



VALIDATION REPORT

Sichuan Furong Coal Mine Methane Utilization Project in China

REPORT NO. 2008-9052

REVISION NO. 04



VALIDATION REPORT

DET NORSKE VERITAS
CERTIFICATION AS

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

Date of first issue: 2008-08-29	Project No.: PRJC-1-9887-2008-CCS-JPN
Approved by: Michael Lehmann	Organisational unit: Climate Change Services
Client: Marubeni Corporation	Client ref.: Masayuki Hirano

Project Name: Sichuan Furong Coal Mine Methane Utilization Project

Country: China

Methodology: ACM0008

Version: 4

GHG reducing Measure/Technology: CMM fuelled power generation with gas engines

ER estimate: 257 976 tCO₂e/year

Size

☒ Large Scale

☐ Small Scale

Validation Phases:

☒ Desk Review

☒ Follow up interviews

☒ Resolution of outstanding issues

Validation Status

☐ Corrective Actions Requested

☐ Clarifications Requested

☒ Full Approval and submission for registration

☐ Rejected

In summary, it is DNV's opinion that "Sichuan Furong Coal Mine Methane Utilization Project" in China, as described in the PDD version 7 of 2 March 2010, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0008 version 04. Det Norske Veritas Certification AS thus requests the registration of the project as a CDM project activity.

Report No.: 2008-9052	Date of this revision: 2010-04-12	Rev. No. 04
Report title: Sichuan Furong Coal Mine Methane Utilization Project in China		
Work carried out by: Cuiping Deng, Akira Sekine, Kang Kuo, Chao Zhu		
Work verified by: Ole Andreas Flagstad		

Key words:

☒ No distribution without permission from the Client or responsible organisational unit

☐ Limited distribution

☐ Unrestricted distribution



VALIDATION REPORT

Abbreviations

CAR	Corrective action request
CBM	Coal bed methane
CDM	Clean development mechanism
CEF	Carbon emission factor
CER	Certified emission reductions
CL	Clarification request
CM	Combined Margin
CMM	Coal mine methane
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EIA	Environment impact assessment
FSR	Fesibility study report
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
NGO	Non-governmental Organisation
NSCR	Non-selective Catalytic Reduction
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change



VALIDATION REPORT

TABLE OF CONTENTS

1	EXECUTIVE SUMMARY – VALIDATION OPINION	1
2	INTRODUCTION	3
2.1	Objective	3
2.2	Scope	3
3	METHODOLOGY	4
3.1	Desk Review of the Project Design Documentation	4
3.2	Follow-up Interviews with Project Stakeholders	6
3.3	Resolution of Outstanding Issues	8
3.4	Internal Quality Control	9
4	VALIDATION FINDINGS	10
4.1	Participation Requirements	10
4.2	Project Design	10
4.3	Baseline Determination	12
4.4	Additionality	20
4.5	Monitoring	31
4.6	Calculation of GHG Emissions	35
4.7	Environmental Impacts	36
4.8	Comments by Local Stakeholders	37
4.9	Comments by Parties, Stakeholders and NGOs	37

Appendix A: Validation Protocol

Appendix B: Certificates of Competence



VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the "Sichuan Furong Coal Mine Methane Utilization Project" in China. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design, baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

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

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

The project activity consists of the installation of a set of gas engine generators of total approved capacity of 15 MW firing CMM from the four coal mine possessed and operated by Sichuan Furong Group's Limited Industrial Company. It will displace part of the electricity from the captured coal firing power generation and Central China Power Grid (CCPG) instead of passively venting the CMM. Therefore, the project results in reductions of CH₄/CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change.

The project correctly applies ACM0008 "Consolidated baseline methodology for coal bed methane and coal mine methane capture and use for power (electrical and motive) and heat and/or destruction by flaring", version 4. The determination of the baseline is well elaborated, transparent and sufficiently supported with facts. The selected baseline scenario, i.e. the continuation of the current situation, where there will be no installation of gas engine generators is reasonable for the fixed 10 year crediting period. Benchmark analysis and common practice analysis of CMM utilization facility in China demonstrate that 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 monitoring plan is in line with the approved monitoring methodology ACM0008 version 4. The monitoring plan makes sufficient provision for monitoring relevant baseline emission indicators. Detailed responsibilities and authorities for project management, monitoring and reporting and QA/QC procedures have also been envisaged.

The ex-ante GHG emission estimations are calculated and documented in a complete and transparent manner. The algorithm and methodologies for accounting GHG emissions are appropriate and the total emission reductions from the project are estimated to be on the average 257 976 tCO₂e per year over the fixed 10 year crediting period.

The project is not expected to create any adverse environmental impacts. The Environmental Impact Assessment Report regarding the project has been submitted to the local environmental authority and it was approved on 10 September 2007.



VALIDATION REPORT

In summary, it is DNV's opinion that the "Sichuan Furong Coal Mine Methane Utilization Project" in China, as described in the PDD version 6.2 dated 5 June 2009, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0008 version 4. DNV thus requests the registration of the project as a CDM project activity.



VALIDATION REPORT

2 INTRODUCTION

Marubeni Corporation has commissioned DNV to perform a validation of the “Sichuan Furong Coal Mine Methane Utilization Project” in China (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

The validation team consisted of the following personnel:

Role/Qualification	Last Name	First Name	Country	Type of involvement					
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
CDM validator / technical team leader	Deng	Cuiping	China	✓		✓	✓		
GHG auditor	Guo	Kang	China	✓	✓				
GHG auditor	Sekine	Akira	Japan	✓	✓	✓			
Sector expert	Zhu	Chao	China	✓	✓				✓
Technical reviewers	Flagstad	Ole Andreas	Norway					✓	

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

2.1 Objective

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

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech



VALIDATION REPORT

Accords, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0008, version 4.

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.

3 METHODOLOGY

The validation consisted of the following three phases:

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

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table lists the documentation that was reviewed during the validation:

- /1/ Marubeni Corporation, PDD “Sichuan Furong Coal Mine Methane Utilization Project”, Version 1, 7 May 2007
- Marubeni Corporation, PDD “Sichuan Furong Coal Mine Methane Utilization Project”, Version 2.1, 30 September 2007
- Marubeni Corporation, PDD “Sichuan Furong Coal Mine Methane Utilization Project”, Version 3, 1 April 2008
- Marubeni Corporation, PDD “Sichuan Furong Coal Mine Methane Utilization Project”, Version 6.2, 6 June 2009
- Marubeni Corporation, PDD “Sichuan Furong Coal Mine Methane Utilization Project”, Version 7, 2 March 2010
- /2/ Liaison Committee for Utilization of the Kyoto Mechanism (DNA of Japan), Letter of approval, 20 November 2007
- /3/ The National Development and Reform Commission of the People’s Republic of China, Letter of Approval, 25 June 2008
- /4/ CLEAN DEVELOPMENT MECHANISM VALIDATION AND VERIFICATION MANUAL (Version 01), http://cdm.unfccc.int/Reference/Manuals/accr_man01.pdf
- /5/ ACM0008 version 04, ”Consolidated baseline methodology for coal bed methane and coal mine methane capture and use for power (electrical or motive) and heat and/or destruction by flaring”
- /6/ Tool for calculation of emission factor for an electricity systems, version 01.1
- /7/ Tool for demonstration and assessment of additionality, version 05.2
- /8/ Sichuan Furong Group, Gas Power Station Safety Operation Standard (including training procedure), October 2007
- /9/ Shandong Shendong Mechanical Equipment Co., Ltd., Certificate of analysis of CMM, 19 July 2006



VALIDATION REPORT

- /10/ Xinan Communication University Environmental Science and Engineering College, Environmental Impact Assessment Report for Power Generation, 9 September 2007
- /11/ Xinan Communication University Environmental Science and Engineering College, Environmental Impact Assessment Report for Gas Holder, 29 August 2007
- /12/ - Yibin City Environmental Protection Bureau, Approval on Environmental Impact Assessment Report for gas tank and gas distribution system, 29 August 2007
- Yibin City Environmental Protection Bureau, Approval on Environmental Impact Assessment Report for Power Generation, 10 September 2007
- /13/ Yibin City Power Plant Safety Assessment and Work Safety Bureau, Approval on Safety Assessment Report for Gas Holder, 23 September 2007
- /14/ Yibin Furong Geological Observation and Design Co., Ltd., Feasibility Study Report, January 2007
- /15/ Develop and Reform Commission of Sichuan Province, Approval on Feasibility Study Report, 28 August 2007
- /16/ USEPA, Mitigation of Methane Emissions from Coal Mine Ventilation Air: An Update
- /17/ BCS Incorporated, Utilization of Mine Ventilation Air Methane (presentation material at North American Coalbed Methane Forum), 22 October 2008
- /18/ Furong group company, Purchase Order of 500 kW Gas Engine Generator, 30 July 2007
- /19/ - The People's Republic of China State Administration of Coal Mine Safety, National Coalmine safety Regulation, 2005
- /20/ - General Office of the State Council China, Notice on prohibiting small coal fired power generation by, decree No. 2002-6
- /21/ - National Develop and Reform Commission China, Notice on encouragement of large scale high pressure and ultra high pressure coal fired power generation, 21 May 2004
- /22/ - US-EPA and International Resources Group, Mitigation of Methane Emissions from Coal Mine Ventilation Air: An Update
- /23/ - US-EPA, Coalbed Methane Outreach Program, 26 October 2006
- /24/ - US-EPA, Coalbed Methane Outreach Program (12th North American Mine Ventilation Symposium Presentation), 9-11 June 2008
- /25/ - MEGTEC System AB, MEGTEC with Vocsidizer (presentation material at Guizhou CMM Workshop), 17 July 2008
- /26/ - IT Power and Wardell Armstrong, 2005, Enhancing Coal Mine Methane Utilisation in China, December 2005
- /27/ - National Develop and Reform Commission China, Notice on encouragement of CMM utilization for power generation, 2 April 2007
- /28/ - China National Planning Commission and China Ministry of Construction, *Methods and Parameters for Economic Assessment of Construction Project* (version 3) (Valid from September 2006)
- /29/ - Yibin City Economy Commission, Recommendation to Furong Group, 30 December 2006 (to encourage CMM fired power generation to displace captive power generation)
- /30/ - Furong group company, Gas supply data 2000-2007



VALIDATION REPORT

- /31/ - Furong group company, CMM prediction (spreadsheet)
- Furong group company, CMM prediction (rationale)
- /32/ - Sichuan Province Coal Products Supervisory Testing Laboratory, Test report of waste coal, 27 May 2003
- Furong group company, Specification of weigh bridge
- China National Standard, Sampling of commercial coal (GB 475-1996)
- China National Standard, Preparation of coal sample (GB 474-1996)
- China National Standard, Proximate analysis of coal (GB/T 212-2001)
- /33/ China Energy Trade Network, Coal price trend in China (2008), 3 January 2008
- /34/ Furong group company, Spreadsheet for investment analysis, January 2009
- Furong group company, Spreadsheet for investment analysis, 16 December 2009
- /35/ - China Coal Information Institute (CCII), Optimal Projects for China's CMM Mitigation, 3rd International Methane & Nitrous Oxide Mitigation Conference, Beijing, China, November 2003,
<http://www.coalinfo.net.cn/coalbed/meeting/2203/papers/coal-mining/001.pdf>.
- /36/ - China Coal Information Institute, New Development of CMM Projects in China, page 295, The proceeding of 2007 Methane to Markets Partnership Expo, October – November 2007
- /37/ - Furong group company, Spreadsheet for CER calculation
- /38/ China National Standard (on trial), Emission Standard of Coal Bed Methane and Coalmine Gas GB21522-2008, 2 April 2008 (Effective 1 July 2008)
- /49/ CDM, A TRIGGER FOR COAL MINE METHANE EMISSION REDUCTIONS IN CHINA by Westlake A (IT Power), Creedy D.P. (Wardell Armstrong), Hu Yuhong (CCII), abstract of 3rd International Methane & Nitrous Oxide Mitigation Conference Beijing, 19 November 2003,
<http://www.coalinfo.net.cn/coalbed/meeting/2203/papers/coal-mining/005.pdf>
- /50/ Yibin City Economy Commission, Recommendation to Furong Group, 30 December 2006", http://www.gov.cn/zwggk/2007-04/16content_583702.htm

Main changes between the version published for the 30 days stakeholder commenting period on 28 April 2008 and the final version submitted for registration:

- Baseline determination
- Common practice analysis
- Vintage of grid emission factor

3.2 Follow-up Interviews with Project Stakeholders

On 30 and 31 January 2008, DNV performed interviews at the project site with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Marubeni Corporation, Marubeni (Beijing) Trading Co., Ltd., Toyo Energy Corporation, Furong group company, Chongqing Coal Science Institute and the local stakeholders living in Jinqiao residence area were interviewed /39/-/46/. The main topics of the interviews are summarised in the table below.



VALIDATION REPORT

	Date	Name	Organization	Topic
/39/	2008-01-30/31	- Masayuki Hirano, Senior Manager, Energy & Natural Resource Project Department 1	Marubeni Corporation	- Project design - LoA - Additionality - Monitoring
/40/	2008-01-30/31	- Keisuke Miyazaki, Deputy General Manager, Metals & Mineral Resources Department - Zhang Chao, Metals & Mineral Resources Department	Marubeni (Beijing) Trading Co., Ltd.	- Project design - LoA - Additionality - Monitoring - EIA - Local stakeholder consultation
/41/	2008-01-30/31	- Akira Takahara, Vice President,	Toyo Energy Corporation	- Project design - Additionality - Monitoring
/42/	2008-01-30/31	- Xiaodong Tang, Vice President & Chief Engineer - Yuejian Li, Deputy Chief Engineer - Xiangyi Wu, Gas Extraction Department - Hongge Zhang, CDM Department	Furong group company	- Project design - LoA - Additionality - Monitoring - Local stakeholder consultation
/43/	2008-01-31	- Ke Deng, Chief Engineer - Yao Liang, Chief Engineer	Furong group company, waste coal power generation plant	- Project technology
/44/	2008-01-31	- Yong Peng	Furong group company, gas supply company	- Project technology
/45/	2008-01-31	- Zhigang Mo	Chongqing Coal Science Institute	- Project technology



VALIDATION REPORT

		- Qing Yu		
/46/	2008-01-31	- Jinjun Xu, local resident	Jinqiao residence area	- Local stakeholder consultation
/47/	May 2009	Mr. Liu Wenge	Director of China Coal Information Institute	- CMM utilization regulation
/48/	May 2009	Ms Sun Cui Hua	Director of NDRC	- CMM utilization regulation

3.3 Resolution of Outstanding Issues

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

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

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the "Sichuan Furong Coal Mine Methane Utilization 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:

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

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



VALIDATION REPORT

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

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

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
<i>If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the CAR or CL is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1 Validation protocol tables

3.4 Internal Quality Control

The validation report underwent a technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.



