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Att: CDM Executive Board

Your ref.:	Our ref.:	Date:
CDM Ref 1931	LIW/MLEH	26 January 2009

Response to request for review of the project "Jinling Coal Mine Methane (CMM) Power Generation Project of Dengfeng City, Henan Province" (1931)

Dear Members of the CDM Executive Board,

We refer to the issue raised by the requests for review by Board members regarding project activity 1931 "Jinling Coal Mine Methane (CMM) Power Generation Project of Dengfeng City, Henan Province" and would like to provide the following initial responses to the issue raised.

Comment 1: The DOE is requested to justify the suitability of the benchmark, in particular, appropriateness of a benchmark of year 2006 when assessing the additionality of a project activity with investment decision made in 2005

DNV Response:
The Project Proposal[1] for the proposed project was developed in August 2005. In the project proposal, it is addressed that the financial assessment of the project can be based on the "Technical Stipulation of the Feasibility of Combined Heat and Power Projects (Ji Jichu [2001] No. 26)" by the National Planning Committee that was published in year 2001. In the financial evaluation section of the Technical Stipulation, it is stated that when the project IRR is above the banking loan rate or the target IRR hurdle rate set by the investor, the project can be considered financially attractive[2].
However, the banking loan rate IRR was not chosen as the benchmark during investment decision making process by the project proponent. Another possible target IRR hurdle rate that could be considered by the investor was 13.5%, which is based on survey of 337 industrial investors by the Confederation of British Industry (CBI) in 2001[3]. This benchmark was also not selected for decision making since it was based on survey of foreign investors.
As per response from the project proponent, the benchmark of 15% for coal mining industry was applied at the time of decision making based on the "Economical Assessment and Parameters for Construction Project" version 2[4], since the project investor is Jinling Coal Mine Company as later explained in this response.

[1] Project proposal of Jinling coal mine methane power plant in August 2005
[2] http://www.powerem.com.cn/Article/2006/200611/19340.html; Technical Stipulation of the Feasibility of Combined Heat and Power Projects (Ji Jichu [2001] No. 26)
[3] Department of Trade and Industry and HM Treasury. 2004. Productivity in the UK 5: Benchmarking UK productivity performance. DTI Economics Papers Series: 27-28.
[4] Economical assessment and parameters for construction projects (version 2, 1993) by the National Development and Reform Commission and Ministry of Construction in China

The project IRR of the proposed project without CDM is 4.36 %(after tax) and 6.25 %(before tax). While it is 22.86 %(after tax) and 24.18 %(before tax) with CDM revenue[5]. Thus, the project IRR without the CDM revenue is lower than any of possible IRR benchmarks that could be applicable during decision making in year 2005, and higher than those benchmarks with CDM revenue. Under this situation, the project owner decided to develop the project considering the CDM revenue.
DNV also confirms that the benchmark in the PDD was not the investment hurdle rate considered by the project investor in the decision making in 2005. However, it had been changed as different references became available during validation.
The use of 13% as benchmark for the investment analysis as mentioned in the validation report is based on the "Economical assessment and parameters for construction projects[6]" (version 3), and was published in 2006 by the National Development and Reform Commission and Ministry of Construction in China and is considered conservative. This document has been widely used by the relevant authorities in China for assessing the financial viability of potential new projects. DNV has verified this document during validation and confirms its applicability to the proposed project activity.

Comment 2: The DOE is requested to clarify whether the project participant is independent from the Jinling Coal Mine, and if so, considering that the investment being made is in the power sector by an independent power company, further substantiation that the benchmark reflects the risk profile of this project activity is required.

DNV Response:
The project is not independent from the Jinling Coal Mine because of the following reasons:

- The parent company of Jinling coal mine, Dengcao Group Co., Ltd., made a decision to approve Jinling Coal Mine starting the CMM utilization project on 20 May 2005[7];
- To develop CMM utilization business, Jinling Coal Mine invested and registered an independent accounted subsidiary company - Dengfeng Jinling CMM Power Generation Co. Ltd. in March 2006[8].

DNV has verified the relevant documents from the project proponent confirming that the proposed project falls under one of the businesses of Jinling Coal Mine.
According to "Economical assessment and parameters for construction projects", when a project owner invests in a project based on another sector rather than its own core business, and has little experience concerning characteristics of this project as well as the related risks, the sectoral benchmark IRR of its own core business will be applied. The relevant description in "Economical assessment and parameters for construction projects" was verified by DNV. Jinling Coal Mine, the project investor, is specialized in coal mining. DNV was able to verify that the Income Explication of Jinling Coal Mine from 2006 to 2008 indicated that in the last three years, about 250 million RMB was from coal mining[9], while only about 3.7 million will be from electricity generation per year.

