



VALIDATION REPORT

Tiefa Coal Industry Group CMM Utilization Project in China

REPORT No. 2007-9112

REVISION No. 03



VALIDATION REPORT

Date of first issue: 2006-12-26	Project No.: 63603505	DET NORSKE VERITAS CERTIFICATION AS Veritasveien 1 N-1322 Høvik Norway http://www.dnv.com
Approved by: Mari Grooss Viddal	Organisational unit: Climate Change Services	
Client: Mitsui & Co., Ltd.	Client ref.: Masaya Inamuro	

Project Name: Tiefa Coal Industry Group CMM Utilization Project
Country: China
Methodology: ACM0008
Version: 03
GHG reducing Measure/Technology: Coal Mine Methane capture and utilization, and displacement of fossil fuel based energy sources.
ER estimate: Annual emission reductions are 731 169 tCO₂e during a first seven years renewable crediting period.
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 Tiefa Coal Industry Group CMM Utilization Project in China, as described in the PDD of 17 May 2008, 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 project as a CDM project activity.

Report No.: 2007-9112	Date of this revision: 2008-09-24	Rev. No. 03
Report title: Tiefa Coal Industry Group CMM Utilization Project in China		
Work carried out by: Weidong Yang, Wilson Tang, David Creedy		
Work verified by: Flagstad Oler Andreas, Michael Lehmann		

Key words:

Climate Change
 Kyoto Protocol
 Validation
 Clean Development Mechanism

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Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CBM	Coal Bed Methane
NCPG	Northeast China Power Grid
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CMM	Coal Mine Methane
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EIA	Environmental Impact Assessment
EPB	Environmental Protection Bureau
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
NMHC	Non Methane Hydro Carbon
ODA	Official Development Assistance
OM	Operation Margin
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change
VAM	Ventilation Air Methane



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1 EXECUTIVE SUMMARY – VALIDATION OPINION

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

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

The project correctly applies ACM0008 “Consolidated baseline methodology for coal bed methane and coal mine methane capture and use for power (electrical and motive) and heat and/or destruction by flaring”, version 3.

By supplying CMM to households and industrial uses to generate heat, this project will displace fossil fuel based energy sources instead of passively venting CMM. Hence, the project results in reductions of CH₄/CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 731 169 tCO₂e per year over the selected 7 years renewable crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented.

In summary, it is DNV’s opinion that the “Tiefa Coal Industry Group CMM Utilization Project” in China, as described in the PDD of 17 May 2008, 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 project as a CDM project activity.”



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2 INTRODUCTION

Mitsui & Co., Ltd. has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “Tiefa Coal Industry Group CMM Utilization Project” in China (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

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 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.

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.



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3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation:

- /1/ Mitsui & Co., Ltd., PDD of Tiefa Coal Industry Group CMM Utilization Project for City Gas, Version 1.1, dated 09 November 2006
- /2/ Mitsui & Co., Ltd., PDD of Tiefa Coal Industry Group CMM Utilization, Version 2.2, dated 03 July 2007
- /3/ Mitsui & Co., Ltd., PDD of Tiefa Coal Industry Group CMM Utilization, Version 3.1, dated 17 May 2008.
- /4/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.ieta.org/ieta/www/pages/index.php?IdSitePage=200>
- /5/ CDM Executive Board, ACM0008 - *Consolidated baseline/monitoring methodology for coal bed methane and coal mine methane and use for power (electricity or motive) and heat and/or destruction by flaring*, Version 03
- /6/ CDM Executive Board, *Tool for the demonstration and assessment of additionality*, Version 05
- /7/ CDM Executive Board, ACM0002 - *Consolidated baseline methodology for grid-connected electricity generation from renewable sources*, version 06.
- /8/ CDM Executive Board, Guidance for request for deviation titled "Application of AM0005 and AMS-I.D in China" (<http://cdm.unfccc.int/Projects/Deviations>)
- /9/ *National Coalmine Safety Regulation (2005)*
- /10/ Tiefa Coal Industry Group and Tieling Electricity Bureau, *Contract of Power Generation and Connection to Grid*, 01 March, 1999
- /11/ Host Party approval letter by DNA of China dated 05 March 2007
- /12/ Annex 1 Party approval letter by DNA of Japan dated 21 May 2007
- /13/ China NDRC and National Construction Committee, *Economic Evaluation Code and Parameter for Construction Project (Version 03)*
- /14/ China Coal Information Institute & National Institute for Occupational Safety (CCII&NIOS), *Financial Budget for CMM Utilization Project of Tiefa*, 10 July 2004
- /15/ Environment Impact Assessment for Daming Storage Station in 27 December 2006
Environment Impact Assessment for Daxing Storage Station in 20 December 2006
- /16/ Approval letters to EIA of Daming Storage Station from Environmental Protection Bureau of Tieling Municipality on 11 January 2007
Approval letters to EIA of Daxing Storage Station from Environmental Protection Bureau of Tieling Municipality on 11 January 2007
- /17/ Minutes of Tiefa Coal Industry Group CMM Utilization Project through CDM on 12 August 2004 (Participants to this meeting were the members of Board of Directors of



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Tiefa Coal Industry (Group) Limited Liability Company)

- /18/ Mitsui & Co., Ltd., Operations Monitoring Plan for the Tiefa Coal Industry (Group) Co., Ltd. CMM Utilization Project for City Gas, July 04 , 2007
- /19/ The compressor procurement contract signed on 8 October 2005 between Tiefa Coal Industry (Group) Co., Ltd. and Jiangxi Gas Compressor Co., Ltd.
- /20/ Memorandum of Understanding about CDM between Tiefa Coal Industry Group and Mitsui & Co., Ltd. on 7th March, 2005.
- /21/ Cooperation Agreement about CDM Project between Tiefa Coal Industry Group and Mitsui & Co., Ltd. on 19th December, 2005

The main changes between the version of the PDD published for the 30 days stakeholder consultation period and the final version of the PDD submitted for registration:

- Project title change to conform to that in the LoA from Chinese DNA
- More detailed information about formulating baseline scenario alternatives
- More detailed information about CMM utilization in the baseline scenario