VALIDATION REPORT

4 VALIDATION FINDINGS

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

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

4.1 Participation Requirements

The project participant of non-Annex I Party is Sichuan Furong Group's Limited Industrial Company of the People's Republic of China. The Government of Peoples' Republic of China ratified the Kyoto Protocol on 30 August 2002 and designated the National Development and Reform Commission as the DNA. The DNA of China had issued the letter of approval on 25 June 2008 /2/.

The project participant of Annex I Party is Marubeni Corporation of Japan. The Government of Japan ratified the Kyoto Protocol on 4 June 2002 and designated the Liaison Committee for Utilization of the Kyoto Mechanism as the DNA. The DNA of Japan had issued the letter of approval on 20 November 2007 /2/.

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

4.2 Project Design

The project consists of construction and operation of an additional gas tank of 20000m³ for capturing and utilizing excessive coal mine methane currently released to the atmosphere. The utilisation is done through two groups of gas engine generators. The project covers four coal mines: Baijiao, Shanmushu, Xunchang and Gongquon that are located close to each other.

The drainage system of CMM here had been already constructed according to the safety regulation of China and no additional drainage system is included in the project activity.

In average of year 2003 – 2007, approximately 12.5 million m³ CMM of the captured coal mine methane has been supplied to household use and vehicle fuels, however major part of the CMM has been released to the atmosphere without any treatment.

The first stage of the project consists of 16 gas engine generators (500kW for each, total 8 MW) and the second stage and the second stage will consist of 7 MW installed capacity built up by of 700 or 1000 kW gas engine generators. The generated power is to be used to displace the part of the power generated by the existing captive waste coal fired power generation (generation capacity: 24 MW) and the part of grid power generation. The waste heat from the gas engines is to be recovered and used for steam generation and it is to be used to displace the steam generated by the existing two waste coal fired boilers (1 ton/h and 2 ton/h). However, CERs from the steam displacement is not to be claimed. The total installed capacity is 15MW, of which 13MW for one CMM power plant at Baijiao mine and 2MW for another CMM power station at Gongquan mine. The capacity and the



VALIDATION REPORT

implementation schedules of the gas engine generators are clearly described in the PDD as follows;



VALIDATION REPORT

Year	Installed capacity of gas engine generator
2007	2MW
2008	8MW + 1.4 MW waste heat boiler
2009	8MW + 2.52 MW waste heat boiler
2010	10MW + 2.52 MW waste heat boiler
2011	13MW + 2.52 MW waste heat boiler
2012	15MW + 2.52 MW waste heat boiler

The validation team observed during site visit the four 500 MW gas engine generators were already installed and in operation as a part of the first stage activity. The waste heat was verified not to be recovered as described in the PDD at the moment.

According to the plan, the installation of the equipment is to be completed as follows;

- January 2009: complete waste heat boiler installation
- December 2009: stop operation of the existing waste coal fired boiler
- December 2011: complete gas engine generator installation

The methane concentration of the captured CMM was confirmed to be approximately 33% during the site-visit by DCS readings and the value in the PDD is equivalent to this. It is adequate as the fuel for gas engine power generation.

The project participants have no plan to utilize CBM.

The geographic coordinates of the project sites are clearly described in the PDD and they are verified appropriate.

The starting date of the project activity described in the PDD is 30 July 2007 and it was verified to be the contract date of the procurement of gas engine generators by its purchase order /18/. The project activity was seriously considered as a CDM prior to the starting date. It was verified by the feasibility study report of January 2007.

The starting date of the crediting period of 1 September 2009 is reasonable.

The project operational lifetime described in the PDD is 20 years. It is reasonable considering the lifetime of the gas-engine generator.

The estimated total emission reductions for the ten-year crediting period are 2 579 764 tCO₂e.

4.3 Baseline Determination

ACM0008 version 04 is applied.

Applicability

The applicability of the project activity was verified as follows;

a) Extraction activities:

- surface drainage wells to capture CBM associated with mining activities: *not included*



VALIDATION REPORT

- underground boreholes in the mine to capture pre mining CMM: *included*
- surface goaf wells, underground boreholes, gas drainage galleries or other goaf gas capture techniques, including gas from sealed areas, to capture post mining CMM: *underground boreholes, or the other goaf gas capture techniques, including gas from sealed areas, to capture post mining CMM are and will be adopted to capture post mining CMM*

- ventilation air methane (VAM) that normally be vented: *Yes*

b) The treatment of CMM:

- The methane is captured and destroyed through flaring: *No*
- The methane is captured and destroyed through catalytic oxidation with or without utilization of the thermal energy: *No*
- The methane is captured and destroyed through utilisation to produce electricity, motive power, and/or thermal energy; emission reductions may or may not be claimed for displacing or avoiding energy from other sources: *Yes, captured and destroyed by gas engine heat and power generator*
- The remaining share of the methane, to be diluted for safety reason may still be vented: *Yes*
- All the CBM or CMM captured by the project should either be used or destroyed, and cannot be vented: *No, the project will capture CMM but not CBM. The underground gas drainage system already exists, and the captured methane will be destroyed by gas engine generators and will not be vented.*



VALIDATION REPORT

c) Availability of the data for ex-ante projections of methane demand

Project participants must be able to apply the necessary to data for ex-ante projections of methane demand as described in Section 7/8 of ACM0008: *Yes*

d) New or existing mine

The methodology applies to both new and existing mining activities: *existing mine*

e) Prohibitive condition

ACM0008 does not apply to project activities with any of the following features:

- Operate in open cast mines: *No (underground mine)*
- Capture methane from abandoned /decommissioned coalmines: *No (under mining)*
- Capture/use of virgin coal-bed methane, e.g. methane of high quality extracted from coal seams independently of any mining activities: *No (no CBM capture included)*
- Use CO₂ or any other fluid/gas to enhance CBM drainage before mining takes place: *No (no CBM capture included)*

DNV validation team concluded that the project activity complies with the criteria of the applied methodology, ACM0008 version 04.

Baseline determination

The baseline conditions of the project activity and the elimination of the baseline alternatives are discussed according to the each step of ACM0008 version 04 as follows;

Step 1. Identify technically feasible options for capturing and/or using CBM or CMM or VAM

Step 1a. Options for CBM and CMM or VAM extraction

The project participants discussed the three options for CMM extraction. CBM and VAM extraction were excluded as they are included in the proposed project activities.

- A. Pre mining CMM extraction
- B. Post mining CMM extraction
- C. Possible combination of options A and B, with the relative shares of gas specified

All options above are technically feasible. However the methane concentration in the air at coalmine needs be controlled according to the regulatory requirement. It is discussed further in Step 2.

Step 1b. Options for extracted CBM and CMM or VAM treatment

According ACM0008 version 4, seven options for extracted CMM treatment were discussed. CBM and VAM treatment were excluded similarly to Step 1a.

- i. CMM ventilation
- ii. using/destroying ventilation air methane rather than venting it
- iii. flaring



VALIDATION REPORT

- iv. use for additional grid power generation
- v. use for additional captive power generation
- vi. use for additional heat generation
- vii. feed into gas pipeline

All options above are technically feasible. Alternative v is the proposed project activity not implemented as a CDM project.

Step 1c. Options for energy production

According to ACM0008 version 4, three options for power generation (option 1 - 3) and heat production (option 4 – 6) were discussed respectively as follows;

- 1. Electricity from the existing on-site captive power plant and the Central China Power Grid, CCPG (current practice)
- 2. Electricity from coal-fired power plant with the same installed capacity as the proposed project
- 3. Electricity from CMM fired power generation (proposed project activity not undertaken as a CDM project)
- 4. Steam generation by the existing waste coal fired boilers (current practice)
- 5. Steam generation by CMM fired boiler
- 6. Steam generation by waste heat boiler using waste heat from CMM fired gas engine (proposed project activity not undertaken as a CDM project)

All energy production options listed above are technically feasible. Option 1 and 4 are the current practice and Option 3 and 6 are the proposed project activity not undertaken as a CDM project.

Step 2. Eliminate baseline options that do not comply with legal or regulatory requirements

Options for CMM extraction:

The methane concentration in the air at coal mines is required by National Coalmine safety Regulation 2005, section two, item 100 - 150 to be below 1% to avoid explosion risks. In CMM drainage process, solely adopting “pre mining” or “post mining” could not meet the regulatory requirement. Thus the option A and B were eliminated. Option C is the proposed project activity not implemented as a CDM project.

The average methane concentration in the captured coalmine gas is 33%. A new regulation relevant to CMM utilization /38/ was published on 2 April 2008 and entered into force on 1 July 2008, covering only new mines from that date. The regulation requires CMM utilization also by existing coal mines as of 2010 /38/ as summarised in the following table;

GB21522-2008, Coalmine methane emission limits

Facilities	Items	Emission Limits
CMM surface developed	Coalmine methane	Forbidden release to air



VALIDATION REPORT

system		
CMM extraction system	High concentration methane ($\text{CH}_4 \geq 30\%$)	Forbidden release to air
	Low concentration methane ($\text{CH}_4 < 30\%$)	-
Coalmine ventilation well	Ventilated air methane	-

Interviews performed by DNV with the government officials/47-48/ indicate that it is unlikely that this regulation will be enforced for existing mines. Nonetheless, the monitoring plan provides for monitoring the enforcement of regulation GB21522-2008 and the baseline will be adjusted in case the systematic non-enforcement of regulation GB21522-2008 can not be demonstrated.

Options for extracted CMM treatment

The local Government formally recommended the project participants to utilize CMM for captive power generation not for power generation to displace grid power consumption if extracted CMM is planned to be utilize for power generation. DNV confirmed the requirement to encourage CMM fired power generation to displace captive power generation, Yibin City Economy Commission, Recommendation to Furong Group, 30 December 2006 /29/ was not a mandatory requirement for the coal mine industry to implement CMM power generation. All options for extracted CMM treatment thus comply with legal or regulatory requirements.

Options for energy production

A grid connection with fuel-fired power plant of the generation capacity smaller than 135 MW is prohibited by General Office of the State Council, decree No. 2002-6. Thus option 2 for energy production was eliminated.

Step 3. Formulate baseline scenario alternatives

One alternative for CMM extraction, seven alternatives for CMM treatment and two alternatives for energy production are defined to be technically feasible, comply with safety regulations and other legal regulatory requirement.

The project participants formulate all possible combinations of the above options as follows;

Scenario 1 is a current practice and Scenario 5 is the proposed project activity not undertaken as a CDM project.

Scenario	CMM extraction	CMM treatment	Power generation	Heat production
1	C	i. CMM venting	1. Captive power and grid power	4. Heat supply by current waste coal fired boilers
2	C	ii. Using/destroying	1. Captive power and	4. Heat supply by



VALIDATION REPORT

		VAM rather than venting	grid power	current waste coal fired boilers
3	C	iii. CMM flaring	1. Captive power and grid power	4. Heat supply by current waste coal fired boilers
4	C	iv. Use for additional grid power generation	3. Generate electricity from the extracted CMM	6. Waste heat recovery from CMM fired generator
5	C	v. Use for additional captive power generation	3. Generate electricity from the extracted CMM	6. Waste heat recovery from CMM fired generator
6	C	vi. Use CMM for additional heat generation	1. Captive power and grid power	5. Heat supply from CMM fired boilers
7	C	vii. Feed into gas pipeline	1. Captive power and grid power	4. Heat supply from current waste coal fired boilers

The average methane concentration in the captured coalmine gas is 33%. A new regulation relevant to CMM utilization, China National Standard (on trial), Emission Standard of Coal Bed Methane and Coalmine Gas GB21522-2008, was published on 2 April 2008 and entered into force on 1 July 2008, covering only new mines from that date. The regulation requires CMM utilization also by existing coal mines as of 2010. Interviews performed by DNV with the government officials indicate that it is unlikely that this regulation will be enforced for existing mines. Thus the regulation was ignored for the assessment. Nonetheless, the monitoring plan provides for monitoring the enforcement of regulation GB21522-2008 as mentioned above.

Step 4. Eliminate baseline scenario alternatives that face prohibitive barriers

Scenario 1:

This scenario does not face any barriers as it is the current practice.

Scenario 2:

Scenario 2 includes VAM technology as CMM treatment option. VAM technology had been in an investigation phase in some developed countries at the time of making decision and still in a trial phase with regard to qualifying the technology. Thus the project participants eliminated the option as VAM technologies are considered to be immature and Scenario 2 thereby was facing a technological barrier. DNV confirmed through the literature of US-EPA and the symposium of VAM technology. And it was concluded that the elimination was reasonable.

Scenario 3:

Scenario 3 includes of CMM flaring as CMM treatment option. Flaring is not a



VALIDATION REPORT

mandatory requirement by regulation. It needs considerable investment for flaring facilities however no return on it. Also it is facing a technological barrier and the barrier due to the prevailing practice. DNV confirmed it through the literature, “CDM, A TRIGGER FOR COAL MINE METHANE EMISSION REDUCTIONS IN CHINA by Westlake A (IT Power), Creedy D.P. (Wardell Armstrong), Hu Yuhong (CCII) /49/ and concluded that the elimination was reasonable.