[5] IRR calculation spreadsheet
[6] Economical assessment and parameters for construction projects (version 3, 2006) by the National Development and Reform Commission and Ministry of Construction in China
[7] Approval letter for the CMM utilization project in Jinling Coal Mine by Dengcao Group Co., Ltd. on 20 May 2005
[8] Certificate for Dengfeng Jinling CMM Power Generation Co. Ltd. is the subsidiary of Jinling Coal Mine by Dengfeng Commerce and Industry Bureau on 15 January 2009
[9] Income Explication from coal selling of Jinling Coal Mine from 2006 to 2008 by Jinling Coal Mine of Dengcao Group Co. Ltd. on 15 January 2009

The average annual amount of electricity imported from the grid was more than 15.7 GWh[10]. Comparing with the estimated amount of 9.75GWh/year by the project, the electricity import from the grid is much more than the electricity generated by the project and delivered to the coal mine.
Furthermore, as explained above, Dengfeng Jinling CMM Power Generation Co. Ltd. is administratively affiliated to the Jinling Coal Mine of Dengcao Group. Thus, the benchmark IRR of coal mining industry is appropriate for this project.
DNV therefore finds it reasonable that JCIG applies a benchmark of 13% issued for construction projects in the coal mining sector according to "Economical assessment and parameters for construction projects" (version 3).
Nevertheless, a revised IRR analysis provided by the project participants demonstrates that even if a benchmark of the power sector (IRR 8% of total investment *after* tax) is applied, the IRR of the project is 4.36%[11], and still less than the benchmark of the power sector. DNV compared the input parameters for the financial analysis and IRR calculation spreadsheet and was able to confirm that the project activity is not financially attractive option even if compared with 8% benchmark of power sector.

Comment 3: The project boundary is not described in the PDD section B.3 and the DOE is requested to clarify why a CAR was not raised.

DNV Response:
Even though, the project boundary was not described in the PDD, DNV's assessment of the project boundary was based on the sources of emissions included under the baseline and project activity given in Section B.3 of the PDD. The boundary of the project includes: CMM drainage station, CMM transporting system, all equipments in the power plant, the CMM boiler, the internal power grid of Jinling Coal Mine, the mining equipments consuming the electricity by the project and Central China Power Grid.
The PP has included a diagram in his response to illustrate the project boundary DNV confirms that the project boundary is appropriate and in line with ACM0008.

Comment 4: The DOE is requested to substantiate the appropriateness of the baseline selection as: (a) continuation of current practice (alternative 1) has not been assessed financially, and (b) other alternatives such as all project CMM used for power generation and all CMM used for heat generation are not considered.

DNV Response:
According to methodology ACM0008, the possible alternative scenarios in the absence of the CDM project activity would be as follows:

Alternative 1: The continuation of current situation.
Alternative 2: Project activity without being registered as CDM project.
Alternative 3: Use and/or destruction of Ventilation Air Methane (VAM, methane concentration is lower than 1%).
Alternative 4: The extracted CMM would simply be destroyed by flaring.
Alternative 5: The extracted CMM would be used for additional captive power generation.
Alternative 6: The extracted CMM would be used to provide additional heat energy for civil purpose.
Alternative 7: A gas purification plant could be constructed and the CMM recovered could be processed and sold to the natural gas pipeline grid.

[10] The explication for electricity consumed by Jinling Coal Mine from 2006 to 2008
[11] IRR calculation spreadsheet

Alternative 8: CMM would only be used to fuel a power plant with a capacity of 3000KW.
Alternative 9: CMM would only be used to fuel one boiler.

As proposed by the comments, two more baseline scenario alternatives are also considered,
Alternative 10: All project CMM used for heat generation.
Alternative 11: All project CMM used for power generation.

As discussed in the PDD and subsequently confirmed in the validation report, alternative 3, 4, 5, 6 and 7 face barriers and have therefore been excluded.

For alternative 10, if all project CMM is used for heat generation, the amount of the CMM would be 3.51 million m^3, the NCV of the CH_4 is 35.53 MJ/M^3, so the generated heat energy would be 124 710 GJ. While the annual coal consumption of the boiler was 810 tons and the historic annual heat demand is 17 623GJ (caloric value: 5200kcal) in Jinling Coal Mine to meet the heating demand in the winter[12], so more than 85% of the heat energy would have to be wasted. Thus, this alternative can be eliminated. DNV verified the calculation and data sources and finds it not reasonable that all CMM is used for heat generation in the coal mine.

