

Response to Request for Review of Project Activity

“Zhejiang Jiaxing Ultra-supercritical Power Generation Project”(No.5027)

Dear Members of the CDM Executive Board,

We were informed that our project “Zhejiang Jiaxing Ultra-supercritical Power Generation Project” (Reference number 5027, herein referred to as the Project or the proposed project) was requested for review by the CDM Executive Board. As required by the Executive Board, and on behalf of the Project Participates (PP) we would hereby like to answer the questions and clarify the issues raised in the review requested.

1. The DOE is requested to further justify how it has validated the baseline identification, in particular the exclusion of alternative A4 (natural gas power plants) based on the natural gas policy and base/peak load service, as per ACM0013 v04 page 8. In doing so, the DOE shall also explain the relevance of this natural gas policy to the project activity and whether the policy considers the same definition of base/peak load as per ACM0013. Please refer to ACM0013 v04 page 8, VVM version 01.2 para 84.

For this issue, we would like to response from two parts:

Firstly, natural gas power plant only can be built as peak load power plant within ECG due to the following reason:

According to Notification of Natural Gas Utilization Policy¹ (Fagainengyuan[2007] No.2155), natural gas is only permitted to be utilized in natural gas power plant served as peak load within electricity load center region with sufficient natural gas supply. ECG suffers a severe insufficiency of electricity² and the region ECG covered is a typical electricity load center in China (31.11% of the total electricity consumption in China in 2008, according to China Electric Power Yearbook 2009), thus it is unlikely to build a natural gas base load power plant within ECG.

Secondly, the definition on peak load mentioned in the natural gas policy to the Project is same to the definition in the ACM0013, i.e. peak load is defined as a load factor of less than 3,000 hours per year, and can be proved from two parts:

- According to the *Essential information on Power Plant Design*, (reference at the website, <http://wenku.baidu.com/view/ce863036eefdc8d376ee32a3.html?from=related>), the load factor of the peak load power plant was less than 3,000 hours per year;
- The load factor of the natural gas power plant which severed as peak load plant in China is less than 3,000 hours per year:

According to China Power Yearbook 2009, Xiaoshan Natural Gas Power Plant, which served as peak load power plant and connecting to ECG had annual operation hours below 3000 hours (1907 hours). In addition, natural gas power plant with annual operation

¹ http://www.sdpc.gov.cn/zcfb/zcfbtz/2007tongzhi/t20070904_157244.htm

² <http://industry.caijing.com.cn/2011-09-16/110863168.html>

hours below 3000 hours are also observed in other power grid (Shenzhen Guangqian Power Co.,Ltd (LNG), 2,680 hours, Guangdong Huizhou Natural Gas Power Plant, 2,498 hours, and Shenzhen Energy Group Dongbu Power Plant, 2,805 hours), also served as peak load power plant.

Based on the above analysis, we can conclude that the exclusion of alternative A4 (natural gas power plants) is reasonable and complied with the definition of base/peak load as per ACM0013.

2. The DOE is requested to further explain how it has validated the input values in the levelized cost analysis, in line with the VVM version 01.2 paragraph 111, as sufficient information has not been provided how the DOE validated:

- (a) the investment cost of the project activity, as the breakdown of the cost has not been provided and the DOE has not substantiated how much the signed fees contribute to the total investment and the likelihood of the rest;**
- (b) the plant load factor of the supercritical coal power plant (57%), as the electricity generation of this alternative in the spreadsheet considers the same output as the project activity, hence has PLF of 95% (i.e. 10,000 GWh/y or equal to 95%);**
- (c) the potential revenue from the sale of the ash, if any. Please refer to VVM version 01.2 paragraph 111.**

We would like to response this issue as follows:

For issue (a):

The total static investment used in the PDD is 7.54 billion RMB, which sourced from the approved FSR. According to the Final Financial Accounts Report of the proposed project, issued by the third-party, the actual total dynamic investment and static investment are summed as 7.94 billion RMB and 7.68 billion RMB, respectively, 0.6% and 1.9% higher than those of the estimation in the FSR .

