



UNFCCC Secretariat  
Martin-Luther-King-Strasse 8  
D-53153 Bonn  
Germany

DNV CLIMATE CHANGE  
SERVICES AS  
Veritasveien 1,  
1322 HØVIK, Norway  
Tel: +47 67 57 99 00  
Fax: +47 67 57 99 11  
http://www.dnv.com  
Org. No: NO 994 774 352 MVA

Att: CDM Executive Board

Your ref.:  
UNFCCC Ref # 6242

DNV responsible ref.:  
MROBO/MLEH

Date:  
19/12/12

### ***Questions raised by CDM Executive Board members***

1) The DOE is requested to further substantiate the project start date of 29 April 2011 as an earlier action related to the project activity is observed on 17 December 2009 when the gas purchase agreement was signed according to page 3 of the validation report. In case the project start date is revised, the DOE should ensure that the prior considerations are valid for the revised project start date. Please refer to VVM version 1.2 paragraphs 99-103.

### ***Response Summary from DNV***

The gas purchase agreement was signed 17 December 2009. However, it is not been considered to represent the start of the proposed project activity due to the requirement for the proposed project's FSR being approved by the local regulator before implementation and construction can proceed as per Shanxi Province Project Design and Approval Management Regulation this is reflected in the lack of any financial commitment in the gas purchase agreement as the agreement does not specify a required CMM purchase volume or that any CMM must in fact be purchased. The importance of such approval is reflected in the lack of any investment committed by the project participant until after such approval was awarded to the project participant. The FSR approval was provided on 31 December 2010 and the project participant informed the UNFCCC of its intention to seek CDM status on 16 March 2011 one month prior to the signing of the main equipment purchase contract on 29 April 2011, which was the first financial commitment to the proposed project and is within 6 months of the nominated start date.

The gas purchase agreement could not represent the proposed project start date due to the regulatory requirement for the proposed project to attain an approved FSR prior to implementation and the lack of any financial commitment made in the gas purchase agreement. As such, DNV can confirm that the selected start date associated with the main equipment purchase contract is in line with local regulation and represents the first commitment to financial expenditures.

### ***Action taken (if relevant)***

No update to the Validation Report or PDD

### ***Questions raised by CDM Executive Board members***

2) The DOE is requested to further substantiate the input values to the investment analysis, in particular:

a) The CMM price of 0.11 RMB/m<sup>3</sup>, considering that:

- i) it is supplied to other mines in Jincheng group for free of charge and excess is vented to the atmosphere in the baseline, thus has no financial value in the baseline,
- ii) pre- treatment of the gas is done by the project activity, and not by the mine,
- iii) the project activity supplies electricity and heat to the mine for free of charge, and

iv) based on the DOE's statement, it appears that the reference used only refers to CMM with methane concentration above 40%.

b) The VAT refund and/ or tax exemption, by clarifying: i) which tax exemption and/ or VAT refund policies were considered, and

ii) how it was confirmed that the project participant is not eligible for any of them, by providing details of the "nature of the project activity" that made them ineligible for tax exemption, and refund schemes. Please refer to VVM version 1.2 paragraph 111..

### ***Response Summary from DNV***

**a) i)** The delivery of CMM in the baseline to recurring demand from the Yuecheng Coal Mine and the local community, (which constitutes less than 10% of the total annual volume of extracted gas) and the delivery of CMM to other coal mines within the Jincheng Group for incidental usage during renovation do not constitute exchanges of a commercial nature as the CMM was used within the same commercial entity.

The incidental delivery of CMM to other mines within the Jincheng group constitutes and intra organisational transfer of assets and as such does constitute a commercial transaction or command a price. This however does not mean it is without value should a market exist.

The self use of CMM by the Yuecheng Coal Mine is not capable of recognising the commercial value as the CMM is self used and no opportunity for commercial transaction exists.

It is noted and confirmed by DNV that the Yuecheng Coal Mine is located approximately 35km from the nearest town of Yangcheng as verified by DNV. The financial barriers to accessing this potential market to realise the existing commercial value of the CMM have been dealt with in DNV's response to Question 5 of this response to request for review.

In conclusion, DNV can confirm that while a commercial market for CMM did not exist prior to the decision to proceed with the proposed project, the CMM does have a calorific and thus commercial value where real commercial markets exist.

