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Att: CDM Executive Board

Your ref.:
CDM Ref. 1966

Our ref.:
WT/BRINKS

Date:
24 November 2008

Response to request for review of the project "China Guangdong Shenzhen Qianwan LNG generation project" (1915)

Dear Members of the CDM Executive Board

We refer to the requests for review raised by three Board members concerning DNV's request for registration of project activity "China Guangdong Shenzhen Qianwan LNG generation project" (1915) and would like to provide the below initial response to the issues raised in the requests.

Comment 1: The determination of the project activity start date requires further substantiation, in particular it should be demonstrated that no contracts for equipment or fuel supply as well as a power purchase agreement (PPA) were entered into prior to 14 December 2004.

DNV Response:

The timeline of the proposed project activity has been provided as part of the project participant response to this request for review.

August 2002: The project owner attended the Carbon Credit Conference held in Zhuhai City and became familiar with the concept of CDM, which is evidenced by the Minutes from the Environmental Development & Carbon Credit Meeting held in Zhuhai on 20 August 2002.

February 2003: the project owner agreed to authorize Tsinghua University and Energy Research Institute NDRC to start a "Case Study of Clean Development Mechanism Project of Zhuhai Natural Gas Power Plant Project Phase II". The case study took into account the economic potential influence of CDM, which is evidenced by the Minutes from Yudean Group and Zhuhai Electric Power Company meeting held in February 2003.

March 2003: The Yudean Group, the parent company of Shenzhen Guangqian Electric Power Co., Ltd., signed the main equipment contract with Mitsubishi Heavy Industries, Ltd., Mitsubishi Corporation and Dong Fang Steam Turbine Works. The conditions for the contract to become effective were as follow:

- a) Getting the project FSR approval from NDRC (National Development and Reform Commission)
- b) Provision of the Performance Guarantee by the Equipment supplied upon the project owner's notification of the contract validity.

DNV has verified the Contract for Gas Turbine Combined Cycle Power Generation Project Qianwan LNG Power Plant (Contract No. 03JP01GTA10IXC0007) between Yudean Group and

Mitsubishi Heavy Industries, Ltd., Mitsubishi Corporation and Dong Fang Steam Turbine Works, signed in March 2003.

July 2003: The FSR was prepared by Guangdong Electric Power Design Institute (GEDI). The FSR report was verified by DNV

February 2004: Due to the increase in the natural gas price, the project owner commissioned the Guangdong Electric Power Design Institute to develop a revised Financial Assessment (FA) to take potential CDM revenues into account. The revised FA is based on the FSR as well as the results from case study for a similar natural gas-fired power generation project completed in November 2003 ("Case Study of Clean Development Mechanism Project of Natural Gas Zhuhai Power Plant Project Phase II", Energy Research Institute of the NDRC & Global Climate Change Institute, Tsinghua University, November 2003). The results from the case study showed the project owner that CER revenues could improve the financial performance of the project.

30 April 2004: The project investor, Yudean Group signed the LNG Sales and Purchase Contract with the Guangdong Dapeng LNG Company. DNV has verified the contract. The conditions for this contract to become effective were as follow:

- a) Getting the project FSR approval from NDRC (National Development and Reform Commission);
- b) The confirmation from the project participant to the contract counterparty on validity of the contract in written format.

May 2004: Guangdong Electric Power Design Institute completed the revised financial assessment, which was verified by DNV. The revised FA shows that the IRR of total investment is 5.55% without CDM revenues, which is lower than the benchmark of 8%.

28 May 2004, the Directorate Decision of Shenzhen Guangqian Electric Power Co., Ltd. discussed the financial viability of the project. The directors agreed that applying CDM will ensure the financial validity of project. This was evidence through the Directorate Decision dated 28 May 2004, which was reviewed by DNV.

31 May 2004: The project owner (Shenzhen Guangqian Electric Power Co., Ltd.) submitted the FSR and the FA to the government. This was evidenced through the confirm letter issued by Guangdong provincial Development and Reform Commission. The confirmation letter was verified by DNV.

13 July 2004: The approval letter was issued by the National Development and Reform Commission and the project was approved by the government. The approval letter was verified by DNV.

14 December 2004: The construction permit was issued by Guangdong Tianan Engineering Supervision Co. Ltd.).

May 2005: The project owner got the information that the CDM application from an India natural gas project was approved by the Indian government and the validation started, which is evidenced by project owner's meeting minutes in May 2005.

