (e.g. review of approval authority documents, etc)
Total installed capacity	780MW i) <Supplement to FSR> /11/ ii) Equipment purchase contract /33/	The validation team has checked the project design against the <Supplement to FSR>, and confirms its selection of equipment to be 2 units of 390MW gas-steam combined cycle generation system (unit code.: GE-109FA) Hence, total installed capacity = $390\text{MW} \times 2 = 780\text{MW}$ The validation team has further checked the equipment purchase contract for the 2 sets of 390MW power generation units /33/ against site observation (i.e. equipments' identity plates), and confirms that it is being consistent with the figures used in PDD. During the OSV, the installation work was completed and the turbines were in operation. Thus, the validation team considers the input value for total installed capacity as 780MW is suitable.
Annual operation hours	3,500 hrs i) Supplement to FSR /11/ ii) Thermal Power Engineering Design Reference Cost Index (2005 Edition) /59/ iii) Power generation records /102/	The validation team has checked from the <Supplement to FSR>, that the estimated annual operation hours were 3,500 hrs, being consistent with the figure used in PDD. This value could be further confirmed by cross-referencing to the <Thermal Power Engineering Design Reference Cost Index (2005)>, which is a common design standard for power plants in China, which states (on p.234) that the annual operation hours for gas-fired power plants is 3,500 hrs. As advised by the representative of the power company /xiii, xiv/ during OSV, the plant operation schedule is to be adjusted by the grid company according to the peak regulation scheme, which in turns depends on the electricity demand. The PP has provided evidence of on-site operation records /102/, verified by the validation team, that show the actual operation hours of the project since it stated operation have never reached the design value of 3,500 hrs (see below for further details). The team therefore considered the application of 3,500 annual operation hours in the investment analysis during

		the investment decision was thus suitable and conservative.
Annual electricity supplied to the grid	2,716,000 MWh i) Supplement to FSR /11/ ii) “ New development of gas fired combined cycle power generation technology” /103/ iii) Power generation records /102/	The validation team has checked against the <Supplement to FSR> that the annual nominal electricity output is 2,800,000 MWh. The calculation of net electricity supply on-grid is based on calculation of the nominal electricity generation minus the auxiliary power consumption use (indicated as 3%), which was clearly demonstrated in <Supplement to FSR>. The validation team can also confirm that the 3% auxiliary consumption rate is a common rate for the existing NGCC operation worldwide, as referable to the China Electrical & Mechanical Net “New development of gas fired combined cycle power generation technology” /103/. <i>Thus, the net annual electricity supply</i> $= 2,800,000 \times (1 - 3\%) \cong \mathbf{2,716,000 \text{ MWh}}$ As such, the validation team considers the result of net annual electricity supply in <Supplement to FSR> is traceable. Furthermore, as explained above, since the actual operation hours of the project since operation have never reached the design value of 3,500 hrs, the figure of net annual electricity supply presented in <Supplement to FSR> and as applied in the IRR analysis is much higher than the actual power generation. The validation team has verified by cross-checking the operation records of Year 2007 – 2009 /102/ (which are directly generated by Software programme), and observed that the power generation are 2,321,500 MWh, 2,207,330 MWh & 2,273,351 MWh respectively from Year 2007 – 2009. Hence, the validation team considers the input value for annual electricity supplied to grid as 2,716,000 MWh is conservative and suitable in the IRR analysis. Project load factor is thus 39.75%
Operational lifetime	20 operational years (plus 2 years of construction) i) Supplement	According to the <Supplement to FSR>, the operational years would be 20 years; plus 2 years of construction period which is consistent with PDD. The 20 years technical lifetime can be referenced to “Thermal Power Engineering Design Reference Cost Index

	to FSR /11/; ii) Thermal Power Engineering Design Reference Cost Index (2005 Edition) /59/	(2005)", which is a common design standard for power plants in China. The 20 years operational lifetime applied in the financial analysis is also considered complying the "Guidance on the Assessment of Investment Analysis (Version 03.1)" EB51 (i.e. clause 3), which states that in general a minimum period of 10 years and a maximum of 20 years of financial project lifetime will be appropriate. Hence, the validation team considers the input value for operational lifetime as 20 years is suitable in the IRR analysis.
Fixed assets investment	RMB 2,465.80 million Yuan i) Supplement to FSR /11/ ii) Thermal Power Engineering Design Reference Cost Index (2005 Edition) /59/	The validation team has verified with the <Supplement to FSR> that the fixed assets investment is attributed in the 3 years of project construction period respectively as below:- 986.32 million + 986.32 million + 493.16 million = RMB 2,465.80 million The figures have been checked by the validation team with the <Supplement to FSR> to be consistent with the PDD ; During the OSV, the calculation has also been counter-checked with the deputy financial director of the project owner /vii/; and further discussed with the bank representative /xxiii/, who agreed the figures to be precise. The validation team confirmed that the figure is reasonable by comparing the unit investment cost with the guidance cost stipulated in "Thermal Power Engineering Design Reference Cost Index (2005)". For the proposed project, the unit investment cost is 3,161 RMB/kW (i.e. 2,465.8 million RMB / 780 MW), which is very much comparable to the guidance unit investment of a same newly built facility (i.e. F-series turbines) stipulated in the <Cost Index> (p.212) of 3,060 RMB/kW. Furthermore, it is also noted through interview with the top management of project owner /viii/ that the overall investment would even go beyond the stated amount due to the ever-increasing material, transportation & labour costs. The validation team is also able to make comparison with 6 other registered NGCC CDM projects located also in the East China Grid (deploy also F-series turbines) and found the applied figure in the proposed project being also very much comparable to those others, as below:-

		<table border="1"> <thead> <tr> <th>CDM registration no.</th><th>NGCC Projects</th><th>Unit investment (RMB/kW)</th></tr> </thead> <tbody> <tr> <td>2383</td><td>Wangting</td><td>3,818</td></tr> <tr> <td>2382</td><td>Qishuyan</td><td>3,474</td></tr> <tr> <td>2439</td><td>Zhanjiagang</td><td>3,671</td></tr> <tr> <td>1343</td><td>Xiaoshan</td><td>3,337</td></tr> <tr> <td>1227</td><td>Yuyao</td><td>2,969</td></tr> <tr> <td>1344</td><td>Zhenhai</td><td>3,253</td></tr> </tbody> </table> Therefore, the validation team considers the input value for investment cost as 2,465.80 million RMB is suitable in the IRR analysis.	CDM registration no.	NGCC Projects	Unit investment (RMB/kW)	2383	Wangting	3,818	2382	Qishuyan	3,474	2439	Zhanjiagang	3,671	1343	Xiaoshan	3,337	1227	Yuyao	2,969	1344	Zhenhai	3,253
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1343	Xiaoshan	3,337																					
1227	Yuyao	2,969																					
1344	Zhenhai	3,253																					
Grid-in tariff (Incl. VAT)	RMB 0.442 Yuan/kWh i) <Supplement to FSR> /11/ ii) PPA /30/ iii) Notice on adjustment of grid-in tariff in East China Grid /N8/	The validation team has checked in the <Supplement to FSR> that the grid-in tariff was RMB 0.442 Yuan/kWh (incl. VAT). It can also be counter-confirmed that in the PPA signed in November 2006, the grid-in tariff is also agreed to be RMB 0.442 Yuan/kWh (incl. VAT). To further investigate, the validation team is able to check against the announcement from the NDRC regarding the notice on adjustment of grid-in tariff in East China Grid in 2005 /Ref. N8/. It is noted from the announcement that the grid-in tariff for thermal power plants in Jiangsu Province at that time was 0.371 RMB/kWh, which is 19% lower than the figure sourced from the <Supplement to FSR>. <u>The validation team thus considers the application of input value for grid-in tariff as 0.442 RMB/kWh in the IRR analysis be suitable and conservative.</u>																					
Natural gas price (incl. tax)	RMB 1.10 Yuan/m³ i) Supplement to FSR /11/ ii) NG supply agreement /37/ iii) Thermal Power Engineering Design Reference Cost Index	The validation team checked that the NG price in the PDD was consistent with the estimation in the <Supplement to FSR>. In addition, as per the signed NG supply contract (Appendix F) in December 2004 /37/, the price of NG supply is an integration of two prices, i.e. (i) base price of RMB 0.48 Yuan/m³; & (ii) delivery price of RMB 0.62 Yuan/m³ , which results the total NG price to be RMB 1.10 Yuan/m³. It was realized from the aforesaid contract that the price of																					

	(2005 Edition) /59/	natural gas could be adjusted only by the national authority. The validation team thus considered that the application of RMB 1.10 Yuan/m³ as the NG price in the investment analysis was reasonable. It is also noted from referring to p.234 of the “Thermal Power Engineering Design Reference Cost Index (2005)”, that the guidance NG price for 300MW level GE units is 1.30 RMB/m³; hence confirming the applied input value as 1.10 RMB/m³ in the IRR analysis be conservative. The conservativeness of the applied input value can also be further supported by realizing that during the <Supplement to FSR> was prepared the NDRC has placed an advance notice for the increase of NG price in near future. It turned out in November 2007, during the 1st year of project operation the NG price has been increased to 1.58 RMB/m³. This further supports the fact that application of 1.10 RMB/m³ in IRR analysis be much conservative.
Average operational cost	RMB 0.262 Yuan/kWh i) Supplement to FSR /11/ ii) IRR spreadsheet /55/ iii) Thermal Power Engineering Design Reference Cost Index (2005 Edition) /59/	The validation team is able to check on the <Supplement to FSR> and observe that the average operational cost is calculated based on fuel cost, material expenditure, water expenditure, employee payroll, maintenance cost, insurance, & other cost (per unit (kWh) of electricity generated), and does not include the depreciation cost & interest expenses. Cost breakdown is transparently referable in the source data from <Supplement to FSR>, and listed as below:- = (fuel cost) + (material expenditure) + (water expenditure) + (employee payroll) + (maintenance cost) + (insurance) + (other cost) = (0.215 + 0.0085 + 0.0005 + 0.00187 + 0.02398 + 0.00087 + 0.011) Yuan/kWh ≅ RMB 0.262 Yuan/kWh All parameters were checked by the validation team against the <Supplement to FSR> (details in IRR spreadsheet) and confirmed to be applied correctly. The validation team noted from referring to the “Thermal Power Engineering Design Reference Cost Index (2005)”, that all of these parameters are taken not higher than the

		guidance figures from the <Cost Index>. The operational cost was further reviewed during on-site interview with the project owner, where it is reported that the operational cost would be even higher than those predicted in the <Supplement to FSR> due to the increasing material, transportation & labour costs. Therefore, the validation team can confirm the input values for operation cost as 0.262 RMB/kWh applied in the IRR analysis is suitable and conservative.
Tax	i) Supplement to FSR /11/ ii) & other relevant tax documents (as individually quoted, see below) Income tax (33%) City construction tax (7% of VAT) Education surtax (3% of VAT)	The applied tax rates are in line with the existing tax laws in China, which are checked by the validation team against the credible public information, details as below:- Income tax rate – 33% http://opinion.people.com.cn/GB/8213/55724/55731/3881426.html The known income tax rate is 33% during the time of finalization of <Supplement to FSR> (April 2005) and decision making (15th June 2005), and this input value of 33% has been correctly applied in the IRR calculation. The validation team is able to confirm that the announcement of new income tax rate of 25% was made only on 16th March 2007 and comes effective on 1st January 2008. (Ref. no: State Order [2007] (63)) City construction tax rate – 7% of VAT http://www.gov.cn/banshi/2005-08/19/content_24817.htm The validation team has checked against the relevant tax law (Ref no.: GuoFa [1985](19)) released by the State Council on 8th February 1985 and confirms that the city construction tax is 7% of VAT for entity with its tax registry at city level. Education surtax – 3% of VAT http://www.gov.cn/gongbao/content/2005/content_91662.htm

	Value added tax (VAT) 17%	The validation team is able to confirm that the education surtax is 3% of VAT in accordance with the State Council Decree (Ref.: State Council Decree [2005] no.448) which is effective since 1st October 2005. The validation team is able to confirm that the tax rate is 17% according to the State Tax Laws (Ref.: State Council Order[1993] no.134). http://www.gov.cn/banshi/2005-08/19/content_24733.htm The validation team checked that the reference information was valid during the investment decision in June 2005, thus it was able to confirm the VAT rate was reasonably applied in the investment analysis.
Depreciation period; & Depreciation rate (%)	15 years i) Supplement to FSR /11/ ii) Thermal Power Engineering Design Reference Cost Index (2005 Edition) /59/ 6.33% (calculated)	The applied depreciation period of 15 years in the financial analysis is clearly stated in <Supplement to FSR>, and can also be cross checked from the Thermal Power Engineering Design Reference Cost Index (2005) /59/. It is noted that the depreciation period and rate are not fixed in the benchmark reference /94/. The calculation of depreciation rate can be worked out based on the applied residual rate, the equation is as below:- <i>Depreciation rate = (1 – residual rate) / depreciation period</i> The applied depreciation period is in line with the Chinese taxation laws, i.e. minimum 10 years of depreciation period for machineries (Reference source: State Administration of Taxation, GuoFaShui[2000](84) <Deduction guideline for Corporation Income tax>, Clause 25.2 (http://www.chinatax.gov.cn/n480462/n480513/n480919/index.html). The validation team thus considers the input values for depreciation period & rate as respectively 15 years & 6.33% are applied suitably in the IRR analysis.
Residual rate (%)	5 % i) Supplement to FSR /11/ ii) Thermal Power Engineering Design	Referring to applied benchmark reference (Clause B.3), it clearly indicates the calculation of depreciation rate is based on 3-5% residual rate. The selection of 5% is transparently referable to the “Thermal Power Engineering Design Reference Cost Index (2005)” /59/, on which the validation team considers the input value is applied suitably in the IRR analysis.

	Reference Cost Index (2005 Edition) /59/	
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On the other hand, the validation team confirms the adoption of fixed price level for parameters (including tariff) throughout the entire financial assessment period, with justification as below:-

- In China, project developers are required to follow Ministry guidance (in this power sector case referable to <Economic Assessment of Electric Engineering Retrofit Projects>) and therefore the investment analysis for the proposed CDM projects have also been conducted in accordance with the guidance available from this document. According to <Economic Assessment of Electric Engineering Retrofit Projects>, fixed price levels shall be used for conducting the financial assessment;
- The guidance makes a very clear explanation on the price system applied in investment analysis. It states that rates for both cash inflows (revenues from electricity generation) and outflows (costs from O&M) should be predicted at the beginning of the operation period and that these predictable rates will be fixed and applied throughout the operation period;
- The issue is of a general manner and could be used to every project using IRR and benchmark approach for the additionality proof; &
- The validation team has checked against the PPA signed with the power company and it is noted that the tariff is fixed throughout the contract agreement period unless otherwise mutually agreed.

Based on the above, adoption of a fixed price level for parameters (including tariff) throughout the financial assessment period is thus reasonably agreed by the validation team.

Sensitivity Analysis

A sensitivity analysis is carried out and is presented in the PDD which demonstrates that the project activity is unlikely to be financially viable under reasonable variations in the critical assumptions, i.e. fluctuation range of -10% and +10% (as stipulated in <Supplement to FSR> which complies with the Economic Assessment Method and Parameters of Construction Projects (version 3), and also in line with the requirement in the <Guidance on assessment of investment analysis> /Ref.3.2/ in five financial parameters, incl. (i) total fixed assets investment, (ii) annual operation hours, (iii) annual O&M cost, (iv) electricity tariff and (v) NG price. The selection of the sensitivity test parameters focuses mainly on those parameters which are considered more likely to be varying along the project implementation. The selection covers the key variable in the project's cash flow, which are the most sensitive parameters for testing the robustness of the investment analysis. Those parameters which are deemed stable throughout the project lifetime, e.g. tax rate, are not convincingly included in the analysis. The selected parameters are checked against the <Supplement to FSR> and other reference documents and are verified by the validation team.

It is noted that from the calculation spreadsheet that some parameters with fluctuation of certain percentage shall boost up the Project IRR to exceed the 8% benchmark IRR, which are respectively:-

- - 5% in NG price;
- - 5% in annual O&M cost;
- + 5% in electricity tariff

For variation of NG price, it can be noted that since the <Supplement to FSR> stage until the most recent adjustment, the approved NG price has been increasing from RMB 1.10 Yuan/m³ (April 2005) to RMB 1.58 Yuan/m³ (November 2007). The validation team was able to counter-check the figures against the corresponding government approval notices on the NG price adjustment /91/, and the trend of the ever-rising NG price throughout the past years is apparently observed. Considering this fairly indicative projection of the NG price in China, it is reasonable to believe that a decrease of 5% (i.e. resulting $[1.10 \times (1-5\%)] = \text{RMB } 1.045 \text{ Yuan/m}^3$) shall very unlikely to occur, hence the Project IRR not to reach the benchmark under variation of NG price.

For variation of annual O&M cost, it is realized that among the various components of O&M cost the expenditure on fuel (NG) cost & maintenance cost are the major ones, which occupy approx. 82% & 9% respectively of the overall O&M cost. The justification on how unlikely the NG price will decrease has been discussed in the above paragraph, it is indeed a common understanding that in China the NG price has been increasing over the past years and shall likely be continuing in the foreseeable future. Besides, according to the maintenance service contract signed with GE /39/, it is verified that the actual expenditure on committed maintenance cost is even higher than the estimated figure. Therefore, it is agreed by the validation team that the annual O&M cost is unlikely to decrease by 5%, thus it is unrealistic to assume the Project IRR to be reaching the benchmark under variation of annual O&M cost.

