

ANNEX 1: RESPONSE TO INDUSTRY COMMENT ON DRAFT DETERMINATION PAPER DATED 3 AUG 16

Technical Parameters

S/No.	Parameters	Industry's Comment	PB's Response
1.	Capital cost Initial Plant Capital Cost	<p>YTL PowerSeraya :</p> <p>Note that amount for additional security measures has been subject only to indexing since the amount was first determined in 2012 with the figure of SGD 2,418 k given in the paper "Review of the vesting contract parameters for 2013 and 2014 –Final report" dated 30 September 2012.</p> <p>This had been in response to the comment from Keppel "As highlighted in the clarification meeting, capital and other costs for compliance of various new/recent regulatory requirements such as, but not limited to, Security by Design, Grid protection devices, QRA and Cyber-risk mitigation measures should be included into the respective cost calculations." with EMA responding "SKM has assessed and recommended a nominal allowance of \$2.4 million per unit to cover enhanced security measures required for a plant in Singapore. (Source: Page 48 of "RESPONSE TO INDUSTRY'S FEEDBACK ON EMA'S DRAFT DETERMINATION ON THE REVIEW OF THE LONG RUN MARGINAL COST (LRMC) PARAMETERS FOR SETTING THE VESTING CONTRACT PRICE FOR THE PERIOD 1 JANUARY 2013 TO 31 DECEMBER 2014" dated 21 Aug 2012).</p> <p>This means that the costs of additional cyber security measures required after September 2012 have not been incorporated into the determination of the Vesting Price.</p>	<p>PB has reviewed the cost of cyber security measures submitted and assessed it to be reasonable. The cost of cyber security measures has accordingly been updated by S\$0.268m per CCGT unit. In addition, S\$0.141m per CCGT unit is included in the fixed operating and maintenance cost to cover the associated annual maintenance cost.</p>

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		<p>These costs will need to be incorporated into the Vesting Price.</p> <p>Please see attached document "Cyber Security costs for requirements after Sep 2012 (as at 24 Aug 2016)" for details of the costs for additional cyber security measures required after September 2012 incurred by or to be incurred by YTL PowerSeraya. Please note that the cost details are CONFIDENTIAL but are being provided for the purpose of providing data for estimating the costs of additional cyber security measures required after September 2012 to be incorporated into the Vesting Price.</p>	
2.	Capital cost Through-life capital costs	<p>Senoko Energy ("Senoko"):</p> <p>In our response to the Consultation Paper, we made two forms of general comment on a number of specific cost items:</p> <ol style="list-style-type: none"> a. We requested a description of the fundamental reason for the decrease in certain costs since previous reviews. b. We noted that our shareholders estimate higher costs for certain cost categories compared to PB. <p>In general, PB's response to these comments is that they have referred to their in-house data and consider the costs to be reasonable and/or sufficient. No evidence is provided to support PB's claims.</p> <p>In addition, we provided a specific list of capex items that should be included for replacement under through-life capital costs. PB responded that these items have been "included in the fixed maintenance and other operations cost and LTSA</p>	<p>PB's clarifications as follows:</p> <ul style="list-style-type: none"> • Gas compression system: From PEACE software. • Air filters: Actual cost information provided by Senoko in 2015-2016 mid-term review adjusted by MAS core inflation. • DCS: Cost estimate provided in Table 3.4 in the Technical Parameters report is not computed from SGD/USD exchange rate. DCS cost estimate is derived from similar sized projects in the region and PB is unable to disclose specific project references due to confidentiality of commercial information. • Initial spares: It is an industry norm to estimate initial spares as a percentage of the initial plant capital cost. <p>Consistent with the previous reviews, the major cost items in the through-life capital cost are explicitly listed. The fixed annual operating cost and LTSA cost components are</p>

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		<p>component under variable non-fuel cost.” While we consider it would be more intuitive to include these items under through-life capital costs, if PB’s treatment is retained we suggest that the PB report is updated to make this approach clear, with the specific values for the replacement items being made transparent.</p>	<p>reasonable to cover expenditures for other equipment due for replacement or refurbishment as per the OEMs’ recommendations. PB is unable to provide a detailed breakdown of the cost information which is commercially sensitive.</p>																																										
3.	<p>Operating cost O&M manning and head office services cost</p>	<p>PacificLight Power (“PLP”):</p> <p>We understand that the labour cost index used by the consultant uses information from the Economic Development Board’s “Remuneration Per Worker of Manufacturing by Industry Cluster” which is made available via the SingStat website. Information therein however shows that remuneration for the Chemicals sub-sector have increased by ~10% over the last two years. If we were to compare the 2012 and 2014 data points, the increase is ~20%. In this regard we would request that the EMA further reconsider the O&M manpower costs to reflect actual wage data movements.</p>	<p>We disagree with PLP’s feedback. Data from the most recent two years (2014 to 2015) shows that the average remuneration per worker has decreased by 0.2%.</p> <p>The historical five-year data for “Remuneration Per Worker Of Manufacturing By Industry Cluster, Annual” obtained from http://www.singstat.gov.sg/ is reproduced in the table below. The average remuneration per worker for the chemicals manufacturing industry is used in the calculations.</p> <table border="1" data-bbox="1317 874 2114 1225"> <thead> <tr> <th colspan="6">Remuneration Per Worker of Manufacturing By Industry Cluster, Annual (Thousand Dollars)</th> </tr> <tr> <th>Year</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> </tr> </thead> <tbody> <tr> <td>Chemicals</td> <td>87.6</td> <td>87.8</td> <td>92.7</td> <td>104.2</td> <td>104</td> </tr> <tr> <td> Petroleum</td> <td>156.6</td> <td>154.4</td> <td>142.6</td> <td>186</td> <td>173.2</td> </tr> <tr> <td> Petrochemicals</td> <td>98.7</td> <td>97</td> <td>98.1</td> <td>105.1</td> <td>112.3</td> </tr> <tr> <td> Specialty Chemicals</td> <td>76</td> <td>77.2</td> <td>83</td> <td>86.7</td> <td>87.4</td> </tr> <tr> <td> Others</td> <td>50.7</td> <td>52.8</td> <td>70.2</td> <td>71.2</td> <td>72.5</td> </tr> </tbody> </table>	Remuneration Per Worker of Manufacturing By Industry Cluster, Annual (Thousand Dollars)						Year	2011	2012	2013	2014	2015	Chemicals	87.6	87.8	92.7	104.2	104	Petroleum	156.6	154.4	142.6	186	173.2	Petrochemicals	98.7	97	98.1	105.1	112.3	Specialty Chemicals	76	77.2	83	86.7	87.4	Others	50.7	52.8	70.2	71.2	72.5
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4.	<p>Operating cost</p>	<p>PLP:</p> <p>In the current LRMC review dated 29 July 2016, it is stated</p>	<p>The calculation on property tax is updated to include the cost</p>																																										

