



VALIDATION REPORT

JIANGXI FENGCHENG CMM DISTRIBUTION PROJECT IN THE PEOPLE'S REPUBLIC OF CHINA

REPORT No. 2008-9129

REVISION No. 01



VALIDATION REPORT

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CERTIFICATION AS

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Approved by: Ole Andreas Flagstad	Organisational unit: Climate Change Services
Client: ČEZ a.s.	Client ref.: Jan Baláč

Project Name: Jiangxi Fengcheng CMM Distribution Project
Country: People's Republic of China
Methodology: ACM0008
Version: 04
GHG reducing Measure/Technology: Capture of coal mine methane (CMM) for use in heating and cooking purposes
ER estimate: annual average over 10 years crediting period is 118 789 tCO₂e i.e. totally 1 187 888 in 10 years

Size

- ☒ Large Scale
☐ Small Scale

Validation Phases:

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

Validation Status

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

In summary, it is DNV's opinion that the "Jiangxi Fengcheng CMM Distribution Project" in People's Republic of China, as described in the PDD of version 06, dated 05 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. DNV thus requests the registration of the Jiangxi Fengcheng CMM Distribution Project as a CDM activity.

Report No.: 2008-9129	Date of this 2009-06-06	Rev. No. 01
Report title: Jiangxi Fengcheng CMM Distribution Project in People's Republic of China		
Work carried out by: Zuzana Andrtová, Ole Andreas Flagstad; Zhang, Xiaojun Johnsen; Chao Zhu, Mario Vöröš; Michael Lehmann; Ramesh Ramachandran		
Work verified by: Chandrashekara Kumaraswamy		

Key words:

Validation
Clean Development Mechanism
Kyoto Protocol

- ☒ No distribution without permission from the Client or responsible organisational unit
☐ Limited distribution
☐ Unrestricted distribution



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Abbreviations

CAR	Corrective Action Request
CBM	Coalbed methane
CDM	Clean Development Mechanism
CMM	Coal Mine Methane
CER	Certified Emission Reduction
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EB	Executive Board
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
PDD	Project Design Document
PDR	Preliminary Developed Document
PP	Project Participant
UNFCCC	United Nations Framework Convention on Climate Change
EF_{OM}	Operating Margin Emission Factor
EF_{BM}	Build Margin Emission Factor
EF_y	Emission Factor



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1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the “Jiangxi Fengcheng CMM Distribution 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 review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is People’s Republic of China and the Annex I Party is Netherlands. These Parties fulfil the participation criteria and have approved the project and authorized the project participants. The DNA from China confirmed that the project assists in achieving sustainable development.

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

The project correctly applies ACM0008, version 04: “Consolidated baseline methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction by flaring or catalytic oxidation”.

The project collect CMM from two existing coalmines and supply CMM for heating and cooking, instead of passively venting it, the project results in reductions of CH₄ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 118 789 tCO₂ per year over the selected 10 year crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The monitoring methodology ACM0008 has been correctly applied and the monitoring plan sufficiently provides for collection of data to determine the project’s emission reductions.

Adequate training and monitoring procedures have been developed and will be implemented prior to start of the crediting period.

In summary, it is DNV’s opinion that the “Jiangxi Fengcheng CMM Distribution Project” in China, as described in the PDD of 6 version 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 04. DNV thus requests the registration of the project as a CDM project activity.



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2 INTRODUCTION

The ČEZ a.s. has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “Jiangxi Fengcheng CMM Distribution Project” in the People’s Republic of 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.

2.1 Objective

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

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0008. The validation team has, based on the recommendations in the Validation and Verification Manual /10/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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



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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/ Enecore Carbon Co.,Ltd., PDD of Jiangxi Fengcheng CMM Distribution Project, Version 02, dated 27 March 2008, and version 06 dated 5 June 2009
- /2/ **CDM Executive Board:** ACM0008, “Consolidated baseline methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction by flaring or catalytic oxidation”, version 4, valid from 2 November 2007
- /3/ **CDM Executive Board:** “Tool to calculate the emission factor for an electricity system”, version 01, Annex 12 of of the EB 35 Report.
- /4/ **CDM Executive Board:** “Tool for demonstration and assessment of additionality”, version 04, Annex 13 of the EB 36 Report.
- /5/ GSP IRR- Jiangxi Fengcheng CMM.xls
- /6/ Feasibility study report completed by light Industry Design Institute of Jiangxi Province in January 2006 and Feasibility Study Report (FSR) approved by Yichun Development and Reform Commission on 9 October 2006.
- /7/ Environment Impact Assessment by Yichun City Environment Protection Research Institute in August 2006 and its Approval letter to EIA by Jiangxi Environment Protection Bureau on 19 September 2006.
- /8/ Letter of approval, DNA of the Republic of China No. 1380 in 22 August 2008
- /9/ Letter of approval, DNA of Netherlands on 4 March 2009
- /10/ Clean Development Mechanism Validation and Verification Manual, EB 44 report, annex 3 http://cdm.unfccc.int/EB/044/eb44_repan03.pdf
- /11/ **CDM Executive Board:** *ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources*, version 06 of 19 May 2006.
- /12/ CDM Executive Board, Guidance for request for deviation titled “Application of AM0005 and AMS-I.D in China” (<http://cdm.unfccc.int/Projects/Deviations>)
- /13/ Revision Suggestion on Investment Estimation and Financial Analysis by Jianxi Light Industry Design Institution dated on 20 January 2007



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- /14/ Contact with CCC for CDM consideration on 5 February 2007
- /15/ China Electricity Grid OM & BM Calculation Process
<http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1364.pdf>
- /16/ *CMM Gas supply and Distribution contract between Fengcheng City government and Fengcheng coalmine Co., Ltd on 21 October 2005*
- /17/ *Gas purchase agreement between Jianxi Fengcheng Pipeline Gas Co. Ltd., and Shangzhuang Coalmine Co., Ltd., on 29 September 2006*
- /18/ Fengcheng city plan 2003-2020
- /19/ Shanghsi Jilaing Standard Gas Analysis Co. Ltd.: Gas analytical Report 26 October 2005.
- /20/ Meeting minutes for Board of directors as serious consideration of CDM revenues for the project on 21 February 2006
- /21/ Fengcheng City Government: Minutes of *CMM Gas supply and Distribution* project construction and CDM application for economic viability on 20 February 2006.
- /22/ The project construction start report dated 4 March 2006.
- /23/ Answered questionnaires for the stakeholder comments by project owner dated 14 March 2008 and the CDM Stakeholders Consulting Meeting of Jiangxi Fengcheng CMM distribution project was held in the office of Fengcheng Pipeline Gas Co., Ltd on 24th, March 2008.
- /24/ Business license for Jianxi Fengcheng Pipeline Gas Co. Ltd.
- /25/ Extraction system flowchart
- /26/ Distribution process flowchart for residential supply, industrial use, commercial use
- /27/ Extraction Record and coal production data for Shangzhuang and Fenglong Dajing coalmine on 9 May 2008
- /28/ *National Coal Mines Safety Regulations, 2005* (For safety reason, VAM less than 1%)(CMM 30% above can be used)
- /29/ NDRC, *Coalmine Methane Treatment and Utilization Macro Plan*, June 2005 (CMM 30% above can be used and encourage to apply for CDM support)
- /30/ NDRC and the National Construction Committee, 2006, *Economic Evaluation Code and Parameter for Construction Project. Version 03* (for benchmark)
- /31/ **CDM Executive Board:** Requests for clarification AM_CLA_0087;
<http://cdm.unfccc.int/methodologies/PAMethodologies/Clarifications/index.html>)
- /32/ The personnel training plan for Jiangxi Fengcheng CMM Distribution Project on 20 February 2008.
- /33/ Fengcheng Pipeline Gas Co., Ltd: Training records of employees for year 2006, 2007 and 2008
- /34/ Fengcheng Pipeline Gas Co., Ltd: The Management and Operation Manual for Jiangxi Fengcheng CMM Distribution Project on 15 March 2008.



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- /35/ Carbon Asset Development Agreement between Enecore and Jiangxi Fengcheng Coal Mine Methane Distribution Project on 18 October 2007
- /36/ LOI between ČEZ a.s. and Fengcheng Pipeline Gas Co, Ltd. dated on 30 October 2007 and 2 April 2008
- /37/ ERPA between Fengcheng Pipeline Gas Co, Ltd. and ČEZ dated on 26 May 2008
- /38/ Approval of revision of FSR /13/ by Fengcheng Development and Reform Commission on 28 March 2007
- /39/ Fengcheng Price Administration Bureau File [2006]010 dated 4 March 2006
- /40/ China Coal Information Institute, New Development of CMM Projects in China, page 190, The 5th International Symposium on CBM/CMM in China & “Methane to Markets Partnership” Regional Workshop in China, November – December 2005
- /41/ Insist the self-dominated intellectual property right, pave coal mine methane zero emission way, 20th edition, 2007, China Science and Technology Achievement
- /42/ Comment on the investment re-evaluation of Fengcheng CMM Distribution Project from Jianxi Light Industry Design Institution dated 17 February 2006 (draft revised financial and investment part of FSR)
- /43/ Emission Standard of CBM/CMM issued by the Ministry of Environmental Protection in April 2008
(<http://www.ccchina.gov.cn/WebSite/CCChina/UpFile/2008/200841511338298.pdf>)
- /44/ NDRC Notice About CMM Price Management dated 20 April 2007
(http://www.hebwj.gov.cn/upfiles/xy_col32super_20081201154229000773.htm)

3.2 Follow-up Interviews with Project Stakeholders

A site visit at Fengcheng Pipeline Gas Co., Ltd. was conducted by Zuzana Andrtova, Zhang Xiaojun and Zhu Chao between 19-22 May 2008. During the site visit, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review.