Scenario 4

Scenario 4 consists of “iv. Use for additional grid power generation”, “3. Generate electricity from the extracted CMM” and “6. Waste heat recovery from CMM fired generator” as options for CMM treatment and power/heat generation.

As discussed in Step 2 the project participants had received the official recommendation from the local government to utilize CMM for captive power generation not for power generation to displace grid power. DNV confirmed the recommendation “Yibin City Economy Commission, Recommendation to Furong Group, 30 December 2006”, /50/ and it was concluded that the elimination of Scenario 4 was reasonable.

Scenario 5

It is a proposed project activity not undertaken as a CDM project, and is not facing any prohibitive barrier.

Scenario 6

Scenario 6 includes “CMM for additional heat generation” as an option for CMM treatment. The thermal demand of the coal mines are not expected to increase in future regardless of the coal production expansion. The project participants eliminated the option as the thermal demand would not be increased and the additional heat generation was not necessary. DNV confirmed the coal production plan and thermal demand and concluded the additional heat generation was facing a barrier due to lack of demand increase.

Scenario 7

Scenario 7 includes “Feed into gas pipeline” as an option for CMM treatment. The residential use of the extracted CMM including the vehicle use has been almost constant in 2000 – 2007, and it is not expected to increase during the crediting period. DNV confirmed it through the approved Environmental Impact Assessment Report for gas tank and gas distribution system and no additional gas demand was expected. Thus the elimination is concluded to be justified,

Through Step 4, the options facing the prohibitive barriers were eliminated in an appropriate manner and the requirements of VVM, v1, paragraphs 80, 81, 86 and 87 are supposed to be fulfilled.

The calculation details of the investment comparison analysis is provided:

The project participant selected “Sub-step 5b – Option II. Apply investment comparison analysis” as Scenario 5 generate economic benefit. DNV has validated all the input values to the investment analysis according to “Guidance of EB38 paragraph 54(c)”. The spreadsheet provided was used for both the investment comparison analysis and the



VALIDATION REPORT

benchmark analysis.

The period of the assessment is 20 years and covers the expected lifetime of the project activity. The project lifetime is reasonable compared to the similar project activities registered as follows;

- Tianfu Coal Mine Methane Project (ref. 2418): **22 years**
- Jincheng Fengrun CMM Utilization from Nine Mines in Jincheng City Shanxi Province China (ref. 1928): **22 years**
- Shanxi Datuhe Coal Mine Methane Utilization Project (ref. 1801): **19 years**
- Jincheng Sihe Coal Mine CMM Generation Project (ref. 1896): **26 years**
- Jinling Coal Mine Methane (CMM) Power Generation Project of Dengfeng City, Henan Province (ref.1931): **21 years**
- Duerping Coal Mine Methane Utilization Project (ref. 1900): **20years**

The tax, depreciation, loan repayment and interest are not deducted from the income.

The input values used in all investment analysis were valid and applicable at the time of the investment decision.

The spreadsheet was provided by the readable format and all calculations are confirmed to be appropriate according to "Guidance on the Assessment of Investment Analysis, version 02.1".

System boundary

The system boundaries defined in the PDD (Table B.3-1) are concluded that all GHG emissions are included and reflect the situation properly. They are summarised as follows;

	GHGs involved	Description
Baseline emissions	CH ₄	- The amount of methane released to atmosphere in the baseline (main emission source)
	CO ₂	- CO₂ from destruction of CMM by household use - CO₂ from captive heat and power generation - CO₂ from public transportation (accounted for together with household use as it has been supplied through the common gas grid) - CO₂ from grid power generation (Central China Power Grid: CCPG)
Project emissions	CH ₄	- CH ₄ release to atmosphere due to incomplete combustion from heat/power generation and household
	CO ₂	- CO ₂ from on-site fuel consumption



VALIDATION REPORT

		for project activity (transport of the captured CMM) - CO ₂ from CMM combustion for heat/power generation and household - CO ₂ from NMHC combustion for heat/power generation and household (if NMHC is less than 1%, it will be ignored)
Leakage	CH ₄ /CO ₂ , etc.	- Impact of CDM project activity on coal production need not be considered

4.4 Additionality

The alternative scenarios defined are compared and discussed according to ACM0008 and the latest version of "Tool for demonstration and assessment of additionality (version 5.2).

3.4.1 Investment analysis

- The project participants selected Step 2 "Investment Analysis" with benchmark analysis. Project IRR was selected as a financial indicator. As the project generates economical benefit other than CER revenue, the indicator chosen is appropriate.
- The benchmark IRR of 13% was derived from Economical Assessment and Parameters for Construction Project, edition 3.

Among the 6 registered listed above 4 projects applied the project IRR before tax as follows;

- Tianfu Coal Mine Methane Project (ref. 2418): **13%**
- Jincheng Fengrun CMM Utilization from Nine Mines in Jincheng City Shanxi Province China (ref. 1928): equity IRR after tax
- Shanxi Datuhe Coal Mine Methane Utilization Project (ref. 1801): **12%**
- Jincheng Sihe Coal Mine CMM Generation Project (ref. 1896): **15%**
- Jinling Coal Mine Methane (CMM) Power Generation Project of Dengfeng City, Henan Province (ref.1931): **13%**
- Duerping Coal Mine Methane Utilization Project (ref. 1900): NPV

DNV concluded the applied benchmark of 13% is within the range of the similar project thus reasonable.

- In the PDD published for the global stakeholder comment dated 1 April 2008, the IRR without CER revenue was described as 3.46% and with CER revenue was 20.21%. However the spreadsheet used for calculating the CER and background evidences were not provided from the PP. Thus DNV issued CL7 to request the provision.
- It was revealed during the validation of the IRR spreadsheet and the relevant evidence provided in response to CL7 that there were some mistakes in calculation and the values inconsistent with the evidence provided. Thus the IRR in the PDD submitted for requesting registration was updated reflecting the DNV comments. The modifications are summarized as follows;



VALIDATION REPORT

Items	PDD (ver. 3, 1 April 2008)	PDD (ver. 7, 23 March 2010)	Cause of inconsistency between PDD Version 3 and Version 6.2
Total investment (million CNY)	84.3	84.4	Typographic error in ver. 3 The value in ver. 6.2 is in line with the FSR completed in January 2007 which was available at the time of decision.
Annual O&M costs (million CNY)	5.19	11.057	Calculation mistake in ver. 3 The value in ver. 6.2 is in line with the FSR completed in January 2007 which was available at the time of decision.
Annual average electricity supply (MWh)	39,375	43,890	The average power generation during the crediting period was described in ver. 3. However the data source was unclear. The average power generation during the project lifetime of 20 years was described in ver. 6.2. The values from 2008 to 2017 were obtained from the FSR completed in January 2007, and the values from 2018 to 2027 were obtained from the value of the 2017 in the FSR which is to be constant from 2018 to 2027.
City construction tax and educational surcharge (%)	10	-	Since the project does not sell the power to the grid or end users, therefore, the tax imposed on the grid-connected power generation project is not applicable to the proposed project. The PDD ver. 3 applied the wrong calculation.
Project IRR (%)	3.46	Negative	Due to the above wrong calculations and input values, the IRRs described in the PDDs are inconsistent.

- The corrected spreadsheets /34/ provided from the project participants for the calculation of the IRR were verified to be appropriate. The IRR without CER revenue is negative and it shows the project activity can reach the set benchmark. The assessment on the investment analysis is further discussed below.

3.4.2 Investment analysis: Input values to investment analysis

- DNV has validated all the input values to the investment analysis according to “*Guidance of EB38 paragraph 54(c)*” as described in the following steps:
 - **Step 1: Assessment of sources of the used input parameters:** All the input parameters used in the financial analysis at the moment of investment decision are taken from the feasibility study report (FSR) /13/ developed in January 2007 by



VALIDATION REPORT

Yibin Furon Geological Observation and Design Co., Ltd which is independent and officially accredited entity /13/. The FSR only covers from 2008 to 2017, and the investment analysis was conducted covering from 2008 to 2027 according to “Guidance on the Assessment of Investment Analysis, version 02.1”. Thus the both averages are not consistent. It is further explained in Step 2 item 2. The input values in the FSR was verified and approved by Develop and Reform Commission of Sichuan Province on 28 August 2007. Thus it can be considered to be the information provided by an independent and recognized source.

- **Step 2: Confirmation that the values used in the PDD and investment analysis are fully consistent with the FSR:** DNV compared the input parameters for the financial analysis included in the PDD with the parameters stated in the FSR, and was able to confirm that the values applied are consistent with the values stated in the FSR (except for average power generation) as follows;

1. Initial investment: RMB 84.4 million (RMB 45 million in year 0 and RMB 39.4 million in year 3)
2. Power tariff: 0.286 RMB/kWh, weighted average of grid power price (buying price: 0.48 RMB/kWh) and generation cost of waste coal fired captive power plant (0.229 RMB/kWh)

The project activity planned to implement the gas engine power generation unit stepwise. The average annual power generation described in the PDD was confirmed to be in line with the expected annual power generation from 2008 to 2017 described on the approved FSR as shown in the following table.

Year	Annual power generation, GWh/year	Average power generation, GWh/year
2008	25.2	
2009	30.6	
2010	40.2	
2011	42.0	
2012	43.5	
2013	46.5	
2014	48.0	
2015	48.0	
2016	48.0	
2017	48.0	
Average 2008 - 2017		39.78
2018	48.0	
2019	48.0	
2020	48.0	
2021	48.0	
2022	48.0	
2023	48.0	
2024	48.0	
2025	48.0	
2026	48.0	



VALIDATION REPORT

2027	48.0	
Average 2008 - 2027		43.89

On the other hand, the average power generation used for investment analysis covers the entire lifetime of the power generation facilities from 2008 to 2027. This is in line with “Guidance on the Assessment of Investment Analysis, version 02.1”. The expected annual power generation from 2018 to 2027 is 48.00 GWh/year and same as the value for 2017. The average of 43.89 GWh/year described in the PDD was confirmed to be correct.

The purpose of the project is to displace the part of captive power generation and grid power with CMM fired power generation and thus the captive power plant will still be operated after the project activity starts. The average expected power generation by the project from 2008 to 2027, 43.89 GWh/year (approximately 44 GWh/year) is equivalent to 36% of total average annual power consumption from 2003 to 2005, 119.680 GWh/year (approximately 120 GWh/year). The expected total power consumption by the coal mine is increasing and the incremental consumption will be covered by the captive power generation and the grid power. The weighted average electricity tariff of 0.286 RMB/kWh described in the PDD version 3 was not sufficiently evidenced thus the PP was requested to clarify the background (CL7) and then the FSR formally approved was provided as the evidence. The value, 0.286 RMB/kWh was confirmed to be inline with the FSR. In the FSR, the weighted average electricity tariff was calculated as follows;

- Captive power generation ratio: 77.2%
- Captive power cost: 0.229 RMB/kWh
- Grid power ratio: 22.8%
- Tariff for the purchased power from the CCPG: 0.480 RMB/kWh

$$0.229 \text{ RMB/kWh} * 77.2\% + 0.480 \text{ RMB/kWh} * 22.8\% = 0.286 \text{ RMB/kWh}$$

The FSR was completed in January 2007 when the share of captive and grid power consumption data from 2003 to 2005 were available at that time. The share was calculated as follows;

	Captive Power, GW/y	Grid Power, GW/y	Total Power, GW/y (internal grid)
2003	98.980	15.100	114.130
2004	90.810	27.420	118.230
2005	87.470	39.260	126.730
2003 – 2005 Total	227.260	81.780	359.090
2003 – 2005 Average	92.420	27.260	119.680
2003 – 2005 Ratio	77.2%	22.8%	100%
Generation cost/tariff, RMB/kWh	0.229	0.480	-
Weighted average, RMB/kWh	0.286		-



VALIDATION REPORT

All of the above assumption including the captive power cost of 0.229 RMB/kWh is derived from the approved FSR and it was concluded to be appropriate for the investment analysis of the project activity as it is deemed to be an independent and recognized source. However, we acknowledge that a more conservative approach would have been to consider the expected share of electricity to be imported from the grid as a result of the project activity. Nonetheless, as noted earlier, even if applying 100% grid power tariff of 0.480 RMB/kWh, the IRR of the project is 10.63% and is thus still lower than the benchmark of 13%.

3. O & M cost: 0.255 RMB/kWh, including consumable, personnel cost, maintenance and others

The O&M cost described in the PDD version 3 of 5.19 million RMB/year was revised to 11.057 million RMB/year (CL7) . The breakdown of the O&M cost for the generated power of 40 GWh/year is described in the approved FSR as follows;

Cost	Annual cost for 40 GWh/year (PDD, version 3)*	Annual cost for 40 GWh/year (PDD, version 7)	Details
CMM compression and delivery cost	Excluded	RMB 4.800million	Proportional (RMB 0.12/kWh * 40 GWh)
Lubricant cost	RMB 1.200million	RMB 1.200million	Proportional (RMB 0.03/kWh * 40 GWh) (0.003 kg/kWh * RMB 15/kg)
Maintenance cost	RMB 2.400million	RMB 2.400million	Proportional (RMB 0.06/kWh * 40 GWh)
Labor cost	Excluded	RMB 0.640million	Fixed (RMB 40 000/person * 16 person) (8 operators, 6 mechanics, 2 foremen)
Contingency cost	RMB 1.200million	RMB 1.200million	Fixed
Total annual O&M cost	RMB 4.800million (RMB 5.198million in spreadsheet version 3)	RMB 10.240 million for 10 years (RMB 11.057million for 20 years)	



VALIDATION REPORT

*O&M cost breakdown is not described in the spreadsheet for the PDD version 3. The values were obtained from the corrected spreadsheet by excluding “CMM compression and delivery cost” and “Labor cost”.

