



To  
The CDM Executive Board  
UNFCCC Secretariat  
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06/03/2012

**Response to the request for Review for the CDM project activity” Zhejiang Jiaxing Ultra-supercritical Power Generation Project” (5027)**

Dear Members of the CDM Executive Board,

The DOE “China Environmental United Certification Center Co.,Ltd.” was informed on 08/02/2012 that the CDM Project “Zhejiang Jiaxing Ultra-supercritical Power Generation Project”(Ref.No.5027) is requested for review for four reasons.

We would like to provide our response to the issues raised in the following pages and how that the input by the project participants and this explanation will find acceptance among the members of the Executive Board.

**Issue 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.

**Response to Issue 1:**

According to VVM, ver.01.2 para 84,

*The DOE shall determine whether the baseline scenario identified is reasonable by validating the assumptions, calculations and rationales used, as described in the PDD. It shall ensure that documents and sources referred in the PDD are correctly quoted and interpreted. The DOE shall cross check the information provided in the PDD with other verifiable and credible sources, such as local expert opinion, if available.*

(1) The proposed project will deliver the service of both base and peak load, which is derived from the FSR (prepared by East China Investigation and Design Institute under CHECC) and also approved by State Development and Reform Commission. However, according to the

approved methodology ACM0013 ver.04.0.0, the alternatives need not consist solely of power plants of the same capacity, load factor and operational characteristics, however they should deliver similar services (e.g. peak vs. base load power). The validation team has checked the Notification of Natural Gas Utilization Policy<sup>1</sup> (Fagainengyuan[2007] No.2155), issued by NDRC, natural gas power plant is served as peak load within electricity load center region with sufficient natural gas supply. Hence, the exclusion of alternative A4 is reasonable. Please see attached Annex 1\_Natural Gas Policy

(2) According to the applied methodology ACM0013 ver.04 page 8, the base/peak load is defined as: *At peak load (defined as a load factor of less than 3,000 hours per year) or base load (defined as a load factor of more than 3,000 hours per year)*. The validation team has checked the China Power Yearbook 2009 page 704 and found that Xiaoshan Natural Gas Power Plant connected to CEPG, is served as peak load power plant( 1,907h), therefore the validation team confirms that the exclusion of the alternative of natural gas power plants based on base/peak load service is reasonable;

(3) The validation team has checked that the base/peak load is defined as the load above/below a level in the electric dictionary. Besides that, the validation team has checked the relative information on the website <http://wenku.baidu.com/view/ce863036eefdc8d376ee32a3.html?from=related> and considered that the peak load in natural gas policy is considered the same definition as defined in ACM0013 ver.04.0.0.

Based on the above, the validation team has ensured that the documents and sources referred in the PDD are correctly quoted and interpreted and has cross checked the information provided in the PDD with other verifiable and credible sources.

## **Issue 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:

## **Response to Issue 2:**

(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;

According to the VVM, ver.01.2 Para.111, the validation team has verified the following values in the investment analysis as follows:

- *Conduct a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determine the accuracy and suitability of these parameters using the available evidence and expertise in relevant accounting practices;*
- (1) The total static investment used in the PDD is 7.54 billion RMB, which is derived from the approved FSR. The Feasibility Study Report was completed by a qualified third party of

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<sup>1</sup> [http://www.sdpc.gov.cn/zcfb/zcfbtz/2007tongzhi/t20070904\\_157244.htm](http://www.sdpc.gov.cn/zcfb/zcfbtz/2007tongzhi/t20070904_157244.htm)

East China Investigation and Design Institute under CHECC, which has qualification and abundant expertise in power industry and the FSR is approved by National Development Reform Commission and they are the basis for investment analysis.