3.2 Follow-up Interviews with Project Stakeholders

	Date	Name	Organization	Topic
/22/	2007-01-15	Guojun Li	China Coal Information Institute	➤ 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
/23/	2007-01-15	Junya Nishikawa, Mao Sun	Mitsui & Co., Ltd.	➤ 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



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/24/	2007-01-15	Ms. Xin Sun, Hongjun Li	Tiefa Coal Industry (Group) Co., Ltd.	➤ Information of project construction ➤ The development of CMM utilization projects in China ➤ Starting date of project and crediting period ➤ The approval status (incl. EIA approval, the feasibility study report approval, CDM project approval) ➤ Technology utilized ➤ Historical gas venting/drainage ➤ Risks and barriers for investment and technology ➤ Training and detailed procedures and records. ➤ Emission reduction monitoring plan and implementation ➤ Consulting process for stakeholders' comments
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3.3 Resolution of Outstanding Issues

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

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

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the "Tiefa Coal Industry Group CMM Utilization Project" is enclosed in Appendix A to this report.

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

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

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

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Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities				
Requirement	Reference	Conclusion		
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (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
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a corrective action request (CAR) due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table 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
If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the project participants during the communications with the validation team should be summarised in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

Figure 1 Validation protocol tables



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3.4 Internal Quality Control

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

3.5 Validation Team

Role/Qualification	Last Name	First Name	Country
Team Leader, CDM validator	Yang	Weidong	China
Sector expert	Creedy	David	China
CDM validator	Tang	Wilson	China
Technical reviewer (applicant)	Flagstad	Ole Andreas	Norway
Technical reviewer	Lehmann	Michael	Norway

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 revised and resubmitted project design documentation.

4.1 Participation Requirements

The project participants are Tiefa Coal Industry (Group) Co., Ltd. of China and Mitsui & Co., Ltd. of Japan. The host Party China and the participating Annex I Party Japan meet the requirements to participate in the CDM.

The DNA of China has issued a Letter of Approval (LoA) /11/ on 05 March 2007, authorizing Tiefa Coal Industry (Group) Co., Ltd. as a project participant and confirming that the project assists in achieving sustainable development.

The DNA of Japan has issued a LoA /12/ on 21 May 2007 authorizing Mitsui & Co., Ltd. as a 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 proposed project aims to supply coal mine methane (CMM) to two gas companies, and the two gas companies will supply gas to factories as industrial fuel and to households as city gas. The proposed project will collect CMM from six coalmines (Daxing, Dalong, Xiaonan, Xiaoqing, Daming and Xiaoming). The gas supply is kept high and stable by installing additional equipments, such as gas tanks and compressors, and by developing the goaf wells.

Currently, only less than 5% of the total CMM emitted by China is being used at coal mines and utilization of CMM is thus not common practise. Moreover, advanced gas drainage technology, namely surface vertical goaf wells, need to be installed in the project in order to meet the utilization requirements by the gas companies. The project is one of the first commercial scale projects in China to use this technology. The project is deemed to employ best practice currently available in China.

The project starting date was 8 October 2005. The selected start date is the date on which the first equipment procurement contract was signed /19/.

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The expected operational lifetime of the project is at 20 years, which is considered reasonable. A 7-year renewable crediting period starting from 1 September 2008 or the date of registration, whichever is later, is selected.

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4.3 Baseline Determination

The project applies the approved baseline methodologies ACM0008 (version 03) “Consolidated baseline/monitoring methodology for coal bed methane and coal mine methane and use for power (electricity or motive) and heat and/or destruction by flaring” /5/.

DNV was able to verify that the project meets all applicability criteria of ACM0008s: The project will drain and capture CMM. The captured CMM will be utilized as energy to generate heat. All six project mines, Daxing, Dalong, Xiaonan, Xiaoqing, Daming and Xiaoming, are underground coal mines. No CBM drainage will be involved in the project.

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

In step 1, four options for CMM extraction, nine options for extracted CMM treatment, and three options for energy production are identified. These options are technically feasible and conform to the requirements of ACM0008 and the project’s situation.

In step 2, according to the identified relevant regulatory requirement “*National Coalmine Safety Regulation*” /9/. Only one option of CMM extraction complies with the requirements of the regulation. For “Options for CMM Treatment”, the option to “use for additional captive power generation” is eliminated according to the regulatory requirement of captive power generation.

In step 3, six baseline scenario alternatives are formulated, including the BAU and the proposed project activity undertaken without being registered as a CDM project activity. The formulation is reasonable and appropriate.

In step 4, either technology or financial barriers are identified for all the other baseline scenario alternatives except for the BAU. The barrier assessment is appropriate.

It is in our opinion sufficiently demonstrated that among all the identified baseline scenarios, the most likely baseline is the continuation of the current practice, i.e. continuation of the current CMM extraction practice with most of the CMM to be released into the atmosphere.

The system boundaries are presented in the following table:

	GHGs involved	Description
Baseline emissions	CH ₄	Baseline emissions from methane release into atmosphere that are avoided by the project activity, i.e. equivalent to what is utilized in the project activity.
Project emissions	CO ₂	Electricity required to operate ancillary equipment and facilities such as gas extraction stations and pumps.



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	CO ₂	Emissions from combustion of methane in the end users.
	CH ₄	Unburned methane from combustion use in the end users.
Leakage		No leakage

4.4 Additionality

Since the project's starting date is prior to the project requesting validation, DNV requested and assessed evidence that demonstrates that CDM benefits were seriously considered in the decision to proceed with the project activity. The evidence provided was the Minutes of Meeting by the Tiefa Coal Industry Group on 12 August 2004 /17/ (in this meeting, the members of BoD of Tiefa Coal Industry (Group) Limited Liability Company decided to proceed with the project as a CDM project), which was verified by DNV. After the decision, the project proponent had been pursuing the CDM benefit evidenced by signing a Memorandum of Understanding /20/ with Mitsui & Co., Ltd. on 7th March, 2005 to confirm both parties' intention to proceed with this Project as a CDM project and by signing a Cooperation Agreement /21/ on 19th December, 2005 to confirm basic terms and conditions applicable to the commercial transaction between Tiefa Coal Industry Group and Mitsui & Co., Ltd. Then, on 8th October, 2005, Tiefa Coal Industry (Group) Limited Liability Company signed the first equipment procurement contract /19/ for this project; the date is defined as the starting date of the project.