Regarding to new legislation related to CMM/CBM utilization /43/ telephone call with director of NDRC and meeting with director of China Coal Information Institute was done in May 2009 by DNV China.

	Date	Name	Organization	Topic
/45/	19-22 May 2008	Andrea Camponogara Wu Fugui Gong Xiao Zhang Xinhui	Encore Carbon GCG Company	<ul style="list-style-type: none"> ➤ Applicability of selected methodology ACM0008 ➤ Baseline determination of the project ➤ Issues related to the additionality ➤ Common practice analysis ➤ Emission reductions calculation ➤ Emission reduction monitoring plan and project management
/46/	19-22 May 2008	Yan Zengyi Lei Genbao	Shangzhuang Coalmine	<ul style="list-style-type: none"> ➤ Information of project construction ➤ The development of CMM utilization projects in China



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		Xiong Zhenbao	Local NDRC	➤ Starting date of project and crediting period
		Fu Baohua	Local EIA Bureau	➤ The approval status (incl. EIA approval, the feasibility study report approval, CDM project approval)
		Xu Li		➤ Technology utilized
		Wang Jun	Local Customer	➤ Historical gas venting/drainage
		Yu Huihua		➤ Risks and barriers for investment and technology
		Yang Jianlin	Fengcheng Pipeline Gas Co., Ltd	➤ Training and detailed procedures and records.
		Zhang Guihui		➤ Emission reduction monitoring plan and implementation
				➤ Consulting process for stakeholders' comments
/47/	May 2009	Madam Sun Cui Hua	director of NDRC	➤ Application of new CMM legislation and possibility of its enforcement
/48/	May 2009	Mr. Liu Wenge	director of China Coal Information Institute	➤ Application of new CMM legislation and possibility of its enforcement

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for 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 transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for “Jiangxi Fengcheng CMM Distribution 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.



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

Following the clarifications made to the issues raised in the draft validation report, the PP has revised the PDD /1/. The main differences between the PDD published for the global stakeholder comments process and the revised PDD are:

- 1) Revisions to the financial and sensitivity analysis as per latest requirement
- 2) Elaboration on the project boundaries;
- 3) Revision to the description of CDM consideration and project's starting date;
- 4) Discussion and analysis of alternative baseline scenarios;
- 5) Updated the starting date of the first crediting period;
- 6) Revised the calculations to the baseline and project emission reduction.

After reviewing the revised PDD, DNV issued this final validation report and opinion.



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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



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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.

3.5 Validation Team

<i>Role/Qualification</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>	<i>Type of involvement</i>					
				<i>Desk review</i>	<i>Site visit / Interviews</i>	<i>Reporting</i>	<i>Supervision of work</i>	<i>Technical review</i>	<i>Expert input</i>
Project Manager/GHG auditor	Vöröš	Mario	Czech Republic				√		
CDM validator	Flagstad	Ole Andreas	Norway	√					
CDM validator (CMM)	Ramachandran	Ramesh	India				√		
GHG auditor	Andrtová	Zuzana	Czech Republic	√	√	√			
GHG auditor	Zhang	Xiaojun Johnsen	China	√	√	√			
Sector expert	Zhu	Chao	China		√				√
Methodology expert	Lehmann	Michael	Norway						√
Technical Reviewer	Chandrashekara	Kumaraswamy	India					√	

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



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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 project design documentation dated 5 June 2009 /1/.

4.1 Participation Requirements

The project's host Party is People's Republic of China and the participating Annex-I Party is the Netherlands. Both China and Netherlands fulfil the participation requirements and have ratified the Kyoto Protocol. The project participants are Fengcheng Pipeline Gas Co., Ltd of China (as the project owner) and CEZ a.s. (as the CER buyer).

The DNA of China has issued a Letter of Approval (LoA) /8/ authorising Fengcheng Pipeline Gas Co., Ltd. as a project participant and confirming that the project assists in achieving sustainable development.

The DNA of Netherlands has issued the Letter of Approval /9/ authorizing ČEZ a.s. as the project participant.

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

4.2 Project Design

The project will capture CMM with 33% CH₄ concentration from two operating coalmines (i.e. Shangzhuang and Fenglong Dajing) located in Fengcheng city and the captured CMM will be used for heating and cooking purposes in the households in the city. The extracted CMM was vented to the atmosphere before implementation of this activity and coal and liquid petroleum gas were used for heating and cooking.

To comply with national regulation mandating the extraction of CMM for safety reasons, Shangzhuang coal mine had equipped with CMM drainage system since the year 1979. For the same compliance purposes, a CMM drainage system is currently under construction at the Fenglong Dajing coal mine; and completion of construction is expected to be by October 2009. Shangzhuang's current extraction of CMM is at 26,000,000 m³ per year with a methane content of around 33%, equivalent to 8,580,000 m³ of pure methane. Fenglong Dajing's planned extraction of CMM is at 72,000,000 m³ per year with a methane content of around 33%, equivalent to 23,760,000 m³ of pure methane.

DNV confirmed that the proposed project activity fulfills the Chinese domestic regulations and policy of promoting sustainable development. The project is in line with host-Party specific CDM requirements and the confirmation thereof by the DNA of China was issued in August 2008 /8/.

The project's starting date is defined as the date of start of construction of the project activity which is 4 March 2006 /22/ as elaborated in section 4.4. The expected operational lifetime is 30 years and is as documented in the FSR completed by Industry Design Institute and approved by Yichun Development and Reform Commission on 9 October 2006 /6/. The



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length of the fixed crediting period is 10 years and its starting date will be 1 September 2009 or the date of project registration by UNFCCC whichever is later.

4.3 Baseline Determination

The project applies and complies with the approved methodology ACM0008, “Consolidated baseline methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction by flaring or catalytic oxidation”, version 4 /2/.

The applicability of this methodology is justified as the project activity fulfils the following applicability criteria:

- Extraction activities – involves underground boreholes in the mine to capture pre mining CMM and ventilation CMM that would normally be vented
- Utilization activities – the methane is captured and destroyed through utilization for heating and cooking purposes. Some part of the methane would still be vented for safety reasons

It is also confirmed that there are no open cast mines but rather mining is an ongoing operation from underground mines.

The above conditions were confirmed on site during the site visit at location of mine venting site, site of project activity and in the premises of Fengcheng Pipeline Gas Co. and by reviewing of documents, which were presented there or later as FSR /6/, Fengcheng city plan 2003-2020 /18/, Gas analysis /19/, flowcharts for project /25/ and /26/, data related to production in both of mines /27/ mainly.

In accordance with ACM0008 the baseline is determined through the following steps:

Step 1 - Identify technically feasible options for capturing and/or using CMM

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

Step 3 - Formulate baseline scenario alternatives

Step 4 - Eliminate baseline scenario alternatives that face prohibitive barriers

Step 1 – Identify possible scenario

a) For the baseline scenario the following options for CMM extraction and extracted CMM treatment were identified:

- A. Pre mining CMM extraction using underground drainage systems;
- B. Post mining CMM extraction using underground drainage systems;
- C. Combination of options A and B.

b) Technically feasible options for treatment of the extracted CMM in the project’s coal mines include:

- i. Venting. This is the continuation of existing CMM treatment practice;
- ii. Using/destroying ventilation air methane (VAM) rather than venting it;
- iii. Flaring of CMM;
- 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 (to be used as fuel for vehicles or heat/power generation);



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viii. Combination of i and vii above. This is the proposed project activity not implemented as a CDM project.

c) Options for energy productions are:

1. Continuation of existing heat supply by coal and LPG;
2. CMM piped to household small boilers and/or cooking systems using CMM as alternative fuel. This is the project activity not undertaken as a CDM project.

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

- The baseline scenario has taken into account all relevant national and sectoral policies, including the National Coalmine Safety Regulation /28/, Coalmine Methane Treatment and Utilization Macro Plan /29/. The macro-economic trends and political aspirations are also taken into account and the options A or B are not according to the legal safety requirement /28/

New legislation /43/ was issued in August 2008 relating to CMM regulation on CH₄ emission: According to 2008 Emission Standard of CMM Policy Coal mines with CMM concentration of 30% or higher are prohibited from emitting methane. This legislation should be in force from January 2010 for all old mines. While not affecting the Project for the time being, the Emission Standards may affect the Project from January 2010 onwards, as the individuated alternative scenario for CMM treatment, i.e. CMM venting, will not comply with the Standards. DNV has interacted with the Director of NDRC, Madam Sun Cui Hua /47/ and Mr. Liu Wenge /48/ Director of China Coal Information Institute. The interactions have revealed that there are economic viability barriers to the implementation of this legislation. It is also learnt that the implementation of the said legislation is a challenge as no system or procedure is in place for a) implementation, b) checking methodology (monitoring of implementation), c) supervision of such implementation and d) penalty/punishment. However, given the stated barriers and the lack of incentive for the sector, and the lack of enforcement, this new legislation has not been taken into account for the development of the baseline scenario.

It is also deemed that the Standards entered into force after the CDM decision for the project has been taken and after the starting date of the project implementation. It is therefore deemed acceptable to not consider the standards for the development of the baseline scenario. The PP will be monitoring the legislation enforcement and the same has been addressed in the monitoring plan to ensure that the situation of the new law is considered during verification.