- *Cross-check the parameters against third-party or publicly available sources, such as invoices or price indices;*
- (1) Considering that the project has been commissioning since October 2011, the validation team has checked that the evidence provided by the third qualified party-Zhejiang Wanbang Management and Consultation Co.,Ltd. about the actual investment and found that the actual static investment is added up to 7.68 billion RMB, 1.8% higher than the estimation in the FSR; Please see attached Annex 2\_Notification for Actual Investment
- (2) The validation team has checked the main contracts including boilers, steam turbines and generators with the estimation in approved FSR, and found that it is 5.26% higher than the estimation, which covered 50.29% of total static investment of the project anticipated in FSR. The breakdown of the main cost is as follows:

Contracts	Contract price	Estimation in FSR	Discrepancy rate
Boilers	1740	1630.3	6.73%
Steam turbines	815.2	892.8	-8.69%
Generators	301.2	306.4	-1.70%
subtotal	2856.4	2829.5	0.95%
Installation Contract of Boilers, steam turbines and generators	602.3	481.3	25.1%
Desulfuration project	216.9	189.3	14.6%
Denitrification project	117.6	103.6	13.5%
Total	3793.2	3603.7	5.26%

- (3) The validation team has compared the capital expenditure per kW of the proposal project (3,771RMB/kW)with that reference value provided by Unit Cost Referenced Cost Index of Fossil-fired Power Engineering and Design (2007), which is 3,724 RMB/kW for 2X1000 MW newly-built ultra-supercritical power plants at price level of 2007,with only 1.26% variation by contrast to the reference value. Hence, the validation team considers that the investment cost is reasonable.
- *Review feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants;*

After reviewing the Feasibility Study Report, the validation team confirms that the investment cost is sourced from the Feasibility Study Report of an accredited third party.

- *Assess the correctness of computations carried out and documented by the project*

*participants;*

The computations have been assessed by checking the spreadsheet provided by the PP and they are confirmed to be correct.

- *Assess the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions;*

If the investment is decreased by 46.5%, then the LCOE of the proposed project is the same as that of alternative A1(2\*1,000MW Ultra-supercritical coal-fired power generation). This means that total investment is dropped to 4 billion RMB, the validation team has verified that the current actual investment is add up to 7.68 billion RMB based on the investment statement provided by the third qualified party, which is higher than that estimated in the PDD. Hence, the investment cost is unlikely decreased by 46.5%.

(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%);

According to the applied methodology ACM0013 ver.04.0.0 Page 3, it mentions that these alternatives should deliver the similar services, so it is assumed that the baseline scenario should also generate the same amount of electricity.

(c) The potential revenue from the sale of the ash, if any. Please refer to VVM version 01.2 paragraph 111.

According to the VVM,ver.01.2 Para.111, the validation team has verified the value in the investment analysis as follows:

- *Conduct a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determine the accuracy and suitability of these parameters using the available evidence and expertise in relevant accounting practices;*

According to the definition from "Projected Costs of Generating Electricity 2010 Edition, published by International Energy Agency, the levelized cost of electricity (LCOE) corresponds to the cost of an investor assuming the certainty of production costs and the stability of electricity prices, so it indicates that the revenues are not involved in the LCOE analysis.

The potential revenue from the sale of the ash is taken into consideration as an offset to O&M cost, it only represents a small part of the O&M costs, so it is excluded in the FSR.

Based on the above, the potential revenue from the sale of the ash is derived from the confirmation letter between the PP and Jiaxing Branch of Zhejiang Tianneng Environmental Protection Co.,Ltd. on 17/01/2012; this is verified by the validation team to be credible.

- *Cross-check the parameters against third-party or publicly available sources, such as invoices or price indices;*

According to the evidence provided by the PP on the actual ash production from 26/12/2011 to 15/01/2012, the amount of ash is 93,771 tons, so the ash production annually is estimated to 1,629,725ton/a (93,771/21\*365), the ash revenue is estimated to 14.67 million (the price of the ash is 9RMB/t), which accounts for 3.68% of the total O&M cost.

Now it is assumed that the baseline scenario 2\*600MW supercritical power plant uses the same type of coal as the project whose ash proportion is 15%. The ash production is estimated as 746,673 (44.8\*2\*8,333) thousand tons per year in line with Table 4.7 of the book Design Manual for Electric System, issued by China Electric Power Planning Institute. The revenue can be calculated as 6.72 million RMB/a, 1.97% of the total O&M cost summed in LCOE.

- *Review feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants;*

After reviewing the confirmation letter between the PP and Jiaying Branch of Zhejiang Tianneng Environmental Protection Co.,Ltd. on 17/01/2012, the validation team confirms that it is sourced from a third party.