The project applies the "Tool for demonstration and assessment of additionality" /6/ to demonstrate its additionality in the following steps:

Step 1: Identification of alternatives to the project activity consistent with mandatory laws and regulations. Alternatives to the project activity were identified and assessed according to the 4 steps as described in section 4.3 above and in accordance with ACM0008. The PDD ignores step 1 of the additionality tool as ACM0008 allows for this due to the similarities with the baseline scenario determination.

Elimination of baseline options that do not comply with legal or regulatory requirements: *The National Coalmine Safety Regulations* /9/ require that the maximum concentration of methane in a mine's ventilation air remain below 1%; only one of the CMM extraction options, that is, combination of ventilation, pre-mining CMM and post-mining can ensure that this requirement is met. According to the regulatory requirement of captive power generation, the option to "use for additional captive power generation" is eliminated.

Formulation of baseline scenario alternatives: six alternatives have been formulated, including continuation of the current situation and the proposed project activity not implemented as a CDM project. The other five different alternatives for CMM treatment are also elaborated in detail.

All of the identified baseline options are in compliance with the local legal and regulatory requirements except for sole ventilation air methane, pre mining CMM, post mining CMM and use of CMM for additional captive power generation.



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Elimination of baseline scenario alternatives that face prohibitive barriers: Technical barriers and investment barriers have been discussed. Due to these barriers, the baseline scenario is that most drained gas is vented. The baseline scenario represents the current BAU scenario, which is deemed as a feasible baseline scenario in absence of the CDM.

Step 2: Investment analysis:

Since the proposed project will generate financial benefits through sales of CMM, and since the baseline is the continuation of the current situation, which is not an investment, the benchmark approach is selected for the investment analysis.

A benchmark rate of return (IRR) of 8% is selected. According to “Economic Evaluation Code and Parameter for Construction Project (Version 03)”/13/ published by China NDRC and National Construction Committee. In China, most key industries practically set such hurdle rate at eight percent (8%). The benchmark rate is deemed to be reasonable.

The IRR of the project is calculated as 5.53%.

A sensitivity analysis is conducted with the three most important parameters. The following analysis results demonstrate that within the reasonable range, the calculated IRR is still below the benchmark and that the project is not the most financially attractive alternative.

Investment costs:

Only when the investment cost is decreased 23.7%, will the IRR be over the benchmark. But a 23.7% decrease is not possible for the following reason:

In this project, the biggest investment will be made for the development of surface vertical goafwells. This cost mainly consists of procuring steel pipes used as wells. When Tiefa decided to implement this project, it is reasonably predicted that demand of steel pipes continue to outstrip supply of them, hence, it is reasonable that Tiefa Coal Industry (Group) Co., Ltd. judged that it is unlikely that such a large decrease (23.7%) in investment costs would happen.

Operating costs:

Only when the operation cost is decreased 15.6%, will the IRR be over the benchmark. But, in this project, the largest component of operating costs is labor costs. Considering the economic growth in China, it is highly unlikely that labor cost will be largely decreased.

Gas sales revenue:

Only when the gas sales revenue is increased 8.4%, will the IRR be over the benchmark. But, this is highly impossible for the following reasons:

- Gas Sales Price for the sales to Shenyang Aode Fuel Gas Co. is determined in accordance with the formula in the long term sales contract where the unit price of CMM will be automatically discounted if the consumption amount increases, hence, there exists no case that the total gas sales revenue will increase equal to or more than 8.4%, since even if the total sales quantity will increase, unit price will be discounted.
- And in case of sales to Tieling Panva Gas Co., Ltd., there is a contract effective until the end of 2007 and after that unit Gas Sales Price will be decided by negotiation by taking into account unit Gas Sales Price to Shenyang Aode Fuel Gas Co., hence, in this



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case, either, there might be small possibility that the unit Gas Sales Price increases equal to or more than 8.4%

In assessing the input values used in the investment and sensitivity analyses, DNV has followed a 4-step approach:

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

All the input parameters used in the financial analysis were from the Financial Budget for CMM Utilization Project of Tiefa /14/, which was prepared by the China Coal Information Institute & National Institute for Occupational Safety (CCII&NIOS) on 10 July 2004. The Financial Budget for CMM Utilization Project of Tiefa /14/ was deemed as acceptable document for the following reasons:

- The Financial Budget was prepared by CCII&NIOS which is a national leading research institute directly under the State Administration of Work Safety. The input parameters used in the financial analysis can thus be considered information provided by an independent and recognized source:
- The data collecting process for the Financial Budget for CMM Utilization Project of Tiefa included the following data:
 - ✓ Revenue: The amount of gas supplied to Tieling, CCII & NIOS was estimated considering the estimation provided in F/S for Tieling (1999). Regarding gas supply to Faku, this is based on CCII & NIOS's estimation by considering the results of interview with gas sales company in Faku. For the unit price of gas supplied to Tieling, CCII & NIOS adopted the unit price provided in the agreement between Tiefa and gas sales co. Regarding gas supplied to Faku, CCII & NIOS estimated this considering the situation of the negotiation between Tiefa and gas sales co. at that time.
 - ✓ Operation & Maintenance Cost: CCII & NIOS assumed future O&M costs considering the historical record of O&M costs incurred by Tiefa.
 - ✓ Fixed Asset Investment: CCII & NIOS estimated this by using its own experience and expertise.

All the above input parameters were available at the time when the decision to proceed with the project was made (the start date of the project was 8 October 2005, the date on which the first equipment procurement was signed) and was thus likely to be considered in the investment decision.

Step 2: Confirmation of the values used in the PDD and investment analysis are fully consistent with the Financial Budget for CMM Utilization Project of Tiefa: DNV compared the input parameters for the financial analysis included in the PDD and investment analysis with the parameters stated in the Financial Budget for CMM Utilization Project of Tiefa and was able to confirm that the values applied are consistent with the value stated in the Financial Budget for CMM Utilization Project of Tiefa.