Step 3 – Formulate baseline scenario alternatives + Step 4 – Eliminate baseline scenario alternatives that face prohibitive barriers:

CMM extraction barriers:

- **Option C** is the continuation of current CMM extraction practice in the proposed coal mines and individual use of **options A or B** is not technically feasible as was confirmed during the site visits (extraction system flowchart /25/) as they are not in line with the legal safety requirements /28/

Treatment of extracted CMM barriers:

- The **ii scenario** is unfamiliar in China and pilot projects exist only and this unfamiliarity adds risk to the project /41/.



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- The flaring (**iii scenario**) requires costs and it does not generate any profit. As there are no revenue streams with this option, the investment made to install flares and related equipments will not generate any revenue, making the flaring of CMM deemed to be a highly unattractive investment option. Hence, it is in DNV's opinion justified that flaring is removed as a possible option
- Using of CMM for power generation (**iv scenario**) is deemed not possible regarding to big power plant situated in Fengcheng city (city plan) /18/, this was verified by DNV during the site visit in Fengcheng and this barrier is relevant for next **v scenario** using the captive power generation too. Local residents and local government representative confirmed independent this situation /46/.
- The **scenario vi** using CMM for additional heat generation is blocked regarding to existing coal-boilers which use cheap waste coal and this is reason for no additional investment for gas-fuel boilers /18/. Thus it faces financial barrier too as is demonstrated below. The local information related to power plant, coal-boilers was confirmed with local representatives /46/ on site. Local residents and local government representative confirmed independent situation mentioned above and it was verified by experience and sector knowledge of sector expert and local DNV auditor as well as with legal requirements mentioned further and with Fencheng city plan 2003-2020 /18/ and distribution flowchart for residential supply, industrial use and commercial use /26/.
- And **scenarios vii and viii** have financial barriers as is demonstrated below.

Energy production barriers:

- **Option 1** is current situation and thus it is without barrier
- **Option 2** is the project activity without CDM and it is feasible that is financially unattractive according to IRR calculation /5/, which reached 7.14% without CDM revenue

The clarification of risk from lower CMM production, which could arise with potential delay of fully operation of Fenglong Dajing coal mine, was required to include regarding to it is major risk for project but it was clearly evidenced with analysis of CMM production, which is part of FSR /6/ and from extraction records from both of mine /27/.

Thus, DNV considers the list of realistic and credible alternatives to be complete and chosen baseline scenario Continuation of the current CMM extraction practice with all the extracted CMM to be released into atmosphere with the residential energy supply being coal and liquefied petroleum gas was chosen in proper manner and the steps used for elimination of baseline scenario were performed in a proper manner according to ACM0008 methodology /2/too.

Summarized project boundaries:

	<i>GHGs involved</i>	<i>Description</i>
<i>Baseline emissions</i>	CH ₄	Venting of CMM. This it the main emission source.



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<i>Project emissions</i>	CO ₂	From on-site consumption of electricity from devices used for project activities (e.g. compressors and etc.)
	CO ₂	Emissions from CMM destruction for heat by residential users. – it is incorrect claims the displacement of coal and LPG by the users of the CMM in this part (see CAR2)
	CH ₄	Like fugitive emissions of unburned methane
<i>Leakage</i>		No leakage involved

4.4 Additionality

For demonstration of the additionality of the project, the “Tools for the Demonstration and Assessment of Additionality” was used (version 04).

4.4.1 CDM consideration and continued action to secure CDM status

The chronology of events, together with the evidences checked, for CDM consideration of the project and the continued action to secure CDM status is provided below:

- The project was initially conceived by the Government and FSR completed in January 2006 /6/
- Owing to investment problems, the Government invited Fengcheng Pipeline Gas Co. Ltd. to take over the project in February 2006 /21/
- Fengcheng Pipeline Gas Co. Ltd commissioned Jiangxi Light Industry Design Institute to carryout a revised FSR (draft), in the light of changed conditions and increased investments in February 2006 /42/.
- The Fengcheng Government pushed the PP to implement the project for under CDM, on 20 February 2006 /21/
- Vide a board meeting Fengcheng Pipeline Gas Co., Ltd decided to apply for CDM, on 21 February 2009 /20/
- 4 March 2006, project construction started /22/
- Gas purchase agreement with coal mine owner was signed on September 2006 /17/
- 9 October 2006, formal approval of the first FSR (prepared in January 2006) obtained from Yichun Development and Reform Commission /6/
- January 2007, Jiangxi Light Industry Design Institute finalized the FSR started in February 2006 /13/. The revised FSR considered the changed conditions (from being a government project to a private project) and increased investment costs.
- March 2007, approval obtained for the revised FSR from the local DRC (Yichun Development and Reform Commission) /38/



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The development cooperation agreement with Enecore Carbon was signed on 18 December 2007 /35/, LOI with ČEZ was signed on 30 December 2007 (revised on 2 April 2008) /36/ and ERPA with ČEZ was signed 26 May 2008 /37/.

The project participants commissioned DNV to perform validation on 3 March 2008, and the PDD was made publicly available on DNV's climate change website on 11 April 2008. The construction was started 4 March 2006 /22/.

Identified scenarios are described above in section 4.3. and the continuation of the current CMM extraction practice with all the extracted CMM to be released into atmosphere, and residential energy supply by coal and liquefied petroleum gas was identified as the only baseline scenario.

4.4.2 Investment analysis: Choice of approach

The investment analysis was performed as per option III - benchmark analysis. A simple cost analysis cannot be used because the project generates other benefits than CDM-related income through income from gas sale.

4.4.3 Investment analysis: Benchmark selection

The financial indicator IRR was chosen for comparison of project with and without CDM revenues and for sensitivity analysis too. Sources for investment analysis were checked during the site visit with the sector expert. The benchmark value was stated as a minimum 12% of IRR according to Economic Evaluation Code and Parameter for Construction Project /30/.

4.4.4 Investment analysis: Input parameters

DNV has followed a 5-step approach that ensures requirements of EB38 paragraph 54 are followed:

Step 1: Assessment of the sources of the input parameters used in the investment and sensitivity analyses:

The input parameters used in the financial analysis of the *Jianxi Fencheng CMM Distribution Project* are taken from the revised version of the Investment Estimation and Financial Analysis by Jianxi Light Industry Design Institution dated on 20 January 2007 /13/ approved by Fencheng development and Reform Commission on 28 March 2007 /38/. However, the draft of the revised FSR /42/ carried out in February 2006 was used as the basis for CDM consideration of the project in February 2006 /20/. In other words, the project commenced even before the final FSR was approved, mainly because of the pressure from the government to implement the project /21/. The contract for CMM gas purchase between the project owner and Shangzhuang Coalmine /17/ and supply between government and Fencheng Mining Bureau /16/ were the second source for consideration of CMM gas prices in the IRR analysis.

Step 2: Confirmation of 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 PDD /1/ with the parameters stated in the revised financial part of FSR /13/, gas purchase agreement /17/ and gas supply and distribution contract /16/ and was able to confirm that the values applied are consistent with the values stated and sourced independently.

The revised investment and financial analysis of FSR /13/ clearly stated that major difference is in total investment, which increased primarily due to increased cost of materials, i.e.



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estimated investment increased from 29,418,600 RBM /6/ to 55,123,900 RBM /13/. The second important difference was in price for gas, which increased from 0.285 RBM/m³ /6/ to 0.44 RBM/m³ /13/. The IRR was changed from 21.4% /6/ to 7.14% /13/ without CDM revenue. The main reason for the big difference is commented in revised analysis too. The calculation was based on older documents (1992 – 2004) than was 2005 year, when FSR /6/ was issued. Major parts of project facilities as tanks, compressor room construction, power supply engineering construction and pipeline construction had increased due to the increase cost of construction and installation and raising price of engineering appliance /13/.

Reasons for start of the project before issuing of this document was clearly described in PDD and their verification by DNV is included in section 4.4.1 in the part related to CDM consideration.

Step 3: Assessment of the period of time between the finalization of the FSR and the start date:

As stated above, the FSR /6/ was finished in January 2006 and calculated IRR was 21.4% but while the project owner changed from the Government to Fengcheng pipeline gas Co., Ltd in February 2006, this situation required change in investment and financial analysis. But project was pushed by local government to be implemented immediately /21/. Thus, with only with the draft revised financial and investment part of FSR available in February 2006, the Board directors meeting of Fengcheng Pipeline Gas in 21 February 2006 /20/ confirmed CDM scheme application to the project and decided to start the project even as the revised FSR was being finalized and approved. This revised analysis was completed and issued in January 2007 /13/ and approved on 28 March 2007 /38/. Given these events, it is unlikely in the context of the project that the input values would have materially changed. It is thus reasonable to assume that the FSR /6/ and the revised part related to investment and cost calculation /13/ have been the basis of the decision to proceed with the investment in the project.

Step 4: Cross-check of the parameters used in the financial analysis

The input parameters used in the financial analyses were compared with the data reported for other proposed CMM projects in China, by comparing, electricity tariff, and percentage of O&M costs relative to total investment costs. By additionally applying our sectoral competence, DNV was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project

4.4.5 Investment analysis: Calculation and conclusion

The IRR calculation was provided in a spreadsheet /5/. The calculation was verified and found to be correct by DNV. The IRR is demonstrated to be 7.14% without CDM involvement and 20.25% with CDM, which confirms that the project is unattractive without the CDM revenue by comparing with benchmark value 12% /29/.

4.4.6 Investment analysis: Sensitivity analysis

The total investment, annual O&M cost and revenues from annual gas supply were used for sensitivity analysis demonstration. The prices of gas have not been considered for analysis as these have been fixed for the period of ten years /17/ and /16/.