For variation of electricity tariff, the validation team understands that NDRC announced in December 2004 for the policy linking electricity tariffs to fuel prices /89/, and its detailed arrangement in March 2005 /90/. In the regulations, it determines that “the electricity producers shall bear 30% of the fuel price increase with the government increasing electricity tariffs to compensate for only 70% of the fuel price move”. In such, it is agreed that the margin for the proposed project is worsened as the profit to be gained from tariff increase can never catch up with the loss to be induced from the fuel price increase. This matter of fact could be further demonstrated in the proposed project in reviewing the NG price increase in November 2007 from RMB 1.18 to 1.58 Yuan/m³, whilst the electricity tariff has only increased from RMB 0.488 to 0.545 Yuan/kWh. This disproportional increase of the two parameters directs to a factual situation that an increase of electricity tariff essentially means there is an increase in NG price cost at the same time. In view of this whole picture, it is convincible to trust that the Project IRR shall not reach the benchmark under variation of electricity tariff.

The above arguments have been studied by the validation team that it is concurred to be unlikely for the Project IRR to reach the benchmark under variation of those five selected financial parameters.

[Note: In response to the Request for Clarification, the following part of Section 3.5.3 has been modified and was supplemented to reflect the realistic & practical project situation to cover the concerns raised by the EB to further clarify how the validation team has validated that the sensitivity analysis has been appropriately carried out. In doing this the DOE shall confirm, based on credible evidences that the variation beyond $\pm 5\%$ for NG price, O&M costs and the electricity tariff is not likely.]

In accordance with the requirements of paragraph 17 of the <Guidance on Assessment of Investment Analysis>, sensitivity analysis was conducted on the financial model of the project activity, and the key parameters were altered within the range of $\pm 10\%$. As demonstrated in the sensitivity analysis in the PDD, the Project IRR is sensitive to three parameters in the financial analysis – NG price, O&M costs and electricity tariff – where the IRR could cross the industry benchmark of 8%.

However, according to paragraph 18 of the Guidance on the Assessment of Investment Analysis (version 03.1):

- *In cases where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative, the DOE shall provide an assessment of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific socio-economic and policy context of the project activity.*
 - ❖ **Rationale:** *The ultimate objective of the sensitivity analysis is to determine the likelihood of the occurrence of a scenario other than the scenario presented, in order to provide a cross-check on the suitability of the assumptions used in the development of the investment analysis.*

Paragraph 6 of the Guidance on the Assessment of Investment Analysis (version 03.1) also states:

- *Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant...*
 - ❖ **Rationale:** *... the [investment] decision will therefore be based on the relevant information available at the time of the investment decision and not information available at an earlier or later point.*

This response demonstrates that:

- i. Based on information available at the time of the investment decision, the likelihood of the occurrence of any scenarios that would have pushed the Project IRR above the industry benchmark was extremely remote, and could not possibly have been used as a credible basis for preparing the FSR for the project. In particular:

- *the FSR was prepared on a very optimistic basis because the NG price assumed in the FSR of 1.10 RMB/m³ was below the actual price for natural gas of 1.14 RMB/m³ in Jiangsu province in 2005, and the electricity tariff assumed in the FSR of 0.442 RMB/kWh (including VAT) was higher than the actual tariff of 0.371RMB/kWh (including VAT) at the time (please see Section 1 page 100 and Section 3 page 103 below for more details), and*
 - *the electricity tariff and the NG price are effectively correlated because government regulations only allow a tariff increase based on an increase in the fuel price and the regulations do not allow the full effect of increased fuel price to be passed on in the form of tariff increases. This means that any increase in gas price cannot be fully recovered and margins are eroded (please see Section 3 page 103 below for more details); and*
- ii. The assumptions made at the time of preparation of the FSR concerning unlikelihood of a gas price decrease and the inability of the Project to pass on the full effect of gas price increases in the form of an increased tariff have been borne out by subsequent events and based on the actual data for the NG price and the electricity tariff experienced by the Project, the Project IRR for the period of operation is 5.23%, which is below the industry benchmark of 8% and even lower than the IRR of 6.54% which was expected in the FSR (please see Section 3 page 104 below for more details).

The reasons for the great unlikelihood of NG prices or O&M costs decreasing, or electricity tariffs increasing so as to raise the Project IRR above the industry benchmark is addressed under the following three headings:

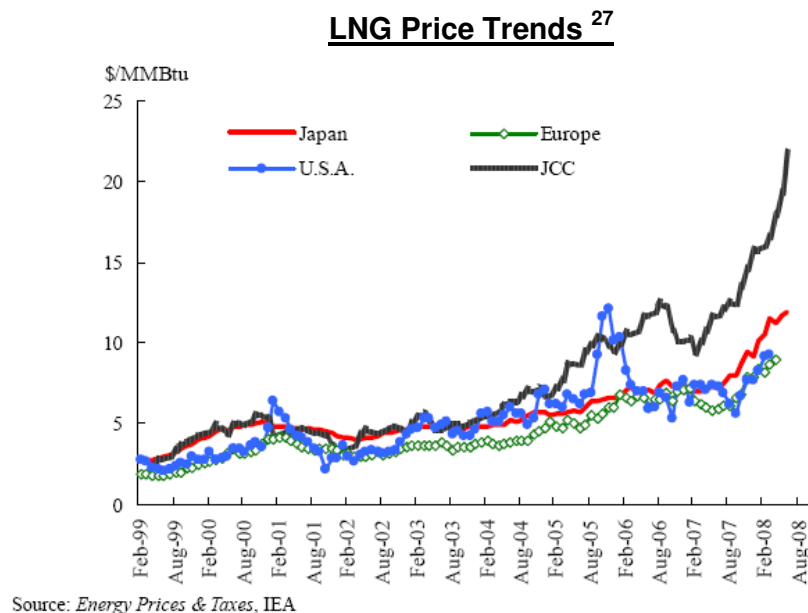
1. The price of natural gas has been rising continuously in China and is set to increase further in the future.
2. The O&M costs faced by the project have been increasing steadily.
3. Government policy requires that any increase in electricity tariff must be preceded by an increase in the price of natural gas, and there are strict limits on the amount of gas price increase that can be recovered by power plants in China through an increase in the electricity tariff. This Government policy means that the two key variables of electricity tariff and gas price are effectively correlated and a rise in tariff cannot occur in isolation from increase gas costs.

1. The price of natural gas has been rising continuously in China and is set to increase further in the future

As has been noted by the Executive Board, and as set out in the PDD, the Project IRR is sensitive to the price of natural gas, and the Project IRR would cross the industry benchmark in the event that the price of natural gas fell by 5%.

At the time of the Project design in 2005, the NG price assumed in the FSR was 1.10 RMB/m³. However, between the finalization of the FSR and the Project Start Date, the gas price was increased to 1.14 RMB/m³²⁵, so at the time of the investment decision, the project owner was aware that the assumption for the gas price was already too optimistic, and that a continuing upward trend in gas prices was almost certain (please see footnote 26 and discussion on page 102 footnote 32). These assumptions were confirmed when the NDRC shortly afterwards issued a notice that gas prices would be increased in the near term²⁶.

Since the Project design in 2005, and in line with the project owner's expectations, the price of natural gas has increased both domestically and across the world. The increase in the international price of gas is illustrated in the diagram below.



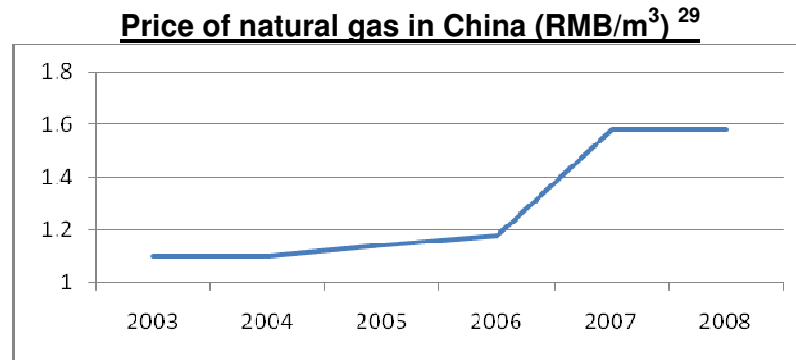
At the domestic level, the price of natural gas in China has also increased. According to the NDRC, the price of natural gas in China is expected to continue to increase, at a rate of 5 – 8% each year for the foreseeable future²⁸.

²⁵ Nanjing Government homepage, "Approval on adjustment of variation of NG price", http://www.nanjing.gov.cn/gsgg/wjst/200610/t20061002_105714.htm - see Ref./N60/

²⁶ "Notification of the reform of NG price mechanism and increase of NG price", 2756[2005] NDRC, 23rd Dec 2005, http://law.baidu.com/pages/chinalawinfo/6/66/f51656d4d1955778c45b441ba3fd5dbf_0.html - see Ref./N61/

²⁷ Institute of Energy Economics Japan (2010) *Natural gas situation and LNG supply/demand trends in Asia Pacific and Atlantic Markets*, see <http://eneken.ieej.or.jp/data/2940.pdf> - see Ref./N62/

²⁸ XinhuaNet News Online, "NDRC: NG price is determined to be increased, the planned increasing ratio will be 5%~8% year by year", http://news.xinhuanet.com/fortune/2006-11/10/content_5311926.htm - see Ref./N63/



The data at the international and domestic level also illustrate that the domestic price of natural gas in China remains considerably lower than the international gas price. According to the IEA, the international price for natural gas reached US\$13/MBtu in 2008³⁰, compared to the actual US\$6.42/MBtu³¹ (1.58RMB/m³) paid by the Project.

China became a net importer of natural gas in 2007, and as imports of natural gas from overseas increase, the pressure for domestic prices to equalize with international prices is increasing³². Gas imported through the Central Asia pipeline by PetroChina (the gas supplier of the Project) costs 2RMB/m³³³. This is substantially higher than the 1.58RMB/m³ currently paid by the project owner. At the end of 2008, PetroChina requested that the project owner indicate the quantity of natural gas it is intending to buy in the future, starting with a base price of 3RMB/m³³⁴.

According to public statements made by PetroChina, news sourced from National Business Daily, that the NG price in China will increase by approximately 10% in 2010 alone³⁵.

It can, therefore, be concluded that at the time of the investment decision, the gas price assumed in the financial analysis was overly optimistic, and prices were almost certain to increase further. Trends in the actual gas price since the date of the Project FSR further demonstrate that it is highly improbable that the Project could experience any decrease in the natural gas price, let alone one which is of a magnitude large enough to push the project IRR over the 8% industry benchmark.

²⁹ <http://www.chinacem.com/21/2101/210101/news/20031124/100003.asp> (figures for 2003 & 2004) - see Ref./N64/
http://www.nanjing.gov.cn/gsgg/wjst/200610/t20061002_105714.htm (figures for 2005, same as footnote 25 above) - see Ref./N60/
<http://www.jzfgw.gov.cn/old/content.asp?id=1472> (figures for 2006) - see VR Ref./N65/; <http://www.sxzz.gov.cn/show.asp?id=69> (figures for 2007) - see Ref./N66/

³⁰ IEA (2009) *Natural gas in China, market evolution and strategy*, IEA Working Paper, p24 - see Ref./N9/

³¹ 1m³ equals 36,000 Btu; RmB/\$US rate is 6.83: conversion is 1,000,000/36,000*1.58/6.83 = 6.42

³² Caijing Net, "Rising Imports may force gas price reform", <http://english.caijing.com.cn/2009-08-07/110221639.html> - see Ref./N67/

³³ Same as Footnote 32 above - see Ref./N67/

³⁴ PetroChina circular on gas demand, 17th November 2008 - see Ref./N68/

³⁵ National Business News, "NG price would increase by 10%", <http://www.mysteel.com/gc/cjzh/syhg/2010/01/21/085237.2192195.html> - see Ref./N69/

2. The O&M costs faced by the project have been increasing steadily

With regard to the O&M costs of the Project, as explained in the Project PDD & validated in the VR Version 05 Section 3.5.3., the O&M costs are comprised of the following elements:

❖	Fuel costs, i.e. expenditure on natural gas	(82.2%);
❖	Maintenance costs	(9.2%);
❖	Water expenditure	(0.2%);
❖	Material costs	(3.2%);
❖	Employee payroll	(0.7%);
❖	Insurance	(0.3%); &
❖	Other costs	(4.2%).

As the costs associated with the purchase of natural gas account for 82.2% of the Project's O&M costs, the impact of the sensitivity analysis on the O&M costs is largely the same as for the price of natural gas, and the Project IRR crosses the industry benchmark with a 5% decrease in O&M costs.

However, as discussed above, at the time of the investment decision, the assumed natural gas price in the FSR was very conservative, and below the actual gas price at the time of the Project start-date and, as discussed above, the gas price has risen substantially since that time.

Furthermore, if the fuel cost is held constant, the other O&M costs would have to decrease by 25% in order to reduce the total O&M by 5%. However, the price for raw materials, fuels and power (/N70/) and the average wage index (/N71/) have increased 8.5% and 14.6% respectively³⁶.

Taken together, the increase in the price of natural gas, combined with inflation in the price of raw materials and employee payrolls further demonstrates that it was very unlikely that the O&M costs would decrease during the operation of the project.

3. Government Policy concerning fuel costs and electricity tariff mean that a rise in electricity tariff must be predicated on a rise in the price of natural gas

The sensitivity analysis conducted in the PDD shows that the Project IRR will cross the industry benchmark if the electricity tariff increases by 5%. However, at the time of the investment decision:

³⁶ China Statistics Yearbook (2009) - see Ref./N70 & N71/

- the electricity tariff applied in the FSR was over optimistic – 19% higher than the actual tariff experienced by power plants in Jiangsu province (i.e. 0.442 vs. 0.371RMB/kWh) in 2005³⁷,
- the actual gas price was higher than the level assumed in the FSR, as explained above in Section 1 on page 100, and,
- the project owner was aware that in accordance with the regulations governing the setting of electricity tariffs in China, any increase in the electricity tariff must be preceded by a rise in the cost of fuel.

In China, the level of electricity tariffs is strictly controlled by the central government, and is directly linked to fuel costs. According to Article 10 of the Management Rules on Feed-in Tariff (NDRC [2005] 514, 28th March 2005), the electricity tariff can be adjusted³⁸ **only** when there is a significant increase in the fuel price.

Furthermore, the regulations also stipulate that electricity price increases are limited such that the power producers must bear a minimum of 30% of the effect of the fuel price increase and the government will only permit an increase in electricity tariffs to compensate for a maximum of 70% of the fuel price move³⁹. This means that in practice, as fuel prices increase, the margin for power plant operators (including this Project, as demonstrated below by the actual prices) is eroded as electricity tariffs are not permitted to keep up with fuel price changes.

In order to demonstrate the interdependence between the fuel costs and the electricity tariff, the following table sets out the actual values for the price of natural gas and the electricity tariff experienced by the Project during its period of operation. From the table and the footnote, it can be seen that the electricity tariff increased in the middle of 2008 and this increase only occurred after a significant rise in the fuel cost at the end of 2007.

Furthermore, from the calculated Project IRR for each year since operation, it can also be seen that the increase in the tariff has not fully compensated for the negative effect of the fuel cost increase on the project owner.

³⁷ NDRC, “Announcement of adjustment on grid-in tariff in East China Grid April 2005”, <http://scjc.scpi.gov.cn/flfg-content.asp?id=1296> - see Ref /N8/

³⁸ NDRC, “Management Rules on Feed-In Tariff, 28th March, 2005, NDRC[2005]514, http://www.ndrc.gov.cn/zcfb/zcfbtz/zcfbtz2005/t20050613_6670.htm - see Ref /90/

³⁹ NDRC Coal-Electricity Linking Directive; 15th December 2004 FagaiJiag[2004]2909, http://www.ndrc.gov.cn/zcfb/zcfbtz/zcfbtz2004/t20080710_223762.htm - see Ref /89/

	NG price with VAT ⁴⁰ (RMB/m ³)	Tariff with VAT ⁴¹ (RMB/KWh)	Calculated Project IRR (Benchmark 8%)
FSR/PDD values	1.10	0.442	6.54%
Actual value in 2007	1.247 ⁴²	0.480	6.95%
Actual value in 2008	1.58	0.509 ⁴³	2.56%
Actual value in 2009	1.58	0.545	6.19%
Average 2007 – 2009	1.469	0.511	5.23%

The above table demonstrates two important points:

- The average tariff price during the plant's operation from 2007 to 2009 is 15.6% higher than the price used in the FSR, whereas the average gas price is 33.5% higher than that used in the FSR. As stated above, the regulations stipulate that electricity price increases are limited such that the power producers must bear a minimum of 30% of the effect of the fuel price increase. In this case, the project owner has absorbed 50% of the cost increase (the electricity tariff has only increased by 50% of the corresponding gas price), which demonstrates convincingly the application of the government's policy of only allowing power producers to pass on a maximum of 30% of the increased fuel costs to the consumer; and,
- the calculated project IRRs, based on the actual values of the NG price and the electricity tariff for the years 2007, 2008 and 2009, are 6.95%, 2.56%, and 6.19% respectively. These are all considerably below the industry benchmark of 8%, thus confirming the continued financial additionality of the Project; moreover, the average IRR during the period of operation of 5.23% is below the level expected in the FSR, which demonstrates the deteriorating financial returns from the project as gas price increases steadily erode the Project's margins.

Conclusion

It has been demonstrated by the PP and cross-checked by the validation team that, in accordance with Paragraph 18 of the Guidelines on the Assessment of Investment Analysis (version 03.1), the likelihood of any scenarios occurring which would push the Project IRR over the industry benchmark are highly improbable and such a scenario could not possibly have been used in the preparation of the FSR that supported the investment decision.

