



RESPONSE TO POINTS RAISED DURING COMPLETENESS CHECK

Subject: Request For Registration Incomplete for "Grid connected electricity generation plant using natural gas at Jurong Island in Singapore" - Ref No. 9687

Bureau Veritas Certification had performed the validation of the CDM Project activity 9687 - "Grid connected electricity generation plant using natural gas at Jurong Island in Singapore". Subsequently, there was a Completeness check reported in which 02 points were raised. Bureau Veritas Certification would like to provide joint responses to the issues raised as given below.

1: The DOE is requested to indicate if the baseline methodology is correctly applied to identify baseline scenario and alternative baseline scenarios as per applied methodology AM0029 Ver. 3 pag. 2, which requires that the identification of alternative baseline scenarios should include all possible realistic and credible alternatives that provide outputs or services comparable with the proposed CDM project activity (including the proposed project activity without CDM benefits), i.e., all type of power plants that could be constructed as alternative to the project activity within the grid boundary (as defined in "Tool to calculate emission factor for an electricity system"). In particular, the DOE is requested to provide information regarding:

- (a) how the alternative of 160 MW coal power plant, substantiated by the existence of Tuas Power plant in the PDD, has comparable output/service to the proposed project activity, considering that the information in the footnotes 27 and 28 of the PDD and the document "Response to Points Raised During Completeness Check, page 2" submitted by the DOE, state that Tuas Power plant uses coal and biomass, and it also supplies chilled water and steam for industrial use;*
- (b) how alternative of 5 x 160 MW is not considered as large scale considered to deliver similar service as the project activity 5 plants have to be operated simultaneously, considering the PDD page 12 states: "the Government has decided not to use coal for power generation on a large scale, until the demand for LNG stabilizes".*

Response:

The information provided in the PDD and Validation report is in accordance with the Approved methodology i.e. AM0029 Ver 3 as well as "Tool to calculate emission factor for an electricity system". PP has all identified alternatives which could be possible for establishing power plant in Host country Singapore utilizing current scenarios as well as future energy resource plan by EMA. This is done transparently to arrive at most plausible alternatives. Please note that the example of under construction 160 MW power plant itself is a baseline but only an example to show that the baseline alternative considered is realistic (with at least one similar example in the host country). The following paragraphs in PDD supports why PP has selected the Alternative of Power Generation using coal as the energy source.

Validation Team also has validated these alternatives utilizing publically available information and found realistic and credible.

To elaborate more on this, the context it is explained as below

PP has considered exiting scenario i.e. 160 MW Coal based co generation power plant which is already approved by Singapore government and it is under construction. Presently the approval for this plant is for the cogeneration, as it is catering to the specific group of industries which are under construction in Jurong Island, however in future there is a possibility of 5 separate Coal based power plants of 160 MW capacities (Without Cogeneration). Also Singapore government has taken a decision not to proceed with the Coal based technologies until the demand for LNG stabilizes, which does not mean that this option is totally ruled out.

Refer following paragraphs in PDD Page 12 “Thus, large scale coal based power plant was not considered as a baseline alternative. A precedence of approval for 160 MW coal based power plant in Singapore exists, hence this unit size was chosen as appropriate for the baseline alternative.

Also, supercritical power plant has minimum size requirement of 660 MW due to technical design of boilers that can operate on supercritical conditions. Thus, supercritical power plants cannot have sizes lower than 660 MW for single unit size. Thus, due to this limitation, this was not considered as realistic scenario in Singapore where large scale coal based power plants are not allowed by Government decision as discussed earlier. Thus, the size of coal/ lignite based power plant equivalent to the project activity is unprecedented in Singapore. However, as per baseline methodology AM0029, several smaller plants may be a reasonable alternative to the project activity. Thus, five units of 160 MW each using subcritical technology (equivalent to Tuas Power’s coal based power plant) is a realistic scenario.”

And please refer Paragraph in PDD page 14, where PP has arrived at the most plausible alternatives to the project activity based on the transparent justification provided in the Section B.4 of PDD.