- The total investment would have to decrease by 37.72% to reach benchmark. This is deemed to be unrealistic given that prices of materials have been on the rise due to



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inflation etc. The fact that the FSR /13/ had to be revised in 2007 due to increased investment costs is in itself a pointer to this direction.

- Annual O&M cost would have to decrease 12.6 % to reach the benchmark value and this is also deemed unrealistic for the reasons described above.
- Revenue from gas supply would have to increase 9.36% but the level of price is regulated by government /39/, /44/ and it is unrealistic and difficult to predict an increase.

The sensitivity analysis provided evidence that key indicators are robust and IRR of the project is lower than the benchmark.

The sensitivity and investment analyses have shown that the project is unlikely to be the most financially attractive option. The financial calculation and assumptions have been assessed by DNV and are considered correct and conservative. The project IRR with CER revenues for the project is estimated above the benchmark.

4.4.7 Common practise analysis

Venting of CMM is legal and common practise in China and coalmine owners or operators do not have reason for changing practise as on date. Supportive reasons for CDM application is that local the NDCR has focused initiatives in seeking CDM support as is demonstrated in the Coalmine Methane Treatment and Utilization Macro Plan issued by NDCR in June 2005 /29/

It is also confirmed that there is only one similar project (Fengcheng Mining Administration) that is in Jiangxi province which however, is also a registered CDM project.

Similar projects in other places in China (other than in Jiangxi province) are subsidized by government or developed as CDM projects too as was confirmed by China Coal Information Institute, New Development of CMM Projects in China /40/ and confirmed on website of UNFCCC.

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 activity.

4.5 Monitoring

The project applies the approved monitoring methodology ACM0008, “Consolidated baseline methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction by flaring or catalytic oxidation”, version 4 /2/. The selected monitoring methodology is applicable for the project activity.

The detailed Monitoring Plan /34/ for the project has been verified to be in accordance with the monitoring methodology. The brief description is in latest version PDD /1/, The monitoring plan will give opportunity for real measurement of achieved emission reduction.

Individual parameters are described below. The measured devices are described for all monitored parameters sufficiently in PDD /1/ including the place of installation and technical standards kept for installation.

All flow meters and ammeters will be calibrated before installation and they will be tested and inspected regularly by third party agencies. The procedures for tackling emergency situations have also been detailed.



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4.5.1 Parameters determined ex-ante

The project and baseline emissions are described and calculated according to methodology ACM0008 /2/.

Project emission:

Emission from additional energy required for CMM capture and use PE_{ME}

The project will require electricity for its operation. Fencheng is located in Jiangxi province and the project site is connected to Central China Power Grid (CCPG). The ex-ante determination of the emission factor for CCPG was performed according to the “Notification on Determining Baseline Emission Factor of China’s Grid” /15/. The operating margin emission (OM) factor and build margin (BM) emission factor of CCPG are determined according this method:

OM (tCO ₂ /MWh)	1.2899
BM (tCO ₂ /MWh)	0.6592

The additional electricity consumption for capture and use of methane (MWh) will be monitored and is estimated based on information included in the FSR /6/ of the project (2,520MWh/y).

Combustion emission from use of captured methane PE_{MD}

The concentration of methane in CMM gas is 33%, the density of methane under normal conditions of temperature and pressure is 0.00067 t/m³ according to ACM0008 and 2006 IPCC. The flow of CMM and the methane concentration will be monitored to determine the project’s emissions due to combustion of captured methane.

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Baseline emissions

The baseline emissions are calculated as emissions from release of methane into the atmosphere.

The estimated quantity of venting gas was verified during the site visit by sector expert with the FSR /6/, extraction records and coal production data /27/, Coalmine Methane Treatment and Utilization Marco Plan /29/ and Economic Evaluation Code and Parameter for Construction Project /30/.

Leakage

No leakage needs to be considered in accordance with ACM008 since there is no displacement of baseline thermal demands, no CBM drainage, no noticeable impact on coal production and the project and involved coal mines are not large enough to impact coal prices or market dynamics in China.

In summary these values are used:

Data and Paramets	Unit	Value applied	Source of data used
Density of Methane	t/m ³	0.00067	2006 IPCC and ACM0008
EF _{OM}	tCO ₂ e/MWh	1.2899	“The Clarification of Determining Baseline Emission Factor for China Regional Grid” by NCCC
EF _{BM}	tCO ₂ e/MWh	0.6592	“The Clarification of Determining



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			Baseline Emission Factor for China Regional Grid" by NCCC
CEF _{CH4}	tCO ₂ e/tCH ₄	2.75	ACM0008/Version 04
Eff _{GAS}	%	98.5	ACM0008/Version 04
GWP _{CH4}	tCO ₂ e/tCH ₄	21	2006 IPCC and ACM0008

4.5.2 Parameters monitored ex-post

The project activity in accordance with ACM0008 and as described in the PDD /1/ monitors the following parameters:

Additional electricity consumption by project - continuously monitored by electricity meter

Methane sent to grid for end users - it will be continuously monitored by gas flow meters adjusted by temperature and pressure

Carbon emission factor for combusted non methane hydrocarbons (various) – from annually monitoring and analyzing NHMC concentration (If it is above 1%, determining each carbon emission factor of different components)

Concentration (in mass) of methane in extracted gas (%) , measured on wet basis – with concentration meters, optical and calorific

NMHC concentration(in mass) in extracted gas - Annually monitoring NHMC concentration to check out whether it is less than 1% to determine whether its emissions to be included in the calculation

Enforcement of the Emission Standards of Coalbed Methane/Coal Mine Gas – this parameter will be monitored from Official statistics from central and provincial competent authority and Technical reports from CMM and Coalmine research institutes. If this is not available a sample group of coalmines in South China Region (R3), will be established to assess the implementation of this legislation in China. It will be monitored yearly and resources will be official data or the chosen sample of mines. In case of a sample it will be selected within the South China Region (R3). The sample group will be randomly selected according to criteria of similarity with the project activity, including a methane concentration equal or greater than 30%. A number of projects equal to the square root of the total number of applicable projects in the selected zone will be selected.

4.5.3 Management system and quality assurance

The brief description of management system and quality assurance adopted for the project activity is described in PDD /1/ and contain all needed information of procedures, including placement of measuring devices, their calibration and emergency situation. Detailed description of these procedures is included in the monitoring plan /33/ and in the personnel training plan /32/.

The collection, monitoring and archiving of all need data is provided by procedures mentioned above. It is:

Project emission:

- Consumed electricity by project
- CMM sent to users – its volume, press and temperature
- Concentration of methsane
- NMHC concentration and



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- Carbon emission factor for combusted NMHC if increase above 1%

4.6 Estimate of GHG Emissions

The application of the baseline methodology is transparent and conservative.

The emission reductions are the difference between the baseline emissions and the project emissions for given year (regarding to leakage emissions are 0 according to ACM0008).

Project emissions (PE) are determined as sum PE_{ME} from combustion emission from additional energy required for CMM capture and use with PE_{MD} combustion emission from use of captured methane and PE_{UM} un-combusted methane from end uses.

For PE_{UM} and PE_{MD} is used default value Eff_{GAS} (98.5%) according to methodology requirement.

PE_{ME} use as default values EF_{OM} and EF_{BM} for CCPG fro combined margin emission factor, which is calculated ex-ante in accordance with ACM0002 /2/.

The OM emission coefficient is determined ex-ante using aggregated generation and fuel consumption data. The simple OM emission coefficient is calculated as 1.2899tCO₂/MWh.

The calculation of the BM emission coefficient is in accordance with the EB's guidance for the application of AM00005 in China /12/ and:

- The capacity additions from the years 2000 to 2004 is chosen and reach 22.5% of total installed capacity.
- The weight of installed capacity additions for thermal power plant is accounted for 69.80% of total installed capacity additions, where 99.53% from coal, 0.22% from oil and 0.25% from gas in term of CO₂ emission.

The coal consumption efficiency of 343.33 g SCE/kWh is selected as the best technology commercially available in China. This can be acknowledged as the best available data available for estimating the BM in the CCPG. The BM emission factor of Central China Power Grid is 0.6592.

The combined margin emission factor is calculated as weighted average of the operating margin and build margin. It is calculated ex-ante and it is fix.

Quantity of the CMM gas is estimated according FSR /6/ and information from coalmines /27/ 90000 m³/day. This capacity will reach after 2 years; it is estimated that it will be 50% per first year and 70% of full capacity in second year.

Baseline emissions (BE) are determined as BE from release of methane into the atmosphere in year, regarding to only CMM venting into atmosphere is baseline scenario. All used formulae are used in compliance with methodology ACM0008 /2/.

Regarding to only part quantity of CMM sent to project activity is calculated as baseline and part which will be still vented is not calculate in PE nor BE and project is not related to CBM, VAM and PMM, the quantity of baseline emissions is determined as Pre-mining CMM destruction/oxidation through gas grid to various combustion end uses in the project activity in year y (tCH₄) multiple global warming potential of methane (21tCO₂e/tCH₄).

Leakage (LE) is determined as 0 regarding to: CBM is not included in this project, the project does not displace thermal energy use and the project doesn't have impacts to coal production, coal prices, or other market dynamics.

Uncertainty



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The major uncertainty related to project emissions is quantity of CMM gas. Estimation is back up arguments from FSR /6/ and extraction records /27/ and based on methane concentration 33% confirmed by analysis /19/.