October 2005: The project owner made a CDM work group, which was evidenced by the Notice of Shenzhen Qianwan LNG Project Building up CDM Work Group. This notification was reviewed by DNV.

June 2006: the project owner started the CDM application process for the project after getting the information that the methodology AM0029 was approved by EB on 10 May 2006. This was evidenced by the project owner's Directorate Decision dated 03 June 2006.

19 July 2006: The CDM consulting agreement was signed between the project owner and Tsinghua University, which was evidenced by the CDM consulting agreement with Tsinghua University date 19 July 2006. The agreement was reviewed by DNV.

16 September 2006: The PDD of the project was made public on UNFCCC's website (<http://cdm.unfccc.int/Projects/Validation/index.html>)

October 2006: the Power Purchasing Agreement (PPA) was signed by the project owner and Guangdong Power Grid Company. The PPA was verified by DNV.

26 June 2008: ERPA (certified Emission Reductions Purchase Agreement) for the project was signed between the project owner and Mitsui, which was checked by DNV.

According to the time table and EB's latest guidance on CDM project start date, the earliest date of the main equipment contract, the LNG Sales and Purchase Contract and the PPA will be selected as the project start date.

As mentioned in timeline, in March 2003, the investor of the project, Yudean Group signed the main equipment contract, which mentions that the contract shall become effective upon the following conditions:

- a. Getting the project FSR approval from NDRC (National Development and Reform Commission);
- b. Equipment supplier provides the Performance Guarantee upon the project owner's notice of contract validity. The performance guarantee is to protect the interests of the buyer. Before the performance guarantee is issued, the seller needs to deposit money into the bank. According to the terms of contract, when the buyer receives the performance guarantee, the buyer needs to pay advance payment. If the Seller do not execute the contract, the buyer has right to take back the advance payment by performance guarantee.

The project FSR was approval by NDRC on 13 July 2004. The Performance Guarantee from equipment supplier was issued on 18 August 2004 based on receipt of the project owner's notice of the contract validity. The Performance guarantee was verified by DNV. The advance payment was paid by the project owner, which is evidenced by the advance payment invoice issued by the supplier on 23 August 2004. The effective date of the main equipment purchase contract is 18 August 2004.

As mentioned in timeline, on 30 April 2004, the project investor, Yudean Group signed the LNG Sales and Purchase Contract (LNG Sales and Purchase Contract signed between Yudean Group and Guangdong Dapeng LNG Company on 30 April 2004), the condition for this contract to become effective are:

- a. Getting the FSR approval from NDRC (National Development and Reform Commission);
- b. The project participant confirms to the contract counterparty the validity of the contract in written format.

The project FSR was approval by NDRC on 13 July 2004. The confirmation letter to the contract counterparty on validity of the contract by the project owner was issued on 29 September 2004, this was checked by DNV. The letter to the contract counterparty confirming on validity of the contract by LNG supplier was issued on 27 June 2005, this was verified by DNV. The actual legal effective date of the LNG Sales and Purchase Contract comes after the main equipment contract effective date.

The Power Purchase Agreement was signed by the project owner and Guangdong Power Grid Company in October 2006.

So the earliest date of the main equipment contract, the LNG Sales and Purchase Contract and PPA comes into force is 18 August 2004 (equipment purchase contract effective date), which should be considered as the project activity start date.

In addition, DNV can confirm that the effective condition in the contract is the right endued by Chinese law, which is evidenced by the Contract Law of P. R. China. The effective condition in the contract is also common practice in other industries. In China, no construction or actual investment is legally permitted without the official approval (<http://www.law110.com/law/jiwei/16044.htm>), so the signed equipment or fuel purchasing contracts are only the intent without legal effectiveness before the governmental approval (<http://www.cec.org.cn/news/showc.asp?ID=11937>).

Comment 2: Further clarification is required on how the DOE has validated: (i) the suitability of the input values to the investment analysis as per the guidance of EB 38 paragraph 54, in particular gas price, plant load factor and investment cost, etc, and (ii) that the tariff it is unlikely to increase by 6.5%.