This is further demonstrated through the assessment of whether the implementation of the project by another entity than the project participant is a plausible baseline scenario. DNV has validated the financial analysis provided by the project participant of the scenario of the Yuecheng Coal Mine developing the proposed project instead.

**a) ii)** The Yuecheng Coal Mine owner has provided DNV with a record of infrastructure and costs associated with the delivery of CMM from its existing gas drainage assets to the proposed project. This includes:

- 2.4 km of gas drainage pipeline, installation of gas dehydration units, pressure regulator units and CMM gas drainage fixtures from the Yuecheng Coal Mine gas drainage station to the geographical boundary of the proposed project site resulting in a cost of 20.5 million RMB /46/.
- Construction costs associated with the installation of the gas carriage pipeline and associated equipment resulting in costs of 30 million RMB /46/.
- The on-going management and maintenance obligations associated with the pipeline and the associated equipment resulting in a cost to the Yuecheng Coal Mine of 2.4 million RMB/year /46/.

DNV can confirm that as per in the spread sheet "Yuecheng CMM sale financial analysis.xls" the IRR of the sale of CMM to the proposed project results in a pre tax IRR of 12.07% and a post tax IRR of 14.01% which is in line with the benchmark for coal mining operations at 13% before tax and in line with the benchmark for CMM sales at 12% before tax. DNV notes that the benchmarks for both coal mining and CMM sales are only listed in pre tax scenario.

As such DNV can confirm that the nominated CMM price of 0.11 RMB/m<sup>3</sup> reasonably represents the cost of supplying CMM, based upon costs incurred by the Yuecheng Coal Mine and a return on investment in line with the nominated industry benchmarks for both mining and CMM sales.

**a) iii) Supply of heat to the Yuecheng Coal Mine:**

As per the PDD and as verified by DNV there is no proposed supply of heat to the Yuecheng Coal Mine or indeed the local community as not waste heat recovery is planned as a part of the proposed project. It is incorrect to state that waste heat will be provided to the Yuecheng Coal Mine as part of the proposed project for free or otherwise.

**Supply of 3 600 MWh of electricity to the Yuecheng Coal Mine:**

DNV has assessed the impact of the delivery of the 3 600 MWh electricity to the Yuecheng Coal Mine. This supply of electricity was negotiated as a part of the gas purchase agreement between the project participant and the Yuecheng Coal Mine.

The supply, according to the electricity tariff of 0.38 RMB/kWh including VAT constitutes a fixed value of 1.368 million RMB per year in addition to the revenue from CMM sales equivalent to 12.068 million RMB/yea . As a result, the supplied electricity (3 600 MWh/year) the represents forgone income for the project participant (lost sales to the NCPG) of 1.368 million RMB/year.

DNV has assessed the impact of the financial value of the 3 600 MWh upon the CMM price to be equivalent to an increase in the CMM price from 0.11 RMB/m<sup>3</sup> to 0.1225 RMB/m<sup>3</sup>.

The provision of 3 600 MWh/year electricity to the Yuecheng Coal Mine costs the project participant 1.368 million per year. Due to the negotiation of this as part of the gas purchase agreement DNV has deemed it appropriate to consider this cost in terms of the CMM price. DNV demonstrated that accounting for the supplied electricity in this way, that the effective cost of the CMM to the project participant is 0.1225 RMB/m<sup>3</sup> and that the effect of such a price rise is negligible on both the investment analysis and sensitivity analysis.

Furthermore, DNV has demonstrated in Table 2 of the FVR that the CMM price including the supply of 3 600 MWh/year is in line with other registered projects and the Jincheng City Government Coal Mine Methane sale price guidelines, which when linearly adjusted for concentration at 35% details a cost of 0.23 RMB/m<sup>3</sup>.

**a) iv) The project participant has utilised the following sources to justify the validity of the CMM price in the proposed project. These references include:**

- Jincheng City Government: Coal Mine Methane sale price guidelines, dated 28 October 2008/. This details the price of 0.65 RMB/m<sup>3</sup> for 95-100% methane CMM. This was linearly adjusted to 35% concentration methane CMM for price comparison resulting in a price of 0.227 RMB/m<sup>3</sup>.
- Jincheng City Government: Item 2 of the Notice Regarding CMM Pricing, No. 301 of 2003. This details the price of 0.15 RMB/m<sup>3</sup> for 40% methane CMM. This was linearly adjusted to 35% concentration methane CMM for price comparison resulting in a price of 0.13 RMB/m<sup>3</sup>.