4.7 Environmental Impacts

The EIA /7/ was performed according to China's legal requirement and covers both the construction and operational phases.

The project is found to have no significant negative impacts. However, based on the EIA all recommended measures to address various aspects (noise, waste water, air quality, wastes and ecological effect) is planned to be implemented, during construction and operation of the project.

4.8 Comments by Local Stakeholders

All local stakeholders were invited to a meeting in the office of Fengcheng Pipeline Gas Co., Ltd on 24th, March 2008. 24 delegates participated in the meeting, including representatives from local government and Environmental Protection Bureau; representatives from coal mine; representatives from the local residents; staffs of Fengcheng Pipeline Gas Co., Ltd and representatives from Enecore Carbon Co., Ltd.

Public opinion was also sought from stakeholders by distributing questionnaires about the project activity, 10 days prior to the meeting. 119 out of 119 questionnaires distributed were returned with responses.

Result of both the above events was 100 % support for the project development among the stakeholders. These results were confirmed by DNV during the site visit on 21 May 2008.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD, version 02, dated 27 March 2008 was made publicly available on DNV's climate change website (http://www.dnv.com/focus/climate_change/projects/projectlist.asp?) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period respectively from 11 April to 10 May 2008.

No comments were received.

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	OK.
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK.
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	CAR1 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	No public funding is used
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,	OK

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	
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	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	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	O.K.
Other		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	O.K.
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.
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.

Requirement	Reference	Conclusion
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 I	Yes. It is located in Fengcheng city, in the center of Jiangxi province, along the Gan River. It is specified in geographical coordinates 28°09'12'' north latitude and 115°43'50'' east longitude.		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR I	It defines as all new constructed equipment (it contains two storage tanks, compressor and household and commercial users). But for conservativeness, two pump stations should be included. The two pumps were included to boundaries in revised PDD /1/.	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	<u>Involved Parties</u> People's Republic of China as Host Party, and Netherlands as Annex I Party.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview
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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<u>Project Participants</u> Fengcheng Pipeline Gas Co.,Ltd. as the project owner, and CEZ a.s. as the CER buyer are participating in the project.		
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/ /8/ /9/	DR	Yes. Letters of Approval from DNA of China /8/ and Letters of Approval from DNA of Netherlands /9/ was received.	CAR1	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/ /8/ /9/	DR	<u>Ratification of the KP:</u> China ratified the Kyoto Protocol on August 30 th , 2002, and Netherlands ratified the Kyoto Protocol on May 31 st , 2002 <u>Voluntary Participation:</u> China confirmed the issuance of the LoA /8/ in April 2008 and LoA was issued in August 2008. Netherlands: LoA was issued on 4 March 2009 <u>Designed National Authority:</u> DNA China is under the National Development and Reform Commission of the People's Republic of China, while DNA of the Netherlands is under Ministry of Housing, Spatial Planning and the Environment	CAR1	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 used for the project activity.		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.3. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.3.1. Does the project design engineering reflect current good practices?	/1/	DR	Yes. Technology used and project design engineering is well known in China and reflects current good practice.		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	Yes. The project uses state of art technology that involves two storage tanks with volume of 30000 m ³ and reciprocating compressor (type L-60/1.5 ^a). Compresors will be manufactured by Liuzhou General Compressor Works.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/ /32/ /33/ /34/	DR I	Yes, it is clearly demonstrated in the personnel training plan /32/, employees' trainng records for 2006-2008 years /33/ and in The Management and Operational Manual for Jiangxi Fencheng Manual /34/.	CL-2	OK
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/ /8/	DR I	Yes, it was confirmed in LoA from Chinese DNA /8/ issued in August 2008.	CAR-1	OK

* MoV = Means of Verification, DR= Document Review, I= Interview
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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes. It is estimated that the project activity would create additional jobs for 72 people and also reduce air pollution.		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/ /2/ /3/ /4/ /5/	DR	Yes. Project applies ACM0008 in version 4 with tools to calculate the emission factor for an electricity system, version 01 and tool for demonstration and assessment of additionality, version 04.		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /2/	DR I	Yes. The PDD clearly defines the applicability criteria for extraction (underground boreholes using for capture pre and post mining and air methane ventilation) and utilization (CMM capturing and destroying through utilization of distributing to gas grid for households, venting of part of CMM and at least all collected CMM is used and destroyed for household cooking and heating) activities and for non-applicable features (the project operate in coal mines,		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			both coal production and CMM extraction are ongoing coal mines, any activities related CBM aren't included to the project). The project meets all the applicability requirements of ACM0008.		
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 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/ /2/	DR I	The baseline scenario is business as usual scenario ; it includes two parts; one is continuation of current gas extraction practice. It consists of a combination of VAM extraction and pre and post CMM extraction; another is also the continuation of the current situation, which involves venting extracted CMM and VAM and power purchase from Central China Power Grid. Onsite check confirmed the complete venting in baseline scenario.		OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /2/ /5/	DR	For extraction, combination of pre and post mining CMM extraction using underground drainage systems. This is also the continuation of current CMM extraction practice in the proposed coal mines to guarantee the safe need for coal production.		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<p>For CMM treatment are defined 8 alternatives in compliance with local laws.</p> <ul style="list-style-type: none">• Venting as current situation;• use/destruction VAM, which has technological barriers as unfamiliar technology in Chinese mining companies;• flaring, which isn't widely adopted in China;• using CMM for additional grid power generation, which is stressed by local government in connection with location biggest coal-fire power plant and other CDM project for using CMM for grid-power generation;• using CMM for additional captive power generation, which is not attractive as was said above;• using for additional heat generation, which in not attractive for waste coal using for this;• feed into gas pipeline for using as fuel to vehicles or heat/power generation, which has a investment barriers without CDM revenue (IRR is 7.14% which is lower than benchmark of 12%)		

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			<ul style="list-style-type: none">• and last is combination of all above scenarios but is impossible regarding to above mentioned barriers. <p>For energy production, two alternatives including continuation of existing heat supply by coal and LPG and CMM piped to household cooking systems (facing investment barrier if not considering CDM revenues) are identified.</p> <p>The selected scenario (continuation of the current CMM extraction practice with all the extracted CMM to be released into atmosphere, residential energy supply by coal and liquefied petroleum gas) is the most likely one, because other scenarios face afore discussed barriers respectively.</p>		
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/ /2/ /3/ /4/	DR	<p>The discussion for the determination of the baseline basically follows the key methodological steps indicated by ACM0008.</p> <p>Step 1: Identify all technically feasible options for capture and/or using of CMM; Step 2: Eliminate baseline options that do not comply with legal or regulatory requirements; Step 3: Formulate baseline scenario alternatives;</p>		OK

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			Step 4: Eliminate baseline scenario that faces prohibitive barriers.		
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /2/ /3/ /4/	DR	Yes. The baseline has been determined using conservative assumptions where possible.		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/	DR I	Yes. The baseline scenario has taken into account all relevant national and sectoral policies, including the <i>National Coalmine Safety Regulation, Coalmine Methane Treatment and Utilization Macro Plan</i> . The macro-economic trends and political aspirations are also taken into account.		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR I	Yes. The baseline is determined using data available.		OK
B.2.7. Have the major risks to the baseline been identified?	/1/ /5/ /27/	DR I	The major risk to the baseline is whether CMM from Fenglong Dajing coal mine currently under construction will be put into production as expected in October 2009. Analysis of CMM production at Shangzhuang mine and Fenglong Dajing coal mine was provided /27/	CL-3	OK
B.3. Additionality Determination					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					
B.3.1. Is the project additionality assessed according to the methodology?	/1/ /4/	DR	ACM0008 and “the Tool for the demonstration and assessment of additionality” are followed to demonstrate the additionality of the project.		OK
B.3.2. Are all assumptions stated in a transparent and conservative manner?	1/ /4/ /6/ /14/ /15/ /16/ /17/ /20/ /21/ /22/ /27/ /28/ /29/	DR	Yes the next issues were clarified <ul style="list-style-type: none">When and how CDM benefit was considered for the project as the construction permit date is before approval of FSR and information on this needs to be included in section B.5 of the PDD (refer to Annex 46 of the EB 41 report for further guidance)? – DNV verified that FSR /6/ dated 6 January 2006 suggested CDM revenue to overcome the financial barrier. The details of history of decisions pointing CDM project decision is included in revised PDD /1/Data of BM of emission factor of CCPG needs confirmation. - The PP needs adoption of the most recently available OM and BM from NDRC website. – it was demonstrate on website http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1364.pdf /15/Data source of 33% CMM , NCV_{GAS} :	CL-4	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<p>14.6MJ/m³ and NMHC content in the CMM should be provided. – demonstrate by documents /27, 28,29/</p> <p>For financial analysis, clarification is needed as:</p> <ul style="list-style-type: none">• Why is different supposed total investment in PDD and in spreadsheet with IRR calculation- in revised PDD and spread sheet calculation are correct• A justification of the selected benchmark of 13% as DNV has observed that the benchmark of gas supply projects in China for coal mines is 12%; - the 12% was used in revised PDD /1/• The income tax rate is 25% since January 1, 2008.• A justification that a variation of the parameters by ±10% represents a reasonable variation of these parameters in the sensitivity analysis. Alternatively, the value of input parameter’s value at which the IRR will be equal to the benchmark can be identified and the likelihood of the parameter		

