MID-TERM REVIEW OF THE CAPITAL COST PARAMETERS FOR SETTING THE VESTING CONTRACT PRICE FOR 2018

CONSULTATION PAPER

Closing date for submissions of comments and feedback: 9 June 2017

19 MAY 2017

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1. INTRODUCTION

1.1. The Energy Market Authority (**"EMA"**) implemented vesting contracts on 1 Jan 2004. The objective of the vesting regime is to enhance economic efficiency in the electricity market by mitigating the exercise of market power by the generation companies (**"gencos"**). The vesting contracts mandate a specified amount of electricity (viz. the vesting contract level) to be hedged at a specified price (viz. the vesting contract price). This removes the incentives for gencos to withhold their generation capacity to sustain inefficient spot prices in the wholesale electricity market.

1.2. The vesting contract price is set based on the long run marginal cost (**"LRMC"**) of the most efficient generation technology that accounts for at least 25% of the system demand in Singapore. The most efficient technology at present is the F-class combined cycle gas turbine (**"CCGT"**). EMA reviews and determines the vesting contract price parameters biennially or when necessary in accordance with the published *EMA's Procedures for Calculating the Components of the Vesting Contracts* (**"Procedures"**). EMA also conducts a mid-term review of the capital cost parameters.[1]

1.3. EMA appointed Parson Brinckerhoff Pte Ltd (**"PB"**) and KPMG Services Pte Ltd (**"KPMG"**) (**"Consultants"**) to conduct a review of the LRMC parameters for setting the vesting contract price for 2017 and 2018, and also the mid-term review of the capital cost parameters for 2018. A summary of the Consultants' assessment of the capital cost parameters for 2018 is set out in ***Appendix 1***.

2. REQUEST FOR COMMENTS

2.1. EMA invites comments on the Consultants' draft report on the mid-term review of the capital cost parameters for setting the vesting contract price for 2018.

2.2. All comments must be submitted using the format in ***Appendix 2*** and in both PDF and Microsoft Word format.

[1] The capital cost parameters refer to item 7 (Capital cost of the plant) and item 8 (Land, infrastructure and development cost of the plant) under Section 2.3 of the Procedures.

2.3 Please submit your comments in writing via email to Mr Eugene Lim (eugene_lim@ema.gov.sg) and Mr David Yeo (david_yeo@ema.gov.sg) **no later than 5pm on 9 Jun 2017**.

2.4. EMA will acknowledge receipt of all submissions via email. Please contact Mr Eugene Lim (DID: 6376 7760) or Mr David Yeo (DID: 6376 7827) if you do not receive an acknowledgement of your submission within two business days.

2.5. Please note that anonymous submission will not be considered. EMA reserves the right to make public all or parts of any written submission made in response to this Consultation Paper and to disclose the identity of the respondent. Any part of the submission, which is considered by respondents to be confidential, should be clearly marked and placed as an annex. EMA will take this into account regarding disclosure of the information submitted.

* * *

Appendix 1

Consultants' Assessment of the Capital Cost Parameters

1. Base Month

1.1. For the purpose of this initial consultation, March 2017 is used as the Base Month. The Base Month will be updated to May 2017 for subsequent reports including EMA's final determination to be made by end September 2017.

2. Generating Technology

2.1. Currently, the most efficient technology that accounts for at least 25% of the system demand in Singapore is the F-class CCGT.

3. Capacity per Generating Unit

3.1. A new entrant is assumed to install two units of CCGTs. Taking into account the effects of degradation (due to fouling, erosion and material losses in the turbine section), local air temperature and conditions, and allowance for gas compression, the achievable effective plant capacity in Singapore for an F-class CCGT is 407.9 MW.

4. Exchange Rate

4.1. The SGD/USD and SGD/EUR exchange rates, averaged over the three-month period from Jan 2017 to Mar 2017, are 1.4159 and 1.5085 respectively.

5. Investment Cost

5.1. ***Capital cost***. The capital cost includes the cost of purchasing the plant and all associated equipment, including the cost of delivery of the plant in a state suitable for installation in Singapore. The total capital cost for one CCGT unit is $515.4m, comprising:

a. Turnkey Engineering, Procurement and Construction (EPC) cost:[2] *$507.9m (about US$358.7m)*

b. Discounted through-life capital cost: *$7.5m*

5.2. ***Land and site preparation cost***. The total land and site preparation cost for one CCGT unit is $16.0m, comprising:

a. Land lease cost and waterfront fees: *$15.0m*

b. Land preparation cost: *$1.0m*

5.3. ***Connection cost***. The total connection cost for one CCGT unit is $46.3m, comprising:

a. Electrical connection cost including standard connection cost payable, switchgear and underground cable: *$39.2m*

b. Gas connection cost: *$7.1m*

5.4. ***Miscellaneous costs***. The total miscellaneous cost for one CCGT unit is $94.2m, comprising:

a. Owner's costs after financial close including engineering, initial spares, start-up costs and construction related insurance: *$61.0m*

b. Owner's costs prior to financial close including permits, licences, fees, legal and financial services, engineering and in-house costs: *$33.2m*

[2] The EPC costs include the cost for specialised equipment, mechanical and electrical engineering, gas compressors, the jetty and fuel tanks.

6. Summary

6.1. ***Table 1*** and ***Table 2*** respectively summarises the proposed capital cost parameters (including a comparison with the current values), and the corresponding indicative vesting contract price for 2018.

Table 1: Summary of Capital Cost Parameters

Capital Cost Parameters	Current	Proposed for 2018
Capital cost (S$ million) • Turnkey EPC cost • Discounted through-life capital cost	$495.7m	$515.4m
Land, infrastructure and development cost (S$ million) • Land and site preparation cost • Connection cost • Miscellaneous cost	$155.7m	$156.5

Table 2: Indicative Vesting Contract Price

Vesting Contract Price for Q2 2017*	Current	Proposed for 2018
Vesting Contract Price (S$/MWh)	145.32	146.30
Capital Cost Component (S$/MWh)	31.13	32.10

* Based on the weighted average gas price of S$12.91/GJ for Q2 2017 vesting contract price.

Appendix 2

FORMAT FOR SUBMISSION OF COMMENTS

MID-TERM REVIEW OF CAPITAL COST PARAMETERS FOR SETTING THE VESTING CONTRACT PRICE FOR 2018

S/No.	Please indicate in each cell in this column, the section/paragraph in the consultation Paper or the Consultant's Draft Report to which your comment refers	Comment
1		
2		
3		
4		

Comments submitted by

Name :
Designation :
Company :
Email :
Contact No. :