In particular it has been demonstrated that:

⁴⁰ Same as references in Footnote29 above

⁴¹ See attached spreadsheet - see Ref./N72/

⁴² Weighted average value calculated as the NG price was increased from 1.18 RMB/m³ to 1.58RMB/m³ incl VAT from early Nov 2007

⁴³ Weighted average value calculated as the tariff was increased from 0.480 to 0.520 on 30 June, 2008 and then to 0.545 on 20th August, 2008

- at the time of the investment decision, the assumptions for key parameters – namely the price of natural gas and electricity tariff – were already too optimistic. The actual price of natural gas was increased before the project start-date, and the actual electricity tariff used in the financial model was 19% higher than the tariff for the thermal power plants in Jiangsu province at the time.
- the price of natural gas has been increasing both domestically and internationally, and domestic gas prices are set to increase further so as to equalize with international prices in the near future. The price of natural gas in 2009 paid by the Project itself has increased by 33.5% over the price assumed in the project design in 2005. Therefore the likelihood of a decrease in the price of natural gas of a magnitude sufficient to push the project IRR above the industry benchmark is extremely low;
- the O&M costs are closely correlated to the price of natural gas (which accounts for 82.2% of total O&M costs) for which it has been demonstrated that gas prices have been increasing, and are set to increase further in the future. In addition to this, there has been continuous inflation in the cost of other materials and employee payroll and this inflation is expected to continue. Therefore, the likelihood of a decrease in O&M costs is also very remote;
- electricity tariffs in China are strictly regulated by the Chinese government, and are adjusted based upon adjustments to the fuel price. Therefore, any increase in electricity tariff cannot occur in isolation, and thus the likelihood that the electricity tariff would increase in a way that could push the IRR above the industry benchmark is highly improbable; and
- the actual electricity tariffs and gas prices experienced by the project owner since the start of operation in 2007 have resulted in a project IRR lower than that calculated in the FSR (and PDD), thereby further confirming the financial additionality of the Project.

In summary, based on the information provided by the project participant and the assessment by the validation team, the investment analysis and sensitivity analysis are considered readily demonstrating that the project activity is unlikely to be the most financially attractive option.

3.5.4 Barrier analysis

This section is not applicable since barrier analysis is not applied.

3.5.5 Common Practice Analysis

12 nos. of Natural Gas power generation projects are identified for common practice discussion in the PDD. The validation team agrees that the project identification to be appropriately determined, because they all provide similar output, services and applying similar technology as the proposed project, i.e. peak load regulating electricity supply to ECPG using combined cycle technology.

The proposed project is connected to the ECPG, which includes Shanghai, Zhejiang, Anhui, Fujian and Jiangsu Provincial Grids (i.e. where the proposed project is located). As each grid (both regional or sub-grids) represents a different and unique geographical area from the others, it faces different aspects in power structure, economic situations, construction conditions, regulatory structure, tariff setting, policy background, geographical environment, etc. According to the “Tool or demonstration and assessment of additionality” /3/, it reads *“projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc.”*. It is thus agreed by the validation team that the selection of Jiangsu provincial grid as the discussion boundary shall be reasonably acceptable in the common practice analysis. Nonetheless, it is noted that the PP has applied an even rigorous analysis to select the entire ECPG (which covers the most economically developed Yangtze Delta Economic Region in China) as the discussion boundary. This selection covers even larger numbers of NGCC power generation projects in the discussion, the validation team thus confirms that the geographical scope selected is appropriate, and making the coverage of analysis even more comprehensive.

The validation team has also checked the reference sources to be valid, i.e. (i) official CDM project list released in NDRC website & (ii) the “NGCC projects contracted or executed since 1990” /96/ released in CNTIC company homepage. CNTIC (China National Technology Import Export Company) is an enterprise under the commission of the NDRC, which is responsible for technology transfer and the import of all NGCC technology from the West. Being an official interface for importing major NGCC units into China, the reference source from CNTIC official homepage is therefore deemed authoritative. The analysis is considered comprehensively covering similar projects for discussion.

One of the identified projects, namely “Fujian Xiamen Dongbu LNG power project (Dongbu Project)”, enjoyed financial support from the government, resulting the project not facing any financial difficulty. The Dongbu Project is totally invested by an international company, East Asia Power (EAP) China, which is owned by RGM International, a multinational corporation with the head office in Singapore. The validation team understands from China News Net /86/ and confirms that the Dongbu Project being the first LNG project solely owned by a foreign enterprise in China (Fujian Province) has enjoyed financial privileges from the local government, e.g. tax exemptions, tax refund, lower tax rates, and VAT subsidies, etc., which are all exclusive to those investments from foreign enterprises, and significantly improve the project’s economic viability. It should be noted that the Proposed Project has not received any financial support in any form. The preferential tax rate that will be enjoyed by the Dongbu project during its operations is only 15% compared to the normal nationwide tax rate of 33%. In addition to this, the Dongbu project has already benefited from 77.5 million RMB of tax rebates in its construction phase⁴⁴, and these special preferential taxes are designed to make the project significantly more attractive so as to secure foreign investment. The validation team also verified the claimed financial privileges to be complying the State Policy on foreign investor enterprises /87/. These tax policies are not available to domestically

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⁴⁴ Xiamen Tax Bureau, Tax rebate for Dongbu LNG power project, http://www.xm-n-tax.gov.cn/qjpd/xaswj/gzdtxa/200902/t20090211_6135.htm

funded projects. Thus, these benefits made the Dongbu Project more financially attractive than the proposed project.

All the remaining 11 nos. of identified projects faces the same obstacles in project finance as the proposed project does. They did not enjoy any national special funding nor any other financial aids in building up a strong resistance against project risk and faced the same investment barrier that they had to strike for CDM support. The validation team is able to check against the UNFCCC website, and verifies that 6 nos. of them were successfully registered as CDM project since Year 2007 to 2009, and the other 5 nos. of them were all in the validation process. They are hence not to be included in this analysis for discussion, as per requirements stipulated in "Tool for the demonstration and assessment of additionality (Version 05.2)".

In summary, the validation team confirms that the proposed project is not a common practice, and hence not the baseline scenario and is additional.

3.6 Monitoring

The monitoring plan is included in PDD Section B.7 based on the approved monitoring methodology AM0029/Version 03 – "Grid connected electricity generation plants using non-renewable and less GHG intensive fuel", and is correctly applied to the proposed CDM project activity. Applicability criteria of the monitoring methodology to the project activity are met as noted in Section 3.4 above.

Monitoring of GHG emission reduction is based on measuring the net quantity of electricity supplied to the ECPG, i.e. difference between imported and exported electricity, which is transparently presented in Section B.7. of the PDD. The data will be counter-verified against the selling receipt from the grid. The PDD has made provisions in B.7 & Annex 4 for full details in monitoring the GHG emissions reduction due to the project activity.

3.6.1 Parameters determined *ex-ante*

The project adopts the *ex-ante* calculation of emission factor of the grid based on the most recent information available at the time of PDD submission to DOE. It identifies the build margin (Option 1) as the lowest emission factor among the three as the baseline emission factor options stipulated by AM0029. The parameters for determining the GHG emission reductions have been clearly demonstrated in B.6.2. of PDD. The validation team has verified those parameters by means of document review (i.e. <Supplement to FSR> /11/, IPCC 2006, China Electric Power Yearbooks /65/, China Energy Statistics Yearbooks /64/, and the applied methodology, etc), and interviews during OSV. Please refer to Section 3.4.4 above for detailed discussion. The actual build margin emission factor applied for the *ex-post* determination of emission reductions will be updated *ex-post*.

Therefore, validation team can conclude that all relevant parameters to calculate the GHG emission reductions of the project have been sufficiently considered and the value of the parameters is real, measureable and conservative.

3.6.2 Parameters monitored *ex-post*

According to AM0029, the following parameters are required to be monitored:-

- i) net electricity supplied to the grid generated by the project;
- ii) net quantity of NG consumption by the project activity;
- iii) build margin emission factor of ECPG (note: calculated *ex-post* as per “Tool to calculate emission factor for an electricity system”, based on latest data available from Chinese DNA);
- iv) NCV of NG per volume unit of NG (refer to NG supplier’s test report, which is to be performed fortnightly; In case data from NG supplier is not available, shall use local or country specific data)

Monitoring arrangement of these parameters has been described in the monitoring plan, in which the first two parameters will be directly measured by metering equipments. The recording frequency is described in line with the requirements stipulated in the monitoring methodology. The validation team further confirms the monitoring arrangement against document review and on-site interview with representatives from project participant /viii, xi, xii/ and power company /xiii, xiv/, and thus considers that the monitoring plan has complied with requirement in the approved methodology.

3.6.3 Management system and quality assurance

Monitoring of sustainable development indicators is not required by the applied monitoring methodology, nor by the China’s DNA. The environmental impacts are considered minor and will be monitored by the local environmental authority during the project lifetime (please refer to Section 3.8 below). According to the PDD, the project’s monitoring plan outlines the requirements, instruction and detailed arrangements for:-

- Monitoring institution and training plan;
- Data to be monitored;
- Equipment for monitoring and installation of meters;
 - Monitoring of net electricity generated by the project and sold into the Grid (ECPG)
 - Monitoring of quantity of NG combusted
- Monitoring of NCV;
- Calibration;
- Data management; and
- Monitoring report

Steps undertaken to assess the monitoring plan

According to document review in PDD, on-site interview with representatives from project participants and the grid company, the monitoring arrangements described in the monitoring plan is assessed; it is reasonably believed that the monitoring plan can be feasible within the project operation period.

Detailed procedures have been developed and the implementation of these will enable subsequent verification of the project's emission reductions. The management team for monitoring of the project is identified in the PDD. Appropriate training has been provided to the management team and operation team for ensuring they are suitable and competent for carrying out the work. The validation team is even able to assess the central control system during OSV and checked some of the recorded operational data in the computer system. It was observed that the operation data such as the electricity generation data was recorded systemically. The plant operational staff is well capable to explain to the validation team about the monitoring procedure.

Thus, the validation team considered that the project participant is capable to implement the monitoring plan by the trained monitoring team.

3.7 Sustainable Development

The project is considered to be contributing to sustainable development in the host country P.R. China, by utilizing the less GHG intensive fuel for power generation, and significantly reducing the environmental pollution caused by operation of fossil fuel-fired plant. In addition to CO₂ emission reductions, the project would mitigate other pollutants, such as SO₂, NO_x and particulates associated with power generation from fossil fuel.

Several more benefits would be expected by implementation of the proposed project, which includes improvement in the local and regional economy development by providing electricity to meet the increasing electricity demand, as well as the additional tax income brought to the local community originated from the sale of electricity by the proposed project. Temporary & permanent employment opportunities were also created for the project construction and operation phases. During OSV, the validation team has interviewed with the MR of the proposed project /viii/ and confirmed that a total of 135 local residents have been contracted by the project to provide logistical services for the project. And 167 nos. of temporary employment opportunities have been created during project construction /101/.

As confirmed by the local government officials from DRC /i, ii/ during on-site interview, the economic development would be secured by providing constant and stable power supply to local community, especially during the peak regulation periods. Thus, the sustainable development in social, environmental and economic aspects could be achieved by implementation of the project activity.

In addition, the validation team has checked on the Letter of Approval (LoA) /7/ issued by NDRC on 22nd May 2007, which indicates the confirmation from the China DNA for the contribution of the project to the sustainable development.

3.8 Environmental Impacts

The validation team considered that the environmental impacts in both project construction & operation phases and the relevant mitigation methods have been comprehensively described

in Section D of PDD including the land use, air pollution and noise, wastewater, solid waste and ecological impacts according to the EIA report.

The environmental impacts of the project were sufficiently assessed by means of an Environmental Impact Assessment (EIA) study according to the China laws & regulations such as “*Environmental Protection Law of P.R. China*” and “*Law of the People's Republic of China on the Environmental Impact Assessment*”. The EIA Report /13/, which was prepared by the China Power Company Design Centre in August 2001, which was granted by the government with “Environmental Impact Assessment Certificate on Construction Projects” (Ref no.: GuoHuanPingZheng Class-A no. 2604).

The EIA Report /13/, which was approved by the Ministry of Environmental Protection (SEPA) on 10th June 2003, was inspected by the validation team to be valid /13/. According to the EIA Report, the proposed project is located in an industrial region in Nanjing City, where it is planned and approved for development area for industrial and residential purposes, with no environmental protection zone nearby. The environmental impact to the project area has been considered in the EIA Report with proposed corresponding measures during project development. It is reported that the project activity is not expected to cause significant environmental impacts.

During the on-site interview, the local EPB official /iii, iv/ stated that there were inspectors from provincial EPB carried out inspections and monitoring works for the environmental impacts arisen from the project activity during plant construction. In the operation phase, there is even Continuous Emissions Monitoring Systems (CEMS) being installed at the exhaust points of plant chimneys for real-time emission quality monitoring, which is considered the key environmental concern. From the EPB officials’ understanding, the project owner has implemented the project construction and operation well according to mitigation measures in the EIA Report, thus there was no adverse effect on the ecology, air, water and solid waste, arisen from the project activity. In addition, there was also no endangered species found in the project location.

During OSV, the power plant was in operation. The validation team revealed that the project activity was carried out within an industrial zone with only staff apartment buildings and scattered villagers nearby. The nearest residents from Donghua village, Xihua village & Guangminxing village /xviii, xix, xx/, were living at about 2km away from project site. During the on-site interview, the local residents advised that there was no critical impacts to their living environment induced by the proposed project since the past construction phase until the current operation phase. No environmental complaint on the proposed project is received by the local EPB official.

It is also understood from the DRC official /i, ii/ that the land acquisition for project development in the entire industrial zone was responsible by the property management agent of the industrial zone and the compensation process has been duly completed years ago. The project owner is not held responsible for this compensation issue (incl. arrangement nor payment).

3.9 Local Stakeholder Consultation

Although it is not a formal requirement by the current legislation of the host country to carry out a public consultation process, a local stakeholder questionnaire survey was conducted in August 2006, which was prior to the PDD publication on UNFCCC website (i.e. 28th October to 26th November 2006), for collecting comments on the project implementation. Most of the comments from stakeholders considered that the project would bring positive impacts to the local economy and livelihoods of local people with increased job opportunities and more stable power supply. The majority of them expressed their full support to the implementation of the project activity. All the comments were summarized and recorded in the PDD, Section E. Record evidence of the filled questionnaires is received from the project participants for the validation team's verification.

36 nos. of the distributed questionnaires /75/ were collected from the public interviewees and were received from the project owner for validation team's inspection. The validation team has read through the questionnaires and concurs the summary in Section E of PDD to be comprehensive. The stakeholder survey itself is also deemed appropriate as it reasonably covered the most affected people in the neighbor community, incl. residents from the proximate villages, etc. Moreover, groups from different background (e.g. gender, age, vocation and education level) were invited for giving comments. In particular, the surrounding of construction site operation plants was identified as the highlighted spot for investigation.

The results of the questionnaire survey can be counter-confirmed with the general voices noticed from the on-site visit. Representatives from the local community (i.e. Donghua village, Xihua village & Guangminxing village /xviii, xix, xx/) were interviewed. In general, the interviewees show adequate understanding of the nature of the project and are satisfactory with the overall project implementation & relevant environmental mitigation measures. As confirmed by the government officials from local DRC /i, ii/ & EPB /iii, iv/ during OSV, the citizens consider that the project would benefit the improvement in local social, economic and environmental development. The response is overall supportive to the project implementation. There has been no complaint ever received from the residents to the project construction or operation. The questionnaires results are hence deemed representative.

3.10 Comments by Parties, Stakeholders and NGOs

The PDD (version 01) of September 2006 was made publicly available on TÜV Rheinland's website

(<http://www.tuvdotcom.com/pi/web/TuvdotcomIdSearchResults.xml?TUVdotCOMID=9105039069&LanguageSelected=en-us&strLevel=0&pageno=01&strUserId=&strUrlId=1&sLand=&sLang=&searchbox=nanjing%20jinling>) and parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 28th October to 26th November 2006.

One comment was received, which are questioning the supply guarantee respectively security of supply of natural gas. The comments received are provided in below:

Comment by: Teresa Chou

Comment provided on: 11 November 2006

Subject: Nanjing Jinling Grid Connected Natural Gas Combined Cycle Power Plant Project
Comment:

Same as the LNG project in Shanghai, widely known reality in Nanjing is this city is facing big natural gas shortage.

<http://www.21ct.cn/info/infoview.asp?id=48179>
www.china5e.com/news/jichu/200609/200609180029.html

If the LNG supply to the project is ensure. There will be leakage from families use and industrial use.

It needs to be carefully reviewed by TUV and CDM executive board.

TÜV Rheinland's validation team forwarded the comment to the project proponent on 13th November 2006, and requested the project proponent to provide a response to the comment received. Gaisi Peony Carbon Capital s.a.r.l's response is given below:

Response to comment made by Teresa Chou:

Gaisi Peony Carbon Capital s.a.r.l, the Project Participant, is happy to reply the comment made by Ms. Chou on the 11 Nov. 2006 as follows:

Natural gas is sufficiently available in the project region and the project's demand only accounts for 2.5% of the currently available natural gas. This share will reduce to only 1.4% in 2015 as capacity increases following the completion of a number of investment projects.

In addition, according to the NDRC's Policy on Utilization of Natural Gas, as a 'permitted' user which is ranked below these 'priority' users, in the event of a scarcity of gas, the Proposed Project gas supply would be suspended in favor of priority users. Provisions have been included in the natural gas supply agreement with PetroChina for this. Therefore, the project activity will not displace natural gas that would otherwise be used elsewhere.