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			having this value can be assessed to demonstrate that it is not likely that the IRR will become equal to the benchmark. - new sensitivity analysis was performed with need decreasing or increasing of chosen parameters (total investment, O&M cost and revenues from gas supply) for benchmark value reach • It is not clear why <u>approximately 30% to 40% from Investment in Fixed Assets is as Annual O&M cost?</u> - it was clarified that the major part from <u>annual O&M cost is value of gas purchase</u> How was calculated the revenue from CDM and why is supposed during the 20 years when is used 10 years fixed period? - the calculation was changed and now is calculated correctly with 10 years period.		
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	1/ /4/ /5/	DR I	Identification of alternatives was performed in terms of alternatives scenarios and their barriers identification as was referred above. For investments analysis was chosen benchmark analysis because project		OK

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			generates benefits other than CDM-relate income (through sales of gas) and benchmark analysis is simplest method appropriate for accessing.		
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/ /6/ /14/ /16/ /17/ /20/ /21/ /22/	DR I	The construction starting date was 4 March 2006. The evidence that CDM was seriously considered, shall be provided and information on this needs to be included in section B.5 of the PDD (refer to Annex 46 of the EB 41 report for further guidance). The evidences were provided and section B.5. was modified	CL 4	OK
B.4. Calculation of GHG Emission Reductions – Project 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 I	Yes. The calculation id correctly documented according to ACM0008.		OK
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	For the replaced electricity in the Central China Power Grid (CCPG), the CEF is calculated ex-ante in accordance with ACM0002. The OM emission coefficient is determined ex-ante using aggregated generation and fuel	CL 4	OK

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			<p>consumption data. The simple OM emission coefficient is calculated as 1.2899tCO₂/MWh.</p> <p>The calculation of the BM emission coefficient is in accordance with the EB's guidance for the application of AM00005 in China.</p> <ul style="list-style-type: none">- The capacity additions from the years 2000 to 2004 is chosen and reach 22.5% of total installed capacity.- The weight of installed capacity additions for thermal power plant is accounted for 69.80% of total installed capacity additions, where 99.53% from coal, 0.22% from oil and 0.25% from gas in term of CO₂ emission. <p>The coal consumption efficiency of 343.33 g SCE/kWh is selected as the best technology commercially available in China. This can be acknowledged as the best available data available for estimating the BM in the CCPG.</p> <p>The BM emission factor of Central China Power Grid is 0.6592.</p> <p>Data of BM of emission factor of CCPG needs confirmation – see CL 4 – it was confirmed</p> <p>It is not clear in PDD, if emissions factor recalculated annually or if it fix. There is link to the official resource of this but it should be changed in time. – it is clearly specified in revised PDD that it is calculate ex-ante and it is fix.</p>	CL12	OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Yes.		OK

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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 I	Yes. The calculations are documented according to ACM0008 and in a complete and transparent manner.		OK
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	The project claims the displacement of coal and LPG by the users of the CMM. However, this is not allowed by ACM0008 as confirmed by the clarifications on ACM0008 provided by the Meth Panel (refer to AM_CLA_0087 published on http://cdm.unfccc.int/methodologies/PAmethodologies/Clarifications/index.html) In revised PDD it is claimed only ER generated from avoidance of CMM venting into the atmosphere.	CAR2	OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Yes. Uncertainties in the baseline emission estimates have been properly addressed.		OK
B.6. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated according to the methodology and whether the</i>					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>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 I	The leakage is not calculated because there is no displacement of baseline thermal demands in the Project, no CBM drainage and no noticeable impact on coal production. Moreover, the Project and involved coal mines are not large enough to impact coal prices or market dynamics in China. Therefore, this project does not need to account for leakage but this situation shall be check during the site visit.		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?			Yes.		O.K.
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?			Yes.		O.K.
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. The emission reductions are real, measurable and give long-term benefits related to the mitigation of climate change. But the amount of emission reductions	CL5 CL6	OK

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			should be revised accordingly and the CMM leakage in pipelines after the two tanks should be considered in project emissions.		
B.8. Monitoring Methodology <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/ /32/ /34/	DR I	Yes. The PDD briefly documented all requirement procedures but it is not clear if more detail document or procedures exist.	CL5	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	Yes, it is prescribed in paragraph related data management.		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	Yes. All values needs for calculation are described. But It is not clear in PDD, if emissions factor recalculated annually or if it fix. There is link to the official resource of this but it should be changed in time. – it was clearly defined in revised PDD; it is fix and calculated ex-ante The correct description of monitored and ex-ante parameters in sections B.6.2 and B.7.1 of PDD is	CL12 CAR3	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			required. – it is correct in revised PDD		
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/1/	DR	Yes. The choices of the baseline indicators are conservative and deemed reasonable (except CL12).		OK
B.9.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/1/	DR	<p>But onsite visit revealed the measurement devices were not sufficiently enough for measuring the greenhouse gas emissions within the project boundary during the crediting period.</p> <p>The measurement method for the concentration of NMHC should be clearly stated. The measurement methods for all other GHG value are clearly stated and deemed appropriate.</p> <p>The measurement accuracy should be addressed. Detailed procedures should be in place to deal with erroneous measurements.</p> <p>It is sufficiently describer and clarified in revised PDD</p>	CL-6	OK
B.9.4. Is the measurement equipment described and deemed appropriate?	/1/	DR I	See B.9.3.	CL-6	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 I	See B.9.3.	CL-6	OK

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B.9.6. Is the measurement <i>interval</i> identified and deemed appropriate?	/1/	DR I	The measurement interval is identified and deemed appropriately. All the measurement intervals are continuous except for the concentration of NMHC, which is annually measured.		OK
B.9.7. Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?	/1/ /34/	DR I	Detailed procedures for the registration, monitoring, measurement and reporting were prepared and it has been addressed in the CDM Monitoring Manual.	CL7	OK
B.9.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/ /34/	DR I	Refer to above, procedures were prepared and it has been addressed in the CDM Monitoring Manual.	CL7	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/ /34/	DR I	Refer to above, procedures were prepared and it has been addressed in the CDM Monitoring Manual..	CL7	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 I	Yes. 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		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			consumption by the project.		
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR	Yes. The choices of baseline GHG indicators are reasonable and conservative.		OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR I	See B.9.3.	CL-6	OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR I	See B.9.3.	CL-6	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 I	See B.9.3.	CL-6	OK
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR I	The measurement interval is identified and deemed appropriately. All the measurement intervals are continuous.		OK
B.10.7. Is the registration, <i>monitoring</i> , <i>measurement</i> and <i>reporting</i> procedure defined?	/1/ /34/	DR I	Detailed procedures for the registration, monitoring, measurement and reporting were prepared and it has been addressed in the CDM Monitoring Manual.	CL-7	OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/ /34/	DR I	Refer to above, procedures were prepared and it has been addressed in the CDM Monitoring Manual..	CL-7	OK

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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/ /34/	DR I	Measurement details are only briefly described in PDD and they were checked during the site visit as was mentioned above – CL13 + individual comments in section B.9. - procedures were prepared and it has been addressed in the CDM Monitoring Manual..	CL 7	OK
B.11. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for 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	There is no displacement of baseline thermal demands in the Project, no CBM drainage and no noticeable impact on coal production. Moreover, the project and involved coal mines are not large enough to impact coal prices or market dynamics in China. Therefore, this project does not need to account for leakage.		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		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			will be monitored by local environmental authority.		
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR I	Yes.		OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR I	Yes.		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/ /33/	DR I	The authority and responsibility of project management needs to be explained more detailed. Yes. Now it is more elaborated in Monitoring plan, sufficient describing in PDD	CL-8	OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/ /33/ /32/	DR I	These procedures need to be prepared. Yes. Project participant performed Monitoring plan and Training Plan	CL-2	OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	These procedures need to be prepared. Yes. Now it is more elaborated in Monitoring	CL-8	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			plan, sufficient describing in PDD		
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR I	These procedures need to be prepared. Yes. Now it is more elaborated in Monitoring plan, sufficient describing in PDD	CL-8	OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR I	These procedures need to be prepared. Yes. Now it is more elaborated in Monitoring plan, sufficient describing in PDD	CL-8	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/ /22/	DR I	The date of starting construction of the project is 4 March 2006 and the supposed operational time lifetime is 30 years. However, start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. This, for example, can be the date on which contracts have been signed for equipment or construction/ operation services required for the project activity. – the evidence was provided	CL-9	OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	Yes. The start of crediting period is 1 September 2009.		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will 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 I	Yes. The analysis of environmental impacts has been sufficiently described in the PDD.		OK
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR I	Yes. There are requirements for an EIA for such project in China. The project has performed the EIA and Jiangxi Environment Protection Bureau has ratified the environmental assessment report in September 19 th , 2006.		OK
D.1.3. Will the project create any adverse environmental effects?	/1/	DR I	According to the EIA report for the project, the project will not cause any adverse impacts to the environment.		OK
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR I	No transboundary environmental impacts are identified according to the EIA report.		OK
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR I	Yes.		OK
D.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR I	Yes. The project's EIA reports have been approved by Jiangxi Environment Protection Bureau.		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
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 I	It was meeting with representatives from local government and Environmental Protection Bureau; representatives from coal mine; representatives from the local residents; staffs of Fengcheng Pipeline Gas Co., Ltd and representatives from Enecore Carbon Co., Ltd. in March 24 th , 2008.		OK
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR I	Yes. See above.		OK
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 I	Even though stakeholder consultation process is required only for those projects which are thought having significant potential impacts to the environment, for this project, public comments have been invited to evaluate the proposed project during the environmental impact assessment stage. The consultation process was carried out in accordance with the relevant regulation and the EIA report was approved by local EPB.		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR I	Yes.		OK