- *Assess the correctness of computations carried out and documented by the project participants;*

The computations have been assessed by checking the spreadsheet provided by the PP and they are confirmed to be correct.

- *Assess the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions;*

If taking the ash revenue into account for the proposed project and baseline scenario, the LCOE of both scenarios can be re-calculated as 0.3245 RMB/kWh and 0.3404 RMB/kWh, respectively, so it means that the alternative of supercritical coal-fired power plant is still the baseline.

### **Issue 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.

### **Response to Issue 3:**

According to the applied methodology ACM0013 ver.04.0.0, page 10,

*$\eta_{BL}$  is the energy efficiency of the power generation technology that has been identified as the most likely baseline scenario. As a conservative approach, the efficiency should be determined as the efficiency at optimum load, e.g. as provided by the manufacturers.*

(1)  $\eta_{BL}$  is calculated based on the data sourced from Unit Cost Referenced Index of Fossil-fired Power Engineering and Design of 2007. The book is 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.

(2) The  $\eta_{BL}$  is calculated based on the Coal Consumption per kWh for Power Supplied to Grid of baseline (2x600MW sup-critical coal-fired power generation technology), the calculation formula is same as the formula (6) of ACM0013, as follows:

$$\eta_{BL} = 3.6 \cdot \frac{EG}{FC \cdot NCV} = 3.6 \text{ MJ/kWh} \times 1 \text{ kWh} / (315.4 \text{ gce/kWh} \times 0.029307 \text{ MJ/gce}) = 38.9\%,$$

Of which:

0.029307 MJ/gce is net calorific value of coal equivalent (also called standard coal in China).

315.4 is Net Coal Consumption Rate, which is calculated via  $299(\text{gce/kWh}) / (1 - 5.20\%) = 315.4(\text{gce/kWh})$ ,

in which:

299gce/kWh: The Gross Coal Consumption Rate is cited from the Unit Cost Referenced Cost Index of Fossil-fired Power Engineering and Design (2007)/3.24/, the data also has been checked by the validation team via the registered CDM project activity "Shanghai Waigaoqiao coal-fired power project using a less GHG intensive technology (Ref.3288)", in which the gross coal consumption rate (299 Sgce/kWh) for a 2\*600MW supercritical power plant is adopted, as same as the proposed project. So the validation team considers that the Gross Coal Consumption Rate (299Sgce/kWh) is suitable for baseline scenario of the project activity.

5.2%: The plant electricity self-consumption rate is cited from page 288 of the Unit Cost Referenced Cost Index of Fossil-fired Power Engineering and Design (2007), so the validation team considers that this is suitable for the baseline scenario of the proposed project.

2) According to the requirement in the methodology ACM0013 ver.04.0.0, the efficiency should be determined as the efficiency at optimum load as a conservative approach. The validation team has checked the efficiency of 38.10%, which is calculated based on the efficiencies of newly built top 30 performing 600 MW coal-fired power plants sourced from the Statistics by the State Electricity Regulatory Commission (SERC) and considered that the baseline efficiency of 38.9% is conservative.

#### **Issue 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.

#### **Response to Issue 4:**

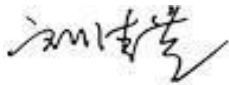
According to the applied methodology ACM0013 ver.04.0.0, page 9, it requires that:

*All steps should be documented transparently; including a list of the plants identified in Step 3 and 5, as well as relevant data on the fuel consumption and electricity generation of all identified power plants.*

Based on the actual condition, the coal-fired power unit data was not public available in China and only available to the central government, NDRC. China DNA has calculated the emission factor as per the steps above in ACM0013, version 04.0.0, so the list of the plants identified in

Steps 3 and 5 (top 15% coal-fired power plants in CEPG) and the relevant data on the fuel consumption and electricity generation of all identified power plants was documented transparently by Chinese NDRC. The calculation and the data sources were allowed to be validated by DOE in the NDRC's office but not allowed to be published. The validation team has performed the emission factor calculation process in accordance with option 2 in China NDRC's office and confirms that the all steps are documented transparently, including a list of the plants identified in step 3 and 5.

Beijing, 02/03/2012



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Beijing, 05/03/2012



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Chairman of Board