On the basis of this, it can be concluded that Ms Chou's concerns that "There will be leakage from families use and industrial use" will be avoided.

TÜV's opinion towards the comment and response received:

The validation team has reviewed the public comment received. The comment by Ms Teresa Chou said that natural gas supply is not adequate in Nanjing and hence the implementation of the project would result in leakage.

The validation team has undertaken due considerations on the comment and responses given during the validation and especially during the on-site visit, and has reviewed the status of the supply of the natural gas to Nanjing, the greater Jiangsu area, and the Yangtze Delta

Region. According to the news report and communications with the local stakeholders during the on-site interview, there was a shortage of supply of natural gas in 2006. The shortage redeemed meanwhile owing to the program to increase the gas supply from the West China, see detailed discussion below. Key factors that accelerated the greater consumption of natural gas include the following:

- faster economic developments which result in greater demand for power;
- faster industrial developments, especially those petrochemical plants with great demand in power;
- the usage of natural gas for residential use for heating during winter becomes more and more popular and faster than expected.

As reported in the PDD and validated as per Section 3.4.1 in this report above, the demand for natural gas will be met by increasing supply from the West to East gas program, as well as supplies from other sources such as those from the Jiangsu LNG programme. Furthermore, there is a seasonal pattern in the consumption of natural gas, with typically a relatively lower consumption in summer and higher demand in winter. The higher consumption in winter is due to the usage of natural gas for heating within residential houses. The power plant would be used to balancing peak electricity load and hence would be most active in summer only where the supply of natural gas is less in demand comparing with winter times. Also considering the percentage of consumption of the power plant, which is relatively small comparing with other modes of consumption (such as industrial uses, residential uses), the presence of the project activity would not likely pose a constraint to the building of other natural gas power plants.

It is the opinion of the validation team that natural gas will be sufficiently available as reported in Section 3.4.1 of the this Validation Report.

Appendix A

CDM VALIDATION PROTOCOL

PROJECT TITLE: NANJING JINLING GRID CONNECTED NATURAL GAS COMBINED CYCLE POWER PLANT PROJECT

PROJECT LOCATION: P. R. CHINA

REPORT No. 01 997 9105039069

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
1. Approval					
1.1 Have Letters of Approval have been provided from all involved Parties? If yes, indicate: – when and by which Party the LoA has been issued, with a clear reference to the LoA itself and any supporting documentation; – whether the LoA was provided to the DOE by the project participants or directly by the DNA; – the means of validation employed to assess the authenticity of the document; and – by a clear statement, that the DOE considers the LoA to be valid. –	/7 - 9/	DR	The LoA from the China's DNA, i.e. NDRC, has been received for authorizing HNNJJ as a voluntary project participant. The LoA from the UK's DNA, i.e. Defra, has been received for authorizing Peony Capital as a voluntary project participant. (Note: official letter from Credit Suisse /Ref 9/ is checked to be valid for its voluntary withdrawal from the proposed project.) <u>CAR01</u> It is appeared in China's LoA that "Credit Suisse International" is listed as one of the PPs, which is inconsistent with PDD. Please clarify. <u>CAR02</u>	~~CAR01~~ ~~CAR02~~ ~~CAR04~~	OK

⁴⁵ MoV = Means of Verification, DR = Document Review, I = Interview, www = internet search.

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			Please re-confirm on the information of the submitted UK LoA (dated 2007-12-12). As referring to the DNA's (Defra's) public announcement, there's another latest LoA (dated 2008-01-07) issued for this proposed project, where it reads "Credit Suisse International" to be the PP, but not "Gaisi Peony Carbon Capital S.a.r.l".		
1.2 Are all Parties, who issued the LoA, Parties to the Kyoto Protocol <u>and</u> is this stated in the LoA?	/7 - 8/	DR	Yes. NDRC of P. R. China is the host party to issue the LoA. P.R. China ratified the Kyoto Protocol on 30th August 2002. Defra of UK is the Annex I party to issue the LoA. UK ratified the Kyoto Protocol on 31st May 2002. CAR04 The LoA from DNA of P.R.China is not available for inspection. The project proponent has to obtain a written approval for the project from the DNA of the P.R. China in English language, which shall contain all required CDM elements in the letter as defined by UNFCCC	OK	OK
1.3 Is every LoA from the Parties involved issued by an organisation listed as	ditto	DR	Yes. NDRC is listed as DNA of P.R. China on the UNFCCC web site. <u>Contact Person:</u>	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
Designated National Authority (DNA) on the UNFCCC web site? <i>Indicate the official name of the DNA and contact person name.</i>			<u>Mr. Wang Shu</u> <u>Project Officer of the Department of Climate Change, NDRC</u> Defra is listed as UK's DNA on the UNFCCC web site. <u>Contact Person:</u> <u>Mr Chris Dodwell</u> <u>Head of International Climate Change Division</u> http://cdm.unfccc.int/DNA/index.htm <u>1</u>		
1.4 Is the participation in the CDM project activity voluntary <u>and</u> is this stated in all LoAs? <i>Indicate the source of proof.</i>	/7 - 9/	DR	As stated in China and UK LoA respectively, HNNJJ and PC participate in the CDM activity voluntarily.	CAR01 CAR02	OK
1.5 Is the LoA unconditional with respect to 1.2 to 1.4?	/7 - 8/	DR	Yes. The LoA for HNNJJ and PC are unconditional with respect to 1.2 to 1.4.	OK	OK
1.6 Is the title of the CDM project activity as given in the PDD identical with the title given in all LoAs and Modalities of Communication? <i>Provide Yes/No answer, and include details into Tables 2, 3 and 4 accordingly.</i>	ditto	DR	Yes. The title of project in PDD is identical with LoA & MoC. CAR03 Contact information is not precisely consistent between MOC & PDD (Annex 1), e.g. fax no, email, mobile no, address. Please re-confirm.	CAR03	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
1.7 If any of provided LoAs contains additional specification of the CDM project activity (PDD version number, validation report version number, amount of ER, etc.) are those specifications valid and consistent with other documents?	ditto	DR	No. The provided LoAs do not contain additional specification for the project activity.	OK	OK
1.8 Does the project activity involve any public funding from Annex I Parties? <u>If yes</u> , has Annex I Party provided a written confirmation that the use of such funding does not lead to the diversion of the official development assistance.	/7 - 8/ /11/ /15 - 17/ /20/ /27 - 28/	DR	According to Annex 2 of the PDD, the project does not receive any public funding. Several information (incl. financial audit report, company regulations, etc) has been checked and is found in line with the interview results, which show that there involves no ODA for the proposed project. <u>CL04</u> Please provide explanation with supporting evidence to demonstrate that the project is not financially aided in any form (all along the project lifetime), so as to discuss whether or not the project being a baseline scenario.	<u>CL04</u>	OK
2. Participation (VVM E.2)					
2.1 Are the Parties and project	/6/	DR	Yes. The PPs are correctly listed	<u>CAR03</u>	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
participants (PP) listed in the section A.3 of the PDD correctly <u>and</u> is this information consistent with the contact details provided in Annex 1 of the PDD?			in the section A.3. of the PDD and they are consistent with the contact details provided in Annex 1 of the PDD.		
2.2 Has every Party involved approved the participation of each corresponding PP, either by means of a LoA or by a separate written document? <i>Indicate Yes / No answer and describe all inconsistencies in the Tables 2, 3 and 4 accordingly.</i>	/7 - 9/	DR	Yes. The China & UK's LoA for approving HNNJJ & PC's participation are received.	CAR01 CAR02 CAR04	OK
3. Project Design Document (VVM E.3)					
3.1 Is the PDD presented for validation based on the latest template available at the UNFCCC website? <i>Indicate Yes / No answer and describe all inconsistencies in the Tables 2, 3 and 4 accordingly.</i>	/6/ /2.1/	DR	Yes. The PDD (Version 01 dated Sep-06) is based on the latest template available at the UNFCCC website in accordance with the applicable guidance document.	OK	OK
3.2 Has the PDD been established in accordance with the CDM requirements for completing PDDs issued by the CDM EB?	ditto	DR	Yes. The PDD (Version 01 dated Sep-06) & its subsequent revisions have been established in accordance with CDM requirements. CAR09 The enclosed tables in the PDD are different from the latest versions	CAR09	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			of the applied monitoring methodologies. Please revise accordingly.		
4. Project Description (VVM E.4)					
4.1 Does the PDD contain a description, which provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation?	/6/ /10 - 19/ /21 - 14/ /29 - 39/	DR, I	Yes. The project description in PDD provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation. CAR06 The description of the project activity should contain a process flow sheet and more technical specifications, parameters. The results from the performance guarantee tests have to be presented. This section should include a description of how environmentally safe and sound technology and know-how to be used is transferred to the host Party(ies). Systems plans and responsibilities with regard to initial training (capacity building) and maintenance efforts during the project period should be outlined in this section.	CAR06 CL01 CL05 CL06 CL07	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			This is relevant when new technology is implemented such as a new boiler type, new gas turbine type, new waste heat recovery and steam turbine, etc. The actual capacity building activities should be carried out as soon as possible and at all events prior to start of the crediting period to ensure effective operation of the project. <u>CL01</u> The provided geographic coordinate for identification of project location is deemed not precise, as it can be merely seen from public map that the coordinate demarcate some grassland area, but not factory area. <u>CL05</u> Please indicate the age and average lifetime of the key equipments with supporting evidence. Other key technology parameters, incl. load factor, efficiency, etc. (of the entire combined cycle system), are also needed as per requirements		

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			stipulated in the "Guidelines for completing PDD". CL06 Please re-confirm the selection of crediting period to be 7 renewable years, which appears inconsistent with the selection in PDD (GSP version). CL07 It is noted that in PDD there's further revision on the key equipments' specification, the validation team would have to verify during on-site visit on the given specifications, against the manufacturers' manual, equipments' nameplate, etc.		
4.2 In the case of greenfield project activity, is the project design described sufficiently by means of specifications, drawings and manuals? <i>Provide Yes/No answer and indicate the documents which have been reviewed in relation to the issue.</i>	ditto	DR, I	Yes. During OSV, the power plant is in operation. The specifications of major equipment were checked against the equipment contracts & operation manual. Some of the technical drawings were checked in the project site area. The operation and maintenance manuals were available during OSV. The validation team consider the	~~CL07~~	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			project design is sufficiently described by means of specifications and drawings.		
4.3 Does the project activity reflects current good practices, uses state of the art technology or would the technology result in a significantly better performance, than any commonly used technologies in the host country? <i>Provide the description of how validation has been carried out and what comparisons have been made.</i>	ditto	DR, I	Yes. The project FSR was jointly prepared by the Southern China Electric Power Design Institute and Jiangsu Provincial Electric Power Design Institute. The gas-steam combined cycle power generation technology used for the project reflects current good practices where on one hand less GHG intensive fuel would be utilized for cleaner power generation, and on the other hand the environmental pollution caused by commonly used technologies of fossil fuel-fired plant could be eliminated.	OK	OK
4.4 In cases where the project activity involves the alteration of an existing installation or process, does the PDD provide a clear description of the differences between the project and the pre-project scenario? <i>Please, provide Yes/Now answer and update Tables 2, 3 and 4 accordingly,</i>	--	DR, I	N/A. According to validation team's physical inspection and on-site interview with pp, the project activity did not involve the alternation of existing installation or process.	N/A	N/A

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<i>if there is anything unclear in the provided description.</i>					
5. Baseline and Monitoring methodology					
5.1 General requirements					
5.1.1 Is the methodology used in the project activity approved by the CDM EB and is the selected version still valid?	/2/ /6/	DR	Yes. The methodology used in the project activity is approved by the CDM EB and the selected version is still valid.	OK	OK
5.2 Applicability of the selected methodology					
5.2.1 Does the project activity qualify under the criteria for small-scale CDM project activities set out in §6 (c) of decision 17/CP.7 and Annex II of the Modalities and Procedures for the CDM? <i>Please provide Yes/No response and description of how this was validated.</i>	--	DR	N/A. The project activity is a large scale project.	N/A	N/A
5.2.1.1 If yes, does the PDD extensively demonstrates and confirms that the small-scale project activity is not a debundled component of a larger project? <i>Please indicate Yes/No answer. In case of positive conclusion provide details of the validation measures taken and</i>	--	DR	N/A. The project activity is a large scale project.	N/A	N/A

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<i>data found during the procedure. Otherwise amend the Tables 2, 3 and 4 accordingly.</i>					
5.2.2 Are all applicability conditions of the selected baseline and monitoring methodology and all tools involved satisfied by the project activity? <i>Please indicate Yes/No answer. In case of positive conclusion provide details of the validation measures. Otherwise amend the Tables 2, 3 and 4 accordingly.</i>	/10 - 12/ /36 - 40/ /55 - 58/ /77 - 99/	DR	Yes. The project applies the approved baseline and monitoring methodology AM0029/Version 3 together with the "Tool to calculate the emission factor for an electricity system" Version 01.1, and "Tool for the demonstration and assessment of additionality" Version 05.2. Applicability criteria for the baseline methodology are assessed by the validation team by means of document review and interview. It is agreed in the validation team's opinion that the project activity fully met the criteria as described below: The project activity is the construction and operation of a new NG fired grid-connected electricity generation plant, which has been confirmed by the validation team through on-site interview with the	CAR13 CL03 CL15 CL16 CL17	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			local DRC. According to the project owner, there is no any other fuel used for plant operation other than NG. During OSV, the validation team was able to further confirm with this by checking the equipment drawings in the operation manual, project site plan (with indication of all NG pipelines) and physical inspection to the plant equipments (incl. both the main gas turbines & the start-up boiler), confirming that there is no such design for other auxiliary fuel inlet ports, except the one clearly indicated as "NG inlet". Besides, the validation team did not reveal any storage of other fuel in project location; • The geographic/physical boundaries of the baseline grid (ECPG) can be clearly identified and information on the characteristics of		

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			the grid is published by the DNA of China, which is publicly available The NG is sufficiently available in the region and country. Use of NG by the proposed project shall not constrain the NG use of any other comparable users, and would not thus lead to any possible leakage. CAR13 It has to be evidenced with updated information (Feasibility Study Report, further updates, 11th 5-year-plan), that the application criteria for the approved baseline methodology AM0029 can be fulfilled with regard to the availability of natural gas (The critical NGO comments during global stakeholder process have to be taken into account). It has to be documented in this context, that supply limitations will not result in significant leakage. CL03 Please demonstrate that there'll be		

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			no start-up/auxiliary fuel being used in the project activity, which is to justify the methodology applicability. <u>CL15</u> How is the NG supply throughout the project operation period (20 years) be guaranteed, given that the NG supply contract signed with PetroChina (dated 2004-12-29) states clearly the NG supply period is only until 2023-12-31. <u>CL16</u> Please provide the spreadsheet to demonstrate all the numbers used in the gas availability analysis. The PP has to demonstrate the deletion of Yancheng LNG program is actually not affecting the gas availability. <u>CL17</u> It is noted in the previous discussion that a number of measures have been adopted by the government to protect the priority supply to residents are ensured, including cutting of some industrial uses. Please explain the		

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			above saying with supporting information, and are these measures implying that industrial users shall be therefore affected.		
5.2.3 Is the selection of the applied baseline and monitoring methodology justified?	ditto	DR	Yes. The selection of the applied baseline and monitoring methodology is justified as per AM0029/Version 03.	~~CL03~~ ~~CL15~~ ~~CL16~~ ~~CL17~~	OK
5.2.4 Is the selected methodology correctly quoted in all related documents?	ditto	DR	Yes. The selected methodology is correctly quoted in all relevant documents.	OK	OK
5.2.5 Does the PDD sufficiently describe all the GHG emission sources or sinks occurring as a result of project activity, which have not been accounted for under the selected methodology and are expected to contribute more than 1% of the overall expected average annual emission reductions? <i>Provide Yes/No answer. Indicate the sources or sinks of GHG, which were proved to be negligible. Otherwise amend the Tables 2, 3 and 4 accordingly.</i>	ditto	DR	Yes. The GHG emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed CDM project activity are the project emissions due to combustion of NG. As observed during OSV, there's no other facility generating emission nor shall contribute more than 1% of overall expected average annual emission reductions.	~~CL03~~	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
5.3 Project boundary					
5.3.1 Does the PDD correctly describe the project boundary? <i>Provide Yes/No answer. And amend the Tables 2, 3 and 4, if needed.</i>	/6/ /10 - 12/ /29 - 31/ /61/	DR	Yes. As per AM0029/Version 03, the project boundary is clearly defined as the physical, geographical site of the power generation source, i.e. the NGCC power generation plant to the ECPG.	OK	OK
5.3.2 Does the PDD correctly indicate and describe the emission sources and sinks of GHG gases that are included in the project boundary?	ditto	DR	Yes. The PDD correctly describe the project emission that is included in the project boundary as a result of project activity.	OK	OK
5.3.3 In cases where the methodology allows project participants to choose whether a source or gas is to be included in the project boundary, is the choice explained and justified by PPs?	ditto	DR	Idem.	OK	OK
5.4 Baseline identification					
5.4.1 Has the procedure contained in the selected methodology to identify the most reasonable baseline scenario been applied correctly and documented in the PDD?	/10 - 12/ /36 - 40/ /55 -	DR	Yes. As per AM0029/Version 03, the baseline is applied correctly and documented in the PDD. Please refer to Section 3.4.3 for details.	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
	58/ /62 - 63/ /77 - 99/				
5.4.1.1 Is the identified baseline scenario plausible?	ditto	DR	Yes. As per AM0029/Version 03, the identified baseline is plausible. Please refer to Section 3.4.3 for details. <u>CAR07</u> The different alternatives provided have to be explained with regard to applied technology, efficiency parameters and technical lifetime according to AM0029. <u>CAR08</u> According to AM0029 (P.3, 2nd paragraph) should the levelized cost of electricity production in \$/kWh be used as financial indicator for the investment analysis, critical assumptions including "the load factor" should be used for the sensitivity analysis as variation parameter. <u>CL04</u>	<u>CAR07</u> <u>CAR08</u> <u>CL04</u> <u>CL13</u> <u>CL14</u> <u>CL33</u> <u>CL34</u>	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			Please provide explanation with supporting evidence to demonstrate that the project is not financially aided in any form (all along the project lifetime), so as to discuss whether or not the project being a baseline scenario. CL13 In the discussion of alternative scenario for baseline determination, please further substantiate with supporting evidence on the claimed:- 1. Prohibition of oil fired power plant 2. Unfeasibility of biomass power plant CL14 Alternative scenarios on ultra super critical technology to be further discussed. As per the provided reference, the technology as alternative is not readily excluded. The construction of ultra super critical power plant has been commenced in 2004-06, which is before the project starting date. The alternative scenario identification, and hence the		