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E.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR I	No project amendment needs to be conducted according to the public consultation.		OK

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

A.5. Letter of approval					
A.1.1 Is the LoA received directly from the DNA or through the project participant.			DNV has received the original Letter of Approval from the project participant. But DNV also verified the authenticity of the LOA and the approval status through the official website of DNA of China at http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1860.pdf		OK
A.6. Project design					
A.2.1 Does the PDD describe the CDM project activity with all relevant elements in a transparent and accurate way?			Yes. The revised PDD describes all the issues transparently.		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?			Yes. The part of project was constructed regarding to the project started in March 2006.		OK
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?			It is proposed as a large scale project, methodology ACM0008 Site visit has been carried out to interact with the stakeholders mainly the proposed hausholders and also the officials of local NDCR and local EIA Bureau and Shanzhuang Coalmine representative /46/. See chapter 3.2.		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?			No. This project used CMM gas which was in previous time vented only.		OK

A.7. 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).			Yes. Project emissions are due to combustion emission from additional energy required for CMM capture and use, combustion emission from use of captured methane and un-combusted methane from end uses	OK
A.8. Documentation of baseline emissions				
1. A.4.1 Documentation of the baseline determination: <ol style="list-style-type: none"> 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. All documentation is relevant as well as correctly quoted and interpreted. Assumptions and data can be deemed reasonable Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity 			<p>Yes. All the data pertaining to baseline determination have been adequately addressed in the revised PDD that is submitted for registration. All assumptions deemed reasonable and also considers all national sector policies.</p> <p>The correct and latest applicable version of methodology (ACM0008 version 4) has been applied.</p>	OK
A.9. Documentation of the calculations				
2. A.5.1 Algorithms and/or formulae used to determine emission reductions <ul style="list-style-type: none"> All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced 			All assumptions and data used are listed in the revised PDD that is submitted for registration. All references are adequately added.	OK

<ul style="list-style-type: none"> • 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. 			<p>All values used in the ex-ante estimations and the baseline estimations are verified to be accurate and conservative.</p> <p>All the calculations proposed in the applied methodology are adequately followed and included in the PDD.</p>		
A.10. 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 extent can the emission reductions achieved by the project be monitored ex-post and verified later by a DOE?			The proposed monitoring procedures documented in PDD are inline with the existing best practices in the relevant project activities. The extent of emission reduction is depend to quantity of CMM gas and their quality both of them were supposed on the basis relevant information (gas analytical report /19/, FSR /6/ and data for both of mine /27/, /25/ and /26/) and verified by DNV sector expert		OK
A.11. CDM consideration prior to starting date					
A.7.1 The prior consideration of CDM for the project activity complies with EB41 annex 46			<p>Yes. It is in line with EB41 decision and gives a reasonable confirmation as the project activity will be implemented after clear decision develop it as CDM project by project owner and how was confirmed in revised financial and investment analysis by local government.</p> <p>For more detail see explanation in chapter 4.4.1.</p>		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 Letters of Approval from DNA of China and DNA of Netherlands have not been received.	Tab.1, 3. and 6. A.2.3	LoA from Chinese DNA issued on 22 nd Aug 2008 http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1860.pdf LoA from Netherlands was issued 4 March 2009	OK. The LoA /8/ from Chinese DNA was submitted to DNV. The LoA /9/ from Netherlands was submitted to DNV. CAR Closed
CAR 2 The project claims the displacement of coal and LPG by the users of the CMM. However, this is not allowed by ACM0008 as confirmed by the clarifications on ACM0008 provided by the Meth Panel (refer to AM_CLA_0087 published on http://cdm.unfccc.int/methodologies/PAmethodologies/Clarifications/index.html .)	B.5.2	Given the EB clarification PPs decided to give up with claiming CER for displacement of fossil fuels in residential areas. Only ER generated from avoidance of venting of CMM into the atmosphere is claimed. ER is recalculated and the PDD and the Monitoring Plan are revised accordingly.	OK only BE from venting of CMM is claimed in revised PDD. The CAR is closed
CAR 3 Please correct description of monitored and ex-ante parameters in sections B.6.2 and B.7.1 of PDD	B.9.1.	Description of monitored and ex-ante parameters in sections B.6.2 and B.7.1 have been corrected. The PDD is revised accordingly.	OK changes have been made in the revised PDD. The CAR is closed
CAR 4 The new legislation related to CMM venting was issued in host country.	B.2, B.3	The client changed PDD in section B.4 on related baseline scenario identification and B7.2.2 section about monitored parameters.	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
CL 1. It is not clearly defined, why are not the two pump stations included to project boundaries.	A.1.2	The project boundary has been revised by including the two pump stations. The project emission reductions are recalculated and the PDD is revised accordingly.	OK changes have been made in the revised PDD. The CL is closed
CL 2. The relevant training plan and records for the project are required to be available.	A.3.3.	Training plan and relevant records as well as monitoring manual are available. The PDD is revised accordingly.	OK documents /32/, /33/, /34/ were provided. The CL is closed
CL 3. The major risk to the baseline is whether CMM from Fenglong Dajing coal mine currently under construction will be put into production as expected in October, 2009. And analysis of CMM production at Shangzhuang mine and Fenglong Dajing coal mine is required; it needs to include the following information for each mine: coal reserves, coalbed methane reserves, existing and planned coal production, absolute gas emission, relative gas emission, existing and planned coal mine methane production.	B.2.7.	Information of Shangzhuang coal mine are provided and the PDD revised accordingly. Relevant information of Fenglong Dajing coalmine is specified in PDR, this part of information is provided.	OK Analysis of CMM production /27/ at Shangzhuang mine and Fenglong Dajing coal mine have been provided to DNV; it needs to include : coal reserves, coalbed methane reserves, existing and planned coal production, absolute gas emission, relative gas emission, existing and planned coal mine methane production. The CL is closed
CL 4.	B.3.2.	The first FSR was made by the	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
<p>Please clarify the following issues:</p> <ul style="list-style-type: none"> • When and how CDM benefit was considered for the project as the construction permit date is before approval of FSR? Moreover, this information this needs to be included in section B.5 of the PDD (refer to Annex 46 of the EB 41 report for further guidance). • Data related BM of emission factor of CCPG needs confirmation. - The PP needs adoption of the most recently available OM and BM from NDRC website. • Data source of 33% CMM , NCV_{GAS} : $14.6 MJ/m^3$ and NMHC content in the CMM should be provided. • Modification of $CON_{SELEC,PJ}$ as 2,520 MWH/y accordingly as the project boundary change. <p>For financial analysis, clarification is needed as:</p> <ul style="list-style-type: none"> • Why is different supposed total investment in PDD and in spreadsheet with IRR calculation? • A justification of the selected 	<p>B.3.4. B.4.1. B.4.2.</p>	<p>government at the end of 2005 in view of replacement of gas supply guaranteed till then by an existing coal gas plant that was shut down in Oct 2005 due to serious pollution problem. Since government had no money to conduct this CMM project, appointed Fengcheng pipeline gas Co. Ltd (hereafter call “the project owner”) to its development. When the project owner received the project and relevant FSR, he investigated further and ask Jiangxi Light Industry Design Institute to make another financial assessment base on current situation. Finally found that the financial situation of this project was not attractive, IRR was lower than benchmark, but considering CDM revenue, the project owner decided to take this project. Due to the shortage of gas supply at the beginning of 2006, the government pushed the project owner to start construction before approval considering this project has very little negative effect to the local environment. In the draft revised economy analysis</p>	<p>DNV verified that in FSR dated January 2006 /6/ the CDM was suggested to overcome the financial barrier.</p>

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
<p>benchmark of 13% as DNV has observed that the benchmark of gas supply projects in China for coal mines is 12%;</p> <ul style="list-style-type: none"> • The income tax rate is 25% since January 1, 2008. • A justification that a variation of the parameters by $\pm 10\%$ represents a reasonable variation of these parameters in the sensitivity analysis. Alternatively, the value of input parameter's value at which the IRR will be equal to the benchmark can be identified and the likelihood of the parameter having this value can be assessed to demonstrate that it is not likely that the IRR will become equal to the benchmark. • It is not clear why <u>approximately 30% to 40% from Investment in Fixed Assets is as Annual O&M cost?</u> <p>How was calculated the revenue from CDM and why is supposed during the 20 years when is used 10 years fixed period?</p> <p>The correct version of IRR spreadsheets and sensitive analysis shall be included in PDD.</p>		<p>performed by Jiangxi Light Industry Design Institute, CDM benefit was suggested as a good option to overcome the economy barrier. (17th Feb 2006)</p> <p>The following evidences are provided in support:</p> <ol style="list-style-type: none"> 1. Government meeting report 20th,Feb,2006 by Fengcheng government 2. board meeting 21st,Feb,2006 3.Contract with New Resources Investment Management Co.,Ltd on 28th,Feb,2006 <p>Section B.5 of the PDD is revised in compliance with Annex 46 of EB 41 Meeting Report.</p> <p>OM and BM emission factor were used from most recent resource in time of PDD publication.</p> <p>Data source of 33% CMM, NCV_{GAS} and NMHC content in the CMM are provided, i.e. FSR and Gas analytical report.</p> <p>$CONS_{ELEC,PJ}$ has been modified considering the change of the project</p>	<p>OK, the CL is closed</p>