No further advice from the Jincheng City Government was available to identify pricing guidelines for 35% CMM. These pricing guidelines both provide estimates in excess of the gas price contractually agreed to for the proposed project of 0.11RMB/m<sup>3</sup> (or 0.1225 RMB/m<sup>3</sup> if the supply of 3 600 MWh/year electricity is accounted for).

Furthermore, as part of the response to Question 2 a) ii), DNV has verified the IRR of the Yuecheng Coal Mine's gas sales to the proposed project and demonstrated how the nominated price of 0.11 RMB/m<sup>3</sup> is reasonable, based upon costs incurred by the Yuecheng Coal Mine and in line with the nominated industry benchmarks for both mining and CMM sales.

**b) i) and ii) DNV has elected to respond to both parts i) and ii) of this question in a single response for simplicity and brevity due to the interrelatedness of the two components.**

As required by VVM version 1.2 paragraph 111, DNV has evaluated the project participants' consideration of tax exemptions and/or VAT refund policies. DNV can confirm the following analysis of policies potentially applicable to the proposed project:

1. Urban construction and maintenance tax exemption.

DNV can confirm that the proposed project does not qualify for the Urban construction and maintenance tax exemption.

2. Education surcharge levy exemption.

DNV can confirm that the proposed project does not qualify for the Education Surcharge tax exemption.

3. VAT preferential policies.

DNV can confirm that the proposed project does not qualify for the VAT Preferential Policies tax exemption.

As such, DNV can confirm that the proposed project does not qualify for any of the available VAT refund or tax exemption policies available in China at the time of validation.

**Action taken (if relevant)**

Responses a) ii), a) iii), b) i) and b) ii) have been updated in the Validation Report.

**Questions raised by CDM Executive Board members**

3) The DOE is requested to clarify the baseline scenario and pre-project activities, in particular:

a) The leakage due to the displacement of baseline thermal energy uses: whether the calculation was made in a conservative manner, in line with pages 14-17 and 28-29 for the following parameters:

- i) the projection of the extraction rate for the crediting period,
- ii) the baseline demand of CMM by the other mines, considering the large difference in the demand of 2009, 2010 and 2011;
- iii) the baseline demand by the local residence, taking into consideration the seasonal demand by using the daily log rather than an annual total; and
- iv) whether they are reflected to the motoring plan. Please note according to page 16 of the applied methodology, "even when a project's average annual VAM/CMM/CBM use for electricity generation or other uses is significantly below baseline VAM/CMM/CBM emissions, there may be times due to daily fluctuations in thermal energy demand or in VAM/CMM/CBM extraction rates – that the project will use VAM/CMM that would have been used for thermal energy under baseline conditions". Where regulations require that local thermal demand is met before all other uses, the DOE shall demonstrate that the regulation is systematically enforced by assessing the compliance rate.

b) The electricity of 3,600 MWh supplied to the mine, as it is not clear:

- i) how they are supplied in the pre-project scenario and would be supplied in the baseline in the absence of the project activity, and
- ii) whether it is correctly and conservatively reflected in the emission reduction calculations. Please refer to VVM version 1.2 paragraph 84, 90 and 91.

**Response Summary from DNV**

**a) i)** As per the methodology ACM0008 version 7, "Calculation of the mean annual demand (Thy) for each year of the crediting period" The project participant has calculated  $TH_{BL,k}$ , the methane used to serve estimated thermal energy demand in the baseline for day k of year y ( $tCH_4$ ) using option c) as only 2.5 years' worth of historical data are available.

$$ME_k - (MM_{ELEC,k} + MM_{HEAT,k}) < TH_k \quad (35)$$

$$229,820.55 - (105,201.37 + 0) = 124,619.18 \text{ m}^3 > 22,480 \text{ m}^3$$

Therefore, there is no leakage in the project.

**a) ii)** The baseline demand for the other coal mines in the Jincheng group has been discussed at length in the Validation Report. The Jincheng Runhong New Energy Power Co., Ltd, owner of the Yuecheng Coal Mine, has issued a statement detailing and confirming the nature of the CMM demand associated with the other mines in the Jincheng Group to an isolated event associated with the refurbishment of those mines which is now complete.

No permanent infrastructure was put in place to service the delivery of CMM to those mines and as per the statement from the Jincheng Group, the demand for CMM to those mines has ceased with the completion of the refurbishment program.