DNV Response:

(i) the suitability of the input values to the investment analysis as per the guidance of EB 38 paragraph 54, in particular gas price, plant load factor and investment cost, etc

As reported in the validation report and the response from the PP, the input parameters used in the financial analysis are taken from the feasibility study report (FSR) developed by Guangdong Electric Power Design Institute in July 2003 and approved letter by the National Development and Reform Commission of 13 July 2004, except for the gas price, the supply gas volumes and electricity generation. The latter three parameters were calculated in May 2004 in the revision of the Financial Assessment (FA) by Guangdong Electric Power Design Institute (Revision of the Financial Assessment (FA) by Guangdong Electric Power Design Institute in May 2004) based on LNG Sales and Purchase Contract (LNG Sales and Purchase Contract signed between Yudean Group and Guangdong Dapeng LNG Company on 30 April 2004).

Guangdong Electric Power Design Institute is a qualified third party independent organization, which is verified by the DNV through its website (<http://www.gedi.com.cn/index.asp>). The input parameters used in the financial analysis can thus be considered information provided by an independent and recognized source.

DNV compared the input parameters for the financial analysis included in the PDD with the parameters stated in the FSR and was able to confirm that the values applied are consistent with the value stated in FSR. The electricity generation, the supply gas volumes and gas price were taken from the revised Financial Analysis.

The FSR was approved in 13 July 2004 and thus only 1 month prior to the decision to proceed with the project activity (i.e. the start date of the project) which was on 18 August 2004 as mentioned above (the earliest date of the main equipment contract, the LNG Sales and Purchase Contract and PPA comes into force). Given this relative short period of time between approval of the FSR and the decision to proceed with the project activity it is unlikely in the context of the project that the input values would have materially changed and that it is thus reasonable to assume that the FSR has been the basis of the decision to proceed with the investment in the project.

Furthermore, the input parameters used in the financial analyses were compared with the data reported for other similar proposed CDM projects in China.

By in addition 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.

1) The input data of Gas Price

The value of 1.55 Yuan/m³ (including tax) was used in the financial analysis. This value was calculated by Guangdong Electric Power Design Institute based on LNG sales and purchase contract (30 April 2004). This is evidenced in the revision of the Financial Assessment (FA) by Guangdong Electric Power Design Institute in May 2004. The value is higher than 1.442 Yuan/m³ in FSR dated in July 2003 (including tax), due to the continuous rising price of crude oil and raw materials in early 2004, which is checked by DNV in the website (<http://okokok.com.cn/Htmls/GenCharts/080215/7037.html>). The gas price of the project increased to 1.5961 Yuan/m³ (including tax) from 1 April 2007, which is evidenced by DNV through the Notice of the Price of Natural Gas from Guangdong Dapeng Company issued by Bureau of Commodity Price of Guangdong Province [Yuejia 2007 Doc No.190] on 3 September 2007,. So 1.55 Yuan/m³ of gas price used in the investment analysis is conservative and credible.

2) The input data of supply gas volume

The value of supply gas volume used in the financial analysis was calculated by Guangdong Electric Power Design Institute based on LNG sales and purchase contract and the calculation model in FSR compiled in July 2003, which is verified by the FA prepared by Guangdong Electric Power Design Institute (dated May 2004).

3) The input data of Annual Electricity Generation

The value of supply gas volume used in the financial analysis was calculated by Guangdong Electric Power Design Institute based on annual supply gas volume and the unit gas consumption (m³/kWh), which are sourced from LNG sales and purchase contract and FSR respectively. The calculated value was mentioned in the financial analysis (dated May 2004), which was checked by DNV. According to the PPA, the annual electricity generations of Qianwan project's units are subject to the provincial electricity generation plan regulated by Electricity Power Administration Department of Guangdong Province. In the meanwhile, the annual electricity generation also limited by the sales and purchase contract.

4) The input data of Load Factor

Load Factor was based on the annual electricity generation according to the formula as follows:

Load factor = Annual Electricity Generation/(installed capacity x 8760 h)

The annual electricity generation has been stated in item 3). The install capacity of the project is sourced for FSR. The project PLF in the financial analysis is 39%, which is reasonable due to the function of peak load regulation. DNV also checked the websites of other NG projects' load factors mentioned in PP's response, and could confirm that other NG projects have a similar load factor. The value of load factor used in the financial analysis is reasonable.

5) The input data of total investment

The value of 3690.55 million RMB of investment in fixed assets in the financial analysis was sourced from the FSR. The actual investment in fixed assets is 3985.79 million RMB, the difference with the FSR value is due to the price increase of raw material. This is evidenced by the completion of settlement audit report of the project issued by Guangzhou Zhiheng Construction cost of the Advisory Co., Ltd. on 22 October 2007 and verified by DNV. So the input data of total investment used in the financial analysis is conservative and credible.