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			Levelized Cost Analysis, remain open. CL33 It has to be clarified, whether all other plausible alternatives (e.g. other alternatives that are documented in official power expansion plans, 5-year-plans, etc.) have been taken into account as possible baseline scenarios. CL34 For the identified Alternatives (2) and (3), please clarify the given explanation within the text that these alternatives also comply to Sub-step 1b – Enforcement of applicable laws and regulations.		
5.4.1.2 Are all assumptions stated in a transparent and conservative manner?	ditto	DR	Yes. As per AM0029/Version 03, all assumptions stated are in a transparent and conservative manner. Please refer to Section 3.4.3 for details.	OK	OK
5.4.2 Does the selected methodology require the use of tools <u>and</u> does PDD reflects that correctly?	ditto	DR	Yes. The selected requires the use of “Tool to calculate the emission factor for an electricity system” and “Tool for the demonstration and assessment of additionality”. PDD	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			reflects the use of tools correctly.		
5.4.2.1 Were all the tools applied correctly?	ditto	DR	Idem	OK	OK
5.4.3 In case the methodology requires several alternative scenarios to be considered in the identification of the most reasonable baseline scenario, have all scenarios been considered <u>and</u> have no reasonable alternative scenario been excluded?	ditto	DR	As per AM0029/Version 03, alternatives scenarios are considered in the identification of the most reasonable baseline scenario. All scenarios have been comprehensively considered, and there is no reasonable alternative scenario been excluded. Please refer to Section 3.4.3 for details.	~~CL04~~ ~~CL13~~ ~~CL14~~ ~~CL33~~ ~~CL34~~	OK
5.4.3.1 Has the choice of the baseline scenario been done using conservative assumptions?	ditto	DR	Idem. As per AM0029/Version 03, the baseline scenario is chosen using conservative assumption. Please refer to Section 3.4.3 for details.	OK	OK
5.4.4 Is the identified baseline scenario reasonable according to the assumptions, calculations and rationales used in the PDD and other reference sources?	ditto	DR	Idem. As per AM0029/Version 03, the baseline is identified reasonably according to the assumptions, calculations and rationales in reference sources. Please refer to Section 3.4.3 for details.	OK	OK
5.4.6 Does the PDD describe how the national and sectoral policies relevant to the baseline scenario have	ditto	DR	Yes. As per AM0029/Version 03, the baseline is identified with reference to the national and	~~CL13~~ ~~CL14~~	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
been identified and considered in the PDD?			sectoral policies, and is considered in PDD.	CL33 CL34	
5.4.7 Does the PDD provide a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the project activity?	ditto	DR	Yes. As per AM0029/Version 03, the PDD provides a verifiable description of the identified baseline scenario. Please refer to Section 3.4.3 for details.	CL13 CL14 CL33 CL34	OK
5.5 Algorithm and/or formulae used to determine emission reductions					
5.5.1 Are all calculations applied and documented according to the selected methodology and in a complete and transparent manner?	/6/ /10 - 12/ /55 - 57/ /61/ /64 - 65/ /79 - 80/ /98 - 99/	DR	Yes. The calculation is documented according to "Tools to calculate the emission factor for an electricity system", and in a complete and transparent manner that was checked by the validation team. The baseline emission has been estimated as the difference between the baseline emissions, project emissions and emissions arising from leakage. CAR05 Annex 3 & 4 of the PDD have to be provided according to the relevant PDD guidelines, which includes in Annex 3 tables for the calculation	CAR05 CAR10	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			of the grid carbon emission factor, including IPCC default and local values from official or other assumptions; whereas in Annex 4 a copy of worksheets used by the operator based on aggregation of monthly / weekly / daily worksheets and calculated from the formulas given in methodology AM0029 respectively ACM0002 are required. Please provide in Annex 3 any further background information used in the application of the baseline methodologies. This may include tables with time series data, documentation of measurement results and data sources, etc. CAR10 The methodology AM0029 requests also the deduction of the project emissions from the emission reductions, which was not correctly applied within the PDD, even the relevant emissions related to own electricity consumption are of small amount.		
5.5.2 In case the methodology allows a	ditto	DR	Yes. Idem.	CAR05	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
selection between different options for equations or parameters, has adequate justification been given and have the correct equations and parameters been used, in accordance with the methodology selected?					
5.5.3 In case some data and parameters will not be monitored throughout the crediting period, but have already been determined and fixed, are all data sources, assumptions and calculations correct, applicable to the proposed CDM project activity and conservative?	ditto	DR	Yes. Idem.	CAR05	OK
5.5.4 In case data and parameters will be monitored on implementation and hence become available only after validation of the project activity, are the estimates provided in the PDD for these data and parameters reasonable?	ditto	DR	Yes. Idem.	CAR05	OK
5.5.5 Have the major risks and uncertainties, which can influence the emission reduction estimates, been identified and addressed in the PDD?	ditto	DR	Yes. Idem.	CAR05	OK
5.6 Leakage					
5.6.1 Has the leakage been identified and	/6/	DR,	Yes. According to OSV, the	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
calculated according to the approved methodology?	/10 - 12/ /55 - 57/ /61/ /64 - 65/ /79 - 80/ /98 - 99/	I	validation team realized that only natural gas was used as the energy source in the project activity. Thus the leakage was only estimated from the fugitive upstream CH ₄ emissions. The calculation of fugitive CH ₄ emissions for the project activity identified and calculated as per AM0029/Version 03, and is considered as zero leakage.		
5.6.2 Have the leakage been addressed in complete, conservative and substantiated manner?	ditto	DR, I	Yes. The PPs even consider the fact that LNG is to be consumed to meet the future local NG market demand in Jiangsu region from the year of 2011 as described in Section B.2 of PDD, calculation of leakage emission due to the use of LNG is included for conservative estimation approach.	OK	OK
5.6.3 Are uncertainties in the leakage emission estimates properly addressed?	ditto	DR, I	Yes. Idem.	OK	OK
6. Methodology-related issues for afforestation or reforestation CDM project activities					
Add specific A/R requirements - if applicable!	--	N/A	N/A	N/A	N/A