As such DNV can confirm that the delivery of CMM to other mines in the Jincheng Group does not form part of the baseline scenario.

Furthermore, DNV notes that as per the methodology ACM0008 version 7, that as per option c) on page 17 of the methodology:

“prospective thermal energy demand in the absence of the project may be estimated from the maximum amount of VAM/CMM/CBM that could be delivered to end users through existing pipelines.”

And,

“Maximum throughput estimates should be based on a detailed engineering description of the existing pipeline infrastructure.”

The delivery of CMM to the other mines in the Jincheng Group was conducted via vehicular transport as no pipeline connection to those locations exists. As such the project participant is not required by the methodology ACM0008 version 7 to consider such usage.

In conclusion, while the methodology restricts the consideration of leakage to the extent of pipeline infrastructure connected users, DNV considers the demand from other mines in the Jincheng Group to be temporary and isolated as confirmed by the Jincheng Group both in writing and via telephone interview, which clearly indicated no future plans by the Jincheng Group to divert Yuecheng Coal Mine CMM to for such uses.

**a) iii)** Please refer to a) i) where the methodology ACM0008 version 7 has been applied to demonstrate that no leakage from residential usage will occur.

**b) i)** The project participant has provided DNV with the electricity purchase invoices for the Yuecheng Coal Mine demonstrating the supply of electricity for the mine from the North China Power Grid (NCPG) prior to the negotiation and implementation of the proposed project. DNV has verified the electricity purchase invoices from Shanxi Jincheng Electricity Supply Co. Ltd.

The Yuecheng Coal Mine is not currently licenced to generate electricity as per its business operation license and as such is required to acquire its electricity from the local power grid.

**b) ii)** DNV can confirm that the Yuecheng Coal Mine’s electricity demands were supplied by the NCPG as per electricity purchase invoices from the pre project operation of the mine. As such, the replacement of electricity supplied to the coal mine from the NCPG by the electricity (3 600 MWh) by the proposed project is equivalent to the emissions reductions claimed by the proposed project for the sale of electricity into the NCPG.

#### ***Action taken (if relevant)***

Responses Q2 a) ii), Q2 a) iii), Q2 b) i) and Q2 b) ii) have been updated in the FVR.

#### ***Questions raised by CDM Executive Board members***

4) The DOE is requested to further justify the baseline scenario to vent CMM to the atmosphere in line with the existing regulations, particularly the Emission Standard of Coal Bed Methane/Coal Mine Methane (GB 21522-2008) which was issued on 2nd April 2008, and prohibits venting of

CMM with methane concentration above 30% from 1 July 2008 for new mines and 1 January 2010 for existing mines, as it is not clear how the DOE has concluded that the standard is not enforced based on:

- a) a discussion with a local official on 28 June 2009 in response to the request for review of another project activity, considering that at the time of the discussion, the standard was not effective for existing mines,
- b) a telephone interview in March 2012, as it is not clear whether it was sufficient to examine whether the standard is not systematically enforced and that non-compliance is widespread, and
- c) various operation permit obtained after the publication of the standard but after the completion of the FSR of the project activity in June 2010. In doing so, please provide a quantitative assessment of the current rate of enforcement of the standard, in line with "Identification of the baseline scenario" Step 2 (page 6) of the applied methodology. Please refer to VVM version 1.2 paragraph 85..

#### ***Response Summary from DNV***

a) The Emission Standard of Coal Bed Methane/Coal Mine Methane (GB 21522-2008) came into force for new mines on 1 July 2008 and for existing mines on 1 January 2010.

DNV notes that the discussion with a local official on 28 June 2009 is before the date of the standard GB 21522-2008 coming into effect for existing mines. As such DNV no longer relies upon this conversation in relation to the actual enforcement of the standard GB 21522-2008 for the proposed project. Please refer to the response to part c) below for a quantitative response to this issue.

b) DNV accepts the finding that the telephone interview held with Dr. Zhang Li, Director at the Occupational Safety Strategy and Policy Institute on 15 March 2012 does not constitute quantitative evidence of a lack of systematic enforcement with the standard GB 21522-2008. Please refer to the response to Question 4 part c) below for a quantitative response to this issue. However, DNV would also like to note that the ACM008 version 7, does not require a quantitative analysis, but only requires to *show that, based on an examination of current practice in the country or region in which the law or regulation applies, those applicable legal or regulatory requirements are systematically not enforced and that non-compliance with those requirements is widespread in the country.*

c) DNV accepts the finding that the issuance of environmental and operational permits to the coal mine do not sufficiently demonstrate widespread non-compliance or systematic un enforcement. As such the project participant has since submitted further data which DNV has validated and investigated under the headings:

- Number of mines in the region that abide by the regulation, and
- Reasons why the regulation is not systematically enforced.

