Supply of Base-Load Generation Capacity to the National Grid

Evaluation of Final Proposals

September 2013

Office of Utilities Regulation

OUR

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Executive Summary

In December 2010, the Office of Utilities Regulation (the "OUR") issued a Request for Proposals inviting applicants to submit proposals to provide new generation capacity amounting to 480MW net to the national grid of Jamaica on a Build Own and Operate Basis (BOO) ("RFP"). This new capacity was to be base-load and was intended to replace approximately 292 MW of inefficient aged plants with the remainder to provide for load growth.

The OUR terminated the RFP process for the procurement of 360 MW of generation capacity with the sole bidder, Jamaica Public Service Company Limited (JPS) on February 1, 2013. Subsequently JPS and a number of other entities expressed an interest to provide a solution for Jamaica's electricity needs.

Given the need to finalize a solution in the shortest possible time, uncertainties regarding the level of participation and the likely outcome of a new open competitive process, the OUR committed to reviewing any proposal submitted by 15 March, 2013 to supply additional generation capacity to the national grid. All such submissions were treated as unsolicited.

The OUR indicated publicly that the objective of its review is to determine if any of the submissions provides a sufficient basis for a recommendation to the Government that as a matter of policy, it ought to consider other options than competitive tender to satisfy the country's electricity need.

Mott MacDonald as the Consultant carried out an evaluation that ranked the unsolicited proposals from highest (most attractive) to lowest (least attractive) according to the evaluation criteria set out by OUR.

From this, and a subsequent review at the instance of the Cabinet of Jamaica which had requested the OUR to review a sixth submission, the OUR selected five entities that it determined should be provided with the opportunity to refine their proposal with a view to submitting best final offers.

The Consultant was again engaged to provide the Office with preliminary and final evaluation of all proposal submitted by any or all of the selected entities listed below as per the criteria set out in the Office of Utilities Regulation's IFFP Document for Supply of

Base-Load Generating Capacity to the National Grid (Jamaica), Document No. IFFP 2013/ELE/005/RFP/002 issued on May 27, 2013:

(a) Amourview Holdings Limited, Kingston (EIG Global Energy Partners, Tankweld Limited, Amourview Holdings Limited)

(b) Azurest-Cambridge Joint Venture Association with Waller Marine Inc

(c) Energy World International Ltd./ Pacific LNG

(d) Jamaica Public Service Company Limited (JPS)

(e) Optimal Energy

In the event, (a) Amourview Holdings Limited and (d) JPS did not submit proposals and submissions were received from four entities viz.

(a) Azurest-Cambridge Joint Venture Association with Waller Marine Inc

(b) Energise Jamaica Ltd

(c) Energy World International Ltd./ Pacific LNG (EWI)

(d) Optimal Energy

This report contains an evaluation of the four submissions in accordance with the OUR defined criteria. Ability to implement, Technical and Economical summaries of each submission are noted within the main body of text. A summary of the "Evaluation of the Final Proposal" may be found in Section 5 below with relevant summations of percentages.

Economic Evaluation

The purpose of this analysis is the comparison of all the proposed options rather than the optimisation of the Jamaican system. Therefore, the main conclusions refer to the proposed candidates rather than the system perspectives of this exercise.

The first economic conclusion is that the natural gas fired proposal from Cambridge – Azurest appears to be the top most attractive option. This is primarily due to the proposed low fuel prices and secondary to the comparatively low proposed capacity charges. Nevertheless it is noted that during the evaluation one of the two companies

gave notice that the other party had exited the project, therefore, increasing the uncertainty around the proposed costs. In subsequent correspondence both parties indicated that they had reunited and would continue as a consortium in the process.

The second conclusion is that the CCGT options proposed by EWI rank second and third. At this point it has to be noted that the proposed fuel costs by EWI were calculated incorrectly and had to be adjusted for HHV against LHV discrepancies. If the proposed and incorrect fuel costs were used, the options from EWI would have ranked first and second, but this would have given them an unfair advantage over competing bids. Additionally EWI's options may be less attractive in reality than they appear in the modelling exercise as the provided heat rates and capacities are quoted in ISO conditions unadjusted for the ambient conditions of Jamaica. The average temperature in Jamaica is higher than the ISO temperature and it is established that gas turbines are affected more adversely from high temperatures than gas engines.

The third conclusion is that for the remaining options, the ranking is as expected. NG options rank higher than HFO options. Energise – Seabord's NG option ranks higher than Optimal's, while on the other hand Optimal's HFO option ranks consistently above Energise – Seabord's HFO option, regardless of whether fuel tax is included or not in the tariff calculations.

The fourth conclusion is that the ranking is insensitive to the system's NG price. Of course this is true for the tested range of prices (12.5 – 14). Nevertheless it is reasonable to assume that in the case that the system's gas price increases or falls beyond the assumed range, the fuel prices that the candidates offer will have to be reassessed as well.