Among the above cost elements, the “CMM compression and delivery cost”, “Lubricant cost” and “Maintenance cost” are proportional to the generated power and “Labor cost” and “Contingency cost” are fixed. As the costs, “CMM compression and delivery cost”, “Lubricant” and “maintenance cost” are deemed to be dependent on load factor mainly however “labor cost” and “contingency” are not. Thus its rationale is acceptable and was confirmed to be reflected to the IRR spreadsheet properly. The overall annual average O&M cost over the entire project period of 20 years is confirmed to be 11.057 million RMB and the average O&M cost from 2008 to 2017 described in the FSR is 10.20 million, they are concluded to be appropriate considering annual power generation increase after 2014.

According to the project participants, the O&M cost described in the PDD version 3 excluded “CMM compression and delivery cost” and “Labor cost”. As the spreadsheet used for compiling the PDD version 3 was not provided during the document review phase of validation, DNV raised a clarification request (CL7). Two versions of the excel sheet was provided, one used for compiling the PDD version 3 describing the O&M cost as 5.198 million RMB/year and another corrected one including “CMM compression and delivery cost” and “Labor cost”. DNV conducted the assessment with the corrected spreadsheet. DNV confirmed that the two cost elements were missing in the original spreadsheet and they were included properly in the corrected spreadsheet.

The CMM compression and delivery cost specified in the FSR was based on the experience in supplying the CMM to gas grid. From 2003 to 2005, the coalmine supplied average 4.2 million m³/year (pure methane base) to household and vehicles through the existing gas grid and the compression and delivery cost was 1.6 million RBM. Thus the unit delivery cost is approximately 0.38 RMB/m³ (= 1.6/4.2). The power generation system in the project activity can generate 3.2 kWh using 1 m³/kWh of methane thus the unit and thus the unit compression and delivery cost of the project activity is 0.12 RMB/kWh (= 0.38/3.2). DNV concluded the cost estimation was reasonable.

When conservatively excluding the “CMM compression and delivery cost” and “Labor cost” from the calculation, the IRR is improved to 5.43%. It is still lower the benchmark of 13%.

As the definition of the breakdown O&M cost of the registered project largely differ by the projects, it is difficult to directly compare the respective breakdown O&M cost among the similar projects. DNV, based on the local and sectoral expertise, compared the total O&M cost of the project with the other 6 project activities already registered.

4. Additional income from selling heat

There is no heat supply pipeline to the individual household in the coalmine area and the project participants do not intend to invest for that as no residents has heating or cooking equipment which can utilize the heat.



VALIDATION REPORT

As described in the validation report, there is gas pipeline grid for transport CMM to household users currently. However according to the environmental impact assessment (EIA) report of the CMM power generation, the CMM consumption for household use has been only 4.3 million m³ which is approximately 21% of the captured CMM and 34% of the utilized CMM, and the CMM demand for household is fully covered. Thus additional demand for household and commercial use is unlikely to occur and the project participants do not plan to increase the gas supply for residential and commercial use, this means that the situation during the project activity will be as in the baseline prior to the project.

It was verified at the site-visit. Therefore DNV concluded it appropriate that the project participants did not consider any additional income incurred from selling heat for residential use.

5. VAT refunds, income tax holiday and CMM subsidy

(1) VAT refunds

According to the Notice on the Tax Policy for Speeding Up the CMM Drainage (Caishui (2007) No. 16) issued by Ministry of Finance and State Administration of Taxation,

Article 1.:

The VAT refunds policy is applicable to the activities of draining CMM for selling by the CMM producers who is the normal VAT payer. The VAT refunds should be exclusively used for the research of CMM technology and for the expansion of CMM drainage. No income tax is imposed on the VAT refunds.

As the project owner, the Furong coalmine is also a coal producer. In order to ensure the safe operation and production of coalmine, the CMM must be extracted at the mining operation. Prior to the implementation of the project, the CMM drainage system has already been in place, and only a small quantity of the drained CMM has been sold to the households and vehicles by Furong coalmine through the existing pipelines. The remaining CMM was discharged to the atmosphere without being used.

In the project activities, the Furong coal mine uses the part of the drained CMM for power generation. The generated power is to be consumed by the coalmine itself displacing a part of waste coal fired captive power generation and grid power consumption. The existing drainage system will not be upgraded or modified by the project activity. Meanwhile, the selling amount of the drained CMM to households and vehicles will not be changed after the implementation of the proposed project.

The proposed project activity does not include selling the additional CMM to the external entities including for household use and vehicle use. Thus the VAT refunds policy in this Notice is not applicable to the proposed project.

In theory, the VAT can be calculated by deducting the input tax on the purchased products from the output tax on the sold products according to the VAT definition (VAT = output tax – input tax). For the project activity, the VAT is determined as follows;



VALIDATION REPORT

Output tax:

Since the project does not sell the generated power to the grid (CCPG), there is no output tax imposed on the project;

Input tax:

CMM purchase price: The project owner is the CMM producer thus needs not purchase CMM from the external entity. Thus, there is no input tax for CMM procurement;

Electricity purchase price: When necessary, the project will consume small amount of electricity from Furong coalmine's internal grid which consists of captive power and grid power (CCPG). Thus there is input tax for the purchased power only on the purchased power from the grid.

Water purchase price: There is input tax for the purchased water consumed by the project.

Based on the above, the VAT for the project is negative. Thus, no VAT can be refunded.

(2) Income tax holiday

According to the Notice on the Preferential Policy of Enterprises Income Tax (Caishuizi [1994] No.001) issued by Ministry of Finance and State Administration of Taxation,

Article 3: For the enterprises using the waste water, waste gas or waste slag as main raw materials to produce the commodities, the enterprises income tax may be decreased or exempted for the first 5 years, which means:

1. Except the income from the main products produced by the enterprises, the income tax imposed on the income incurred from selling the by-products by using the waste resources generated from the main production process, which is listed in the List of Comprehensive Utilization of Waste Resources, is exempted for 5 years, since the enterprises start to produce and sell the by-products.

As aforementioned, the proposed project activity is to utilize the drained CMM for power generation, and the generated power is to be consumed by Furong coalmine itself, and not to be sold to any external entities including the power grid (CCPG). Since no revenue from selling the by-product, i.e. drained CMM or generated power, the income tax and income tax discount policy are not applicable to the project.

(3) 0.2 RMB/m³ subsidy

According to the Implementation Policy on CMM Utilization Subsidy (Caijian [2007] No.114) issued by Ministry of Finance,

Article 2: Applicability Conditions of the Subsidy

(1) The drained CMM by the producers is for selling or for self use as the fuel or chemical raw materials.



VALIDATION REPORT

Article 3: Subsidy Rate

The central government offers the CMM producer with a subsidy rate of 0.2RMB/m³ for the drained CMM which is sold or self used.

In addition, Article 2 also states:

(2) This subsidy policy is not applicable to the drained CMM used for power generation.

As the project activity is to self use the drained CMM for captive power generation, applicability condition (1) above is fulfilled. However due to the condition (2), the 0.2RMB/m³ subsidy rate is not applicable to the project.

In summary, DNV concluded that the regulation and incentive scheme discussed above are not applicable to the project. Thus it is reasonable that the project participants did not consider the economical benefit in the IRR calculation.

6. The cost details of the compared similar activities in the province

The cost details of five projects in Sichuan Province and the other province are compared with the project activity in the following table;

CDM Ref.	Project Name	Installed capacity (MW)	Investment, million RMB	Investment, RMB/kW	O&M cost, RMB/kW	Status
2677	Sichuan Furong (Sichuan Province)	15	84.4	5626	737.13	This project
2428	Dafosi Coal Mine Low Concentration Coal Mine Methane Power Generation (Sichuan Province)	13	80.8	6215.38	586.15	Registered (28 Oct. 2009)
1918	Jiaozuo Coal Mine Methane (CMM) Power Generation (Henan Province)	7.5	64.94	8658.67	1039.29	Registered (27 Feb. 2009)
1900	Duerping Coal Mine Methane Utilization Project (Shanxi Province)	12	147.71	12308.78	273.23	Registered (6 Mar. 2009)
2418	Tianfu Coalmine Methane Project	12	63.35	5278 (USD 754)	1526 (USD)	Registered (21 Oct. 2009)



VALIDATION REPORT

	(Chongqing City)				218)	2009)
1928	Jincheng Fengrun CMM Utilization from Nine Mines (Shanxi Province)	24	81.4	3392	445.77	Registered (30 Apr. 2009)
1801	Shanxi Datuhe Coal Mine Methane Utilization Project (Shanxi Province)	17	78.2	4598	931.92	Registered (23 Apr. 2009)
Average		14.25	86.07	6741	800	

The above shows the investment per installed capacity of the project is 83% of the average and the O & M cost is 92% of the average. Thus it can be concluded to be reasonable.

It was confirmed that;

- The input values used in the PDD and its Annex are fully consistent with the FSR. Regarding the average annual power generation, the value in the FSR was derived from the data from 2008 to 2017, and the value in the investment analysis was derived from the data from 2008 to 2027. Thus inconsistency in the both average is reasonable as it was due to the difference of vintage. The annual power generation of the specific years described in the investment analysis and the FSR are consistent.
- The input values of the investment analysis almost comply with the FSR and the time of completion of the FSR and decision was sufficiently short thus the FSR can be concluded to be the basis of the decision to proceed
- The input values of the project activity are confirmed to be equivalent to the other similar project.

Thus VVM, v1, paragraphs 111 and 112 were fulfilled.

- **Step 3: Assessment of the period of time between the finalization of the FSR and the investment decision:** The FSR was completed in January 2007 in the same period when the decision of the project participants to proceed with the project activity was taken (i.e. the project starting date is 30 July 2007). Given the period of time between the completion of the FSR and the decision to proceed with the project activity, it is unlikely in the context of the project that input values would have materially changed. Thus it is reasonable to assume that the FSR has been the basis of the decision to proceed with the investment in the project.
- **Step 4: Cross check of the main input parameters used in the financial analysis with the parameters used by other similar projects:** The input parameters used in the financial analysis were compared with the data reported for other similar proposed



VALIDATION REPORT

CMM-CDM projects in China, e.g. in the same province. The investment cost per MW, the percentage of operation and maintenance costs relative to total project investment costs of the proposed project activity are aligned with the other analyzed project. DNV has also concluded that the tariff used by the project participant is conservative, as it is the highest tariff of the project analyzed. The project will install gas engine generators of 15MW installed capacity. The mine is obliged to prioritize the household use of the captured gas, but 3MW of the installed capacity has a limited operation time as it is dimensioned to take advantage of the periods with low or no thermal demand. The thermal demand is distributed at the four mines involved. In addition 2MW is a backup for the maintenance periods thus the capacity of stable availability is 10MW. It is in line with the description in the FSR. Thus the project load factor of 55% ($= 48000 \text{ MWh/yr} / (10 \text{ MW} * 24 \text{ Hr.} * 365 \text{ days/yr})$) has been accepted, even if lower than the load factor reported for other similar projects, as the sensitivity analysis concludes that a large reduction in investment is necessary to cross the benchmark (described in the next section).

3.4.3 Investment analysis: sensitivity analysis

- Sensitivity analysis was conducted. The initial investment, operation and maintenance costs, electricity generation and electricity tariff were altered from -10% to +10% of the original input values. None of the variations can reach the benchmark.
- Further, the input values were determined when the project IRR is equal to the benchmark. The investment needs be decreased by 88.5% to reach the benchmark and it is unrealistic. Similarly operation and maintenance cost need be reduced by 82.9%, and electricity generation (load factor) and power tariff need be increased by more than 302% and more than 80.3% respectively. The load factor increased by 302% stands for 166% against the capacity of 10MW and 110% against the capacity of 15MW. They are also unrealistic.

3.4.4 Project starting date

- The starting date is clearly described as the date of the procurement of key equipment. DNV verified it by confirming the date of the purchase order of four 500 kW gas engine generator /17/. The original PDD was published for stakeholder comment on 17 May 2007 and it was prior to the starting date of the project activity.

3.4.5 Common practice analysis

- It has been demonstrated that the utilization of CMM in China is only 5% /24/ and limited to utilization in coal miners' households, by local small-scale industry and for small scale power generation. It has been verified by DNV that currently several CMM power generation projects with installed capacity larger than 10 MW are under development in China are seeking CDM revenue support. Hence, utilization of CMM in China does not represent a common practice. The table below summarizes the CMM power generation projects which the participants conducted the common practice analysis in China and in line with the literature /44/;

Coal Mine	Province/region	CDM applied?
Jiangxi Fengcheng Coal Mining Group	Jiangxi	YES
Ningxia Shizuishan Coal Mine	Ningxia	YES
Guizhou Shuicheng Coal Mine Group	Guizhou	YES



VALIDATION REPORT

Yangquan Coal Mine Group	Shanxi	YES (Registered)
Liaoning Fuxin Coal Mine Group	Liaoning	YES
Huainan Coal Mine Group, Pansan	Anhui	YES
Shanxi Jincheng Coal Mine Group	Shanxi	YES
Huaibei Coal Mine Group, Haizi Luling	Anhui	YES (Registered)
Songzao Coal and Electricity Group	Chongqing city	YES
Tiefa Coal Mine Group	Liaoning	YES
Shanxi Liulin Coal Mine	Shanxi	YES (Registered)
Shanxi Yangcheng Coal Mine Group	Shanxi	YES (Registered)
Huainan Coal Mine Group, Panyi Xieqiao	Anhui	YES
Henan Anyang Xinlong Coal Mine Group	Henan	YES
Shanxi Coal Transport Company, Yangquan	Shanxi	YES (Registered)
Jilin Liaoyuan Coal Mine Group, Meihe	Jilin	YES
Guizhou Qianxi Qinglong	Guizhou	YES
Chongqing Zhongliangshan	Chongqing city	YES
Chongqing Nantong Coal Mine	Chongqing city	YES
Chongqing Tianfu Coal Mine	Chongqing city	YES
Pingdingshan Coal Mine Group	Henan	YES
Yima Coal Mining Group	Henan	YES
Zhengzhou Coal Mining Group	Henan	YES
Jiaozuo Group Company	Henan	YES
Guangxian Company Xinfeng Mine	Henan	YES

In summary, it is demonstrated that, the project is not a likely baseline scenario and the emission reductions are additional to what would have happened in absence of the project.