#### **Number of mines in the region that abide by the regulation**

There are 1053 coal mines in Shanxi Province as detailed by Shanxi post-coal resource integration age published by the Inner Mongolia News Net. Such a large number of the coal mines render providing the number abiding the regulation impracticable, due to the two major reasons: that the methane content of CMM varies and that implementation can vary within the same coal mine from drainage station to drainage station.

Even facing the above mentioned barriers, the recently published data by the State and Provincial governments of Shanxi on the volumes of CMM with a high concentration (No exact definition of 'high concentration' is given but it is commonly understood that this is CMM where the methane content is generally >25-30%) of methane drained and utilised (table 1 below) in the Shanxi province can approximately show that the utilization rate of the CMM drained from coal mines, due to safety concerns, and the funding that was available from varied sources (including CDM), is approximately 20-40% in the period 2006-2011.



**Table 1: CMM drainage and usage in Shanxi province  
(2006-2010 data from Economics Institute of Shanxi Academy of Social Sciences and 2011  
data from Shanxi government Coal Industry Department)**

	<b>Unit</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Drainage	Billion m <sup>3</sup>	1.611	2.080	2.160	2.250	2.513	2.674
Utilization	Billion m <sup>3</sup>	0.327	0.558	0.767	0.873	1.01	1.135
% Utilisation	%	20.30	26.83	35.51	38.8	40.2	42.45

When compared with the target set in the twelfth five year plan (2011-2015) in China:

- The drainage amount of CMM should reach 14 billion cubic meters by 2015
- The utilisation amount of CMM should reach 8.4 billion cubic meters by 2015 (i.e. a utilisation rate of 60%)

It is noted by DNV that the proposed CMM utilization rate of the 12<sup>th</sup> 5 Year plan remains unchanged despite the introduction of the standard GB 21522-2008.

When compared with the target set in the eleventh five year plan (2006-2010) in China:

- The drainage amount of CMM should reach 5 billion cubic meters by 2010
- The utilisation amount of CMM should reach 3 billion cubic meters by 2010 (i.e. a utilisation rate of 60%)

The average utilization rate (around 40%) in Shanxi Province lagged far behind the target for the whole country.

It was confirmed that utilisation of CMM with high methane content can be broken down into CMM used for power, for fuel and or other uses, according to the data released by the State and Provincial governments of Shanxi.

Using its sector competence and local knowledge, DNV can confirm that according to the IEA and World Bank that all CMM fired power projects in Shanxi Province applied for CDM finance and will likely continue to do so. Thus it can be assumed that all CMM being used for power in Shanxi Province resorted to the CDM.

If share of these power projects are excluded from the total utilisation (This is conservative as other registered CDM projects also use some CMM for fuel (e.g. registered projects 902, 3219) and for other uses, and this volume of CMM is not excluded here), the percentage of utilization excluding power generation is historically less than 17% and for 2011 at 13.65%, as shown below. CMM for power accounted for 68% of the total CMM drained in 2011.

**Table 2: Broken down for utilisation of CMM with high methane content in Shanxi province  
(2006-2010 data from Economics Institute of Shanxi Academy of Social Sciences and 2011  
data from Shanxi government Coal Industry Department)**

	<b>Total drained</b>	<b>Total utilisation</b>	<b>Total utilisation (exc. Power)</b>	<b>% utilisation exc. Power</b>	<b>Power</b>	<b>Fuel</b>	<b>Other</b>
2006	1.611	0.327	0.187	11.61	0.14	0.12	0.067
2007	2.08	0.558	0.358	17.21	0.2	0.27	0.088
2008	2.16	0.767	0.367	16.99	0.4	0.27	0.097

2009	2.25	0.873	0.323	14.36	0.55	0.28	0.043
2010	2.513	1.01	0.36	14.33	0.65	0.3	0.06
2011	2.674	1.135	0.365	13.65	0.77	0.3	0.065

Based on the analysis above in table 1, DNV confirms that it is not plausible that even 50% of high concentration CMM will be utilized or destroyed in the region in the near future, although the standard GB 21522-2008 was taken into effect on 1 January 2010 for existing coal mines. In addition, CDM has contributed substantially to utilization of CMM, contributing for 50-68% of the total CMM drained.