Table 1.1: Summary of results

NaturalGas system expansion @ US$12.5/MMBTU			
Option	**Name**	**System NPV**	**LCOE**
1a	Cam-AzurNG	[redacted]	[redacted]
1b	Cam-AzurHFO	[redacted]	[redacted]
1c	Ener-SeaNG	[redacted]	[redacted]
1d	Ener-SeaHFO	[redacted]	[redacted]
1e	Optimal HFOwFT	[redacted]	[redacted]
1f	Optimal HFONoFT	[redacted]	[redacted]
1g	Optimal NG	[redacted]	[redacted]
1i	EWI 1 (SIEMENS)	[redacted]	[redacted]
1j	EWI 2 (GE)	[redacted]	[redacted]

NaturalGas system expansion @ US$12.5/MMBTU NaturalGas system expansion @ US$14/MMBTU			
Option	**Name**	**System NPV**	**LCOE**
2a	Cam-AzurNG	[redacted]	[redacted]
2b	Cam-AzurHFO	[redacted]	[redacted]
2c	Ener-SeaNG	[redacted]	[redacted]
2d	Ener-SeaHFO	[redacted]	[redacted]
2e	Optimal HFOwFT	[redacted]	[redacted]
2f	Optimal HFONoFT	[redacted]	[redacted]
2g	Optimal NG	[redacted]	[redacted]
2j	EWI 2 (GE)	[redacted]	[redacted]
2i	EWI 1 (SIEMENS)	[redacted]	[redacted]

The ranking of the options can be done on two bases. Firstly they can be ranked according to the impact they will have on the PV of system costs. Although this is the economically soundest and the preferred way of ranking the options, it has the risk that the assumed generic CCGT additions that happen in all cases could influence the ranking and favour the more modular options (or modularly modeled) which make more use of the cost effective assumed CCGTs. The second way of ranking the options is according to their average cost of electricity when operated at base load. This approach, although unorthodox, looks at the options in an isolated way and, therefore, gives a ranking which is independent from unknown future additions. In this case it has to be noted that the ranking is the same regardless of the applied ranking method. The following tables present the ranking order.

Table 1.2: Ranking according to System Cost PV; NG @ US$12.5/MMBTU

Option	Name	System NPV	LCOE
1a	Cam-AzurNG	[redacted]	[redacted]
1j	EWI 2 (GE)	[redacted]	[redacted]
1i	EWI 1 (SIEMENS)	[redacted]	[redacted]
1b	Cam-AzurHFO	[redacted]	[redacted]
1c	Ener-SeaNG	[redacted]	[redacted]
1g	Optimal NG	[redacted]	[redacted]
1f	Optimal HFONoFT	[redacted]	[redacted]
1e	Optimal HFOwFT	[redacted]	[redacted]
1d	Ener-SeaHFO	[redacted]	[redacted]

Table 1.3: Ranking according to System Cost PV: NG @ US$14/MMBTU

Option	Name	System NPV	LCOE
2a	Cam-AzurNG	[redacted]	[redacted]
2j	EWI 2 (GE)	[redacted]	[redacted]
2i	EWI 1 (SIEMENS)	[redacted]	[redacted]
2b	Cam-AzurHFO	[redacted]	[redacted]
2c	Ener-SeaNG	[redacted]	[redacted]
2g	Optimal NG	[redacted]	[redacted]
2f	Optimal HFONoFT	[redacted]	[redacted]
2e	Optimal HFOwFT	[redacted]	[redacted]
2d	Ener-SeaHFO	[redacted]	[redacted]

The rankings show that the best option is the Cambridge – Azurest LNG option followed by EWI's options and then, surprisingly, by Cambridge – Azurest HFO option. The Cambridge –Azurest option(s) are surrounded with greater uncertainties than the rest of the options. These uncertainties are rooted in the fact that Cambridge –Azurest have used optimistic assumptions about the fuel price that they can offer, something that is especially visible in their HFO option, which is assumed to achieve about 15% lower fuel costs than similar offers. HFO is assumed to be locally sourced in all cases; therefore, we would expect smaller variations in the fuel costs for options making using similar technologies.

EWI's options have also uncertainties. The confidence in EWI's provided technical and tariff inputs is reduced by the fact that the fuel costs have not been calculated correctly and that the heat rates and the capacity have not been adjusted for ambient. Although OUR's modelling has corrected for the first mistake the second omission was not taken into account. The penalty to the efficiency could reach two percentage points (eg from 55% to 53%) and capacity could be reduced by 10% of the stated ISO net capacity.

The next two options are the NG fired MSD in CC from Energise – Seabord and from Optimal. The difference between them is almost negligible (about 0.2%) and therefore it cannot be safely concluded which one is best. Of course this is to be expected as both options make use of very similar technical solutions. Of course, these results are based on parameters which are uncertain and the final evaluation needs to take all the aspects of the bids into account.

Technical Evaluation

EWI score highest in the technical evaluation at 90% while Azurest Cambridge are at 87.6%. The remaining two bidders, Energise Jamaica (Seabord) and Optimal are level at approximately 76%. Further detail may be noted in Section 3.

Ability to Implement

Mott MacDonald note that none of the 4 bidders currently achieve the minimum 75% of 'Ability to Finance the project' in order to qualify for selection. Based on OUR's advice, Mott MacDonald have proceeded to the Economic and Technical evaluation of all the bidders. In the event of selecting the preferred bidder, Mott MacDonald would expect further investigation/ due diligence of the bidder before contractual negotiations are undertaken. It should be noted that such due diligence will help to mitigate the exposure to possible high levels of risk associated with proceeding with any of the bidders based on the results of the financial evaluation.

Conclusion

The natural gas fired proposal from Cambridge-Azurest is the most economically advantageous of the proposals received. Cambridge-Azurest has achieved a high score in the Technical Evaluation but has failed to meet the required minimum 75% score in the evaluation of "Ability to Implement". Further study of the financial strength of Cambridge-Azurest is, therefore, recommended.