4.5 Monitoring

The monitoring plan is in accordance with the monitoring methodology, ACM0004 version 4. The monitoring plan will give opportunity for real measurements of achieved emission reductions. According to the requirement of EB, the project is a CMM capture and utilization project and has no capture of CBM, hence no indicators relevant to CBM have been defined regarding baseline and project emissions.

Monitoring of sustainable development indicators is not required by the Chinese DNA. The environmental impacts will be monitored by local environmental monitoring station, and the monitoring results are reported to local environmental protection bureau for environment management. They need not be monitored by the project participants.

4.5.1 Parameters determined ex-ante

The parameters determined ex-ante were assessed as follows;

1. Carbon emission factor of methane (IPCC 2006)

The applied value of 2.75 tCO₂e/tCH₄ is consistent with the value specified in IPCC 2006. It is to be applied through the fixed crediting period of 10 years and needs not be updated. The PDD should be corrected accordingly.



VALIDATION REPORT

2. Global warming potential of methane (IPCC 2006)

The applied value of 21 tCO₂e/tCH₄ is consistent with the value specified in IPCC 2006. It is to be applied through the fixed crediting period of 10 years and needs not be updated. The PDD should be corrected accordingly.

3. Efficiency of methane destruction/oxidation (IPCC 2006)

The applied value of 99.5% is consistent with the value specified in IPCC 2006. It is to be applied through the fixed crediting period of 10 years and needs not be updated. The PDD should be corrected accordingly.

4. Carbon emission factor of captive power generation (internal data)

The applied methodology, ACM0008 version 4 requires states "If the source of power for the coalmine is captive power generation, then the emissions factor is calculated based on the emission factor for the fuel used and the efficiency of the captive power plant.

The project participant determined the carbon emission factor of the captive power plant by the following three steps;

1) CO₂ emission factor of fuel

It was calculated from the carbon content in waste coal and its low calorific value (LCV) obtained from the analytical data by the external independent laboratory. Thus it was deemed appropriate.

[CO₂ emission factor]

= [Carbon content in waste coal] / [Low calorific value (LCV)]

= 33.6 tC/TJ

2) Calculate generation efficiency of the captive power plant

It was calculated from the captive power generation and the fuel consumption.

[Captive power generation efficiency]

= [Captive power generation] / [[Waste coal consumption] * [Low calorific value (LCV)]]

= 18.8% (2003), 17.6% (2004), 20.2% (2005)

The captive power generation and the waste coal consumption in 2003, 2004 and 2005 were used to calculate the power generation efficiency.

3) Calculate the carbon emission factor of the captive power plant

It was calculated from the following equation:

$$EF_{captive,y} = \frac{EF_{CO_2}}{Eff_{captive}} \times \frac{44}{12} \times \frac{3.6TJ}{1000MWh}$$

The carbon emission factors were obtained as 2.36 tCO₂/MWh (2003), 2.52 tCO₂/MWh (2004), 2.20 tCO₂/MWh (2005) and the average was 2.36 tCO₂/MWh.

The calculations used were appropriate and the values used for the calculation were evidenced.

5. Project annual baseline CMM demand for thermal energy uses (internal data)



VALIDATION REPORT

As the CMM to be consumed by residential CMM use and the vehicle use have been supplied through the common small gas grid. The seasonal fluctuation of CO₂ emissions from 2003 to 2007 are analysed according to ACM0008 version 4 based on the historical monthly data. The monthly invoices of the gas supply to the individual users are aggregated into a spreadsheet and the monthly baseline thermal demand was obtained from the spreadsheet. It was confirmed that the input values were correct by means of comparing the individual invoice and input data by sampling.

6. Scalar adjustment factor for month k: $d_k^{\max}$ (internal data)

Scalar adjustment factor for month k: $d_k^{\max}$ is determined based on the annual baseline CMM demand described above. The spreadsheet to be used to determine the values /30/ was available for validation and was verified to be appropriate.

7. CMM that would have been captured, used and destroyed (internal data)

Among the values in the PDD version 6.2, the amount of “CMM extracted” and “CMM extracted but not used in the project activity” from 2009 to 2012 are not consistent with the values in the FSR due to typographic errors. The PDD version 3 was completed not referring the FSR and during the update of the PDD to version 6.2, the project participants did not correct the table. The PDD version 7 was confirmed to be correct.

8. Shares of facility electricity demand supplied by grid import and by captive power (internal data)

They were determined as an average of the three historical values from 2004 to 2006. The power supplied by captive power plant was confirmed through monthly captive power generation records and the power supplied by the grid was confirmed through the power purchase invoice provided from the grid operator.

It was concluded that the parameters to be determined ex-ante are properly documented in the PDD version 7.

4.5.2 Parameters monitored ex-post

The following parameters to be determined ex-post are defined in the PDD version 7, B.7.1;

- Additional electric power consumption by the project in year y
- CMM extracted in the project activity in year y, including pre-mining CMM and post-mining CMM
- Methane sent to CMM power plants
- Concentration of methane in extracted gas
- Concentration of NMHC in extracted gas
- Carbon emission factor for combusted NMHC
- Electricity generated by gas engine generators
- Amount of fossil fuel consumed by power plant connected to the CCPG (for grid CEF determination)
- Net calorific value of fossil fuel (for grid CEF determination)



VALIDATION REPORT

- CO₂ emission factor of fossil fuel (for grid CEF determination)
- Power generation of each power source/plant connected to the CCPG (for grid CEF determination)
- Electricity purchased by Furong coal mine from the CCPG
- Electricity supplied by on-site waste coal fired captive power plant to Furong coal mine
- Electricity generation by on-site waste coal fired captive power plant (for captive power CEF determination)
- Quantity of waste coal consumed by the captive power plant
- Lower calorific value of waste coal (to be analyzed by an external laboratory)
- Emission from methane destroyed through heat generation
- Emission from methane destroyed after being supplied to gas grid or for vehicle use
- Enforcement of China National Standard (on trial), Emission Standard of Coal Bed Methane and Coalmine Gas GB21522-2008 and the dissemination rate of CMM capturing measures in Sichuan area

The baseline emission factor for the project is to be monitored and determined *ex-post* as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM) according to “*Tool to calculate the emission factor for an electricity system*” of version 01.1 /5/ according to the data from the latest available China Electric Power Yearbook at the time of verification. The weights ω_{OM} and ω_{BM} are selected as 0.5 and 0.5, respectively, for the CMM project by the default stipulated in the methodology.

The other parameters listed above are to be directly monitored by the project participants.

The necessary information specified by the guideline of CDM-PDD is included in the PDD, B.7.1.

4.5.3 Management system and quality assurance

The authority and responsibility of the project activities are described in the PDD.

Some quality documents and records of Sichuan Furong Group's Limited have been confirmed to be well maintained. The measurement equipment necessary to manage the coal mine operation have been calibrated properly according to the documented procedures. The management system structure is outlined in the PDD, B.7.2 properly including the function of internal audit, corrective action and emergency preparedness.

It is expected that the project activity is to be included in the scope for better QA/QC management of consecutive monitoring and reporting according to the following documented procedures;

- Procedure for training of monitoring personnel;
- Procedure for emergency preparedness for cases where emergencies can cause unintended emissions;
- Procedure for review of reported results/data;
- Procedure for corrective actions in order to provide for more accurate future monitoring and reporting.



VALIDATION REPORT

The application of the monitoring methodology is transparent and DNV considers the project participants able to implement the monitoring plan.

4.6 Calculation of GHG Emissions

4.6.1 Baseline emissions

Calculation method:

Baseline emissions consist of destruction of methane in the baseline scenario, methane release to the atmosphere and emission from heat and power generation (captive and power) to be displaced by the project activity. As stated in this validation report, section 3.3, methane release to the atmosphere, CO₂ emissions from captive power generation, grid power generation, residential thermal and vehicle use. The baseline emission from captive heat generation is not accounted for simplification and conservativeness.

As the CMM to be consumed by residential CMM use and the vehicle use have been supplied through the common small gas grid. The seasonal fluctuation of CO₂ emissions are analysed according to ACM0008 version 4 based on the historical monthly data and it was confirmed to be appropriate.

Baseline CO₂ emissions are from captive power and grid power generation. The emission factor, CEF_{ELEC} is the weighted average of carbon emission factor of electricity supplied from the Central China Power Grid (S_{grid}) and the captive power plant (S_{captive}). The carbon emission factor of the Central China Power Grid is to be monitored ex-post. The calculations defined in the PDD are confirmed to be in line with “Tool for calculation of emission factor for electricity systems (version 01.1)”. The vintage data of 2003-2005 was used for the ex-ante emission reduction calculations. The combined margin of 0.9750 tCO₂/MWh is used for the ex-ante calculation. On the other hand, the carbon emission factor of the captive power plant is the fixed value. The weight (S_{grid}) and (S_{captive}) are to be determined ex-post.

The calculations are checked and the formulas are correctly applied based on ACM0008 version 4. The default values used for the ex ante and ex post baseline emission calculations are well referenced.

Ex-ante baseline emission estimates:

The ex-ante baseline emission estimate can be replicated using the data and parameter values provided in the PDD and supporting files, i.e. spreadsheet /37/ submitted for registration. The data sources and the values used in the PDD, B.6.3 were verified by DNV.

4.6.2 Project emissions

Calculation method:

The project emissions consist of emissions from additional energy required for CMM capture and use, emission from use of captured methane, and emissions from un-combusted methane at end use.

The project needs not any additional energy to capture and use of coal mine methane except electricity. The emissions from the additional power are to be calculated from directly monitored electricity consumption and the weighted average of carbon emission factors of grid power generation and captive power generation to be determined ex-post. The emissions



VALIDATION REPORT

from use of captured methane and from un-combusted methane are calculated from the GWP of methane and the amount of methane released to be directly monitored.

The calculations are checked and the formulas are correctly applied based on ACM0008 version 4. The default values used for the ex ante and ex post emission reduction calculations are well referenced.

Ex-ante project emission estimates:

The spreadsheet /37/ provided from the participants can be reproduced and the correctness of the formula was verified. The assumption used in the calculation is in line with the values in the approved FSR.

4.6.3 Leakage

According to the methodology, only 3 types of leakage need to be addressed;

- The displacement of baseline thermal energy use;
- CBM extraction from out of the de-stressed zone;
- Impacts of CDM project activity on coal production if the project activity is CBM/CMM extraction and the baseline scenario is ventilation only.

There is thermal energy use in the baseline, i.e. the residential use. But, according to the baseline emissions analysis above, there is sufficient CMM to meet the baseline thermal demand and no displacement could occur due to the project activity.

Considering the following situations of the proposed project:

- No CBM drainage is involved in this proposed project, so CBM extraction from out of the de-stressed zone will not happen; the relevant leakage does not exist.
- Since the baseline scenario is not ventilation only, i.e. there is CMM extraction in both the project activity and baseline scenario. According to the ACM0008, no impact of CDM project activity on coal production is needed to be considered; the leakage related to additional coal production due to the project activity does not exist.
- No reliable scientific information is currently available to assess the risk of impact of CDM project activity on coal prices and market dynamics; so the leakage related to this aspect needs not to be considered according to the ACM0008.

To summarize, no leakage effects need to be accounted for under the proposed project.

4.6.4 Emission reduction

Ex-ante calculation of the emission reductions are clearly described in the PDD, B.6.3 and the formula and the value applied for this were verified to be in line with ACM0008 version 4. All values ex-ante and ex-post are verified to be obtainable and appropriate as described in the validation report, Section 3.5.1 and 3.5.2.

In summary, the GHG calculations are complete and transparent, and their accuracy has been verified. No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology have been found.

4.7 Environmental Impacts

All the new projects need EIA process in China according to the law. The following environmental impacts were verified to be assessed in the Environmental Impact Assessment /10/ and summarised in the PDD.



VALIDATION REPORT

- Air pollution, e.g. NO_x emission from gas engine
- Waste water effluent, e.g. waste gas engine coolant
- Noise emission from gas engines
- Solid and liquid waste, e.g. used gas engine lubricant
- Fire/explosion preventative assessed in EIA and safety assessment report

The above impacts can be solved or prevented by means of proper counter measures.

It is mentioned in the PDD that the project complies with environmental legislation in the host country, i.e. NO_x emissions from gas engines.

Although it is not addressed in Environmental Impact Assessment, environmental impact risks and protection measures of the 20000 m³ gas tank are considered in the PDD.

4.8 Comments by Local Stakeholders

The project participants conducted the local stakeholder meeting on 11 January 2007 inviting 22 local residents. The local stakeholders were informed of the project outline by means of letters and local TV program and the participants selected from the various sectors were invited by letters.

Besides the above the local environmental protection bureau encouraged the local residents to participate in it.

The local stakeholders participated were generally positive to the project activity. Although the only concerns were CMM shortage and gas engine noise, the project participants responded to the comments properly.

It was confirmed through interview with local stakeholder.

DNV considers the local stakeholder consultation carried out adequate.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of “7 May 2007” was initially made publicly available on DNV’s climate change website and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 17 May 2007 to 15 June 2007 and no comments were received.

Then the project participants amended the project design and republished the PDD of 30 September 2007 from 20 October 2007 to 18 November 2007. No comments were received during the period.

Again the PDD was updated due to the expiration of the applied methodology, ACM0008 version 3, and the PDD of 1 April 2008 was published from 23 April 2008 to 22 May 2008. No comments were received during the period.