Notably, the common practice analysis for the proposed project, discussed in section 3.6.5 of this report, identified 54 CMM power generation projects within Shanxi Province, of which, 44 are registered as CDM projects or are undergoing validation. The total proposed power generation capacity from the 54 projects in Shanxi Province is 988.9 MW, of which the 44 projects pursuing CDM contribute 951.1 MW, equivalent to 96.18%. As such it may be concluded that the vast majority of CMM utilization for power generation in Shanxi Province is based on CDM support.

ACM0008 version 7 states: *If an alternative does not comply with all applicable legislation and regulations, then show that, based on an examination of current practice in the country or region in which the law or regulation applies, those applicable legal or regulatory requirements are systematically not enforced and that non-compliance with those requirements is widespread in the country.*

Hence, DNV has been able to verify that regulations concerning the utilization of CMM with methane concentrations above 30% are not systematically enforced, and non-compliance with the regulation is widespread in the region.

#### Reasons why the regulation is not systematically enforced

##### *Financial barrier*

According to a statement issued in July 2009, the attitude of the Chinese government is that they “encourage companies to achieve the standard required by the regulation with help from the CDM”. Of the CMM fired power projects that have been constructed in Shanxi Province in recent years, all have been financially unattractive and have applied for CDM status to attract additional funding to overcome this barrier (as demonstrated in the common practice section of the PDD for this project).

*2) Interview with relevant experts indicates that the regulation is seen as ideal declarative, but unrealistic.*

DNV held a telephone interview on 15 March 2012 with Dr. Zhang Li, Director at the Occupational Safety Strategy and Policy Institute, a part of the National Institute for Occupational Safety and China Coal Information Institute. Dr Zhang informed DNV that the regulation Emission Standard of Coal bed Methane/Coal Mine Gas (GB 21522-2008) was at the time of the interview, systematically unenforced and that no penalties were being imposed for non-compliance with the standard

##### *3) Technical barriers preventing the implementation of the standard*

In Article 5.2 of the standard, it states that automatic monitoring systems should be installed in new coal mines. However, there is no such provision requiring this for existing coal mines (that are expected though to comply with the standard). Without specific requirements to do this, it is unlikely that existing coal mines will voluntarily go to the expense and complexity of installing this system.

Since the proposed project is an existing coal mine, and the EIA of the project was approved prior to the implementation of the standard, there was no requirement for provision of automatic monitoring equipment to be installed as part of the project.

##### *4) The possibility to change CMM characteristics (low concentration and high concentration, and*



even VAM) make the verification of compliance to the standard GB 21522-2008 even more uncertain.

The drainage systems under the coal mines will normally take up from the coal seams the CMM, CBM and the rest being VAM. The main concern for the 30% concentration threshold differentiating high concentration and low concentration is for the safe transportation of the CMM drained, due to the explosive limit range of the methane in the air:

*The explosive range of methane in air is 5% to 15%, according to a recent study by the IEA “A Budding Asset with the Potential to Bloom”, 2009*

*“The new policy requiring methane use if CMM concentrations equal or exceed 30% appears to be creating uncertainty for CMM utilisation projects. Based on anecdotal reports gained from the interviews, this policy may result in an increase in CMM dilution to avoid the requirement of flaring/use”*

Many coal mine operators lack the resources to be able to comply with the standard without additional, external resources (such as the CDM). There are fears that some coal mine operators may resort to dilution of extracted CMM to avoid having to comply with the requirement and associated costs of using or flaring CMM with a concentration >30%.

5) *The lack of procedures for implementation and measures for prize/penalties impede the compliance of the standard.*

As demonstrated by the project participant, the coal mine faces 3 options with regard to the Standard GB 21522-2008, these include:

- Non-compliance (continuing to vent and incurring fine as per SEPA order no. 28, *Measures for the Administration of Automatic Monitoring of Pollution Sources*, 2005),
- Compliance (utilisation of CMM),
- Avoidance (dilution of CMM prior to surface)

DNV has validated the spreadsheet provided by the project participant which calculates the NPV of the three options as follows:

Scenario	NPV (RMB)
Continue to vent high concentration CMM and pay the fine (maximum 100,000RMB pa)	- 676,935
Implement a project to utilise/ destroy the CMM thereby avoiding paying the fine.	- 13,914,455
Install equipment to dilute any CMM with a concentration $\geq 30\%$ to a concentration $< 30\%$ and continue to vent, thereby avoiding paying the fine.	- 132,008

The analysis demonstrates that under the current regulatory regime, the NPV of dilution compliance is much more attractive than the actual utilization compliance with the standard GB 21522-2008. This provides a strong financial incentive for the coal mine owner to pro-actively avoid the standard GB 21522-2008 by means of CMM dilution prior to the CMM reaching the surface, still resulting in the baseline scenario atmospheric methane emissions.