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Step 3: Assessment of the period of time between the finalization of the Financial Budget for CMM Utilization Project of Tiefa and the investment decision:

a) Financial Budget for CMM Utilization Project of Tiefa was completed on 10 July 2004, just before the implementation of the project (12 August 2004).

Step 4: Cross-check of the parameters used in the financial analysis with the parameters used by other similar projects:

The input parameters used in the financial analyses were compared with the data reported for other similar proposed CDM projects in the region, i.e. other CMM supply projects in China, by comparing investment costs per volume gas supplied, gas tariff, 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.

Step 4: Common practice: An analysis of CMM capture and utilization in China has been performed. This shows that only less than 5% of the total CMM emitted by China is being used at coal mines. This means that the technology of CMM extraction and utilization is not widespread in China. Moreover, to consistently produce large enough quantities of CMM (>35% methane), Tiefa needs to use advanced gas drainage technology, namely surface vertical goaf wells, as one of the first commercial scale projects in China. The specific conditions in Tiefa coalmine distinguish it from other Chinese coalmines that may currently utilize CMM. Currently, there is no similar project in China to feed CMM into gas pipeline as fuel for industrial use, as well as city gas. So a conclusion can be made that the proposed project activity is not a common practice in China.

In summary, it is clearly 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 monitoring methodology ACM0008 is correctly applied for the monitoring.

4.5.1 Parameters determined ex-ante

The following parameters are determined ex-ante, and have been validated by DNV.

Data and Parameters	Unit	Value applied	Source of data used
Density of methane	kg/m ³	0.67	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Average carbon content of LPG	tC/TJ	17.2	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories
CO ₂ emission factor of Town Gas	tCO ₂ /TJ	110.080	Calculated from local analytical data and Revised 2006 IPCC

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			Guidelines for National Greenhouse Gas Inventories
Operating margin of China Central grid (OM)	tCO ₂ /MWh	1.2404	Calculated following ACM0002 based on values from NDRC
Build Margin of China Central grid (BM)	tCO ₂ /MWh	0.8631	Calculated following ACM0002 based on values from NDRC
Overall efficiency of methane destruction/oxidation through gas grid to various combustion end uses, combining fugitive emissions from the gas grid and combustion efficiency at end user (Eff _{GAS})	%	98.5	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories as stipulated by ACM0008

4.5.2 Parameters monitored ex-post

The following data and parameters need to be monitored; these are considered appropriate.

1. Additional electricity consumption by project;
2. Methane sent to gas supply stations, by measuring concentration, volume, pressure and temperature of the incoming CMM;
3. NMHC concentration in CMM;

4.5.3 Management system and quality assurance

The monitoring plan provides for the collection and archiving of all relevant data:

Project emissions:

- additional electricity consumption by the project CON_{ELEC,PJ};
- CMM sent to the gas supply stations, – their concentration, flow, temperature and pressure
- r , the relative proportion of NMHC compared to CH₄.

Baseline emissions:

- CMM captured, sent to and destroyed in the project activity that would be released to the atmosphere in the baseline;

Leakage:

- No leakage needs to be addressed in the project. See also in 4.6.

All of the above parameters will be monitored continuously except for the non-methane hydrocarbons (NMHC) concentration in the coal mine gas and its carbon emission factor, which will be monitored annually.



VALIDATION REPORT

The responsibility and authority for registration, monitoring, measurement and reporting activities have been properly addressed in the PDD. Also, DNV was able to verify that necessary procedures related to data handling, quality assurance and training of monitoring personnel have been appropriately implemented.

4.6 Estimate of GHG Emissions

Estimate of GHG emissions are in accordance with the formulae given in the baseline and monitoring methodology ACM0008.

Project emission:

The project emission includes additional electricity used to capture and utilize methane PE_{ME} , CO_2 emissions from methane destroyed PE_{MD} and un-combusted methane PE_{UM} . The project boundary includes all equipment for the extraction, compression, storage and transportation of the captured CMM.

For PE_{MD} and PE_{UM} : the default value Eff_{GAS} (98.5%) given in the methodology is applied.

The quantity of methane sent to gas supply station is estimated according to CMM sales forecast.

For the calculation of the project emissions due to additional electricity, the Northeast China Power Grid (NCPG) has been selected as the grid system boundary. This is in accordance with the consolidated baseline methodology ACM0002 which ACM0008 requires to apply to determine a grid electricity emission coefficient. As plant specific fuel consumption and electricity generation data is not publicly available in China, the operating margin (OM) and build margin (BM) emission coefficients were determined according to the guidance by the CDM Executive Board on the application of AM0005 and AMS-I.D in China /8/. Due to the similarities of AM0005 and ACM0002, the EB guidance on AM0005 is deemed to also be applicable to ACM0002.

For the displacement of grid electricity, the combined margin emission coefficient (CM) for Northeast China Power Grid (NCPG) has been determined *ex-ante* in accordance with the “simple OM” approach and BM approach described in ACM0002.

The operating margin (OM) is calculated using the “simple OM” method which is justified because low cost must run projects constitute less than 50% of the total grid generation.

The aggregated generation and fuel consumption data are used due to less aggregated data are not available in the NCPG. Country specific data for net calorific value (NCV_i) of each type of fossil fuel, the IPCC’s effective CO_2 emission factor of each type of fossil fuel and the total electricity delivered to the NCPG selected are deemed reasonable. The data of the local emission factors ($EF_{CO_2,i}$) of the coal selected (25.8 tC/TJ) is conservative. Vintage data for the years 2003, 2004 and 2005 are used for operating margin calculation. The OM is correctly evaluated to be 1.2404 tCO₂/WMh.



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Following the EB's guidance /8/ the build margin is calculated to be 0.8631 tCO₂/MWh as follows:

- The capacity additions from the years 1998 to 2005 is chosen which represents 21.34% of total installed capacity.
- The weight of installed capacity additions for thermal power plant is accounted for 91.31% of total installed capacity additions;
- There are no data available of installed capacity additions for oil and gas power in NCPG. However, the China Energy Statistics Yearbook (2006) shows that the oil and gas used in NCPG are very small, and only for starting up systems of coal fired power plant, accounting for ca. 1.12% of the total CO₂ emissions. So the installed capacity addition for oil and gas power plants being regarded as zero is deemed reasonable.
- The coal consumption efficiency of 343.33 g SCE/kWh identified as the best technology commercially available in China by the DNA of China¹ is applied. This corresponds to a generation efficiency of 35.82% for coal-fired electricity generation.