APPENDIX A

CDM VALIDATION PROTOCOL

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

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

Requirement	Reference	Conclusion
absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	CDM Modalities and Procedures §43	~~concluded~~ OK
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	~~Not yet concluded~~ OK
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK
About stakeholder involvement		
13. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	~~Not yet concluded~~ OK
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
16. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK

Requirement	Reference	Conclusion
17. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
18. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
19. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?	/1/	DR	The proposed project is located in Furong Coal Mining area in Yibin City, China. The project involves treatment of CMM from four coal mines, Baijiao, Shanmunshu, Xunchang and Gongquan, around Xunchang. The geographic coordinate of the site is 28°25'-28'N, 104°39'-41'E.		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR I	The components and facilities to be employed are not clearly defined in the PDD. Several gas engine generators are verified to be already operational during the site-visit. The project plan after the first stage is not clearly described in the PDD. It should be clarified in the PDD how the project is proceeding.	~~CL~~	OK
A.2. Participation Requirements <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>					
A.2.1. Which Parties and project participants are participating in the project?	/1/	DR	The participating non-Annex I Party is P.R. China. The participating Annex I Party is Japan.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Sichuan Furong Group's Limited Industrial Company is the project participant from the host Party. Marubeni Corporation is the project participant from the sponsor party.		
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/ /2/	DR	The DNA of Japan approved the project on 20 November 2007 The DNA of China approved the project on June 2008.		OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/	DR	China is a Party to the Kyoto Protocol and has ratified it on 30 August 2002 and has designated the "National Develop and Reform Commission of the People's Republic of China" as the national authority for CDM projects. The DNA of China has issued the letter of approval in June 2008. Japan is a Party to the Kyoto Protocol and has ratified it on 4 June 2002 and has designated "the Liaison Committee for the Utilization of the Kyoto Mechanisms" as the national authority for CDM projects. The DNA of Japan has issued the letter of approval on 20 November 2007.		OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR	No public funding is involved in the project activity.		OK
A.3. Technology to be employed <i>Validation of project technology focuses on the project</i>					

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.3.1. Does the project design engineering reflect current good practices?	/1/	DR	Yes. The project participants plan to utilize 500 KW class gas engine generators domestically manufactured in the first stage, hundreds of such gas engines have been successfully used in China. . The more modern 700 KW or 1000 KW class domestically manufactured gas engine generators will be utilized at the later stage given such technology realized. The current capacity installed and the future development plan should be clarified in the PDD. -Refer A.1.2.-	~~CL1~~	OK
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR	-ditto-	~~CL1~~	OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/ /7/	DR I	The project participant had already started the gas engine power generation operation at the time of validation. The operation personnel are well trained according to their safety standard. Sichuan Furong Group has a plan to set up training for the gas tank operators and monitoring systems.		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.4. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/	DR	The DNA of China has issued the letter of approval in June 2008..		OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project participants are claiming four contributions to the regional sustainable development as follows; - Promote CMM utilization by eliminating methane release to the atmosphere - Provide a guarantee for coal mine production safety - Create job opportunities over the project construction and operation period - Reduce the pollutant emissions such as SO_x, NO_x, etc. from coal-fired captive power plant and the power plants connected to the CCPG They are supposed to be reasonable.		OK
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1/ /4/	DR	Yes. The project is using ACM0008 "Consolidated baseline methodology for coal bed methane and coal mine methane capture and use for power (electrical and motive) and		

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			heat and/or destruction by flaring” (version 04). Besides ACM0008, the project should apply the latest version of “Tool for the demonstration and assessment of additionality” “Tool to calculate emission factor for an electricity system” is applied instead of ACM0002 to determine the baseline emission factor. “Tool to determine project emissions from flaring gasses containing methane” is not applied as the project does not utilize flaring.	~~CL2~~	
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/	DR	Yes. The project is located at existing underground coal mines, which will use underground CMM drainage to recover the CMM. Part of the extracted CMM is used for cooking fuel and bus fuel prior to the project. The baseline scenario represents the continuous use of partial CMM as cooking and bus fuel, and the rest is to be released directly to the atmosphere. The project meets all the applicability requirements of ACM0008.		OK
B.2. Baseline Scenario Determination <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and</i>					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
B.2.1. What is the baseline scenario?	/1/	DR	The continuation of current situation which means the continuation of current ventilation, drainage, use of CMM as residential fuel and vehicle fuel, and importing electricity from captive power plant and Central China Power Grid as energy support for the Furong mines. The rest of drained CMM will be released to the atmosphere. (Alternative i).		OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/	DR	Other alternatives are considered according to ACM0008 as following: For CMM/CBM/VAM extraction; A. Pre mining CMM extraction; B. Post mining CMM extraction; C. Possible combinations of options A and B, with the relative shares of gas specified. For treatment of extracted CMM; i) Venting. This is the continuation of existing CMM treatment practices; ii) Using/destroying ventilation air methane rather than venting it; iii) Flaring of CMM; iv) Use for additional grid power generation; v) Use for additional captive power generation; This is the proposed project		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			activity not undertaken as a CDM project; vi) Use for additional heat generation; vii) Feed into gas pipeline (to be used as fuel for vehicles or heat/power generation); viii) Possible combination of options i to vii with relative shares of gas treated under each option specified. The alternative C was selected as the current practice is the combination of “pre mining and post mining CMM extraction with the relative share of gas specified. The alternatives ii, iii, iv, v, vi, vii and viii face different prohibitive barriers described in the question below.		
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR	The discussion for the determination of the baseline basically follows the key methodological steps indicated by ACM0008 as follows: - Sub-step 1a: Three options for CBM/CMM/VAM extraction were defined in line with ACM0008. - Sub-step 1b: Eight options for extracted CBM/CMM treatment were defined according to ACM0008.. - Sub-step 1c: Three options for power production were		OK

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			defined. 1. Electricity from on-site captive power plant and the CCPG. 2. Electricity from coal-fired power plant with the same installed capacity as the proposed project. 3. CMM power generation. This is the proposed project activity not undertaken as a CDM project. - Step 2: Due to the safety regulation (National Coalmine Safety Regulation, section 2, item 100-150), ventilation is required at all coal mines, only pre and/or post mining extraction are not sufficient to secure working area safety. Besides “The state council special regulations on the prevention of the mining accidents” restrict to produce coal from gassy mines without CMM drainage and monitoring. Option A and B are eliminated and only Option C is possible. It is described in the PDD that a grid connection with coal -fired power plant of the generation capacity smaller than 135 MW is prohibited by General Office of the State Council, decree No. 2002-6. However it is not applicable for waste coal fired or CMM fired power generation.	CL3	

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			- Step 3: Among the baseline alternatives defined considering legal or regulatory compliance, technically feasible alternatives are defined in the step as follows; Option C defined in Step 2 is the current practice and thus technically feasible. All of eight alternatives defined as the option of treatment of extracted CMM considering the legal compliance are technically feasible. Alternatives for power generation A and C are technically feasible. Technical feasibility of alternative B should be discussed as it is legally or regulatory compliant. Step 4: Considering the prohibitive barrier, seven alternatives defined above were discussed. Alternative C for CMM extraction is not facing any prohibitive barrier as it is the current practice. For the alternative for treatment of extracted CMM, the following prohibitive barriers are considered; Alternative i (CMM ventilation): This is the current practice. Continuation of the current practice has no prohibitive barrier. It should be discussed in the PDD.	CLS	

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Alternative ii (Using/destroying ventilation air methane rather than venting it) It is described in the PDD that the VAM technology is not yet matured. It should be evidenced. Alternative iii (flaring): Treatment of the extracted CMM is not required in China thus the flaring is facing a financial barrier as it doesn't generate any financial revenue. It is deemed obvious and reasonable. Alternative iv (additional grid power generation): It is described in the PDD "The electricity generated by CMM is for on-site use to displace the electricity from the captive power plant and from the CCPG, which is currently consumed by the Furong coal mines. No electricity from the project activity will be delivered to the public power grid. Hence, alternative of use for additional grid power generation stated in the methodology is irrelevant to the project activity and eliminated for further analysis. However it is legally compliant and technically feasible thus the prohibitive barrier should be considered. Alternative v (use for additional captive power generation): No prohibitive barrier exists. However it	~~CL4~~ ~~CL5~~ ~~CL5~~	

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			should be explained in the PDD. Alternative vi (use for additional heat generation): The project activity doesn't involve heat generation. However additional heat generation is technically feasible and it can be used to supply hot water for miners' bathroom. It should be considered. Alternative vii (Feed into gas pipeline to be used as fuel for vehicles or heat/power generation) There is gas pipeline grid for transport CMM to household users currently. However they tend to use natural gas rather than CMM. Moreover the population does not increase in Furong coal mine area. Thus the pipeline expansion is needed to increase CMM demand for household users. It should be evidenced. Step 5 The PP selected Step 5 to identify the most economically attractive baseline scenario alternative. As there are some alternatives generate economical benefit, they selected Sub-step 5b (investment comparison analysis) according to AM0008. The PP considered the factors for estimating	~~CL5~~ ~~CL6~~	

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			economical attractiveness as follows; - Total investment: RMB 84.3 million It should be evidenced. - Annual O & M cost: RMB 5.19 million It should be evidenced. - Annual electricity supply: 39 375 MWh The estimation should be explained transparently. - Electricity tariff: RMB 0.286/kwh It should be evidenced. - City construction tax and educational surcharge: 10% It should be evidenced - Project lifetime: 20 years It is consistent with “Guidance on the Assessment of Investment Analysis, version 02” - IRR and benchmark: 3.46%, 13% The readable spreadsheet should be provided. Type of IRR should be defined, i.e. Project IRR, Equity IRR. The benchmark of 13% is justified by referring to a benchmark for the construction industry. Clarify why this benchmark is relevant for an industrial power generation project.	~~CL7~~ ~~CL7~~ ~~CL7~~ ~~CL7~~ ~~CL7~~ ~~CL7~~ ~~CL-26~~ ~~CL-26~~ ~~CL8~~	

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Besides, in the step 1a option C, and step 1b option viii, the relative share of combinations should be specified. The sensitivity analysis was conducted for the three parameters, i.e. “investment”, “O & M cost” and “electricity supply”. As the power tariff in China is unlikely to be changed dramatically by the energy policy. Thus the amount of electricity supply to the grid is deemed better parameter instead of power tariff. The values of the parameter cover a range of +10% and -10% according to “Guidance on the Assessment of Investment Analysis, version 2”. The spreadsheet should be provided as well as IRR calculation.	~~CL 7~~	
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	-ditto-	~~CL 2-8~~	OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /38/ /47/ /48/	DR I	The baseline scenario has taken into account most relevant national and sectoral policies. Regulation (GB21522-2008) relevant to CMM utilization was published on 2 April 2008 and entered into force on 1 July 2008, covering only new mines from that date. However, the regulation requires CMM utilization also by existing coal mines as of 2010. While interviews performed by DNV with the government officials indicate that it is unlikely that this regulation will be	CAR 1	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			enforced for existing mines, the monitoring plan should provides for monitoring the enforcement of regulation GB21522-2008. Among the option defined in Sub-step 1a, Option B and C were eliminated due to the national safety regulation (National Coalmine Safety Regulation (11/2001) section 2, item 100-150) Besides option A was eliminated because the project coal mines were gassy and simple ventilation is insufficient and does not comply with the special regulation of the state council. It is stated in the PDD that grid connected coal fired power generation is prohibited by the General Office of the State Council, decree No. 2002-6. However it is not correct.	~~CL3~~	
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	The data used to determine the baseline should be fully explained and evidenced, i.e. benchmark analysis.	~~CL7~~	
B.2.7. Have the major risks to the baseline been identified?	/1/	DR	The major risk to the baseline is the CMM supply, evidence for CMM production prediction needs to be provided.	~~CL9~~	OK
B.3. Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.3.1. Is the project additionality assessed according to the methodology?	/1/	DR	ACM 0008 version 4 and “the Tool for the demonstration and assessment of additionality, version 5.2” are not fully followed to demonstrate the additionality of the project.	~~CL2-8~~	OK
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/	DR	Same as B.3.1.	~~CL2-8~~	OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	It is stated in common practice analysis that Sichuan province has a total of 68 towns own coal miness. None of them is carrying out the CMM utilization project without CDM. However the current practice by the PP is partial utilization of CMM. It should be clarified. Discussion in the common practice analysis should be according to the latest additionality tool.	~~CL10~~	OK
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/	DR	The type of the starting date is not clearly described. It was confirmed during the site visit that some of the gas engine generators are in place. It should be clearly stated in the PDD and evidenced when the system was formally ordered by the project participants. If it was prior to the starting date of validation (17 May 2007), it should be explained in the PDD, B.5 whether the project activity was seriously considered as a CDM at the implementation, if the starting date is prior to the validation. (EB33, para76)	~~CL11~~	OK
B.4. Calculation of GHG Emission Reductions – Project					