“From the above discussion it is evident that the plausible baseline scenarios identified include:

a) The project activity i.e. ‘800 MW NG based Combined Cycle power plant with an efficiency of 58.16% and with a lifetime of 30 years’ not implemented as a CDM project activity.

b) Power generation using coal as the energy source”

This was also explained in the response document to previous completeness check, Please refer reproduced paragraphs from response document below

“Under the alternatives to the baseline scenario, with use of natural gas but with different technology than the project activity, the PP has assessed all realistic options i.e. (1) Power generation using Combustion Turbine using Open cycle mode of operation and (2) Power generation using Gas Turbine in Cogeneration mode of operation

A) The baseline methodology requires “ensure that all relevant power plant technologies that have recently been constructed or are under construction or are being planned are included as plausible alternatives”. The coal based power plant is under construction and independent of the fact that the plant will use 20% biomass mix in the fuel or will generate steam and chilled water (tri-generation), this is a coal based power plant. Also, the fact that considering energy security in event of natural gas/ LNG supply disruptions, the country is considering alternative arrangements

including coal based power generation and import of electricity using undersea cables from the neighboring countries.

Further, the baseline methodology also states that ‘several smaller plants or the share of a larger plant may be a reasonable alternative to the project activity’. The project activity has followed this guidance. Thus, the alternative is considered in the analysis.”

Further, PP submitted latest evidences which show that Singapore LNG terminal has already sold out earlier design capacity of 6 MTPA. Due to further demand and to establish Singapore as a LNG trading hub, the terminal is planning expansion to 9 MTPA¹. This fact further clarifies that a coal based power plant as shown in the baseline alternative is realistic option.

2: The DOE shall provide information to substantiate the suitability of coal price (80 SGD/t) in line with the VVS version 03.0 paragraph 120 b,c, noting that "input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant" according to EB 62, Annex 5. It is noted that the link used by the DOE to validate the project (reference /45/) shows that the coal price at the time of the investment decision (14/06/2011) was 158.87 SGD/t (for June 2011). In addition, the DOE has reported in the document “Response to Points Raised During Completeness Check” that the reference quoted also shows price of Australian Coal on a market index in later months of 2013 is around \$80. However, the price of 80 SGD/t was not available at the investment decision date (14/06/2011). Furthermore, the DOE has also responded that the coal price is based on a government report. Kindly provide information regarding this reference source and date.

Response:

The Validation report is now amended with the Reference for the source of Coal Cost. This is found available to PP prior to the investment decision and hence found credible.

Cost of coal taken to arrive at the levelized cost of electricity generation due to coal fired power plant is obtained from the report “Integrated Summary report for proposed Singapore LNG Terminal” by Energy Market Authority /Ref-25/, which is published on 7th august 2006. (Please refer Page 17 - <http://www.ema.gov.sg/consultations/archive/2/id:93>)

PP has considered highest price for the coal as mentioned in the report i.e. US \$65/tonne (@ conversion rate of 1.2307 (Foot Note 37 in PDD)), hence the coal cost is considered conservative.

Please note that the reference mentioned earlier in the Validation Report is to cross check the price of Coal during the period mentioned in the above authorized report and not the price at the time of investment decision. As PP has to link the project to host country scenario, the price taken from EMA report is found conservative.

In EMA report Government considered three coal prices i.e. US \$ 35/Tonne; US \$ 45/Tonne; US \$ 55/Tonne; US \$ 65 /Tonne. PP considered highest price while performing financial analysis to calculate

¹ <http://www.slng.com.sg/newsroom-press-release-20140225.html>; <http://www.slng.com.sg/newsroom-press-release-20110121.html>; <http://www.slng.com.sg/newsroom-press-release-20101102.html>; <http://www.ema.gov.sg/LNG/Procurement/>

Levelized Cost of energy generation. Even at higher cost the Coal based power project is found to be more attractive than that of Gas based Power project.

We hope you will find above responses in accordance with completeness points raised.

Yours faithfully



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