The weights ω_{OM} and ω_{BM} are selected as 0.5 and 0.5, respectively, as stipulated by the ACM0002 version 06.

The combined margin of 1.0518 tCO₂/MWh is fixed *ex-ante* for the entire first crediting period.

The latest data used to calculate OM and BM is derived from China Electric Power Yearbooks 1999, 2004 to 2006 editions and China Energy Statistical Yearbooks 2004, 2005 and 2006 editions. They are the latest data available at the time of PDD submission.

The GHG calculations are complete and transparent, and their accuracy has been verified.

Baseline emissions

The baseline emissions consist of the CH₄ emissions resulting from release of methane to the atmosphere avoided by the project (BE_{MR,y}) and baseline destruction (BE_{MD}).

The BE_{MR,y} was estimated according to the calculations defined in the ACM0008 by timing the quantity of CMM supplied to the grid with the emission factor of methane.

The only methane destruction in the baseline scenario is to supply gas for heat use in Tieling City and Tiefa coal-mine workers residents. The baseline use for CMM is estimated for the project period according to the ACM008 as following:

- Approach a) in the ACM0008 (*Engineering / economic study of thermal energy demand*) was used to project the baseline thermal demand (TH_{BL,y});
- Maximum scalar adjustment factor for month k over the past 5 years ($d_k^{\max}$) was calculated with most recent five-year baseline thermal use data to reflect seasonal variations;
- Methane used to serve thermal energy demand in the baseline (TH_k) was calculated by timing the above two parameters;

¹ <http://www.ccchina.gov.cn/source/ca/ca2004112501.htm>



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- Total methane extracted (ME_k) and total methane used for the project ($MM_{HEAT,k}$) were determined;
- $(ME_k - MM_{HEAT,k}) > TH_k$. So, it can be concluded that there will be no leakage.

Since there is no CBM involved in the project, all the methane destroyed in the project is included as $BE_{MR,y}$.

Leakage

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

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

There is thermal energy use in the baseline, but, no leakage needs to be considered for the displacement of baseline thermal energy use because the quantity of extracted CMM minus the quantity of CMM used in the project is far beyond the quantity of CMM used in the baseline (referring to “Section: Baseline Emissions” for details).

Considering the following situations of the proposed project:

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

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

Uncertainty

The major uncertainty related to the project’s emission reductions is the amount of CMM captured in the future. To estimate future CMM, the project owner provided its formal coal production plan for the 10 years after project start. Relative emissions are not likely to vary significantly at each mine so gas availability can be reasonably predicted from the product of relative emissions and projected annual coal production levels, given that demand for coal will remain at the same level for at least the crediting period.

4.7 Environmental Impacts

Tiefa Coal Industry (Group) Co., Ltd. has performed environment impact assessment (EIA) for the CMM project activity in December 2006. And the EIA have been approved by local



VALIDATION REPORT

environment protection bureau (EPB) in January 2007. No significant adverse impacts to the environment were identified. The relevant environmental impacts are sufficiently documented in the PDD.

4.8 Comments by Local Stakeholders

Through local TV, newspaper and website of Tiefa Coal Mining Group, local stakeholders were invited to make comments for the project. In addition, representatives from the local government, environmental department and groups of enterprises as well as local residents were also invited by phone. More than 30 delegates participated in the consulting meeting, including representatives from the governmental departments, enterprises and local residents. Summary of comments were provided; no negative comments were received.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD's (Version 1.1, dated 09 November 2006, and Version 2.2, dated 03 July 2007 (republished because of revised ACM0008)) were made publicly available on DNV's climate change website² and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period respectively from 11 November to 10 December 2006 and from 28 March to 26 April 2007, respectively.

One comment was received on 17 November 2006. The comment received (in unedited form) is given in the below text box.

Comment by: Yang Qingqing

Inserted on: 2006-11-17

Subject: baseline

Comment: The project owner started the practice of city gas use by developed 7 storage tanks and 50 kilometers pipes (since end of 90's) to have Tieling city utilize CMM (in 2002). Obviously at least Tieling city CMM utilization is part of the baseline thermal energy demand. Which potentially can consume 43 million M3 CMM a year.

Tiefa started utilize CMM since 1985. Now it sends city gas to diaobingshan city, tieling city, kaiyuan city, qinghe district. These should all be included in baseline thermal energy demand.

More, the project combined both Faku (price at 0.28) and Tieling (price at 0.37) together to do the IRR analysis, therefore got 5.52%. While if only analyse Tieling, then the IRR should exceed 8%.

How DNV has considered the comment received in its validation:

The project participants considered the baseline use of the CMM mentioned in the comments, and had explained accordingly in the Section Leakage of PDD (Page 32 – 39).

As for the IRR calculation result, the project proponent provided the following explanation:

Gas utilization can be considered separately for gas supply to Tieling and to Faku, in theory. However, because some parts of pipeline can be utilized for several users simultaneously, the

² http://www.dnv.com/focus/climate_change/projects/projectlist.asp?



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Tiefa Coal Industry Group's optimal solution for investment decision-making is to supply as much gas as possible (taking the physical constraints into account). It is obvious that the project formation (consisting of four users) is the optimal solution, if supplying. Therefore, it becomes sufficient enough to consider gas supply to Tieling and to Faku as a package. Hence, it is adequate to calculate IRR for whole gas supply as a package. Furthermore, assumption for the gas sales price set in the comment is not accurate. In the calculation of the IRR, CMM sales price applied for the gas delivered from Tiefa Coal Industry Group to Shenyang Aode Fuel Gas Co. (which in turn supplies CMM to end users), during the period from 8 August 2006 to 31 December 2007, is set at 0.28 RMB/m³ (provided in the gas sales agreement) while such price from 1 January 2008 is set at 0.37 RMB/m³, which is same as the gas sales price to Tieling City. Also considering that the first three year period is the construction period, the gas supplied amount to Shenyang Aode Fuel Gas Co. during 8 August 2006 to 31 December 2007 is reasonably small, so that even in the case of using 0.37 RMB/m³ as the applicable sales price for the entire gas supplied, the increase in the IRR is not so big and the new IRR continues to fall below the 8% hurdle level. Considering the above, even if IRR is calculated separately for each gas supply, IRR for gas supply to Tieling does not exceed 8%.