6) The input data of O&M

The value of O&M expenditure in the financial analysis was sourced from the FSR. In early 2004, the main part of O&M expenditure, fuel cost is continuous rising (<http://okokok.com.cn/Htmls/GenCharts/080215/7037.html>). The cost of raw material is also rising in these years (http://www.stats.gov.cn/tjgb/ndtjgb/qgndtjgb/t20060227_402307796.htm), including the spare parts. The Consumer Price Index (CPI) was increasing from 2004 to 2008 in China. Moreover, the parts supplier, Dongfang Steam Turbine Works was damaged in the earthquake occurred in Sichuan Province on 12 May 2008, which will cause parts supply more difficult and parts price rising. All of these factors will make O&M cost increase. So the value of O&M expenditure in the financial analysis is conservative and reasonable. Relevant websites mentioned in PP's response have been verified by DNV.

7) The input data of tariff

The analysis of tariff is referred to the description in item (ii) below.

(ii) that the tariff it is unlikely to increase by 6.5%.

The feed-in tariff is strictly regulated by the government and feed-in tariff changes need government's approval, which is evidenced by Notification of Electric Power Tariff Reform by the Office of national council issued on 9 July 2003. Moreover, the average electricity tariff of Guangdong Province power plant was decreasing year by year from 1999 to 2003, which is evidenced by the document of "Certificate of the Average Electricity Tariff from Year 1999 to Year 2003 in Guangdong Province" issued by Guangdong Power Grid Company in November 2008. Therefore at the time of investment decision made by project owner in 2004, it was unlikely that the project owner could predict that the tariff would increase more than 6.5% in the future. Furthermore, the project must take part in the on-grid price bidding, which is evidenced by the FSR approval by NDRC (approved 13 July 2004). From 2006 to 2008, the actual tariff of the project has being fixed as 0.495 RMB/kWh (including VAT), which is the same as the tariff described in PPA. It is evidenced by the electricity invoices of the project, which were crossed-checked by DNV. This supports the conclusion that the tariff is unlikely to increase by 6.5%.

In conclusion, the input values used in the investment analysis are reasonable and conservative. Relevant documents and websites mentioned in PP's response have been crossed-checked by DNV.

Comment 3: Further clarification is required on how the DOE has validated the common practice analysis, in particular, selection of the similar project activities.

DNV Response:

As discussed in the PDD, there are four LNG power generation projects in the CSPG, including:

- Huizhou LNG project;
- Zhujiang LNG project,
- Shenzhen Dongbu LNG project
- the proposed project activity.

In China, NG and LNG projects must be approved by government before the construction. After checking relevant government websites, such as the website of National Development and Reform Commission (<http://www.sdpc.gov.cn>) and Guangdong Provincial Development and Reform Commission (<http://www.gddpc.gov.cn/>), and China Electric Power Yearbooks (China Electric

Power Yearbook from 2002 to 2007), DNV could confirm that there are only 4 LNG power generation projects and two NG power generation projects in CSPG. Four LNG power generation projects are the same as the projects stated in PDD.

According to “Tool for the demonstration and assessment of additionality (Version 04)”, activities similar to the proposed project activity should be considered for the common practice analysis. Similar project activities include:

- Those activities that are implemented previously or currently underway
- Projects in the same region and/or rely on a broadly similar technology;
- Projects are of similar scale;
- Projects take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc.

DNV checked the websites mentioned in PP’s response and could confirm that all of other three LNG power generation projects in CSPG are in the process of applying as CDM projects.

Moreover, the other two NG power generation projects in CSPG are also in the process of applying as CDM projects, which is verified by DNV through checking the websites mentioned in PP’s response.

Hence, DNV can confirm, after validating the information, that the proposed project activity is not common practice.

Comment 4: The DOE shall confirm how applicability of the methodology has been validated, in particular that the implementation of the project will not limit natural gas based power capacity additions in the region.

DNV Response:

According to the methodology AM0029, the methodology is applicable under the following conditions:

- 1) The project activity is the construction and operation of a new natural gas fired grid-connected electricity generation plant
- 2) The geographical/ physical boundaries of the baseline grid can be clearly identified and information pertaining to the grid and estimating baseline emissions is publicly available.
- 3) Natural gas is sufficiently available in the region or country, e.g. future natural gas based power capacity additions, comparable in size to the project activity, are not constrained by the use of natural gas in the project activity.