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
emissions <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	The calculations are basically documented according to the approved methodologies and in a complete and transparent manner. The CEF of Central China Power Grid (CCPG) is from Chinese NDRC. The waste coal power plant has a low operating cost due to cheap waste coal and it's encouraged by the government policy to increase the utilization of waste coal, it is unlikely for the proposed project to replace electricity generated by the waste coal power plant. Evidence is needed to prove the combination of captive electricity and grid electricity to be replaced by the electricity from the CMM power plant. This process should be documented in a more complete and transparent manner. The operating time of equipment should be assumed so that the electricity consumption can be calculated in a transparent manner. Some of the assumption as mentioned above is needed to determine if conservative assumptions have been used. The parameters to be determined ex-post are	~~CL12~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			defined in the PDD, B.7.1. However some parameters required by ACM0008 are missing.	~~CL13~~	
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	-ditto-	~~CL12~~	OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	The uncertainties in the project emission estimates need to be properly addressed in the documentation, for example, in case of failure of monitoring system or any emergency discharge of CMM.	~~CL14~~	OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	The calculations are documented according to the approved methodologies and in a complete and transparent manner.		OK
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/ /8/	DR	It is stated in the PDD that Furong Group gives priority to the residential use of CMM, the amount of CMM used for catering has to be satisfied. In addition, natural gas supply is shrinking the residential use of CMM in Furong mining area, and there are existing CMM fired boilers for heat generation. So there will be no displacement of baseline thermal energy use and according to the	~~CL15~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			methodology. This part of leakage can be ignored. However there are still some assumptions to build the conclusion, relevant evidence to show that the percentage of drained CMM for civil use will be a constant still needed. The value for r (relative proportion of NMHC to the methane concentration) is determined as less than 1%. It was verified by means of the relevant analysis certificate. The calculations of the carbon emission factor of Central China power grid contain some mistakes. They should be corrected. The following parameters are included in the PDD, B.6.2. - Project annual baseline CMM demand for thermal energy uses (internal data) - Scalar adjustment factor for month k: $d_k^{\max}$ (internal data) - CMM that would have been captured, used and destroyed They historical data should be provided as evidence.	~~CL16~~ ~~CL17~~	
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	The uncertainties in the baseline emission estimates need to be properly addressed in the documentation e.g. waste coal consumption.	~~CL18~~	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.6. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes, the leakage calculations documented according to the approval methodology and in a complete and transparent manner.		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	Yes, conservative assumptions have been used when calculating the leakage emissions.		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	The uncertainties in the leakage estimation regarding impacts of CDM project activity on coal price and market dynamics are not concluded by the applied methodology. However it can not be ignored.	~~CL19~~	OK
B.7. Emission Reductions <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	Yes.		OK
B.8. Monitoring Methodology <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/	DR I	Yes. The monitoring plan is documented almost according to ACM0008. Methane flow monitoring is being conducted properly including continuous temperature and pressure monitoring for compensation. It was confirmed at mine sites.		OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	The data archives are to be retained until two years after the end of crediting period.		OK
B.9. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	The project emission will be determined based on the CO ₂ emissions resulting from the utilization of CMM by the project, additional energy used in the project and un-combusted methane. In addition to methane flow and concentration, the temperature and pressure to each end-use of the methane also are considered.		OK
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/1/	DR	The choice of the indicators are reasonable and in line with the methodology.		OK
B.9.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed	/1/	DR	The measurement method and procedure for all GHG indicators to be measured ex-post	~~CL20~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
appropriate?			were described in B.7.1 according to CDM-PDD guideline. However for some parameters, assumed values of data used for calculating expected emission reduction are missing in B.7.1.		
B.9.4. Is the measurement equipment described and deemed appropriate?	/1/	DR	-ditto-	~~CL20~~	OK
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	For project and baseline emissions monitoring, the measurement is deemed appropriate. But, procedures should be prepared on, 1) Identifying appropriate measurement interval; 2) Defining the registration, monitoring, measurement and reporting procedure; 3) Identifying procedures for maintenance of monitoring equipment and the calibration intervals of monitoring equipment; 4) Identifying procedures for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation); 5) Defining measurement accuracy; 6) Defining source of data.	~~CL24~~	OK
B.9.6. Is the measurement <i>interval</i> identified and	/1/	DR	-ditto-	~~CL24~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
deemed appropriate?					
B.9.7. Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?	/1/	DR	-ditto-	~~CL24~~	OK
B.9.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	-ditto-	~~CL24~~	OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	-ditto-	~~CL24~~	OK
B.10. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	According to the monitoring plan, the project owner will monitor: (1) CMM captured, sent to and destroyed in the project activity that would be released to the atmosphere in the baseline; (2) electricity replaced by the project. The emission factors applied to determine the displacement of emissions due to the project's electricity generation are determined ex ante in accordance with ACM0002 version 6.		OK
B.10.2. Are the choices of baseline GHG indicators	/1/	DR	Yes. The choices of the baseline indicators		OK

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
reasonable and conservative?			are conservative and deemed reasonable.		
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR	-same as B.9.3. –B.9.9.-	~~CL~~ ~~20/21~~	OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR	-same as B.9.3. –B.9.9.-	~~CL~~ ~~20/21~~	OK
B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	-same as B.9.3. –B.9.9.-	~~CL~~ ~~20/21~~	OK
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR	-same as B.9.3. –B.9.9.-	~~CL~~ ~~20/21~~	OK
B.10.7. Is the registration, <i>monitoring</i> , <i>measurement</i> and <i>reporting</i> procedure defined?	/1/	DR	-same as B.9.3. –B.9.9.-	~~CL~~ ~~20/21~~	OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	-same as B.9.3. –B.9.9.-	~~CL~~ ~~20/21~~	OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	-same as B.9.3. –B.9.9.-	~~CL~~ ~~20/21~~	OK
B.11. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for</i>					

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>reliable and complete leakage data over time.</i>					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	The additional CMM drainage nor CBM drainage are not a part of the project activity. There is no impact of the project on coal production. The parameters relevant to the leakage need not be monitored.		OK
B.11.2. Are the choices of project leakage indicators reasonable and conservative?	/1/	DR	-ditto-		OK
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	/1/	DR	-ditto-		OK
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR I	Chinese DNA does not require collection and archiving of data related to environmental, social and economic impacts of the CMM fired power plant. The environmental impacts will be monitored by local environmental monitoring station, and the monitoring results are reported to local environmental protection bureau for environment management.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic	/1/	DR	-ditto-		OK

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
impacts?					
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	-ditto-		OK
B.13. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1/	DR	The authority and responsibility of project management needs to be explained more detailed. The following procedures should also be prepared in more detail: - Identifying for training of monitoring personnel; - Identifying for emergency preparedness for cases where emergencies can cause unintended emissions; - Identifying for review of reported results/data; - Identifying for corrective actions in order to provide for more accurate future monitoring and reporting.	~~CL22~~ ~~CL23~~	OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR	-ditto-	~~CL23~~	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	-ditto-	~~CL23~~	OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR	-ditto-	~~CL23~~	OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	-ditto-	~~CL23~~	OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/	DR	The type of the starting date is not clearly described. It should be clearly stated in the PDD, B.5 whether the project activity was seriously considered as a CDM prior to the implementation, if the starting date is prior to the validation. (EB33, para76) -same as B.3.4.- The operational life time of 15 years is reasonable considering similar project activity.	~~CL15~~	OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	It should be amended to the realistic one at the request for registration.	~~CL24~~	OK
D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will</i>					

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	The following environmental impacts were assessed and summarised in the PDD: - Air pollution - Waste water - Noise emission - Solid and liquid waste - Fire /explosion prevention		OK
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /11/	DR	EIA is required and approved by the local EPB. The EIAs for CMM fired power plant component and gas storage and distribution station were approved by Yibing Environmental Protection Bureau on 10 September 2007 and 29 August 2007 respectively.		OK
D.1.3. Will the project create any adverse environmental effects?	/1/	DR	The following minor adverse environmental effects are addressed: a) NOx emission from gas engine generators b) Effluent from gas engine coolant c) Noise emission from gas engine d) Used gas engine lubricants All concerns listed above can be solved or		OK

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			prevented by means of proper counter measures.		
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	There are no transboundary environmental impacts from the project activity.		OK
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	Yes. The gas engine generators are to be selected and installed considering the above negative environmental impacts. Facilities for the gas storage and transportation have been assessed in safety aspect.		OK
D.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	Yes, the project complies with environmental legislation in the host country, i.e. NO _x emissions from the gas engines. As the 20000 m ³ gas tank is main component, environmental impact and protection measures should be described.	~~CL25~~	OK
E. Stakeholder Comments <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>					
E.1.1. Have relevant stakeholders been consulted?	/1/	DR	The participants held a local stakeholder meeting on 11 January 2007 inviting 22 local residents.		OK
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR I	The local stakeholders were informed of the project outline by means of letters and local TV program and the participants selected from the various sectors were invited by		OK

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			letters. Besides the above the local environmental protection bureau encouraged the local residents to participate in it. It was confirmed through interview with local stakeholder.		
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	Stakeholder consultation is not required for this kind of project by the government of china.		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR I	The summary Q & A during the stakeholder meeting is described in the PDD. Main concerns raised from the local stakeholders were CMM shortage for household use and noise emission from gas engine generators. It was confirmed through interview with local stakeholder.		OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR I	It is described in the PDD that the PP responded to the question from the local stakeholders. It was confirmed through interview with local stakeholder that the PP responded properly.		OK

Table 2b: Additional requirements checklist for VVM version 1 (EB 44)

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.1. Letter of approval					
A.1.1 Is the LoA received directly from the DNA or through the project participant.	/2/	DR	The LoA of the host country China dated 21 January 2009 was received through the project participant. It was confirmed on the website of the DNA of China. (http://cdm.ccchina.gov.cn/english/item_new.asp) The LoA of the Annex-I country Japan dated 20 December 2007 was received through the project participant. It was confirmed on the website of the Ministry of Economy, Trade and Industry Japan. (http://www.meti.go.jp/press/20071227001/20071227001.html)	-	OK
A.2. Project design					
A.2.1 Does the PDD describe the CDM project activity with all relevant elements in a transparent and accurate way?	/1/	DR	The all relevant elements to the project activity are described transparently in the latest PDD version 6.1 dated 10 May 2009.	-	OK
A.2.2 Has the CDM project activity at the start of the validation been constructed or does the CDM project activity use existing facilities or equipment?	/1/	DR I	The project activity will use the existing CMM drainage system. It was confirmed to work well during the site-visit.	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.2.3 Is the project a large scale project, a small scale project with average annual emission reductions above 15 000 tonnes or a bundled small scale project? Has on-site visit been carried out?	/1/	DR	The project activity is a large scale project.	-	OK
A.2.4 Does the project activity involved alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/1/	DR	The pre-project activities of CMM treatment and energy production are "venting" and "waste coal firing boiler", and the post-project activities are "combustion by gas engines" and "heat and power generation by gas engines". It is clearly described in the PDD.	-	OK
A.3. Project emissions not addressed by the methodology					
A.3.1 Does the methodology describe all project emission source for the project activity that contributes all 1% of the emission reductions? Sources that the methodology considers not to take into account are not relevant (e.g. cement and iron consumption for building hydropower plants).	/1/	DR	All emission sources required to consider by ACM0008 are addressed in the PDD, Table B.3-1.	-	OK
A.4. Documentation of baseline emissions					
A.4.1 Documentation of the baseline determination: a. All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. b. All documentation is relevant as well as correctly quoted and interpreted. c. Assumptions and data can be deemed reasonable d. Relevant national and/or sectoral policies and circumstances are considered and listed in the	/1/ /19/	DR	Underlying information including relevant policy and regulation used to discuss the baseline determination are correctly referred. The following references are checked; - National Coalmine safety Regulation 2005 - Notice on prohibiting small coal fired power generation by General Office of the State Council, decree No. 2002-6 - Mitigation of Methane Emissions from	-	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
PDD. e. The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity			Coal Mine Ventilation Air: An Update - US-EPA, Coalbed Methane Outreach Program The each steps of the baseline determination specified in ACM0008 are correctly applied.		
A.5. Documentation of the calculations					
A.5.1 Algorithms and/or formulae used to determine emission reductions - All assumption and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced - All documentation is correctly quoted and interpreted. - All values used can be deemed reasonable in the context of the project activity - The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.	/1/	DR	All assumption and data to be used for CER calculations are described correctly referring ACM0008. DNV assessed the following data and parameters in the PDD and concluded to be valid; <u>Default value</u> - Eff_{ELEC} - GWP_{CH4} - CEF_{CH4} - EF_{CO2} <u>Ex-ante value</u> - TH_{BL,y} - m_k^{max} - CMM_{BL,y} <u>Value to be monitored ex-post by the participants</u> - CONS_{ELEC,PJ}	-	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			- $CMM_{PJ,y}$ - MM_{ELEC} - PC_{CH4} - PC_{NMHC} - CEF_{NMHC} - GEN_y - $EG_{grid,y}$ - $EG_{captive,y}$ - $TEG_{captive,y}$ - W_{WC} <u>Value to be obtained from published data or outside laboratory</u> - $FC_{i,y}$ - $NCV_{i,y}$ - $EF_{CO2,i}$ - EG_y - CEF_{ELEC} - $EF_{OM,y}$ - $EF_{BM,y}$ - LCV_{WC}		
A.6. Implementation of the monitoring plan					
A.6.1 How were the plans for implementation of the monitoring plan, data management, QA/QC procedures assessed? To what	/1/	DR	The application of the monitoring methodology is transparent and DNV	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-9052, rev. 04

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
extent can the emission reductions achieved by the project by monitored ex-post and verified later by a DOE?			considers the project participants able to implement the monitoring plan for the consecutive verification.		
A.7. CDM consideration prior to starting date					
A.7.1 The prior consideration of CDM for the project activity complies with EB41 annex 46	/1/ /13/ /17/	DR	The PDD version 1 was published on UNFCCC website for public comment collection on 17 May 2007. The starting date of the project described in the PDD is 30 July 2007 and later than the start of validation. It represents the date of the earliest key equipment purchase date and was verified to be correct by means of reviewing the purchase order of the gas engine generators.	-	OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR 1 Recent regulation requires CMM utilization also by existing coal mines as of 2010. While interviews performed by DNV with the government officials indicate that it is unlikely that this regulation will be enforced for existing mines, the monitoring plan should provides for monitoring the enforcement of regulation GB21522-2008.	B.2.5	The PDD was amended to include monitoring of enforcement the Emission Standard of Coal Bed Methane and Coalmine Gas GB21522-2008 and the dissemination rate of CMM capturing measures in Sichuan area	OK Monitoring plan provides for monitoring the enforcement of regulation GB21522-2008 and the baseline will be adjusted in case the systematic non-enforcement of regulation GB21522-2008 can not be demonstrated
CL 1. The components and facilities to be employed are not clearly defined in the PDD. Several gas engine generators are verified to be already operational during the site-visit. The current capacity installed and the future development plan should be clarified in the PDD	A.1.2., 3.1.	The PDD was amended reflecting the current situation.	OK The PDD amended was confirmed to describe the current situation properly. (Sec. A.2.)
CL 2. The latest version of “Tool for assessment and demonstration of additionality” should be applied.	B.1.1.	The latest version (05.2) of the “ <i>Tool for the demonstration and assessment of additionality</i> ” was applied.	OK The latest version of the methodological tool was properly addressed.
CL 3. It is described in the PDD that a grid connection with fuel-fired power plant of the generation capacity smaller than 135 MW is prohibited by General Office of the State Council, decree No. 2002-6. However it is not applicable for waste coal fired or CMM fired power generation.	B.2.3.	The PDD was amended discussing the feasibility of waste coal fired power generation.	OK Among fuel-fired power generation, waste coal fired power generation and CMM fired power generation are not prohibited. However in case of waste coal power generation, generation capacity of 50MW or above are encouraged and it is not