Besides, capital expenditure per kW, as a key factor of investment analysis, is further compared with the reference value provided by Unit Cost Referenced Cost Index of Fossil-fired Power Engineering and Design (2007), which is 3724 RMB per kW for 2X1000 MW class newly built ultra-supercritical power plants at price level of 2007. The total investment of the project is 7542.27 million RMB according to the FSR, thus the capital expenditure per kW is 3771 RMB per kW, with only 1.26% variation by contrast to the reference value.

Therefore, data input from FSR can be regarded as reasonable and conservative for the investment analysis.

For issue (b):

The project activity is a 2x1000MW power plant, which could generate 10,000GWh electricity at a load factor of 57% annually. To deliver the similar services, as required by ACM0013 v04, page 3, we assume the baseline scenario should also generate the same amount of electricity to meet the huge electricity demands raised by ECG. Only if the load factor increases to as high as 95% could the baseline scenario generate enough electricity as the project activity does at a load factor of 57%. So the load factor for the baseline scenario used in the PDD is reasonable and complied with ACM0013 v04.

Furthermore, according to ACM0013 v04, page 3, these alternatives need not consist solely of

power plants of the same capacity, load factor and operational characteristics, however they should deliver similar services. So even the load factor is different for the alternatives it also meets the requirement of the methodology.

Based on the above analysis, though the load factor is different for the alternatives it also reasonable and meet the requirement of the methodology.

For issue (c)

The levelized cost of electricity (LCOE) correspond to the cost of an investor assuming the certainty of production costs and the stability of electricity prices, according to its definition from Projected Costs of Generating Electricity 2010 Edition, published by International Energy Agency, which indicates that the revenues are not involved in the LCOE analysis. Nonetheless, we take the revenue from ash into consideration as an offset to O&M cost in accordance with this request for review.

- **For the proposed project:** As there are not any related data in the FSR, we investigated the actual ash revenue from PP. According to the statement from PP, the actual ash production from December 26th, 2011 to January 15th, 2012 is 93,771 tons and the price of the ash is 9 RMB per ton. The total actual revenue of the ash is thus 843,941 RMB in 21 days at an average of daily ash production approximate 4,465 tons. We thus assume the power plant will produce $4465 \times 365 = 1629725$ tons per year and the revenue will be 14.67 million RMB per year, 3.68% of the total O&M cost.
- **For the 2*600MW supercritical power plant:** We assume that the baseline scenario 2*600MW supercritical power plant uses the same type of coal whose ash proportion is 15% as the project. Meanwhile, according to *Design Manual for Electric System*, issued by China Electric Power Planning Institute, the ash production is estimated as 746,637 $(44.8 \times 2 \times 8333)^3$ thousand tons per year. The revenue can be calculated as 6.72 million RMB $(746,637 \times 9)$ per year, 1.97% of the total cost originally summed in LCOE.

Therefore, the potential revenue from the sale of ash covers tiny proportion of the total O&M. By taking the ash revenue into account for project and baseline scenario, the LCOE of both scenarios can be re-calculated as 0.3243 RMB/kWh and 0.3404 RMB/kWh, respectively, which means that the supercritical coal-fired power plant is still the baseline.

For issue (a) and issue (c), all supportive evidence is submitted to DOE for further crosscheck.

3. The DOE is requested to further explain how it has validated the energy efficiency of the power generation technology that has been identified as the most likely baseline scenario (38.95%), in line with the ACM0013 v04 page 10. Please refer to ACM0013 v04 page 10.