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
7. Additionality					
7.1 Prior consideration of the CDM (VVM E.6.III.a)					
7.1.1 Is there documented evidence provided by the project participants on how and when the decision to proceed with the project activity was taken?	/1 - 3/ /6/ /32 - 37/ /42 - 54/ /100/ /104 - 108/	DR, I	Yes. The validation team has checked the documented evidence provided by the PP on how and when the decision to proceed with the project activity. Please refer to Section 3.5.1 for details. CL09 Please provide the civil construction contract (2005-06-25) for validation. CL10 According to the PP's meeting minutes dated 2005-05-10, it is understood that quite a numbers of engineering works have been commenced before the claimed project starting date (i.e. 2005-06-25). Please substantiate, with indication on the cost expense and its proportion to the overall investment cost, why weren't these actions to be considered an even earlier real actions being taken by the PP.	CL09 CL10 CL11 CL12	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			CL11 In PDDp.23, the CDM consultancy agreement (dated 2005-02-14) is of another NGCC project and not related to the proposed project. In the view that the CDM consideration ought to be project specific so as to demonstrate the PP's intention during its own investment decision making process, the statement is thus considered irrelevant to the discussion. CL12 It is found that the milestone dates indicated in the project history (PDD) being not precise, e.g. UK's LoA. Please re-check.		
7.1.2 Is the starting date of the project activity, reported in the PDD, in accordance with the "Glossary of CDM terms" and CDM VVM (§97)?	ditto	DR, I	Yes. The PP has reported in the PDD the date of "signing civil construction contract" to be the starting date for the project activity. The validation team agrees with this as the start date of the project activity according to the Glossary of CDM term. CL32 The confirmed start of the project	CL09 CL10 CL32	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			activity has to be clarified in the PDD.		
7.1.3 Is the date stated in the provided evidence consistent with other available evidence (e.g. dates of construction, purchase orders for equipment)?	ditto	DR, I	Yes. The validation team is able to confirm the date being consistent with the evidence.	~~CL09~~ ~~CL10~~	OK
7.1.4 If the project was not published and the starting date is on or after 2 nd August 2008, was it possible to receive from UNFCCC secretariat and/or DNA a written confirmation that PPs previously informed the above entities on commencement of the project activity and of their intention to seek CDM status?	--	DR	N/A. The project was published from Oct 2006 and the starting date was in Jun 2005, which was before 2 nd August 2008.	N/A	N/A
7.1.5 For the project activities with a starting date before 2 nd August 2008 and before the actual publication, was there enough evidence presented to prove that PPs were previously aware of CDM?	refer to 7.1.1	DR, I	Yes. The validation team considers the provided evidence being enough to prove that PPs were previously aware of CDM.	~~CL09~~ ~~CL10~~	OK
7.1.6 For the project activities with a starting date before 2 nd August 2008 and before the actual publication, was there enough evidence presented to	ditto	DR, I	Yes. The validation team considers the provided evidence being enough to prove that CDM benefits have been a decisive factor in the	~~CL09~~ ~~CL10~~	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
prove that CDM benefits have been a decisive factor in the decision to proceed with the project activity?			decision to proceed with the project activity.		
7.1.7 Does the individual or body that took the decision to proceed with the project activity have/had the authority to do so?	ditto	DR, I	Yes. The decision was made by the director board of HNNJJ, which has the authority to do so.	OK	OK
7.1.8 For the project activities with a starting date before 2 nd August 2008 and before the actual publication, was there enough evidence presented to prove that PPs were taking continuing and real actions to secure CDM status for the project in parallel with its implementation?	ditto	DR, I	Yes. The validation team considers the provided evidence being enough to prove that PPs were taking continuing and real actions to secure CDM status for the project in parallel with its implementation. CL12 It is found that the milestone dates indicated in the project history (PDD) being not precise, e.g. UK's LoA. Please re-check.	CL12	OK
7.1.7 In case there is a significant gap between the start date of the project activity and the commencement of validation, how was it possible for the project participant to commit funds to the project in advance of receiving a positive validation opinion?	ditto	DR, I	Yes. The project funding is raised from internal accrual and bank loans. Financial audit report & bank loan contracts have been checked. Thus, it was possible for the PP to commit funds to the project in advance of CDM validation.	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
7.2 Identification of alternatives					
7.2.1 Does the PDD identify and list credible alternatives to the CDM project activity in order to determine the most realistic baseline scenario, unless selected approved methodology prescribes/identifies the baseline scenario and no further analysis is required?	/10 - 12/ /36 - 40/ /55 - 58/ /62 - 63/ /77 - 99/	DR	The PP correctly applies the approved methodology and identifies the credible alternatives. Please refer to Section 3.4.3 for details.	~~CAR07~~ ~~CL13~~ ~~CL14~~ ~~CL33~~ ~~CL34~~	OK
7.2.2 Does the list of alternatives include as one of the options that the project activity is undertaken without being registered as a CDM project activity?	ditto	DR	Yes. Idem.	~~CAR07~~ ~~CL13~~ ~~CL14~~ ~~CL33~~ ~~CL34~~	OK
7.2.3 Does the list contain all realistic/credible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the project activity? <i>Note: All alternatives listed in the selected methodology should be</i>	ditto	DR	Yes. Idem	~~CAR07~~ ~~CL13~~ ~~CL14~~ ~~CL33~~ ~~CL34~~	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<i>included, as well as those not covered by the methodology.</i>					
7.2.4 Is the exclusion of the alternatives for legal reasons justified? <i>Note: Some alternatives might be illegal, according to the local regulations, but still widely practiced due to lack of enforcement. It should be verified.</i>	ditto	DR	Yes. Idem	~~CAR07~~ ~~CL13~~ ~~CL14~~ ~~CL33~~ ~~CL34~~	OK
7.3 Investment Analysis					
7.3.1 Are all sources of revenues (including savings) have been considered in the PDD and all calculations?	/3/ /6/ /10 - 12/ /15 - 17/ /20/ /28/ /32 - 37/ /55 - 59/ /77 - 81/ /91/	DR, I	Yes. All sources of revenues have been considered in the PDD and <Supplement to FSR>.	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
	/94 - 95/				
7.3.2 Is the type of investment analysis selected correctly in the PDD?	ditto	DR, I	Yes. Benchmark investment analysis was selected correctly in the PDD.	OK	OK
7.3.3 Is the selected financial indicator chosen and applied correctly?	ditto	DR, I	Yes. The financial indicators were chosen in line with the benchmark reference & <Supplement to FSR> for conducting the investment analysis.	OK	OK
7.3.4 Is the guidance on IRR calculation and assessment correctly applied? <i>Note: Means of validation should be recorded.</i>	ditto	DR, I	Yes. The guidance on IRR calculation and assessment has been correctly applied. Please refer to Section 3.5.3 for details	OK	OK
7.3.5 In case project participants use values from Feasibility Study Reports (FSR) is it possible to verify that the period between the FSR date and investment decision was reasonably short and FSR values did not change materially?	ditto	DR, I	Yes. The <Supplement to FSR>, issued in April 2005, was the basis of the decision to proceed with the project investment by the PP. The project investment decision was made in June 2005 by directorial decision and hence confirming the civil construction contract with the contractor. The validation team considered that the time interval between finalization of the	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			<Supplement to FSR> and the investment decision was sufficiently short for the DOE to confirm that it was unlikely in the context of the underlying project activity that the input values would have materially changed.		
7.3.6 Are all the values consistent between FSR and PDD <u>and</u> are inconsistencies properly justified?	ditto	DR, I	The PP consistently applied values from the <Supplement to FSR> for the investment analysis. <u>CL18</u> Please provide primary source of parameters applied in the financial analysis. <u>CL19</u> Please discuss in PDD about the other major parameters such as depreciation rate etc., in the financial analysis. <u>CL24</u> Please provide the payment records, with indication of the overall contract amount, of those key contracts, incl. site preparation, main equipments, main construction, etc.	<u>CL18</u> <u>CL19</u> <u>CL24</u> <u>CL25</u>	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			CL25 Please clarify on the auxiliary consumption rate of 3% applied in the financial analysis, as it is apparently inconsistent with the figure indicated in FSR (as 2.3%), and it's nowhere mentioned in the <Supplement to FSR>.		
7.3.7 Were all the values from FSR applicable and valid at the time of the investment decision?	ditto	DR, I	Yes. Since the time interval between the <Supplement to FSR> and investment decision was sufficiently short, it is reasonable to consider most of the values from the <Supplement to FSR> were applicable and valid at the time of the investment decision.	~~CL18~~ ~~CL19~~ ~~CL24~~ ~~CL25~~	OK
7.3.8 Is it reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the project participants or some verifiable circumstances that have lead to a change in the benchmark?	ditto	DR, I	As per Economic Assessment of Electric Engineering Retrofit Projects, the project is financially feasible only when the IRR is above or equal to benchmark IRR. Moreover, during on-site interview the local DRC advised that there is no national fund being provided to the proposed project. Therefore, it is reasonable to assume that no	~~CL04~~	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			investment would be made at a rate of return lower than the benchmark. CL04 Please provide explanation with supporting evidence to demonstrate that the project is not financially aided in any form (all along the project lifetime), so as to discuss whether or not the project being a baseline scenario.		
7.3.9 Is the Investment Analysis prepared in compliance with the latest version of the "Guidance on the Assessment of Investment Analysis" as provided by the CDM EB?	ditto	DR, I	Yes. The investment analysis prepared in compliance with the latest version of the "Guidance on the Assessment of Investment Analysis" as provided by the CDM EB. CL20 In the sensitivity analysis, please justify the selection of fluctuation parameters and the corresponding fluctuation ranges. Please also provide supporting evidence for the NG price in 2008 for discussion.	CL20	OK
7.4 Barrier analysis					
7.4.1 Are there any issues addressed in	--	DR	There is no barrier analysis for	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
the barrier analysis that have a clear impact on the financial viability of the project activity and that shall be assessed by an investment analysis?			the proposed project as per AM0029/Version 03.		
7.4.2 Do the listed barriers exist <u>and</u> is their existence substantiated? Note: (a) by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics and/or (b) by interviews with relevant individuals: including members of industry associations, government officials or local experts if necessary?	--	DR	N/A. Idem.	OK	OK
7.4.3 Would any of the identified barriers prevent the implementation of the project activity but not equally prevent the implementation of the possible alternatives, in particular the implementation of the identified baseline scenario?	--	DR	N/A. Idem.	OK	OK
7.5 Common practice analysis					
7.5.1 If the PPs claim in the PDD that CDM	/86 -	DR	No. The project activity is not	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
project activity is the “first of its kind”, is it justified?	87/ /92 - 93/ /96/		claimed the “first of its kind”. Other similar projects were identified in the PDD.		
7.5.2 Are the geographical boundaries of the project activity identified correctly?	ditto	DR	Yes. The other similar projects in ECPG are identified correctly in the PDD.	OK	OK
7.5.3 Does the PDD provide an explanation why this region was selected and deemed more appropriate <u>and</u> is this explanation traceable and reliable?	ditto	DR	Yes. The explanation of the selection is provided in PDD, due to the similar service provided (peak load power generation) within the same region (ECPG).	OK	OK
7.5.4 Are there similar operational project activities, other than CDM activities, “widely observed and commonly carried out” in the defined region? <i>Note: Use official sources and local and industry expertise.</i>	ditto	DR	Yes. Other than those similar projects which were either registered or applied as CDM projects, the Xiamen Dongbu LNG project has been identified also for common practice analysis. The source is verified to be precise and comprehensive. <u>CL21</u> Reference to NDRC’s website does not reasonably demonstrate the comprehensiveness of the project list in common practice analysis. Please clarify.	<u>CL21</u>	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			Please also ensure the identified project titles being consistent throughout the text.		
7.5.5 In case there are similar commercially operated project activities, other than CDM activities, already “widely observed and commonly carried out” in the defined region, are there essential distinctions between the CDM project activity and the other similar activities?	ditto	DR	Yes. It is validated that the Dongbu project enjoyed financial privilege in various ways, which thus does not face financial difficulty as the proposed project does. CL22 Discussion on Fujian Xiamen Dongbu LNG Project is not supported by the provided reference (footnote 55), especially on the claim that the Dongbu Project enjoys financial privileges from local government.	CL22	OK
8. Monitoring plan					
8.1 Are all parameters required by the selected approved methodology or tool identified <u>and</u> listed in the PDD?	/1 - 2/ /6/ /10 - 12/ /29 - 31/ /41/ /66 -	DR	Yes. All parameters required by the selected approved methodology or tool were identified and listed in the PDD. Please refer to Section 3.6 for details.	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
	72/ /76/				
8.2 Is the measurement method clearly stated for each value to be monitored and deemed appropriate?	ditto	DR, I	Yes. All parameters required by the selected approved methodology or tool identified and listed in the PDD. Please refer to Section 3.6 for details.	OK	OK
8.3 Are values of the ex-ante parameters / monitoring parameters selected correctly and conservative in accordance to methodology or tools?	ditto	DR, I	The project adopts the ex-ante parameters for calculation of emission factor as detailed in PDD Annex 3.	CAR05	OK
8.4 Is the measurement equipment for each parameter described and deemed appropriate?	ditto	DR, I	Yes. The measurement equipment for monitoring parameters shall be adopted in accordance with stipulation of the meter supplier, applicable industry and national standards and relevant agreements, thus it is deemed as appropriate. <u>CL28</u> Please clearly indicate in the PDD for the metering location of each electricity meter (incl. main & backup).	CL28	OK
8.5 Is the measurement accuracy addressed and deemed appropriate?	ditto	DR, I	Yes. Idem.	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
8.6 Are procedures in place on how to deal with erroneous measurements <u>and</u> are the corrective actions identified?	ditto	DR, I	Yes. As reported in PDD and advised from PP, there is standby measurement meter in order to deal with erroneous measurements. In additional, there are QA/QC procedures as corrective actions by doubling checking of monitoring data. CL29 Please re-confirm the monitoring procedure when “data accuracy is found not within the area of allowable error”. i) what is the “allowable error”? ii) the stated procedure is inconsistent with the information obtained during OSV, where it is advised that readings from the backup meter shall be directly referenced?	CL29	OK
8.7 Is the frequency of measurement identified and deemed appropriate?	ditto	DR, I	Yes. The measurement recording frequency is identified as per requirement in AM0029/Version 03. Thus the measurement frequency is deemed as appropriate.	OK	OK
8.8 Is the monitoring plan documented according to the approved methodology and in a complete and transparent	ditto	DR, I	Yes. The monitoring plan is documented in PDD Section B.7, according to AM0029/Version 03 in a	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
manner?			complete and transparent manner.		
8.9 Are the sampling, measurement methods and procedures defined?	ditto	DR, I	Yes. The sampling, measurement methods are defined and documented in PDD Section B.7, according to AM0029/Version 03.	OK	OK
8.10 Are procedures identified for maintenance of monitoring equipment and installations?	ditto	DR, I	Yes. The procedures are identified for maintenance of monitoring equipment in PDD.	OK	OK
8.11 Are the equipment calibration intervals identified and justified?	ditto	DR, I	Yes. The equipment calibration intervals are identified as per national requirement.	OK	OK
8.12 Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	ditto	DR, I	Yes. It is identified in PDD for collection, handling, and storage of monitoring records.	OK	OK
8.13 Are the monitoring arrangements described in the monitoring plan feasible within the project design?	ditto	DR, I	Yes. The validation team has checked the monitoring plan in PDD and considered that the monitoring arrangements are feasible as sufficient training were arranged to the monitoring team.	OK	OK
8.14 Are the means of implementation of the monitoring plan, including the data management and quality assurance and	ditto	DR, I	Yes. Through the implementation of monitoring plan, the electricity data from/to the grid can be	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
quality control procedures, sufficient to ensure that the emission reductions achieved by / resulting from the project activity can be reported ex post and verified?			monitored for sufficiently reporting and verifying the emission reduction ex-post.		
8.15 Do the PPs make provisions for personnel training needs?	ditto	DR, I	Yes. The validation team checked the relevant training plan and records for the necessary technical training for the operation, maintenance and monitoring of power plant. CL08 Please provide training records of the 1) technical training given by the related professional institutions (e.g. GE), and 2) CDM training given by consultant; so as to prove the PP's ability to implement the project activity, as well as its monitoring plan. CL26 It is understood that the CDM training is not yet started for the proposed project. However, please provide the CDM training plan/programme with indicative schedule for demonstrating the PP's	CL08 CL26 CL27	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			ability for project (CDM) implementation. CL27 Please provide the special equipment operator permit/certificate for record.		
8.16 Is the authority and responsibility of overall project management clearly described?	ditto	DR, I	Yes. The management structure for monitoring is clearly described in the PDD with the responsibility of overall project management. CL31 It has to be clarified in the PDD, in which steps the training is planned (before commissioning, during operation) and how the responsibilities and tasks of power plant operator, project developer, technology supplier incl. monitoring equipment and CDM consultant are allocated.	CL31	OK
8.17 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	ditto	DR, I	As per OSV, the PP advised that if there was emergency such as shortage of natural gas supply, the power generation units would basically shut down under such circumstances. According to the project design, such unintended	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			emissions are not expected to occur.		
8.18 Are procedures identified for review of reported results/data?	ditto	DR, I	Yes.	OK	OK
8.19 Is the data archiving period for this project activity stated in the PDD and appropriate? <i>Note: All archived monitoring data, required for verification and issuance, should be kept for at least two years after the end of the crediting period or the last issuance of CER.</i>	ditto	DR, I	Yes. It is stated in the PDD that data collected under the project monitoring plan will be kept for 2 years after the end of the crediting period. Thus, it is considered that the data archiving period is appropriate.	OK	OK
8.2 Monitoring of the leakage					
8.2.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	ditto	DR, I	Yes. According to OSV, the validation team realized that only NG was used as the energy source in the project activity. Thus the leakage was only estimated from the fugitive upstream CH ₄ emissions. The calculation of fugitive CH ₄ emissions for the project activity identified and calculated as per AM0029/Version 03, and is considered as zero leakage. Thus,	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			no monitoring shall therefore be required.		
8.2.2 Is the choice of project leakage indicators made according to selected methodology in a reasonable and conservative manner? <i>Note: local knowledge and sectoral expertise shall also be considered.</i>	ditto	DR, I	Yes. Idem.	OK	OK
8.2.3 Is the measurement method clearly stated and deemed appropriate for each leakage value?	ditto	DR, I	Yes. Idem.	OK	OK
9. Sustainable development					
9.1 Does the LoA from the Host country DNA contain the confirmation that the proposed CDM project activity contributes to the sustainable development of the host Party?	/7/	DR, I	The LoA from China DNA was checked by the validation team, in which it confirms that the proposed CDM project activity contributes to the sustainable development of China.	OK	OK
9.2 If PDD indicates any additional environmental benefits of the project, other than GHG emission reductions, were those benefits properly substantiated?	/6/ /101/	DR, I	Yes. Apart from environmental benefits, the project can contribute to social and economic benefits by providing job opportunities and tax revenue to local society. <u>CL02</u> Please identify and specify, with	<u>CL02</u>	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			supporting documents, the reported creation of employment opportunities (both temporary & permanent) for local residents during project construction & operation phases.		
10. Stakeholders' consultation and comments					
10.1 Were the stakeholders identified in appropriate and complete manner?	/6/ /75/	DR, I	The stakeholders included representatives from different gender, age groups and educational background. From the background of the stakeholders, it is reasonably believed that the survey have reflected the general attitudes towards the project from the local residents who are possibly affected by the project. Thus the stakeholders were identified in appropriate and complete manner.	OK	OK
10.2 Are the identified stakeholders plausible?	ditto	DR, I	Yes. Idem.	OK	OK
10.3 Does PDD describe the means being used to invite local stakeholder's comments?	ditto	DR, I	Yes. According to PDD, the local stakeholder's comments were invited through distribution of questionnaires to the local residents.	~~CL23~~	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			CL23 Please include in the PDD for the background of the surveyed stakeholders, so that the validation team can assess on the claimed “principle of representation and randomness” in identification of stakeholders.		
10.4 Were those means appropriate?	ditto	DR, I	Yes. A stakeholder consultation process is not mandatory in China. The PPs invited stakeholder’s comment through questionnaire and the details are described in Section E of PDD. The validation team considered those means were appropriate.	OK	OK
10.5 Was the project presented to the stakeholders in unbiased manner?	ditto	DR, I	Yes.	OK	OK
10.6 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?	ditto	DR, I	N/A. A stakeholder consultation process is not mandatory in China.	N/A	N/A
10.7 Is a summary of the stakeholder comments provided in the PDD?	ditto	DR, I	Yes. A summary of the stakeholder comments is provided in Section E	CAR12	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			of PDD. CAR12 The description within the overworked PDD, section E has to take into account these comments.		
10.8 Has due account of any stakeholder comments been taken by PPs and reflected in the PDD?	ditto	DR, I	Through the questionnaire and on-site interview with local stakeholders, the interviewees considered that there is no adverse impact for the project activity.	OK	OK
11. Environmental impacts					
11.1 Is the documentation supplied by the PPs regarding environmental impacts relevant and accurately reflected in the PDD?	/6/ /13 - 14/	DR, I	Yes. An EIA study was carried out and approved, and the environmental impacts have been accurately reflected in the Section D of PDD. CAR11 The list of contents and the summary of the EIA and any further requirements have to be described within the PDD, the requirements have to be taking into account for the implementation of the project activity.	CAR11	OK
11.2 Is an environmental impact assessment	ditto	DR,	Yes. Idem.	OK	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
(EIA) required for the CDM project activity? <i>Note: determine by using a review of relevant legislation and local expertise.</i>		I			
11.3 In case an EIA is required, has the EIA has been approved by local authorities and is the outcome accurately reflected in the PDD?	ditto	DR, I	Yes. Idem.	OK	OK
11.4 Does the PDD include a brief description of the environmental effects of the project, including transboundary?	ditto	DR, I	Yes. The Section D of PDD includes a brief description of the environmental effects of the project.	OK	OK
11.5 Are those effects properly addressed in the design of the project activity?	ditto	DR, I	Yes. Idem.	OK	OK
11.6 Does the project comply with environmental legislation in the host country?	ditto	DR, I	Yes. This is confirmed by the interview with the official from the local EPB. The local EPB also issued an EIA approval document for the project which complied with environmental legislation. CL30 It is understood that the EIA approval was only based on the 3x390MW design, but not the adopted	CL30	OK

Table 1: Validation requirements

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)

Checklist question	Ref.	MoV ⁴⁵	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			2x390MW design. Despite the reduced capacity, please clarify if the existing EIA approval is valid/applicable for the final design, and whether or not the corresponding legal requirements are duly fulfilled?		

Table 2: List of Requests for Corrective Action (CAR) and Clarification (CL)

No.	CAR/CL	Observation (CAR/CL)	Reference	Summary of project owner response	Validation team conclusion
1.	✓	CAR01 It is appeared in China's LoA that "Credit Suisse International" is listed as one of the PPs, which is inconsistent with PDD. Please clarify.	LoA	Credit Suisse has voluntarily withdrawn from this project. The withdrawal letter is available for validation.	OK Official letter from Credit Suisse is checked to be valid for its voluntary withdrawal from the proposed project. The CAR/CL is therefore closed.
2.	✓	CAR02 Please re-confirm on the information of the submitted UK LoA (dated 2007-12-12). As referring to the DNA's (Defra's) public announcement, there's another latest LoA (dated 2008-01-07) issued for this proposed project, where it reads "Credit Suisse International" to be the PP, but not "Gaisi Peony Carbon Capital S.a.r.l".	LoA	Originally the Proposed Project involved two PPs from UK (Gaisi Peony Carbon Capital S.a.r.l, and Credit Suisse), therefore UK Defra has issued LoA separately for each: the one for Gaisi Peony Carbon Capital S.a.r.l was issued on 12/12/2007(which is also visible in Defra's announcement list), and the one for Credit Suisse was issued on 07/01/2008.	OK Official letter from Credit Suisse is checked to be valid for its voluntary withdrawal. It is understood that there's only now one PP (Gaisi Peony) from Annex I country to the proposed project. The CAR/CL is therefore closed.
3.	✓	CAR03 Contact information is not precisely consistent between MOC & PDD (Annex 1), e.g. fax no, email, mobile no,	MoC	PDD Annex 1 is revised to be precisely consistent with the MoC. The 'Date of submission' has been inserted in the updated MoC.	OK Contact information is correctly revised in PDD Annex 1, to be consistent with the signed MOC.

			address. Please re-confirm. Besides, it is not indicated in the MOC for the "Date of Submission", as per <Procedure for MOC between PPs & EB>.			The CAR/CL is therefore closed.
4.	✓		CAR04 The LoA from DNA of P.R.China is not available for inspection.	LoA	The LoA from the Chinese DNA was issued in 22 May 2007 and already submitted to the Validator.	OK The CAR/CL is therefore closed.
5.	✓		CAR05 Annex 3 & 4 of the PDD have to be provided according to the relevant PDD guidelines, which includes in Annex 3 tables for the calculation of the grid carbon emission factor, including IPCC default and local values from official or other assumptions; whereas in Annex 4 a copy of worksheets used by the operator based on aggregation of monthly / weekly / daily worksheets and calculated from the formulas given in methodology AM0029 respectively ACM0002 are required. Please provide in Annex 3 any further background	PDD	All the data for calculation of the grid emission factor including IPCC default values and local values from official or other assumptions were provide in Annex 3 in the revised PDD, while the primary parameters to be monitored during the crediting period of the project activity were provided in Annex 4 in the revised PDD	OK The CAR/CL is therefore closed.

			information used in the application of the baseline methodologies. This may include tables with time series data, documentation of measurement results and data sources, etc.			
6.	✓		CAR06 The description of the project activity should contain a process flow sheet and more technical specifications, parameters. The results from the performance guarantee tests have to be presented. This section should include a description of how environmentally safe and sound technology and know-how to be used is transferred to the host Party(ies). Systems plans and responsibilities with regard to initial training (capacity building) and maintenance efforts during the project period should be outlined in this section. This is relevant when new technology is implemented such as a new boiler type, new gas turbine type, new waste heat	PDD	Process Flow Diagram of the Project was provided in the Figure 2 of the revised PDD, while the technical parameter of the Project was described in section A.4.3. The performance guarantee tests result was provided to DOE. The project owner has been working with the various related professional institutions and consultants to provide a series of professional training programs and expected that such training programs will provide the project a highly skilled technician team needed to ensure the desirable results. More detailed information were provided in section A.4.3 and B.7.2 of the revised PDD.	OK The CAR/CL is therefore closed.

			recovery and steam turbine, etc. The actual capacity building activities should be carried out as soon as possible and at all events prior to start of the crediting period to ensure effective operation of the project.			
7.	✓		<u>CAR07</u> The different alternatives provided have to be explained with regard to applied technology, efficiency parameters and technical lifetime according to AM0029.	PDD	More detailed information on the alternative technologies and technical lifetime were provided in section B.4 of the revised PDD.	OK The CAR/CL is therefore closed.
8.	✓		<u>CAR08</u> According to AM0029 (P.3, 2 nd paragraph) should the levelized cost of electricity production in \$/kWh be used as financial indicator for the investment analysis, critical assumptions including “the load factor” should be used for the sensitivity analysis as variation parameter.	PDD	The levelized electricity generation cost was used as financial indicator to identify the most attractive baseline scenario alternative in the PDD, more detailed information were provided in section B.4 of the revised PDD.	OK The CAR/CL is therefore closed.
9.	✓		<u>CAR09</u> The enclosed tables in the PDD are different from the	PDD	The measurement methods and procedures was specified in section B.7.2 of the revised PDD, and the parameters to be monitored during operation period and relevant QA and QC	OK The CAR/CL is therefore closed.

