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Att: CDM Executive Board

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MROBO/MLEH

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Questions raised by CDM Executive Board members

1) The DOE is requested to further substantiate the project start date of 5 March 2010 as an earlier action related to the project activity is observed on 15 November 2008 when the gas purchase agreement was signed according to pages 6 and 17 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

DNV notes that while the gas purchase agreement was signed on 15 November 2008, the proposed project could not be legally implemented (as per the Shanxi Province Project Design and Approval Management Regulation) until the proposed project's FSR was approved by the local authority. The gas purchase agreement therefore does not commit the project participant to financial expenditure as it could have been cancelled if the FSR had not been approved or if the proposed project did not go ahead. The gas purchase agreement was legally conditional upon the FSR approval and as a result would not constitute actual or confirmed implementation, expenditure or construction of the proposed project.

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)

Response above has been included in the Validation Report.

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 0.17 RMB/m³:

i) the comparison to other projects, especially PA 4098 and 4534, considering that according to the validation reports of the respective projects, the prices are: PA 4534: 0.15 RMB/m³ pure CH₄ gas purchase price (page 28), equivalent to 0.0525 RMB/m³ (35% CH₄), and PA 4098: 0.286 RMB/m³ pure methane (page 30), equivalent to 0.1 RMB/m³ (35% CH₄); the price applied by the project activity (0.17 RMB/m³ of CMM with 35% CH₄) is the highest among the projects compared;
ii) the suitability of the value, considering a lower price of 0.11 RMB/m³ was applied for another project activity requested for registration by the same project participant, validated by the same DOE (PA6424), and

- iii) the value indicated in the FSR which does not appear to be presented in the validation report.
- 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

2 a) i) DNV acknowledges the EB's analysis of the CMM price for PA 4098 and 4534 and has updated the analysis to consider this. Furthermore DNV has substantiated the basis for the CMM price of 0.17 RMB/m³ based on validation of the actual costs of CMM delivery from the Wujia Coal Mine to the proposed project and the IRR of the sale of CMM by the Wujia Coal Mine to the project participant.

The Wujia 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:

- 0.5 km of gas drainage pipeline, installation of gas dehydration units, pressure regulator units and CMM gas drainage fixtures from the Wujia Coal Mine gas drainage station to the geographical boundary of the proposed project site resulting in a cost of 17.5 million RMB.
- Construction costs associated with the installation of the gas carriage pipeline and associated equipment resulting in costs of 13.75 million RMB.
- The on-going management and maintenance obligations associated with the pipeline and the associated equipment resulting in a cost to the Wujia Coal Mine of 0.5 million RMB/year.

To adequately consider the applicability and reasonableness of the applied CMM cost of 0.17 RMB/m³ charged by the coal mine DNV has validated the IRR of the CMM sales by the Wujia Coal Mine. The financial calculations contained in the spreadsheet "*Wujia CMM sale financial analysis.xls*" was validated by DNV and the costs claimed were verified against the invoices provided by the Wujia Coal Mine and found to be correct.

DNV can confirm that the IRR of the sale of CMM to the proposed project based upon the stated costs above and the sale price of 0.17 RMB/m³ results in a pre tax IRR of 10.69% 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.

As such DNV can confirm that the nominated CMM price of 0.17 RMB/m³ reasonably represents the cost of supplying CMM, based upon costs incurred by the Wujia Coal Mine and a return on investment in line with the nominated industry benchmarks for both mining and CMM sales.

a) ii) DNV notes that the costs borne by the Yuecheng coal mine in PA6242 differ from those costs borne by the Wujia Coal Mine owner in the case of the proposed project. As such the basis for CMM sale price negotiations are reasonably and logically expected to differ.

DNV also notes that CMM purchase contractual negotiations between the project participant and the Yuecheng coal mine owner in PA6242 and the project participant and the Wujia coal mine owner in the proposed project were commercial and confidential in nature.

DNV considers that the financial analysis contained in the spreadsheet "*Wujia CMM sale financial analysis.xls*" sufficiently justifies the CMM sale price of 0.17 RMB/m³ based upon the known costs for the Wujia coal mine's existing pipeline investment.

2 a) iii) The value of the CMM in the FSR has been included in the PDD by the project participant. DNV can confirm that this is reflected by the entry in the FSR that the value of 0.17 RMB/m³ is sourced from section 7.2.3 on page 44 of the FSR.

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) i), 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 further justify the baseline scenario to vent CMM to the atmosphere is in line with the existing regulations, particularly the mission 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 which was implemented at an existing mine, considering that at the time of the discussion, the standard was not effective for existing mines and the proposed project activity is implemented in a new mine,

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 permits 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 that 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)**

	Unit	2006	2007	2008	2009	2010	2011
Drainage	Billion m ³	1.611	2.080	2.160	2.250	2.513	2.674
Utilization	Billion m ³	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 12th 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)

	Total drained	Total utilisation	Total utilisation (exc. Power)	% utilisation exc. Power	Power	Fuel	Other
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.

Shanxi NDRC, Shanxi Provincial government website Register of all approved electricity generating projects with approval to export electricity to the power grid 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.	- 10,334,074
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

4) 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 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 “Wujia project scenario v fin analysis.xls”.

As detailed in the statement by FSR author Jincheng Engineering Consulting Center: Wujia Coalmine Electricity consumption amount, dated 22 December 2012 the average demand for electricity from the Yuecheng Coal Mine is expected to be 2 500 MWh per year. DNV considers this to be reasonable given the lack of power use records due to the Wujia Coal Mine starting operation in October 2012.

Due to the Wujia Coal Mine beginning operation in October 2012, no electricity invoices were available for verification. DNV has validated the power purchase price for the Wujia Coal Mine through the verification of the ShanXi Province NDRC: Electricity sale price notification, dated 20 September 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 “Wujia project scenario v fin analysis.xls” of 0.45 RMB/kWh including VAT is reasonable.

DNV can confirm that the IRR of scenario v is 12.07% 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

Whether the coal mine owns and operates both coal and/or gas fired boilers for the generation of heat at the coal mine, the coal mine 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 further 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 “Wujia 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 -14.45% before tax and -8.78% 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 Validation Report.