DNV validated the applicability of the methodology as follows:

- 1) Based on FSR and the approval for FSR (approved 13 July 2004), the project activity is the construction and operation of a new natural gas fired grid connected electricity generation plant and no other fuel besides natural gas is used in the Project. Therefore, the Project meets the applicability requirement of the methodology AM0029.
- 2) The electricity generated will be supplied to the China Southern Power Grid, of which the geographic and system boundaries could be clearly defined, which is mentioned in Notification on Determining Baseline Emission Factor of China’s Grid issued by China’s DNA on 09 August 2007 (<http://cdm.ccchina.gov.cn/web/NewsInfo.asp?NewsId=1889>) and used to estimate baseline

emissions is publicly available. Therefore, the Project meets this applicability requirement of the methodology AM0029.

3) As per the Clarification on applicability criteria of AM0029 v1.1

(AM_CLA_0091 by Meth Panel) states the following:

“as indicated in the footnote to the applicability condition in question, this condition is required to ensure the project activity does not displace natural gas that would otherwise be used elsewhere in an economy of the country or region, thus leading to possible leakage. Notwithstanding where the natural gas is imported from, this applicability condition is to be implemented by demonstrating, through monitoring, that the full demand of natural gas by the project activity is dedicatedly met with imported gas, and where dedicated imports is not the case, the monitoring should show that satisfying the project activity’s demand for natural gas will not lead to a shortages in supplies of the gas to other projects within the country”.

In other words, the project is applicable to the methodology AM0029v1.1 by demonstrating that the full demand of the natural gas by the proposed project is dedicatedly met with imported gas. DNV is able to verify that the project is subject to the methodology applicability criteria clarified by Meth Panel as following:

The full demand of natural gas by the proposed project is dedicatedly met and supplied under the long-term take or pay contract signed by Guangdong Dapeng LNG company, by which the liquefied natural gas is imported from Australia, from which 3.7 million tons of LNG per year will be provided for 25 years. Guangdong Dapeng LNG company has also signed take-or-pay long-term contracts for fuel supply over 25 years with all of the consumers. The LNG consumed by the project is about 13.7% of total LNG supply.

As above statement, the consumption of natural gas by the proposed project will not constrain future natural gas capacity additions as required by the methodology AM0029 v1.1 and the applicability of the methodology is met suitably.

Comment 5: The DOE is requested to confirm how it has validated the economic comparison of baseline alternatives, in particular the varying assumptions on the operational hours, efficiency and load factor.

DNV Response:

According to AM0029, the baseline alternatives should include all possible realistic and credible alternatives that provide outputs or services comparable with the proposed project, these alternatives need not consist solely of power plants of the same capacity, load factor and operational characteristics.

After having excluded the alternatives not providing peak load, or not in compliance with all applicable legal and regulatory requirements, five options for the plausible baseline scenarios are selected and confirmed in the PDD for the financial comparison of the baseline alternatives according to step I of identification of the baseline scenarios of the methodology. They are respectively the proposed project without CDM, 600 MW super-critical plant, 600 MW sub-critical plant, 300 MW sub-critical plant and 180 MW oil-fired CCGT.

The economic comparison was carried out according to the requirements of AM0029 v1.1. The 600 MW Sub Critical Plant with lowest levelized cost was identified as the baseline scenario as follows:

- a) The economically most attractive baseline scenario alternative is identified using levelized cost as a financial indicator. The basic levelized cost methodology is based on “Projected Costs of Generation Electricity” published by IEA for the calculation of the financial indicators.
- b) The data and parameters (except the power generation coal consumption of 600 MW coal-fired sub-critical, the power generation coal consumption of 180 MW oil-fired CCGT and the fuel expenditures for different technologies) for financial analysis are taken from “Design reference cost index for thermal power transmit electricity and transformer electricity projects (2004)” issued in 2005 April by China Electrical Power Press based on 2004 data, (China Electrical Power Press, Design reference cost index for thermal power transmit electricity and transformer electricity projects (2004) in April 2005). The power generation coal consumption of 600 MW coal-fired sub-critical is taken from “Operation date of 600 MW units national competition in 2006” and the power generation coal consumption of 180 MW Oil fired CCGT is taken from “Notice of electricity price of oil-fire power plants floating with price of fuel oil” issued by Guangdong Province Price Supervision Bureau.
- c) The fuel expenditures for different technology for financial analysis are taken from the following sources: the expenditure of coal is sourced from “National Economic Operation Analysis of Coal Enterprises from January 2004 to May 2004”; the expenditure of natural gas is calculated by Guangdong Electric Power Design Institute based on LNG sales and purchase contract, which is stated in FA by Guangdong Electric Power Design Institute (Revision of the Financial Assessment (FA) by Guangdong Electric Power Design Institute in May 2004); the expenditure of fuel oil is sourced from “Notice of electricity price of oil-fire power plants floating with price of fuel oil” issued by the Guangdong Province Price Supervision Bureau. The input parameters used in the financial analysis of the proposed project can thus be considered information provided by an independent and recognized source.
- d) DNV has compared the input parameters for the levelized cost analysis included in the PDD with the parameters stated in the “Design reference cost index for thermal power transmit electricity and transformer electricity projects (2004)” and other relevant documents mentioned above and was able to confirm that the values applied are consistent with the value stated in above documents.
- e) The levelized costs for:
 - a. The proposed project without CDM is 0.4324 RMB/kWh (with load factor 39.95%)
 - b. 600 MW super-critical plant is 0.2195 RMB/kWh (with load factor 57.08%)
 - c. 600 MW sub-critical plant is 0.2173 RMB/kWh (with load factor 57.08%)
 - d. 300 MW sub-critical plant is 0.2427 RMB/kWh (with load factor 57.08%)
 - e. 180 MW oil-fired CCGT is 0.6366 RMB/kWh (with load factor 39.95%)

The 600 MW sub-critical plant has the lowest levelized cost of 0.2173 RMB/kWh, taken as the most attractive baseline scenario alternative.

DNV has also verified the levelized cost calculations using the same load factor (39.95%) for all alternatives. The results are as follow:

- f. The proposed project without CDM is 0.4324 RMB/kWh (with load factor 39.95%)
- g. 600 MW super-critical plant is 0.2821 RMB/kWh (with load factor 39.95%)

- h. 600 MW sub-critical plant is 0.2778 RMB/kWh (with load factor 39.95%)
- i. 300 MW sub-critical plant is 0.3122 RMB/kWh (with load factor 39.95%)
- j. 180 MW oil-fired CCGT is 0.6366 RMB/kWh (with load factor 39.95%)

The results above shows that even when using the same load factor for all alternative the 600 MW sub-critical plant alternative still has the lowest levelized cost (0.2778 RMB/kWh). Therefore it is reasonable to assume this alternative as the most attractive baseline scenario alternative.

- f) To further demonstrate the financial attractiveness of the 600 MW Sub Critical Plant is robust to reasonable variations in the critical assumptions for the alternatives (i.e. fuel cost and the load factor), a sensitivity analysis has been conducted by PP in the PDD. The conclusion is that the construction of a 600 MW Sub Critical Plant is identified as the most likely baseline scenario.
- g) Regarding the efficiency, it is calculated using the following formula, which is sourced from the Energy Statistic website of China Government: $\text{Efficiency} = 3600 / \text{fuel consumption} / 29308$ (<http://xmecc.smexm.gov.cn/2007-12/20071227102507.htm>). So the efficiency is only related with the fuel consumption. So PP uses fuel consumption for sensitivity analysis instead of the efficiency. Because it is hard to predict the parameters used in sensitivity analysis, the fluctuation of $\pm 10\%$ for the fuel consumption and load factor is used in the sensitivity analysis for the levelized cost of the project generally. However, to be conservative, even if the fluctuation of $\pm 50\%$ for the fuel consumption and load factor is used in the sensitivity analysis, 600 MW sub critical power plant still remains to have the lowest levelized cost. For fuel consumption and load factor, they are the average values for all of power plants in China, so it is unlikely to fluctuate in so large scale ($\pm 50\%$). The calculation spreadsheet provided by PP is verified by DNV.
- h) For the operational hours, because operational hours = load factor x 8760 h, the fluctuation of the operational hours has the same effect as load factor.

In conclusion, the levelized cost analysis is robust to reasonable variations in the critical assumptions for the alternatives (i.e. operational hours, efficiency, and the load factor)

We sincerely hope that the Board accepts our aforementioned explanations.

Yours faithfully
for DET NORSKE VERITAS CERTIFICATION AS

H.W. Brinks

Hendrik W. Brinks
Technical Director for CDM
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