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
Thus the technical feasibility should be discussed in Step 3.			feasible considering the power demand.
CL 4. It is described in the PDD that the VAM technology is not yet matured. It should be evidenced.	B.2.3.	Supporting documents were submitted to DOE.	OK According to the articles it was concluded that VAM technologies were not matured for commercial use in China at the time of investment decision.
CL 5. Alternative i and iv and v should be discussed. Alternate iv (additional grid power generation) is legally compliant and technically feasible thus the prohibitive barrier for this should be considered. Alternative vi (additional heat generation) is not involved in the project activity. However additional heat generation is technically feasible and it can be used to supply hot water for miners' bathroom. It should be considered.	B.2.3.	The PDD was updated adding the discussion on Alternate i, iv and v.	OK Alternative (i) is not facing any barrier as it is the current practice. Alternative (iv) and (v) are also not facing any barrier. The heat demand of the coalmine is currently satisfied by the existing coal fired boiler thus the additional heat generation is not needed then Alternative (vi) is facing investment barrier.
CL 6. Alternative vii (feed into gas pipeline for vehicle and household users) The lack of demand increase and the additional investment for pipeline expansion is claimed as the prohibitive barriers. It should be evidenced.	B.2.3.	The PDD was updated reflecting the DOE comment. Underlying evidence was also provided.	OK The population of Furong Coalmine area is saturated and no additional gas demand is expected. It was verified by the statistics of gas consumption trend /19/ and EIA report /11/.
CL 7. The benchmark analysis should be explained in a transparent manner according to "Guidance on the	B.2.3.	The relevant evidence and spreadsheet were provided to the DOE.	OK The input values used to the benchmark analysis are based on the feasibility study report (FSR) approved by Sichuan

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
Assessment of Investment Analysis” as follows; - The parameters applied should be evidenced - IRR spreadsheet should be provided - Sensitivity analysis spreadsheet should be provided - Type of IRR should be defined			Provincial Government /13/. The values are in line with the FSR.
CL 8. In the step 1a option C, and step 1b option viii, the relative share of combinations should be specified; Additional heat generation is possible, and it can be used to supply hot water for miners’ bathroom.	B.2.3.	The PDD was updated reflecting the DOE comment.	OK The share of pre-mining CMM and post-mining CMM is approximately 70-90% and 10-30%. It will not be affected by the project activity.
CL 9. The major risk to the baseline is the CMM supply, evidence for CMM production prediction needs to be provided.	B.2.7.	The relevant information was submitted to the DOE.	OK CMM production prediction provided was confirmed to be reasonable /20/.
CL 10. It is stated in common practice analysis that Sichuan province has a total of 68 towns own coal mines. None of them is carrying out the CMM utilization project without CDM. However the current practice by the PP is partial utilization of CMM. It should be clarified. Discussion in the common practice analysis should be according to the latest additionality tool.	B.3.3.	The PDD was updated reflecting the DOE comment.	OK The very limited amount of CMM is commonly utilized as a home fuel and/or vehicle fuel. However utilization for power generation is not common in China. It was evidenced that the first CMM capture and utilization project in Sichuan Province was developed as a CDM /21/. Also the common practice analysis has

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			identified 25 similar projects in China as listed in the PDD. All these are proposed with CDM incentives. Thus, it can be concluded that the proposed project activity is not a common practice in China.
CL 11. The type of the starting date is not clearly described. It was confirmed during the site visit that some of the gas engine generators are in place. It should be clearly stated in the PDD and evidenced when the system was formally ordered by the project participants. If it was prior to the starting date of validation (17 May 2007), it should be explained in the PDD, B.5 whether the project activity was seriously considered as a CDM at the implementation, if the starting date is prior to the validation. (EB33, para76)	B.3.4.	The PDD was updated reflecting the DOE comment. The evidence of the starting date was submitted.	OK The date of the formal order of the key equipment was confirmed to be 30 July 2007. It was later than the date of the publication of the PDD on CDM website.(17 May 2007) The purchase order of the gas engine generators was verified /17/.
CL 12. The waste coal power plant has a low operating cost due to cheap waste coal and it's encouraged by the government policy to increase the utilization of waste coal, it is unlikely for the proposed project to replace electricity generated by the waste coal power plant. Evidence is needed to prove the combination of captive electricity and grid electricity to be replaced by the electricity from the CMM power plant. This process should be documented in a more complete and	B.4.1.	The PDD was updated reflecting the DOE comments. Two kinds of IRR spreadsheet were also submitted.	OK Two kinds of IRR spreadsheet provided were checked. The power tariff applied for the case "captive power displacement" is 0.229 CNY/KWh and for the case "grid power displacement" is 0.48 CNY/KWh. They are in line with the values in the approved FSR. The latter one is more conservative and the project IRR without CER revenue is 3.24% over the equipment lifetime of 20 years.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
transparent manner. The operating time of equipment should be assumed so that the electricity consumption can be calculated in a transparent manner. Some of the assumption as mentioned above is needed to determine if conservative assumptions have been used.			
CL 13. The parameters to be determined ex-post are defined in the PDD, B.7.1. However some parameters required by ACM0008 are missing. Also, the measurement method and procedure for all GHG indicators to be measured ex-post should be described in B.7.1 according to CDM-PDD guideline.	B.4.1.	The PDD was updated reflecting the DOE comments.	OK Section B.7.1 in the PDD was updated including the following information; - measurement equipment - calibration procedures - accuracy of the measurement method - responsible person/entity for measurement - measurement interval
CL 14. The uncertainties in the project emission estimates need to be properly addressed in the documentation, for example, in case of failure of monitoring system or any emergency discharge of CMM.	B.4.3.	The PDD was updated reflecting the DOE comment.	OK Emergency procedure to identify malfunction of process and/or measurement equipment in order to prevent unintended GHG release is outlined in the PDD, B.7.2.
CL 15. It is stated in the PDD that Furong Group gives priority to the residential use of CMM, the amount of CMM used for catering has to be satisfied. In addition, natural gas supply is shrinking the residential use of CMM in Furong mining area,	B.5.2.	The copy of the official data of gas supply for civil use was submitted.	OK From 2000 to 2007, the CMM supply for civil use was constant (11 658 056 Nm³/yr. to 13 617 719 Nm³/yr.). It was verified through the official data of the gas supply /19/.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
and there are existing CMM fired boilers for heat generation. So there will be no displacement of baseline thermal energy use and according to the methodology, this part of leakage can be ignored. However there are still some assumptions to build the conclusion, relevant evidence to show that the percentage of drained CMM for civil use will be a constant still needed.			
CL 16. The calculations of the carbon emission factor of Central China power grid contain some mistakes. They should be corrected. (fuel emission factor of coke) They should be also based on the latest data available at the submission of the original PDD.	B.5.2.	The PDD was corrected reflecting the DOE comment.	OK The grid carbon emission factors were updated based on the latest available data on 7 May 2007. It was confirmed to be correct.
CL 17. The following parameters are included in the PDD, B.6.2. - Project annual baseline CMM demand for thermal energy uses (internal data) - Scalar adjustment factor for month k: $m_k^{\max}$ (internal data) - CMM that would have been captured, used and destroyed The historical data could be provided as evidence.	B.5.2.	The PDD was corrected reflecting the DOE comment.	OK The raw data of the gas supply to the individual users are aggregated by the huge spreadsheet It was confirmed to be correct by means of comparing the invoice and input data by sampling.
CL 18.	B.5.3.	The PDD was corrected reflecting the DOE comment. The laboratory test data was also	OK

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
The uncertainties in the baseline emission estimates need to be properly addressed in the documentation e.g. waste coal consumption.		submitted.	The waste coal has been analyzed by the external laboratory. Sampling, preparation and analysis are according to the national standard. The moisture content of the waste coal is also considered to evaluate the uncertainty of the waste coal consumption monitoring. Relevant national standards and analysis results were confirmed /21/.
CL 19. The uncertainties in the leakage estimation regarding impacts of CDM project activity on coal price and market dynamics are not concluded by the applied methodology. However it can not be ignored.	B.6.3.	The PDD was updated reflecting the DOE comment.	OK As ACM0008 states “it is difficult to assess ex-ante the contribution of any particular project given the dynamic nature of local and global coal market” and the share of coal in national energy demand of China is very high and a little room to be increased more. Also the coal price in China is continuously appreciating /22/ and thus the impact of CDM project activity on coal price and market dynamics can be ignored. The waste coal consumption to be displaced by the project activity is relatively small compared with the coal amount produced, and the unused waste coal is not marketable. The explanation in the PDD is reasonable.
CL 20. For some parameters, assumed values of data used for calculating expected emission reduction are missing in B.7.1.	B.9.3.	The PDD was updated reflecting the DOE comment.	OK The parameters, Eff_{ELEC} , GWP_{CH_4} , CEF_{CH_4} , are included in the updated PDD, section B.7.1.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CL 21. For project and baseline emissions monitoring, the measurement is deemed appropriate. But, procedures should be prepared on, 1) Identifying appropriate measurement interval; 2) Defining the registration, monitoring, measurement and reporting procedure; 3) Identifying procedures for maintenance of monitoring equipment and the calibration intervals of monitoring equipment; 4) Identifying procedures for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation); 5) Defining measurement accuracy; 6) Defining source of data.	B.9.5.- 9.9. B.10.5.-10.9.	The PDD was updated reflecting the DOE comment.	OK The necessary information specified in the latest CDM-PDD guideline is included in the updated PDD, B.7.1.
CL 22. The authority and responsibility of project management needs to be explained more detailed.	B.13.1.	The PDD was updated reflecting the DOE comment.	OK The organizational structure is outlined in the updated PDD, B.7.2.
CL 23. The following procedures should also be prepared in more detail: - Identifying for training of monitoring personnel; - Identifying for emergency preparedness for	B.13.1.-13.5.	The PDD was updated reflecting the DOE comment.	OK The following procedures are outlined properly in the PDD, B.7.2. - Data collection and handling - Reporting - Equipment calibration and maintenance

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
cases where emergencies can cause unintended emissions; - Identifying for review of reported results/data; - Identifying for corrective actions in order to provide for more accurate future monitoring and reporting.			- Internal inspection - Internal audit - Corrective action - Document archive - Emergency preparedness for unintended emissions - Preparation for consecutive verification

CL 24. The starting date of the crediting period should be amended to the realistic one at the request for registration	C.1.2.	The PDD was updated considering the timing of requesting registration..	OK 1 September 2009 is reasonable.
CL 25. As the 20000 m ³ gas tank is main component, environmental impact and protection measures should be described.	D.1.6.	The PDD was updated reflecting the DOE comment.	OK The measures preventing gas leak and explosion are considered properly in the PDD, D.1.
CL 26. The readable spreadsheet should be provided. Type of IRR should be defined, i.e. Project IRR, Equity IRR. The benchmark of 13% is justified by referring to a benchmark for the coal mining industry. Clarify why this benchmark is relevant for an industrial power generation project.	B.2.3.	The PDD was updated reflecting the DOE comments. The spreadsheet calculating IRR was also submitted.	OK The spreadsheet provided was concluded to be correct. Input values are consistent with the feasibility study report. The benchmark of 13% applied in the investment analysis is broadly used by the other CMM CDM projects in China and then it was justified.

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Cuiping Deng

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

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas					
Hydro power	Jan 2009	Jan 2009			
Renewables Wind power	Jan 2009	Jan 2009		Jan 2009	Jan 2009
Other renewable					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery	Mar 2009	Mar 2009			
Efficiency of thermal power plants					
Coal mine methane	Mar 2009				
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency					
N ₂ O		Jan 2009			
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO ₂ recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF ₆					

Høvik, 24 March 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Akira Sekine

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

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas					
Hydro power					
Renewables					
Wind power					
Other renewable					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery					
Efficiency of thermal power plants					
Coal mine methane					
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency					
N ₂ O	Jan 2009	Jan 2009			
HFCs		Jan 2009	Jan 2009		
Flare reduction					
PFCs					
Charcoal					
CO ₂ recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF ₆					

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Kang Guo

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

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas					
Hydro power	Jan 2009				
Renewables	Jan 2009				
Wind power					
Other renewable					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery				Jan 2009	Jan 2009
Efficiency of thermal power plants					
Coal mine methane					
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency					
N ₂ O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO ₂ recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF ₆					

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Zhu Chao

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

GHG Auditor:					
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas					
Hydro power					
Renewables					
Wind power					
Other renewable					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery					
Efficiency of thermal power plants					
Coal mine methane			Jan 2009		
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency					
N ₂ O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO ₂ recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF ₆					

Høvik, 9 January 2009

Michael Lehmann
Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Hendrik Brinks

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

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas	Jan 2009			Jan 2009	Jan 2009
Hydro power					
Renewables Wind power				Jan 2009	Jan 2009
Other renewable					
Biomass				Jan 2009	Jan 2009
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery				Jan 2009	Jan 2009
Efficiency of thermal power plants					
Coal mine methane				Jan 2009	Jan 2009
Fuel switch					
Manure management					
Waste / wastewater treatment				Jan 2009	Jan 2009
Energy efficiency				Jan 2009	Jan 2009
N ₂ O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO ₂ recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF ₆					

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Ole Andreas Flagstad

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

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas					
Hydro power					
Renewables Wind power					
Other renewable					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery				Jan 2009	Jan 2009
Efficiency of thermal power plants					
Coal mine methane				Jan 2009	Jan 2009
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency			Jan 2009		
N ₂ O					
HFCs				Jan 2009	Jan 2009
Flare reduction					
PFCs					
Charcoal					
CO ₂ recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF ₆					

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services