As a conclusion, DNV can confirm that there are real and significant barriers and weaknesses in the standard which prevent its systematic enforcement.

**Action taken (if relevant)**

Response updated in Validation Report.

***Questions raised by CDM Executive Board members***

5) The DOE is requested to further substantiate the baseline identification, in particular, elimination of the alternative scenarios which are economically unattractive.

Step 5 of "Identification of the baseline scenario" (page 8 of ACM0008 version 7) requires that Step 2 (investment analysis) of the latest approved version of the "Tool for the demonstration and assessment of additionality" is used to identify the most plausible baseline scenarios by eliminating options which are clearly economically unattractive.

However, the DOE has not validate the investment analysis for the elimination of the following alternative scenarios sufficiently:

Scenario v, considering the financial savings made in reduced power purchase from the grid as revenue, providing validation of the power purchase price.

Scenario vi, providing validation of the investment comparison analysis, comparing with the continuing use and/or replacement of coal fired boilers.

Scenario vii, providing validation of the investment analysis of the hypothetical pipeline project. Please refer to VVM version 1.2 paragraphs 83 and 111..

***Response Summary from DNV***

*Scenario v: Use of extracted CMM for captive power generation.*

The project participant has demonstrated the financial unattractiveness of the baseline alternative scenario v, namely the use of CMM by the coal mine for captive power generation in the spreadsheet titled "Yuecheng project scenario v fin analysis.xls".

DNV has validated the power purchase price paid by the Yuecheng Coal Mine through the inspection and verification of the January 2012 electricity purchase invoice detailing the consumer as the Yuecheng Coal Mine owner and the tariff rate as 0.45 RMB/kWh including VAT. DNV verified this to be in line with the Electricity sale price notification published by Shanxi Government on 20 November 2009, which nominates an industrial user tariff of 0.4521 RMB/kWh including VAT. As such DNV can confirm that the electricity tariff used by the project participant in the financial analysis spreadsheet titled "Yuecheng project scenario v fin analysis.xls" of 0.45 RMB/kWh including VAT is both accurate, reasonable and stable given the Electricity sale price notification published by Shanxi Government was published in 2009.

DNV can confirm that the IRR of scenario v is 11.73% before tax which is below the benchmark for a coal mining company (13%) . As a result it may be seen that the construction of the proposed project for self use is not financially attractive to the coal mine owner. Therefore scenario v is excluded.

*Scenario vi: Use for additional heat generation*

The coal mine currently owns and operates both coal and gas fired boilers for the generation of heat at the coal mine. The coal mine also has access to both coal and CMM to power this heat demand at no cost to the coal mine. Due to the access to both coal and CMM energy sources for heat generation at no cost to the coal mine owner, the investment in new gas fired boilers or the retrofitting of existing coal boilers to use gas (CMM) fuel can provide no financial benefit to the coal mine owner because no savings can be made.

As there is no financial incentive for the coal mine owner to make an investment in gas fired boilers for additional heat generation, scenario vi is eliminated.

*Scenario vii: Feed into pipeline (used by vehicles or used for power or heat generation)*

The project participant has demonstrated the financial unattractiveness of the baseline alternative

scenario vii, namely the feeding of CMM into a pipeline for use in vehicular or power/heat generation in the spreadsheet titled “*Yuecheng project scenario vii fin analysis.xls*”.

DNV has validated the financial analysis spreadsheet, which is based upon the financial analysis model for the proposed project.

DNV can confirm that the IRR of scenario vii is -2.87% before tax and -0.81% after tax, which is below the benchmark for coal mining (13%) and the benchmark for CMM extraction (12%). As a result it may be seen that the feeding of the extracted CMM into a pipeline for sale is not financially attractive to the coal mine owner. Therefore scenario vii is excluded.

***Action taken (if relevant)***

Response updated in FVR.