			latest versions of the applied monitoring methodologies. Please revise accordingly.		procedures measures were provided in section B.7.1 and Annex 4 of the revised PDD.	
10.	✓		CAR10 The methodology AM0029 requests also the deduction of the project emissions from the emission reductions, which was not correctly applied within the PDD, even the relevant emissions related to own electricity consumption are of small amount.	PDD	The project emission related to own electricity consumption was deducted from the emission reduction, which was provided in section B.6.1 of the revised PDD.	OK The CAR/CL is therefore closed.
11.	✓		CAR11 The list of contents and the summary of the EIA and any further requirements have to be described within the PDD, the requirements have to be taking into account for the implementation of the project activity.	PDD	The list of contents and the summary of the EIA, including potential environmental impacts and mitigation measures and monitoring plan were provided in section D.1 of the revised PDD.	OK The CAR/CL is therefore closed.
12.	✓		CAR12 The description within the overworked PDD, section E has to take into account these comments.	PDD	The answer to the comments received from the validation has been provided to DOE, and some related information and evidences were added in section E of the revised PDD.	OK The CAR/CL is therefore closed.
13.	✓		CAR13 It has to be evidenced with updated information (	PDD	More detailed information on the availability of natural gas is provided in section B.2 of the revised PDD.	OK The validation team has reviewed the information on

			Feasibility Study Report, further updates, 11th 5-year-plan), that the application criteria for the approved baseline methodology AM0029 can be fulfilled with regard to the availability of natural gas (The critical NGO comments during global stakeholder process have to be taken into account). It has to be documented in this context, that supply limitations will not result in significant leakage.		The implementation of the proposed project will not lead to leakage which was also described in section B.2 of the revised PDD.	availability of the natural gas supply, and confirmed that there is a sufficient supply of natural gas. The CAR/CL is therefore closed.
14.		✓	CL01 The provided geographic coordinate for identification of project location is deemed not precise, as it can be merely seen from public map that the coordinate demarcate some grassland area, but not factory area.	PDD	The geographic coordinate of the project location can be checked during site visit. It was confirmed on site that the GPS coordinates are: N 32.1715, E 119.0125; i.e. N 32°10' 17", E 119°00'45". The PDD has been revised accordingly.	OK The coordinate is updated accordingly. The figure is verified by on-site checking with GPS device, to be precise. The CAR/CL is therefore closed.
15.		✓	CL02 Please identify and specify, with supporting documents, the reported creation of employment opportunities (both temporary & permanent) for local residents during project	PDD	There are 135 local residents contracted by the project to provide logistical services for the project. 167 temporary staff were also involved during the construction period.	OK The no. of temporary & permanent staff during construction & operation period has been checked to be correct, according to the information obtained from the project owner.

			construction & operation phases.			The CAR/CL is therefore closed.
16.		✓	CL03 Please demonstrate that there'll be no start-up/auxiliary fuel being used in the project activity, which is to justify the methodology applicability.	PDD	This fact can be confirmed from both design specification and onsite inspection.	OK According to the PP, there is no any other fuel used for plant operation other than natural gas. During OSV, the validation team was able to further confirm with this by checking the equipment drawing, operation manual and physical inspection to the plant equipments (incl. both the main gas turbines & the start-up boiler), confirming that there is no such design for other auxiliary fuel inlet ports, except the one clearly indicated as "natural gas inlet". Besides, the validation team did not reveal any storage of other fuel in project location. The CAR/CL is therefore closed.
17.		✓	CL04 Please provide explanation with supporting evidence to demonstrate that the project is not financially aided in any form (all along the project lifetime), so as to discuss whether or not the project being a baseline scenario.	PDD	The project has not received financial aid at any point along the project lifetime. As demonstrated on site in the Financial Accounts audited by KPMG, the Project does not receive subsidies or favourable tariffs during operation, and the audit report of the expenditure accounting also demonstrates that the project construction has been financed only on the basis of equity and debt. Commercial loans totalling RMB 1.425 billion have been provided by the China Development Bank, Bank of Communications and China Merchants Bank. The receipt records and the audit report of expenditure accounting	OK The validation team can confirm through the financial audit report (verified by independent qualified 3rd party), that the self-accrual was raised by the shareholders according to its own company regulations. Furthermore, it's also verified from the "Capital Construction Examination Report" (which is the audit report of expenditure during project construction, prepared by China

					have been provided.	Audit Certified Public Accountant on 28th Feb 2008), that the project expenditure is all raised from self-capital (equity) & bank loan, but not any other form of funding/subsidy. The validation team is also able to confirm with the official from the local DRC (Mr. Wan Yong), that there is no any foreign aid, fund, favorable on-grid tariff, nor support to the proposed project, hence no ODA. While the project development is solely a business operation, the government does not (and shall not) involve anyhow in project finance, operation, nor management, all along the project lifetime. The aforesaid financial arrangement is also re-confirmed by the representative from the loan bank (China Development Bank, Mr. Li Zhe) during OSV. It is thus reasonably considered the proposed project not being a baseline scenario. The CAR/CL is therefore closed.
18.		✓	CL05 Please indicate the age and average lifetime of the key equipments with supporting evidence. Other key	PDD	Technical specifications of the main equipments are available on site. All the equipments are brand new, thus the age is 0, and the lifetime of the entire NGCC system is 25 years. In electricity industry, the load factor is a measure of the output of a power plant	OK Technical information, e.g. age & average lifetime, load factor, have been correctly included into the revised PDD, as per guidance.

			technology parameters, incl. load factor, efficiency, etc. (of the entire combined cycle system), are also needed as per requirements stipulated in the "Guidelines for completing PDD".		compared to the maximum output it could produce (http://en.wikipedia.org/wiki/Load_factor). It, expressed for a time span of one year, is: $LF = \text{kw-hr produced} / (\text{kw capacity} * \text{hr in year})$. Under the power plant operated with a full capacity, the load factor can be simply calculated as the ratio between actual operating hours and 8760hrs a year. The NGCC power plant of the proposed project is designed to be operated for 3500 hrs per year, and thus its design load factor = $3500/8760=0.4$ and its actual load factor depends on the actual output and may vary along time. Thermal efficiency of the entire NGCC system could reach 57.71% under ISO condition. The photos of the on-site nameplate have been provided. The requested technical information has also been incorporated in the revised PDD.	The technical specification is checked by the validation team against the equipment manuals & on-site nameplates, and found to be precisely correct. The CAR/CL is therefore closed.
19.		✓	CL06 Please re-confirm the selection of crediting period to be 7 renewable years, which appears inconsistent with the selection in PDD (GSP version).	PDD	We confirm the selection of 7 years renewable crediting period instead of the 10 years in the GSP version.	OK Selection of crediting period is confirmed to be 7 renewable years. The CAR/CL is therefore closed.
20.		✓	CL07 It is noted that in PDD there's further revision on the key equipments' specification, the validation team would have to verify during on-site visit on the given specifications,	PDD	The information in the PDD is according to the manufacturers' specification, which can be confirmed against onsite nameplates. The photos of the on-site nameplate have been provided.	OK Photos of on-site nameplates are checked. Key equipments' specification & the technical parameters are confirmed to be precise. The CAR/CL is therefore closed.

			against the manufacturers' manual, equipments' nameplate, etc.			
21.		✓	CL08 Please provide training records of the 1) technical training given by the related professional institutions (e.g. GE), and 2) CDM training given by consultant; so as to prove the PP's ability to implement the project activity, as well as its monitoring plan.	PDD	The training records are available onsite. Training on monitoring work is planned in Dec 2009, which will be conducted by experienced professionals in CDM monitoring.	OK Records of technical trainings given by relevant professional institutions (i.e. GE) are checked to be valid. It is understood that the technical training has been carried out since 2005, and relevant operators had successfully completed the training courses and obtained certificates for demonstrating their ability to project operation. Regarding the CDM (monitoring) training, it is planned to start in Dec-09, and to be conducted by experienced CDM professionals. Training programme is available for validation team's checking. The CAR/CL is therefore closed.
22.		✓	CL09 Please provide the civil construction contract (2005-06-25) for validation.	PDD	The civil construction contract will be provided.	OK Civil construction contract (2005-06-25) is checked to be valid. And the civil construction works was then commenced on 2005-06-28. The CAR/CL is therefore closed.

23.		✓	CL10 According to the PP's meeting minutes dated 2005-05-10, it is understood that quite a numbers of engineering works have been commenced before the claimed project starting date (i.e. 2005-06-25). Please substantiate, with indication on the cost expense and its proportion to the overall investment cost, why weren't these actions to be considered an even earlier real actions being taken by the PP.	PDD As set out in the management meeting minutes (dated 10th May 2005), some preliminary preparatory works were undertaken prior to the start date. Specifically, these were very early stage works involving piling, the installation of water pipelines and some earth excavation. Major invoices, totaling 3.81 million RMB, have been provided as evidence to demonstrate that these actions did not comprise a major part of any work, and are in line with the type of standard preparatory work required for any construction site. As explained during the on site visit, these expenses cannot be considered a binding commitment to the project activity as the final project approval from the NDRC had not been received, the construction contract had not yet been signed and the final decision by the Board to proceed with the project had not been made. At less than 0.2% of the total investment of the project, it is therefore concluded that these expenses do not count as real action on the proposed project activity.	OK The payment receipt records for preconstruction have been checked. It is observed that approx. 3+ million RMB was committed for the preliminarily preparatory works. In comparing to the total project investment of approx. 2,000+ million RMB, it is agreed by the validation team that these expenses (comparing with other major expenses like equipment purchase, equipment installation, main civil construction) were only an insignificantly small portion to the entire project investment, and thus was not considered a binding commitment. The CAR/CL is therefore closed.
24.		✓	CL11 In PDDp.23, the CDM consultancy agreement (dated 2005-02-14) is of another NGCC project and not related to the proposed project. In the view that the CDM consideration ought to be project specific so as to demonstrate the PP's intention during its own	PDD The CDM Consultancy agreement (dated 2005-02-14), which was signed for the Shanghai Baoshan NGCC Project (UNFCCC project code 1381), has been included in the PDD for the purposes of setting the timeline of the Proposed Project in its wider context. Both projects are owned by Huaneng Power International, who itself was a participant in the World Bank CDM in China Study, and the sequence of events for both projects – including the decision making process – were very similar. Therefore, the signing of the CDM consultancy agreement	OK The validation team understands the intention to include such document; however it is still considered not project-specific and could only demonstrate the CDM development history of Huaneng Group & its subsidy companies. Deletion of this reference from the timeline is accepted by the validation team. The early CDM consideration of

			investment decision making process, the statement is thus considered irrelevant to the discussion		further demonstrates an awareness within the Huaneng Group of the importance of CDM for these projects. However, we understand the DOE's concerns, and have therefore deleted this reference from the timeline in the PDD as requested.	the proposed project is not affected. The CAR/CL is therefore closed.
25.		✓	CL12 It is found that the milestone dates indicated in the project history (PDD) being not precise, e.g. UK's LoA. Please re-check.	PDD	The dates in the timeline have been re-checked and the inconsistencies have been corrected. Evidence demonstrating continuous actions to secure CDM status has been incorporated in the PDD.	OK Key milestone has been precisely included in PDD so as to demonstrate the continual action taken by the PP to secure CDM status. The CAR/CL is therefore closed.
26.		✓	CL13 In the discussion of alternative scenario for baseline determination, please further substantiate with supporting evidence on the claimed:- - Prohibition of oil fired power plant - Unfeasibility of biomass power plant	PDD	The reference for unfeasibility of biomass power plant is changed for a clearer illustration, it can be seen that the largest unit capacity in the world is only 38MW. Also the prohibition of oil fired power plant is clearly stated in the " <i>The Notice on Printing Mid Long term Specific Plan of Energy-saving</i> " issued by NDRC. Relevant statements in the references have been highlighted for an easier check.	OK Unfeasibility of biomass power plant in an equivalent capacity is proved with reference to the world largest biomass plant in UK (being of 38MW capacity, not comparable to the proposed project as 780MW capacity). Prohibition of oil fired power plant is referable to the State Policy, as correctly quoted. The CAR/CL is therefore closed.
27.		✓	CL14 Alternative scenarios on ultra super critical technology to be further discussed. As per the provided reference, the technology as alternative is	PDD	As indicated in footnote 27, the research on utilization of USC (ultra super critical) technology was part of the National 863 Energy Plan during the 10 th Five-Year-Period. Huaneng Corporation was commissioned by Chinese Government for the research and the research was conducted based on the Yuhuan USC pilot project. The	OK It is understood that during the decision making process of the proposed project in 2005-06, the ultra super critical (USC) technology is only in conceptual stage, with no USC power plant

		not readily excluded. The construction of ultra super critical power plant has been commenced in 2004-06, which is before the project starting date. The alternative scenario identification, and hence the Levelized Cost Analysis, remain open.	Yuhuan USC pilot project started construction in June 2004 and <u>started operation in Dec 2006</u>. Thus, at the time of the investment decision for the proposed project (<u>June 2005</u>), USC was only a conceptual technology in China as there weren't any USC projects operated at that time. Therefore, USC projects could not be considered as feasible baseline alternatives. “超超临界燃煤发电技术的研发与应用”是国家“十五”863 计划能源技术领域所属洁净煤技术主题研究课题。该课题取得了多项重要科研成果和 17 项技术专利，为自主开发研制具有高效清洁的大型超超临界燃煤发电机组完成了技术支撑，形成了我国完整的超超临界电站的开发基础。华能集团公司承接该研究课题后，组织国内相关设计、制造、研究等单位，研究分析了国际上超超临界燃煤发电技术的现状与发展趋势，在国内已有的超临界发电技术基础上，结合我国发电设备制造及运行的技术条件和基础，以华能玉环电厂百万千瓦超超临界燃煤机组作为课题的依托工程，在国内首次提出了我国发展超超临界火电机组的技术选型方案，即容量为 60 万千瓦级和 100 万千瓦级，一次中间再热、参数为（25—28）MPa、600℃/600℃，以及其它有关的技术选型结论；研发了具有我国自主知识产权的超超临界发电机组的锅炉、汽轮机设计制造技术；自主研究和设计了 100 万千瓦、60 万千瓦超超临界机组电站；研究了超超临界机组运行技术，组织调试了 100 万千瓦超超临界机组，应用了研究提出的运行技术；完成了配套大机组的选择性催化还原法（SCR）烟气脱硝装置的开发。研究成果达到了国内领先、国际先进水平。	in operation stage. Since the first USC unit is still under construction at that time being and has been put into operation only until 2006-12. It is thus reasonably convinced that the USC technology could not be considered as a baseline scenario. The CAR/CL is therefore closed.
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					该课题的节能环保示范作用十分显著，作为示范工程的华能玉环电厂项目，由华能公司全资建设，一期工程于 2004 年 6 月开工，建设 2 台 100 万千瓦超超临界机组，于 2006 年 12 月建成投产。	
28.		✓	CL15 How is the NG supply throughout the project operation period (20 years) be guaranteed, given that the NG supply contract signed with PetroChina (dated 2004-12-29) states clearly the NG supply period is only until 2023-12-31.	PDD	Please see the following extract from the Natural Gas Supply Agreement (the entire agreement will be available for review during the site visit) 21.2 延长期限 双方应在付气期届满前的二十四（24）个月到十二（12）个月内，开始交流探讨延长付气期的可能性。 8. 付气期：自商业运营日起至 2023 年 12 月 31 日止 Although the term of this NG Supply Agreement ends on 2023-12-31, Item 21 in page 79 of the Agreement clearly states that both parties should start discussion on the possibility of the extension of the Agreement 12 or 24 months ahead of 2023/12/31. Thus, the gas supply for the remaining lifetime of the proposed project could still be ensured. Furthermore, as illustrated in the analysis on NG availability in PDD section B.2, a number of alternative NG resources are currently being constructed or are in the planning phase in the project region and will be operational by 2023, i.e. the project will have wider choice for NG supply for the remaining lifetime of the project. In sum, the gas supply throughout the project lifetime is guaranteed.	OK It is understood from the signed NG supply agreement (item 21) that, despite the guaranteed supply period until 2023-12-31, the gas supply period could be further negotiated between the project owner and the supplier, 12 to 24 months before 2023-12-31. It is thus considered the NG supply is not constrained by the stated “guaranteed supply period”. The CAR/CL is therefore closed.