In DNV's opinion, the revision of the PDD and the explanation given above adequately address the comment made.

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	OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK

Requirement	Reference	Conclusion
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	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	OK
Other		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
16. A baseline shall be established on a project-specific basis, in a transparent manner	CDM Modalities and Procedures §45c,d	OK

Requirement	Reference	Conclusion
and taking into account relevant national and/or sectoral policies and circumstances.		
17. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
18. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
19. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	~~CL-2~~ OK

Table 2 Requirements Checklist

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
* MoV = Means of Verification, DR= Document Review, I= Interview						
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?		/3/	DR I	Yes. The project is located in the north part of Shenyang, the capital of Liaoning province, in the northern part of China.		OK
A.1.2. Are the project’s system boundaries (components and facilities used to mitigate GHGs) clearly defined?		/3/	DR I	The PDD defines the system boundaries according to the ACM 0008, the boundaries include, ● All equipment installed and used as part of the project activity for the extraction, compression and storage of CMM at the project site and transportation of CMM to gas supply stations. ● End users of the CMM, to which the project supply CMM. ● Power plants connected to the electricity grid, from which the project activity use additional electricity, as per the definition of project electricity system and connected electricity system given in ACM0002.		OK
A.2. Participation Requirements						

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<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?	/3/	DR I	Tiefa Coal Industry (Group) Co. Ltd. in China, and MITSUI & CO. LTD in Japan are participating in the project.		OK
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?	/11/ /12/	I	Letters of Approval from DNA of China and DNA of Japan have been received.		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		I	Yes. China ratified the Kyoto Protocol on 30 August, 2002. Japan ratified the Kyoto Protocol on 04 June 2002. Chinese DNA is the National Development and Reform Commission. Japanese DNA is the Liaison Committee for the Utilization of the Kyoto Mechanisms Ministry of Foreign Affairs.		OK
A.2.4 Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/3/	DR I	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.		OK
A.3. Technology to be employed					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<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?	/3/	DR I	Yes. The project is divided into two parts: One is to capture and recover CMM from working coal seams. Another is the gas utilization systems by sending the CMM to gas grid.		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?	/3/	DR I	Yes, The project uses advanced gas drainage technology, surface vertical goaf well, as one of the first commercial scale projects in China.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/3/	DR I	Yes. The relevant training plan and records for the project are provided and verified.		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?	/11/	DR I	This is confirmed by the DNA of China.		OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/3/	DR I	Yes. The project will also assure the coal mine safety, decrease emission of air polluting substances and increase opportunity		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				of local employment.		
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?		/3/ /5/	DR I	Yes. The project is using ACM0008 “Consolidated baseline methodology for coal bed methane and coal mine methane capture and use for power (electrical and motive) and heat and/or destruction by flaring” (version 03).		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?		/3/ /5/	DR I	Yes. The project is located at existing underground coal mines, which will use surface vertical goaf well to recover the CMM. Part of the extracted CMM will be supplied to gas grid. Prior to the project, the baseline scenario represents the partial release of the CMM to the air. The project meets all the applicability requirements of ACM0008.		OK
B.2. Baseline Scenario Determination						

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
* MoV = Means of Verification, DR= Document Review, I= Interview						
<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?	/3/	DR I	The baseline scenario is alternative A (Business as usual); it includes two parts; one is continuation of current gas extraction practice. It consists of a combination of VAM extraction, pre-mining CMM from underground boreholes and post-mining CMM from surface goaf wells; another is also the continuation of the current situation, which involves venting of 93.7% of extracted CMM and using the other 6.3% in the same manner as the current situation.		OK	
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/3/	DR I	All other alternative scenarios considered include two parts; one is continuation of current gas extraction practice. It consists of a combination of VAM extraction, pre-mining CMM from underground boreholes and post-mining CMM from surface goaf wells; another parts for other alternatives are as following respectively: B. VAM Utilization No changes to the thermal supply in the coalmines, only using VAM (methane concentration at <0.75%) to produce heat.		OK	