For this issue, we would like to response from two parts:

Firstly, we would like to clarify how the baseline efficiency in the PDD is identified:

In the PDD, the energy efficiency of the power generation technology that has been identified as the most likely baseline scenario (38.95%) is calculated according to data sourced from Unit Cost Referenced Index of Fossil-fired Power Engineering and Design of 2007, which is the main data source cited for baseline scenario in other parts of the PDD. The book is

³ The table 4-7 shows the ash production for single 600MW unit is 44.8 tons per hour when ash content of the coal combusted is 15%. The plant factor adopted here is 8333 hours, consistent with the LCOE calculation.

identified as the official reference to conduct investment analysis, preliminary budget and comparative analysis for newly built and expansion of 300MW, 600MW and 1000MW class coal-fired power plants and 300MW, 180MW class gas-fired power plants.

The energy efficiency η_{BL} is calculated by coal consumption per kWh delivered to the grid, as the formula listed hereafter.

$$\eta_{BL} = 3.6 \cdot \frac{EG}{FC \cdot NCV} = 3.6 \text{MJ/kWh} \times 1 \text{kWh} / (315.4 \text{g/kWh} \times 0.029307 \text{MJ/g}) = 38.95\%$$

Of which,

315 g/kWh, the net standard coal consumption, calculated according to the Gross Coal Consumption Rate (299g/kWh) and the auxiliary electricity consumption rate (5.20%), are both sourced from Unit Cost Referenced Index of Fossil-fired Power Engineering and Design of 2007, coherent with the data source used in evaluation of baseline scenario.

Based on the above analysis, we can conclude that the source of data is in line with the ACM0013 V04, i.e., this parameter is determined as part of the baseline scenario selection procedure.

Secondly, we would like to clarify the data used in the PDD is reasonable and conservative

The appropriateness of the data should be available and comparable for baseline scenario and the project at the same time point when the investment decision was made. Based on this consideration, the parameters used for baseline scenario selection procedure are sourced from Unit Cost Referenced Index of Fossil-fired Power Engineering and Design of 2007. So the energy efficiency of the power generation technology that has been identified as the most likely baseline scenario is calculated as 38.95% in the PDD, and while according to 2009 Bulletin on determining baseline emission factor for China Grid", published on July 2nd, 2009, the best commercial energy efficiency for the 600 MW units estimated to be 38.10% in the year of 2007. The energy efficiency used in the PDD (38.95%) is 2.2% higher than the best commercial energy efficiency.

Based on the above analysis, the energy efficiency used in PDD is reasonable and conservative, and also complied with ACM0013 v04.

Considering the above analysis, the data source of the energy efficiency of the power generation technology that has been identified as the most likely baseline scenario is in line with ACM0013 v04; and the value of this energy efficiency (38.95%) used in the PDD is conservative and complied with ACM0013 v04.

4. The DOE is requested to substantiate how the project complies with the ACM0013 v04 page 9, as the list of the plants identified in Steps 3 and 5 to determine the baseline emission from Option 2, as well as relevant data on the fuel consumption and electricity generation of all identified power plants has not been provided. Please refer to ACM0013 v04 page 9.

For this issue, our response is that:

As per ACM0013, version 04, page 9, all steps should be documented transparently, including

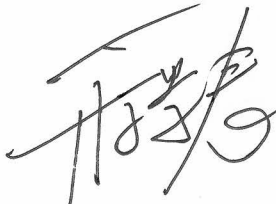
a list of the plants identified in Steps 3 and 5, as well as relevant data on the fuel consumption and electricity generation of all identified power plants. The list of the plants identified in Steps 3 and 5 (top 15% coal-fired power plants in ECG) and the relevant data on the fuel consumption and electricity generation of all identified power plants are documented transparently by the Chinese NDRC. However, as the information is classified by China NDRC as confidential information, DOEs can only check and review it in NDRC's offices. CEC has verified the top 15% coal fired power plants by means of validation at NDRC's premises and could confirm the information presented by NDRC and the list of the plants within ECG.

With the above explanation and clarification, we expect that the concerns raised by CDM Executive Board have been fully and adequately addressed, and we sincerely hope that the CDM Executive Board would approve this project for registration.

Sincerely yours,

Zhejiang Zhe'neng Jiahua Power Generation Co., Ltd.

March 2nd, 2012


2012年3月2日