29.		✓	CL16 Please provide the spreadsheet to demonstrate all the numbers used in the gas availability analysis. The PP has to demonstrate the deletion of Yancheng LNG program is actually not affecting the gas availability.	PDD	The Gas Balance Sheet for the Yangtze Delta is provided and all the footnotes in this sheet are the same as in the PDD. The supply capacity of Yancheng LNG program was not included into the calculations in the spreadsheet, but was included in the PDD in order to demonstrate that further investments in increasing the supply of natural gas to the region are planned, therefore further supporting the fact that there is sufficient supply of natural gas. Therefore, it is confirmed that the deletion of this sentence from the PDD does not affect the calculations or the conclusions surrounding gas availability.	OK The validation team has checked against the gas balance sheet for Yangtze Delta; and noted that the NG demand in the Yangtze Delta could be readily satisfied by the gas supply capacity through 2015. Deletion of NG supply from Yancheng LNG program in the gas balance sheet was not affecting the gas availability in the region. The CAR/CL is therefore closed.
30.		✓	CL17 It is noted in the previous discussion that a number of measures have been adopted by the government to protect the priority supply to residents are ensured, including cutting of some industrial uses. Please explain the above saying with supporting information, and are these measures implying that industrial users shall be therefore affected.	PDD	The previous discussion took place between the former CDM consultant and the former auditor, so it is difficult to provide an explanation of the exact nature of their discussion and context. The meaning behind the comment is not clear, but it does not appear to be directly related to the project activity, as the comment is about the impact of residential consumption on industrial users, whilst the project activity involves power generation. Given that the discussion took place between two other parties, rendering it difficult for us to speculate on their exact meaning, and as the comment does not appear to relate directly to the project activity, it is therefore recommended that the DOE ignore this comment.	OK The validation team is able to confirm and validate from the PDD discussion and other relevant reference sources, in full demonstration of sufficient NG supply in the region (by gas balance analysis), and the project activity will not displace NG that would otherwise be used elsewhere in an economy (by state policy review & on-site interview with local DRC & power company representatives). The NG supply & demand situation is reasonably convinced, and it is thus considered that the use of NG by the proposed project is

				Furthermore, according to the requirements of AM0029, it has been demonstrated in the PDD that “Natural gas is sufficiently available in the region” and “the project activity won’t displace natural gas that would otherwise be used elsewhere in an economy”. As is set out in section B.2. of the PDD, NG is sufficiently available in the project region. It has also been explained in the PDD that the NDRC issued the <i>Policy on Utilization of Natural Gas (NDRC-Energy[2007] 2155)</i>. According to this policy, users of natural gas are separated into four categories: priority, permitted, restricted and forbidden. The project activity falls within the ‘permitted’ category, placing them below ‘priority’ users, which range from residential users, for cooking and hot water, through public service facilities, such as airports, government departments, schools, hotels and office buildings, natural gas vehicles, to combined heat and power (CHP) plants and tri-generation plants. Again, it has been demonstrated in section B.2. that in accordance with this Policy, the project ranks below other users, and therefore will not displace NG that would otherwise be used elsewhere. Furthermore, as the project has been operating for 2 years with sufficient gas supply, and on the basis of the implementation of the Policy mentioned above, it can also be inferred that other users have also had sufficient gas.	not constraining any other NG use, as per AM0029/Ver 03. The CAR/CL is therefore closed.
31.		✓	CL18 Please provide primary	PDD	The primary sources of parameters applied in the financial analysis have been provided and OK Every parameter is correctly

			source of parameters applied in the financial analysis.		the relevant description in the PDD has been revised accordingly. .	referenced to its primary source (e.g. applied tax rate being referenced to corresponding tax policy, etc..) The CAR/CL is therefore closed.
32.		✓	CL19 Please discuss in PDD about the other major parameters such as depreciation rate etc., in the financial analysis.	PDD	The proposed project only generates electricity, thus, there are no parameters for steam price/heat generation. All the necessary parameters for financial analysis have already been shown in PDD section B.5, including the depreciation rate and salvage value.	OK All essential parameters have been included in the revised PDD, e.g. depreciation rate, residual value, etc.. The CAR/CL is therefore closed.
33.		✓	CL20 In the sensitivity analysis, please justify the selection of fluctuation parameters and the corresponding fluctuation ranges. Please also provide supporting evidence for the NG price in 2008 for discussion.	PDD	The five parameters selected in the sensitivity analysis cover the key variables in the project's cash flow and are therefore the most sensitive parameters for testing the robustness of the Project IRR. In the PDD, a range of $\pm 10\%$ was selected as the fluctuation range for the sensitivity analysis, which is in line with the requirement in Para17 in the 'Guidance on Assessment of Investment Analysis'. The above justification has been included in the PDD. For some parameters (Annual OM Costs, Tariff, and NG price), the Project IRR would breach the benchmark of 8% within a 10% fluctuation range. For each of these cases, justification is given in the PDD for the unlikelihood of this occurrence. For the other parameters (Fixed Asset Investment, Annual Operating Hours), the project IRR remains under the benchmark even if they	OK Justification on selection of the five parameters & its fluctuation range has been included in PDD. For those parameters, in which the Project IRR would breach the benchmark of 8% within the 10% fluctuation, discussion has been included in PDD and the validation team confirms that it's unlikely for the occurrence and hence Project IRR is not expected to exceed the benchmark this way. Besides, by reviewing the operation records & the signed equipment purchase contract, the validation team confirms that the operation hours is unlikely to have a 13.7% increase, nor the fixed asset investment to have a

				fluctuate $\pm 10\%$; a further test has been conducted which finds that for the Project IRR to reach 8%, the operating hours needs to be +13.7%, while the Fixed Asset Investment needs to be -11.5%. However, in reality, the operating hours of the plant have never reached the design value (3,500 hours) and the actual Fixed Asset Investment was 2.217 billion RMB. Therefore neither of these parameters leads to a breach of the benchmark IRR of 8%. Evidence of the actual operating hours and the audit report of expenditure accounting of the project have been provided. Therefore, it can be concluded that neither scenario could be possible. With regard to the NG price in 2008, there has been no change to the price since the increase to 1.58RMB/m³ in 2007, i.e. it remains 1.58 RMB/m³. The gas price of 1.43 RMB/m³ in the PDD has been corrected to 1.58 RMB/m³.	11.5% decrease. NG price in 2008 (of 1.58RMB/m³) is correctly referenced in PDD. The CAR/CL is therefore closed.
34.		✓	CL21 Reference to NDRC's website does not reasonably demonstrate the comprehensiveness of the project list in common practice analysis. Please clarify. Please also ensure the identified project titles being consistent throughout the	PDD Another list from CNTIC, which is the official interface for importing big NGCC units into China, further demonstrates that the list of similar projects in ECPG in the PDD is comprehensive. The reference has been included in the footnote in the revised PDD. The inconsistencies of project titles have been corrected in the PDD.	OK The validation team is able to verify the project list from CNTIC & NDRC's CDM project information, so as to confirm the comprehensiveness of the identified project for discussion. The CAR/CL is therefore closed.

			text.			
35.		✓	CL22 Discussion on Fujian Xiamen Dongbu LNG Project is not supported by the provided reference (footnote 55), especially on the claim that the Dongbu Project enjoys financial privileges from local government.	PDD	Footnote 51 in the PDD indicates that Fujian Xiamen Dongbu LNG Project is the first LNG power plant solely owned by foreign enterprise, which is named East Asia Power (EAP). Another footnote (http://portal.gd-n-tax.gov.cn/web/vfs/fs/content/ContentTemplate.jsp?CategoryId=4986&ContentId=99045) is added and relevant preferential measures to foreign enterprises are clearly shown and are consistent with the argument in PDD.	OK The validation team is able to confirm in the updated footnotes, that the Xiamen Dongbu LNG Project being the first LNG project solely owned by a foreign enterprise has enjoyed financial privileges from the local government, e.g. tax exemptions, tax refund, lower tax rates, and VAT subsidies, etc., which are all exclusive to those investments from foreign enterprises. The Xiamen Dongbu project thus does not face financial difficulty as the proposed project does. The CAR/CL is therefore closed.
36.		✓	CL23 Please include in the PDD for the background of the surveyed stakeholders, so that the validation team can assess on the claimed “principle of representation and randomness” in identification of stakeholders.	PDD	The diversity of the surveyed stakeholders is added in the PDD.	OK The background of the surveyed stakeholders has been incorporated in PDD. The validation team believes that the selected interviewees could representatively indicate the comments/opinions of the general voices. In addition, the validation team can further confirm the general voice being similar by referring to the opinion received from the face-to-face stakeholder interview during the team’s on-site visit.

						The CAR/CL is therefore closed.
37.		✓	CL24 Please provide the payment records, with indication of the overall contract amount, of those key contracts, incl. site preparation, main equipments, main construction, etc.	PDD	The key contracts of equipment and construction have been provided. Since in total there are over 250 contracts and considerably more invoices (for example the payment for the steam turbine alone was split into approximately 180 invoices), the audit report of the expenditure accounting of the project has been provided. In this report the overall contract amounts can be crosschecked.	OK It has been crosschecked with the financial audit report, and the capital construction examination report; for confirming the overall contract amount. The CAR/CL is therefore closed.
38.		✓	CL25 Please clarify on the auxiliary consumption rate of 3% applied in the financial analysis, as it is apparently inconsistent with the figure indicated in FSR (as 2.3%), and it's nowhere mentioned in the <Supplement to FSR>.	PDD	3% is commonly recognized as the auxiliary consumption rate for existing operational NGCC plants. (http://www.id37.com/tech/20063/10207.html)	OK It is confirmed from the provided reference source that 3% auxiliary consumption rate is a common rate for the existing NGCC operation. The CAR/CL is therefore closed.
39.		✓	CL26 It is understood that the CDM training is not yet started for the proposed project. However, please provide the CDM training plan/programme with indicative schedule for demonstrating the PP's ability for project (CDM) implementation.	PDD	Training on monitoring work is planned in December 2009, which will be conducted by experienced professionals in CDM monitoring. A preliminary training structure is also provided for validation.	OK CDM (monitoring) training is planned to start in Dec-09, and to be conducted by experienced CDM professionals. Training programme is available for validation team's checking. The CAR/CL is therefore closed.

40.		✓	CL27 Please provide the special equipment operator permit/certificate for record.	PDD	The special operator permits have been provided.	OK Special operator permits have been checked to be valid. The CAR/CL is therefore closed.
41.		✓	CL28 Please clearly indicate in the PDD for the metering location of each electricity meter (incl. main & backup).	PDD	The metering points are now clearly indicated in the revised PDD.	OK The location of metering points has been clearly indicated in B.7.2. of revised PDD. The CAR/CL is therefore closed.
42.		✓	CL29 Please re-confirm the monitoring procedure when “data accuracy is found not within the area of allowable error”. i) what is the “allowable error”? ii) the stated procedure is inconsistent with the information obtained during OSV, where it is advised that readings from the backup meter shall be directly referenced?	PDD	The allowable error refers to the uncertainty of a measurement instrument which is stated in the Calibration Certificate as a tolerable range of variation. As stated on-site, the readings of the main meters are taken for billing purposes between the Project Owner and Grid Company, as well as for CDM purposes. The readings of the backup meters only serve for emergency situations.	OK The monitoring procedure is amended in the revised PDD, which is in line with the information obtained during OSV. The CAR/CL is therefore closed.
43.		✓	CL30 It is understood that the EIA approval was only based on the 3x390MW design, but not the adopted 2x390MW	PDD	The project received NDRC approval in September 2005 for the construction of a 2*390MW NGCC plant. <i>According to the Interim Provisions on Approvals of Enterprises Investment Projects issued by the</i>	OK As per the project approval by NDRC (which is considered the highest level authority in this aspect), it is convincingly

			design. Despite the reduced capacity, please clarify if the existing EIA approval is valid/applicable for the final design, and whether or not the corresponding legal requirements are duly fulfilled?		NDRC on September 15, 2004, approval by the NDRC (which is the highest level authority in charge of approval of such projects) is the final stage of the approval process for a project to be constructed and implemented. (http://www.chinacourt.org/flwk/show.php?file_id=96386&key=%C6%F3%D2%B5%CD%B6%D7%CA%CF%EE%C4%BF%BA%CB%D7%BC%D4%DD%D0%D0%B0%EC%B7%A8) Under the <i>Interim Provisions on Approvals of Enterprises Investment Projects</i>, all projects subject to approvals must submit a number of documents (including EIA approval) to NDRC or its local equivalents, and only upon confirmation that these requirements have been met will the NDRC or its local equivalents approve a project. Therefore, the receipt of NDRC approval in September 2005 confirms that the EIA approval is valid/applicable for the final design.	believed that the EIA approval has been reviewed and accepted by the NDRC. So that it can be concluded that the EIA approval is valid/applicable for the final design; and corresponding legal requirements are duly fulfilled. The CAR/CL is therefore closed.
44.		✓	CL31 It has to be clarified in the PDD, in which steps the training is planned (before commissioning, during operation) and how the responsibilities and tasks of power plant operator, project developer, technology supplier incl. monitoring equipment and CDM consultant are allocated.	PDD	More detailed information on the training regarding the monitoring plan was provided in section B.7.2 of the Revised PDD.	OK The CAR/CL is therefore closed.
45.		✓	CL32 The confirmed start of the	PDD	The starting date of the project activity is 25 June 2005 which was the date of signing the civil construction contract for the proposed project.	OK

			project activity has to be clarified in the PDD.			The CAR/CL is therefore closed.
46.		✓	<u>CL33</u> It has to be clarified, whether all other plausible alternatives (e.g. other alternatives that are documented in official power expansion plans, 5-year-plans, etc.) have been taken into account as possible baseline scenarios.	PDD	All the plausible alternatives have been taken into account, and more detailed information on the plausible alternatives was provided in section B.4. of the Revised PDD.	OK The CAR/CL is therefore closed.
47.		✓	<u>CL34</u> For the identified Alternatives (2) and (3), please clarify the given explanation within the text that these alternatives also comply to Sub-step 1b – Enforcement of applicable laws and regulations.	PDD	More detailed information was provided in the section B.4 of the Revised PDD.	OK The CAR/CL is therefore closed.

Appendix B

CERTIFCATES OF COMPETENCE

Qualification

Chan, Wilfred /

Emission Trading

United Nations Framework Convention on Climate Change

Auditor No.:

(AuditorenRegNr)

Appointed:

(Zugelassen)

☒ ja

Qualification Level: Auditor

(Qualifikationsstufe)

External:

(Externer)

☐ ja

Add. reviewer:

(Zus-tzlicher Prüfer)

☐ yes

EAC Scopes:

(EAC Branchen)

CDM 06 - Construction

CDM 13 - Waste handling and disposal

CDM 01 - Energy industries (renewable - / non-renewable sources)

Add. qualification:

(zus. Qualifikation)

First Appointment:

(Erstberufung)

03/24/2008

Valid to:

(Gültig bis)

03/23/2011

Remarks:

2008-08-03:

Addition of CDM-01 based on project experience, but limited to renewable energies except Biomass power / cogeneration projects.

Languages:

Chinese

Chinese simplified

Chinese traditional

English

Mandarin

Experience Exchange

Date

Location

Remarks

Accreditation(s)

Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next
Monitoring:
(n-chste
Beurteilung)

Remarks:

[View / Edit Monitoring](#)

History of scope allocation

Date:
Change:
By:
Reason:

Date: 2007-06-24
Change: EAC CDM, CDM added
By: Manfred Brinkmann
Reason: No indication yet for training as CDM auditor and participation in completed validation / verification activities, therefore changed application to 'Expert'.

History

Created:	05/23/2007 01:58:07 PM	Wilfred Chan/Hk/Chn/TUV
Modified:	08/03/2008 10:37:43 AM	Manfred Brinkmann/Jpn/TUV

Qualification

Wong, WaiKwok /

Emission Trading

United Nations Framework Convention on Climate Change

Auditor No.:

(AuditorenRegNr)

Appointed:

(Zugelassen)

☒ ja

Qualification Level: Lead Auditor

(Qualifikationsstufe)

External:

(Externer)

☐ ja

Add. reviewer:

(Zus-tzlicher Prüfer)

☐ yes

EAC Scopes:

(EAC Branchen)

CDM 04 - Manufacturing industries

CDM 01 - Energy industries (renewable - / non-renewable sources)

Add. qualification:

(zus. Qualifikation)

First Appointment:

(Erstberufung)

10/31/2006

Valid to:

(Gültig bis)

10/30/2009

Remarks:

2008-03-26: Scope extension to CDM 01, see Personal data and "Final application review".

Languages:

Chinese

Chinese simplified

Chinese traditional

English

Experience Exchange

Date

Location

Remarks

Accreditation(s)

Monitoring

Latest Monitoring:

(letzte Beurteilung)

Next

Monitoring:

(n-chste
Beurteilung)

Remarks:

History of scope allocation

Date: 2007-05-08
Change: EAC CDM added
By: Manfred Brinkmann
Reason:

History

Created:	07/17/2006 05:32:00 PM	WaiKwok Wong/Hk/Chn/TUV
Modified:	03/26/2008 09:36:26 AM	Manfred Brinkmann/Jpn/TUV

Qualification

Brinkmann, Manfred /

Emission Trading

United Nations Framework Convention on Climate Change

Auditor No.:

(AuditorenRegNr)

Appointed:
(Zugelassen)

☒ ja

Qualification Level: Auditor
(Qualifikationsstufe)

External:
(Externer)

☐ ja

Add. reviewer: ☒ yes
(Zus-tzlicher Prüfer)

EAC Scopes:
(EAC Branchen)

CDM 03 - Energy demand
CDM 04 - Manufacturing industries
CDM 05 - Chemical industry
CDM 10 - Fugitive emissions from fuels (solid; oil and gas)
CDM 11 - Fugitive emissions from production and
consumption of halocarbons and sulphur hexafluoride
CDM 12 - Solvents use
CDM 01 - Energy industries (renewable - / non-renewable
sources)
CDM 06 - Construction
CDM 13 - Waste handling and disposal

Add. qualification:
(zus. Qualifikation)

First Appointment:
(Erstberufung)

03/03/2004

Valid to:
(Gültig bis)

03/02/2010

Remarks:

Languages:

German
English
French

Experience Exchange

Date

Location

Remarks

Accreditation(s)

Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next
Monitoring:
(n-chste
Beurteilung)

Remarks:

History of scope allocation

Date: 2004-03-05
Change: EAC CDM, CDM added
By: Klaus-Dieter Fritsch
Reason:

Date: 2004-03-03
Change: EAC CDM, CDM, CDM, CDM, CDM, CDM added
By: Klaus-Dieter Fritsch
Reason: Qualification is based on the applicant's ISO 14001 auditor qualification.

History

Created:	12/11/2003 01:27:13 PM	-
Modified:	11/22/2007 11:00:46 AM	Manfred Brinkmann/Jpn/TUV