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
		<p>boundary and the PDD is revised accordingly.</p> <p>There is no difference between total investment in PDD and in spreadsheet with IRR calculation.</p> <p>The benchmark value of 12% is used as recommended by the DOE and the PDD is revised accordingly.</p> <p>The investment analysis considers parameters existing at the time of the CDM decision (2006). In 2006 income tax was 33%.</p> <p>Sensitivity analysis was revised according to indication received by DOE during validation, i.e. variation of parameters till reaching the benchmark. The PDD is revised accordingly.</p> <p>O&M costs take into consideration also the cost of gas purchase, that is why O&M cost is more than 30% of total investment. The cost of gas purchase represents 70.4% of O&M costs.</p> <p>IRR calculation has been revised considering a 10 years fixed period and the PDD is revised accordingly.</p>	

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 5. But the CMM leakage in pipelines after the two tanks should be considered in project emission.	B.7.1.	Methodology ACM0008 has considered efficiency of methane in gas grid, i.e. 98%	OK, the CL is closed
CL 6. The emission reductions are real, measurable and give long-term benefits related to the mitigation of climate change. But the amount of emission reductions should be revised accordingly.	B.7.1	Same as CL5	OK, the CL is closed
CL 7. The PDD briefly documented all requirement procedures but it is not clear if more detail document or procedures exist.	B.8.1.	More detail procedures are described in monitoring manual and training plan, which are provided to the DOE.	OK DNV verified that the detailed procedures in monitoring manual /34/ and training plan /32/ /34/ satisfied the monitoring methodology of ACM0008. The CL is closed.
CL 8. But onsite visit revealed the measurement devices were not sufficiently enough for measuring the greenhouse gas emissions within the project boundary during the crediting period. The measurement method for the concentration of NMHC should be clearly stated.	B.9.3. B.9.4. B.9.5. B.10.3. B.10.4. B.10.5.	The Monitoring Plan is revised and all needed info is given in the revised PDD.	OK The Monitoring Plan in the revised PDD sufficiently described the accuracy, calibrations, and position of the meters to meet the monitoring requirements of the methodology whilst under the guidance of the equipment manufacturer.

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 measurement accuracy should be addressed. Detailed procedures should be in place to deal with erroneous measurements.			<p>The measurement method for the concentration of NMHC is clearly defined and annually monitoring NHMC concentration to check out whether it is less than 1% to determine whether its emissions to be included in the calculation.</p> <p>The measurement accuracy has been elaborated in the revised PDD and detailed procedures are in place to deal with erroneous measurements.</p> <p>The CL is closed.</p>
CL 9. Detailed procedures for the registration, monitoring, measurement and reporting should be prepared.	B.9.7. B.9.8. B.9.9. B.10.7. B.10.8. B.10.9.	CDM Monitoring Manual	Detailed procedures for the registration, monitoring, measurement and reporting have been addressed in the CDM Monitoring Manual /33/ The CL is closed.
CL 10. The authority and responsibility of project management needs to be explained more	B.13.1. B.13.2. B.13.3.	Authority and responsibility of project management are explained in more detailed in B.7.2.	The CL is closed

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
detailed.	B.13.4. B.13.5.		
CL 11. The start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. This, for example, can be the date on which contracts have been signed for equipment or construction/ operation services required for the project activity.	B.3.4	The starting date is 4 March 2006 as evidenced by Construction Start Report supervised by Fengcheng Dongsheng Engineering Construction Supervision Consultant Co.,Ltd.	OK, DNV verified that this date is correct according to submitted document /22/ The CL is closed
CL 12. Please clarify in the PDD, if the grid emissions factor will be recalculated annually or if it is determined ex-ante. There is link to the official resource of this value in PDD. but the values should be changed to the most recent values available.	B.4.2 B.9.1.	The values of grid emission factor are changed as per the most recent values published by the local DNA in time of PDD publication. As specified in the PDD these values are determined ex-ante.	OK. The clarification is sufficient, the new grid emission factor was issue in June 2008 and PDD publication in March 2008. The CL is closed

APPENDIX B

CERTIFICATES OF COMPETENCE



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

Michael Lehmann
Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Zuzana Andrtová

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

<i>GHG Auditor:</i>	Yes				
<i>Technical Area</i>	<i>CDM Validator</i>	<i>CDM Verifier</i>	<i>Sector Expert</i>	<i>Methodology Expert</i>	<i>Technical Reviewer</i>
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<i>Fuel switch</i>					
<i>Manure management</i>					
<i>Waste / wastewater treatment</i>					
<i>Energy efficiency</i>					
<i>N₂O</i>					
<i>HFCs</i>					
<i>Flare reduction</i>					
<i>PFCs</i>					
<i>Charcoal</i>					
<i>CO₂ recovery</i>					
<i>Transport</i>					
<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF₆</i>					

Høvik, 9 January 2009

Michael Lehmann

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Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Mario Voros

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

<i>GHG Auditor:</i>	Yes				
<i>Technical Area</i>	<i>CDM Validator</i>	<i>CDM Verifier</i>	<i>Sector Expert</i>	<i>Methodology Expert</i>	<i>Technical Reviewer</i>
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<i>Hydro power</i>					
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<i>Coal mine methane</i>					
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<i>Transport</i>					
<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF₆</i>					

Høvik, 9 January 2009

Michael Lehmann

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Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Xiaojun Johnsen Zhang

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

<i>GHG Auditor:</i>	Yes				
<i>Technical Area</i>	<i>CDM Validator</i>	<i>CDM Verifier</i>	<i>Sector Expert</i>	<i>Methodology Expert</i>	<i>Technical Reviewer</i>
<i>Landfill gas</i>					
<i>Hydro power</i>	Jan 2009				
<i>Renewables</i>	Jan 2009				
<i>Wind power</i>					
<i>Other renewable</i>					
<i>Biomass</i>					
<i>Grid connection of isolated system</i>					
<i>Cement</i>	Jan 2009				
<i>Waste-heat / waste-gas recovery</i>					
<i>Efficiency of thermal power plants</i>					
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<i>CO₂ recovery</i>					
<i>Transport</i>					
<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF₆</i>					

Høvik, 14 January 2009

Michael Lehmann

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Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Michael Lehmann

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

<i>GHG Auditor:</i>	Yes				
<i>Technical Area</i>	<i>CDM Validator</i>	<i>CDM Verifier</i>	<i>Sector Expert</i>	<i>Methodology Expert</i>	<i>Technical Reviewer</i>
<i>Landfill gas</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Hydro power</i>	Jan 2009	Jan 2009	Jan 2009		
<i>Renewables Wind power</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Other renewable</i>	Jan 2009	Jan 2009			
<i>Biomass</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
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<i>Cement</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Waste-heat / waste-gas recovery</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
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<i>Fuel switch</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
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<i>Energy efficiency</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
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<i>HFCs</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
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<i>CO₂ recovery</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Transport</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Non-renewable biomass</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Biofuel</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Pipeline leakage reduction</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>SF₆</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009

Høvik, 9 January 2009

Michael Lehmann

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CERTIFICATE OF COMPETENCE

Ole Andreas Flagstad

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

<i>GHG Auditor:</i>	Yes				
<i>Technical Area</i>	<i>CDM Validator</i>	<i>CDM Verifier</i>	<i>Sector Expert</i>	<i>Methodology Expert</i>	<i>Technical Reviewer</i>
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<i>Grid connection of isolated system</i>					
<i>Cement</i>					
<i>Waste-heat / waste-gas recovery</i>				Jan 2009	Jan 2009
<i>Efficiency of thermal power plants</i>					
<i>Coal mine methane</i>				Jan 2009	Jan 2009
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<i>Energy efficiency</i>			Jan 2009		
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<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF₆</i>					

Høvik, 9 January 2009

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CERTIFICATE OF COMPETENCE

Ramesh Ramachandran

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

<i>GHG Auditor:</i>	Yes				
<i>Technical Area</i>	<i>CDM Validator</i>	<i>CDM Verifier</i>	<i>Sector Expert</i>	<i>Methodology Expert</i>	<i>Technical Reviewer</i>
<i>Landfill gas</i>	Jan 2009	Jan 2009	Jan 2009		
<i>Hydro power</i>	Jan 2009	Jan 2009			
<i>Renewables Wind power</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Other renewable</i>	Jan 2009	Jan 2009			
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<i>Grid connection of isolated system</i>	Jan 2009	Jan 2009			
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<i>Biofuel</i>	Jan 2009	Jan 2009			
<i>Pipeline leakage reduction</i>	Jan 2009	Jan 2009			
<i>SF₆</i>	Jan 2009	Jan 2009			

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CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

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	Jan 2009
Hydro power	Jan 2009	Jan 2009			
Renewables Wind power	Jan 2009	Jan 2009		Jan 2009	Jan 2009
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Grid connection of isolated system	Jan 2009	Jan 2009		Jan 2009	Jan 2009
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Waste-heat / waste-gas recovery	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
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Energy efficiency	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
N ₂ O	Jan 2009	Jan 2009		Jan 2009	Jan 2009
HFCs	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
Flare reduction	Jan 2009	Jan 2009		Jan 2009	Jan 2009
PFCs	Jan 2009	Jan 2009		Jan 2009	Jan 2009
Charcoal	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
CO ₂ recovery	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
Transport	Jan 2009	Jan 2009		Jan 2009	Jan 2009
Non-renewable biomass	Jan 2009	Jan 2009		Jan 2009	Jan 2009
Biofuel	Jan 2009	Jan 2009		Jan 2009	Jan 2009
Pipeline leakage reduction	Jan 2009	Jan 2009		Jan 2009	Jan 2009
SF ₆	Jan 2009	Jan 2009		Jan 2009	Jan 2009

Høvik, 9 January 2009

Michael Lehmann

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Technical Director, Climate Change Services