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			C. Flare The CMM drained would be destroyed by flaring. No changes will be made to power and heat supply D. Gas supply(in this case, all energy demand is met by supplied gas) Gas is extracted from pre-mining CMM from underground boreholes and post-mining CMM from surface goaf wells and a ratio of 79% (average during 2007-2013) will be fed into the gas pipeline to be used for city gas or other industrial use while the remaining 21% (average during 2007-2013) will be released into atmosphere without use (Equivalent to the project activity without CER). E. Grid Power Generation The extracted CMM with methane concentration more than 30% could be combusted in reciprocating engines or gas turbines to generate electricity for the local grid. F. Heat Generation Recovered CMM could be combusted in gas boilers to produce thermal energy at the coal mine. This thermal energy could be in the form of hot water, hot air or steam.		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			The selected scenario is the most likely one, because it is the continuation of the project owner’s current practice, while other scenarios face following barriers respectively: Option B faces barriers of prohibitive technology. For VAM utilization, only pilot plant projects are implemented; and have not been proven as a commercially stable operation and implemented in a commercial scale. Option C, as flaring requires additional costs without any revenue created. So clearly, it faces tremendous barriers. Option E, the local grid company will not make any payment for the electricity generated and supplied by the e power plant to the grid. So, this option will face investment barriers. Option F, There is and will be no additional significant heat demand in the coverage of the relevant heat supply system. Therefore, this option faces investment barrier. Option D, the IRR is only 5.53%, while the benchmark IRR for this industry is 8%. So, this option is not economically feasible to		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				implement.		
B.2.3. Has the baseline scenario been determined according to the methodology?		/3/ /5/	DR I	Yes. The discussion for the determination of the baseline basically follows the key methodological steps indicated by ACM0008. 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; Step 4: Eliminate baseline scenario that faces prohibitive barriers.		OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?		/3/ /5/	DR I	Yes. The baseline has been determined using conservative assumptions where possible. The baseline has been determined in line with the methodology, using the 4 steps.		OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?		/3/ /9/	DR I	Yes. The baseline scenario has taken into account all relevant national and sectoral policies, including the National Coalmine Safety Regulation. The macro-economic trends and political aspirations are also taken into account.		OK
B.2.6. Is the baseline scenario determination compatible		/3/	DR	Yes. The baseline is determined using data		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
with the available data and are all literature and sources clearly referenced?		I	available.		
B.2.7. Have the major risks to the baseline been identified?	/3/	DR I	Yes. The major risk to the baseline is the decrease of the coal production, which will lead to the decrease of the methane drainage amount.		OK
B.3. Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					
B.3.1. Is the project additionality assessed according to the methodology?	/3/ /5/	DR I	ACM 0008 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?	/3/	DR I	Yes. All assumptions are stated in a transparent and conservative manner.		OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/3/	DR I	Yes. Sufficient evidence is provided to support the relevance of the arguments made.		OK
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/17/	DR I	The Minutes of Tiefa Coal Industry Group CMM Utilization Project through CDM on 12 August 2004 demonstrates that the incentive from the CDM was seriously considered in the decision to proceed with the		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				project activity.		
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?		/3/	DR I	Yes. The calculations are documented according to ACM0008 and in a complete and transparent manner. ACM0008 only allows to claim emission reductions from generating heat and the methodology requires to monitor the heat generated by the project. This is obviously not possible for CMM being supplied to a gas network with many users. Hence, ACM0008 allows that CMM is supplied to a gas network and used by many users, but not that emission reductions are claimed from displacing fossil fuels because of this. ACM0008 states that $BE_{Use,y}$ are baseline emissions from the production of power, heat or supply to gas grid replaced by the project activity, but ACM0008 only includes equations for power and/or heat generation, but not for determining baseline emission		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			from supply to gas grid. Hence, the project can not claim emission reductions from displacing fossil fuels at users of the natural gas supplied to the gas network and these emissions need to be removed from the PDD.		
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/3/	DR I	Yes. The efficiencies of methane destruction for gas grid are in compliance with the IPCC default values. For additional electricity use, in the Northeast China Power Grid (NCPG), the CEF is calculated ex-ante in accordance with ACM0002. The OM emission coefficient is determined ex-ante using aggregated generation and fuel consumption data published in China Energy Statistics Yearbook for the most recent three years for which data are available, i.e. 2004, 2005 and 2006. The simple OM emission coefficient is calculated as 1.2404tCO₂/MWh. The calculation of the BM emission coefficient is in accordance with the EB's guidance for the application of AM00005 in China. - The capacity additions from the years 1998 to 2005 is chosen and reach 21.34% of total installed capacity. - The weight of installed capacity additions		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			for thermal power plant is accounted for 91.31% of total installed capacity additions, where 98.88% from coal, 0.27% from oil and 0.85% 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 NCPG.		
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/3/	DR I	Yes.		OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/3/ /5/	DR I	The calculations are basically documented according to the approved methodologies and in a complete and transparent manner except for that the methane used to serve estimated thermal energy demand in the baseline for year y ($TH_{BL,k}$) should be calculated	CL1	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			according to the ACM0008. ACM0008 only allows to claim emission reductions from generating heat and the methodology requires to monitor the heat generated by the project. This is obviously not possible for CMM being supplied to a gas network with many users. Hence, ACM0008 allows that CMM is supplied to a gas network and used by many users, but not that emission reductions are claimed from displacing fossil fuels because of this. ACM0008 states that $BE_{Use,y}$ are baseline emissions from the production of power, heat or supply to gas grid replaced by the project activity, but ACM0008 only includes equations for power and/or heat generation, but not for determining baseline emission from supply to gas grid. Hence, the project can not claim emission reductions from displacing fossil fuels at users of the natural gas supplied to the gas network and these emissions need to be removed from the PDD.	~~CAR 1~~	OK
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/3/	DR I	Yes. Conservative assumptions have been used when calculating baseline emission. For the replaced heat generated by LPG and town gas, the carbon emission factor of 17.2tC/TJ was used for LPG; 110.080 tCO ₂ /TJ for town		OK

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			gas was used according to the local analytical result and IPCC values.		
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/3/	DR I	Yes.		OK
B.6. Emission Reductions <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					
B.6.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/3/	DR I	Yes.		OK
B.7. Monitoring Methodology <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					
B.7.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/3/ /5/	DR I	Yes. The monitoring plan is documented according to the approved methodology and in a complete and transparent manner.		OK
B.7.2. 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?	/3/	DR I	Yes.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.8. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
B.8.1. 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?	/3/	DR I	Yes. The project emission will be determined based on the CO2 emissions resulting from the utilization of CMM sent out by the project, additional energy used in the project and un-combusted methane. The flow, concentration, temperature and pressure of the CMM sent to gas grid will be monitored and archived. Additional electricity used will also be monitored and archived. The emission factors applied to determine the emissions due to the project’s additional electricity are determined ex ante in accordance with ACM0002 (version 6). The value for r (relative proportion of NMHC to the methane concentration) will also be monitored.		OK
B.8.2. Are the choices of project GHG indicators reasonable and conservative?	/3/ /5/	DR I	The choice of the indicators are reasonable and in line with the methodology.		OK
B.8.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/3/	DR I	Yes, The measurement methods for all GHG value are clearly stated and deemed appropriate.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.8.4. Is the measurement equipment described and deemed appropriate?	/3/	DR I	Yes.			OK
B.8.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/3/	DR I	The measurement accuracy should be addressed clearly.	~~CL-2~~		OK
B.8.6. Is the measurement <i>interval</i> identified and deemed appropriate?	/3/	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.8.7. Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?	/3/	DR I	Yes.			OK
B.8.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/3/	DR I	Yes.			OK
B.8.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/3/	DR I	Yes.			OK
B.9. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for</i>						