A NPV analysis is used for the alternative 1, 2, 8, 9, 11. For alternative 1: continuation of current practice, all CMM consumed in the proposed project activity would be vented into the atmosphere and there would be no power generation activity. Venting CMM neither creates economic benefit nor requires investment for this scenario. Therefore the NPV of this alternative is 0. The respective NPV of the alternative 2, 8, 9, 11 is -717, -658.59, -66.02, -473[13]. DNV compared the input parameters for the NPV analysis with the parameters stated in the project proposal[14] and was able to confirm that the values applied are consistent with the value stated in the project proposal. Therefore, it can be concluded that only alternative 1 is not prevented by any barriers, is the most financially attractive alternative, and is thus the selected baseline scenario.

Comment 5: The PP/DOE should further clarify the following monitoring information: (i) whether the baseline and project utilization of CMM are independently monitored, (ii) how the mean annual thermal energy demand has been monitored and calculated, (iii) how the amount of electricity generated by the project activity will be monitored, and (iv) consistency in amount of CMM calculation, as sometimes it is expressed in volume and sometimes in mass unit.

DNV Response:

The project participants have provided further details on the monitoring setup in their response to the requests for review.

(i) Four monitoring equipments are installed to monitor the following parameters:
- the amount of total CMM drainage;
- the amount of CMM used for power generation;
- the amount of CMM used to fuel the boiler, and
- the amount or the baseline CMM.

[12] Explanation from Jinling Coal Mine on the amount of coal used to provide heat in the winter each year before being replaced by the CMM-fuelled boiler
[13] NPV calculation for alternative 2. 8. 9; NPV calculation for alternative 11
[14] Project proposal of Jinling coal mine methane power plant in August 2005, Approval letter for the project proposal by Dengfeng City Development and Reform Commission on 18 August 2005

A diagram of CMM pipeline and the monitoring system was provided by PP to illustrate the locations of the motoring equipments, DNV was able to confirm the appropriateness.

(ii) In the baseline scenario, CMM was supplied to the catering facilities by an independent pipeline for cooking in Jinling Coal Mine. Three calculation methods were demonstrated by PP:

1) There are two types, 31 stoves used for cooking in canteens, the amount of the CMM demand is 0.38 million m^3 per year based on the CMM consumption rate by the stoves.[15]
2) An estimated thermal demand of 0.47 million m^3 is according to the diameter of the pipeline and the CMM flow velocity[16].
3) The PP provided the amount of baseline CMM consumption from October 2007 to December 2008 after monitoring equipments installed[17]. A conservative d_k^{max} was used for the calculation, the estimated result is 0.72 million m^3

DNV checked the documents and confirmed that the values used for the baseline thermal demand represent the situation of Jinling Coal Mine.
Based on the above estimation, the maximum of mean annual thermal energy demand is 0.72 million m^3 CMM. After sending CMM to the power plant and boiler, the remaining CMM is 0.95 million m^3 according to the project proposal[18], which is more than 0.72 million m^3. DNV concludes that mean annual thermal demand can be met during project operating.

(iii) An independent electricity meter was installed for every generator to monitor the electricity generated by the corresponding generator. The summation of the electricity generated by all meters is the total amount of electricity generated by this project.
Two meters for monitoring the amount of electricity delivered to the coal mine's internal grid and one meter for monitoring the amount of electricity consumed by the power plant would also be installed. The summation of the readings from these three meters can be used to cross check the total electricity generated by the project.

(iv) The amount of CMM is calculated as per the methodology ACM0008. The data related to the amount of CMM are all calculated in mass unit. However, the monitored data by the equipments can only be expressed as gas flow volume units. Flow meters will record gas volumes, pressure and temperature as well. Density of methane under normal conditions of temperature and pressure is 0.67kg/m^3. Therefore, the records of CMM flow will be volume units and the calculation will be conducted by converting volume unit into mass unit, using the following equation:

Mass=Volume (under normal condition) * Density of methane.

We sincerely hope that the Board accepts our aforementioned explanations.

[15] The explication for the stoves used in the Jinling Coal Mine by Jinling Coal Mine of Dengcao Group Co. Ltd. on 15 January 2009

[16] The calculation conducted by Chongqing Branch of China Coal Research Institute about the maximum throughput of CMM distribution pipeline in Jinling Coal Mine

[17] The record for baseline CMM consumption from October 2007 to December 2008

[18] Project proposal of Jinling coal mine methane power plant in August 2005

Yours faithfully
for DET NORSKE VERITAS CERTIFICATION AS

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