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>reliable and complete baseline emission data over time.</i>					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/3/	DR I	According to the monitoring plan, the project owner will monitor CMM captured, sent to the gas grid that would be released to the atmosphere in the baseline.		OK
B.9.2. Are the choices of baseline GHG indicators reasonable and conservative?	/3/	DR I	Yes. The choices of the baseline indicators are conservative and deemed reasonable.		OK
B.9.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/3/	DR I	Yes.		OK
B.9.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/3/	DR I	Yes.		OK
B.9.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/3/	DR I	The measurement accuracy should be addressed clearly.	CL-2	OK
B.9.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/3/	DR I	The measurement interval is identified and deemed appropriately. All the measurement intervals are continuous.		OK
B.9.7. Is the registration, <i>monitoring, measurement</i> and <i>reporting</i> procedure defined?	/3/	DR I	Yes.		OK
B.9.8. Are procedures identified for <i>maintenance</i> of	/3/	DR	Yes		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
monitoring equipment and installations? Are the calibration intervals being observed?		I			
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)	/3/	DR I	Yes.		OK
B.10. 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.10.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/3/	DR I	Chinese DNA does not require collection and archiving of data related to environmental, social and economic impacts of the CMM fired power plant. The environmental impacts will be monitored by local environmental authority.		OK
B.10.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/3/	DR I	Chinese DNA does not require collection and archiving of data related to environmental, social and economic impacts of the CMM gas grid. The environmental impacts will be monitored by local environmental authority.		OK
B.10.3. Are the sustainable development indicators in line with stated national priorities in the Host	/3/	DR I	Chinese DNA does not require collection and archiving of data related to environmental,		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Country?				social and economic impacts of the CMM gas grid.		
B.11. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>						
B.11.1. Is the authority and responsibility of overall project management clearly described?		/3/	DR I	Yes. This is clearly described in the PDD.		OK
B.11.2. Are procedures identified for training of monitoring personnel?		/18/	DR I	Yes. These procedures are identified for training of monitoring personnel in the Operations Monitoring Plan.		OK
B.11.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?		/18/	DR I	Yes.		OK
B.11.4. Are procedures identified for review of reported results/data?		/18/	DR I	Yes. These procedures are described in the Operations Monitoring Plan.		OK
B.11.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?		/18/	DR I	Yes. These procedures are described in the Operations Monitoring Plan.		OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>						

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
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C.1.1.	Are the project's starting date and operational lifetime clearly defined and evidenced?	/3/	DR I	The project's operational lifetime is defined as 20 years. The project started to implement on 8 October 2005.		OK
C.1.2.	Is the start of the crediting period clearly defined and reasonable?	/3/	DR I	The start of the crediting period is 1 September 2008.		OK
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?	/3/ /15/ /16/	DR I	The analysis of environmental impacts is 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?	/3/ /15/ /16/	DR I	Yes. The EIA is approved by the local environmental protect bureau in January 2007.		OK
D.1.3.	Will the project create any adverse environmental effects?	/3/ /15/ /16/	DR I	According to the EIA report, the project will not cause any adverse impacts to the environment.		OK
D.1.4.	Are transboundary environmental impacts considered in the analysis?	/3/ /15/ /16/	DR I	No transboundary environmental impacts are identified according to the EIA report.		OK
D.1.5.	Have identified environmental impacts been	/3/	DR	Yes.		OK

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addressed in the project design?	/15/ /16/	I			
D.1.6. Does the project comply with environmental legislation in the host country?	/3/ /15/ /16/	DR I	Yes. The project's EIA reports have been approved by the Environmental Protection Bureau of Tieling Municipality.		OK
E.Stakeholder Comments <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>					
E.1.1. Have relevant stakeholders been consulted?	/3/ /15/ /16/	DR I	Yes. The representatives from local governmental departments, enterprises and residents have been consulted		OK
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/3/	DR I	Yes. Local TV, newspaper and website of Tiefa Coal Mining Group were used to invite comments by local stakeholders.		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?	/3/ /15/ /16/	DR I	Yes. The stakeholder consultation process was carried out in accordance with the relevant regulations/laws.		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/3/	DR I	Yes.		OK
E.1.5. Has due account been taken of any stakeholder comments received?	/3/	DR	No negative comments were received.		OK

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		I			

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	Final conclusion
CAR 1 The project claims emission reductions from displacing LPG and town gas with CMM at the end users. ACM0008 only allows to claim emission reductions from generating heat and the methodology requires to monitor the heat generated by the project. Hence, the project can not claim emission reductions from displacing fossil fuels at users of the natural gas supplied to the gas network and these emissions need to be removed from the PDD.	B.5.1.	Changed in the PDD.	The changes to the PDD were verified and emission reductions from displacing LPG and town gas with CMM at the end users were appropriately excluded. This CAR is closed.
CL 1 The methane used to serve estimated thermal energy demand in the baseline for year y (THBL,k) should be calculated according to the ACM0008.	B.5.1.	The calculation is revised in the PDD according to ACM0008. Firstly, the $D_k^{\max}$ is calculated, and the projected methane demand is estimated. Secondly, the THBL,k is calculated.	OK. This CL is closed.
CL 2 The measurement accuracy should be addressed clearly for the monitoring of project emissions and baseline emissions.	B.8.5.	The measurement accuracy is described appropriately in the B.7.1. of the PDD.	OK. This CL is closed.

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Weidong Yang

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

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	Yes	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	--		

Høvik, 4 January 2008

Michael Lehmann

Michael Lehmann

Technical Director, International Climate Change Services



CERTIFICATE OF COMPETENCE

Wilson Tang

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

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 13		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes		
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

David Creedy

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

<i>GHG Auditor:</i>	--		
<i>CDM Validator:</i>	--	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	Sectoral scope 8		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Ole Andreas Flagstad

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1)

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	Yes	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	--		

Høvik, 30 October 2007

Michael Lehmann

Michael Lehmann

Technical Director, International Climate Change Services



CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJi-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0028, AM0034	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0030	Yes
ACM0004	Yes	AM0031	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0032	Yes
ACM0007	Yes	AM0035	Yes
ACM0008	Yes	AM0038	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0041	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0034	Yes
AM0009, AM0037	Yes	AM0043	
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0046	
AM0014	Yes	AM0047	
AM0017	Yes	AMS-II.A-F, AM0044	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes
AM0021	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director