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	Property tax	<p>that the total capital value of the power plant used in the calculation of property tax is S\$279.647m. With an assumed Annual Value of S\$16.779m, or 6% of the land, preparation and buildings/structures cost, the resulting property tax is S\$1.678m. However the calculation has omitted two components used by the IRAS in assessing the property tax, namely cost of repairs & maintenance and cost of insurance as detailed in IRAS's Investor's Guide to Property Tax issued on 2 September 2014 under the Contractor's Test method.</p> <p>Based on the template furnished by IRAS re the computation of property tax, which includes the cost of repairs & maintenance (2% of value of building/improvements) as well as the cost of insurance (0.3% of value of building/improvements), property tax will be S\$2.483m instead of S\$1.678m.</p> <p>PLP is subject to the same methodology for our property tax computation.</p>	of repairs and maintenance and cost of insurance as per the Contractor's Test method. With this adjustment, the property tax for two units is S\$2.484m for two units, i.e. S\$1.242m per unit.
5.	Operating cost Working capital costs	Tuas Power Generation ("Tuas"): While we accept that a new entrant is expected to follow the revised fuel reserves policy of maintaining 60 days of a Genco's normal operation, we wish like to highlight that the risks undertaken by Gencos to hold the oil reserves are higher due to a much volatile oil market. Hence, the working capital should be subjected to a higher pre-tax nominal WACC than the pre-tax nominal WACC of 8.01% used for capital cost recovery. In additional, we would like to propose for an indexation mechanism for the working capital cost using the Domestic	In the determination of WACC, the financial parameters are set taking into account the various risks faced by a new genco. The pre-tax nominal WACC of 8.01% is used for discounting working capital, whereas the real pre-tax WACC of 7.15% is used for discounting capital cost components such as through-life capital cost and waterfront fee. The working capital cost has two components, namely the working capital for holding emergency fuel, and the working

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		<p>Supply Price Index (DSPI). This allows for appropriate adjustments for extremity (high/ low) in prices, which can coincide with the base month period in the current methodology. The working capital cost will be adjusted with the average DSPI from Mar to May-16 as the base index for working capital cost.</p>	<p>capital against cash cycle. Both components are calculated based on the estimated costs of gasoil (10ppm) price, O&M manning (including head office staff) costs, fixed O&M costs, variable O&M costs, and generation output (MWh) of the new entrant plant.</p> <p>PB disagrees with the proposed indexation using DSPI. The DSPI measures the price changes of locally manufactured goods and imported goods which are retained for use in Singapore. The basket of commodities used for the calculation of DSPI is too wide ranging for the purpose of indexing a genco's working capital. The DSPI is used as price deflators of wholesale trade and monitors short term inflationary trends of the economy which may not necessary eradicate extremities in prices over the three months period as suggested. In general, the use of price indexation is kept to a minimum in the review and is only used where the cost build up approach is not available.</p>
6.	<p>Other Parameters Economic life</p>	<p>Senoko:</p> <p>The arguments used by PB to support an increase in the economic life of the reference new entrant generation unit from 24 to 25 years do not appear to be strong. They state in their revised report that "[t]his is an increase from the 2015-2016 review of 24 years and is supported by the significant drop in fuel price since 2014, high generation supply cushion at 29.3% and the slower rate of growth in electricity in Singapore as reported in the NEMS Market Report 2015".</p> <p>Senoko contends that short-term, backward looking measures of demand growth and fuel costs are not relevant for an assessment of economic life. Instead long-term, forward</p>	<p>There is no basis for retaining an economic life of 24 years from the previous review as the underlying set of assumptions used then are not applicable for this period of review.</p>

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		<p>looking, measures are appropriate. There is limited evidence that the long-term growth prospects of Singapore have deteriorated since the 2014 review. Therefore, we suggest retaining the 24 year assumption from the previous review.</p> <p>YTL PowerSeraya :</p> <p>Note PB's statement "On whether to compare LRMC (of the newer and more efficient CCGT in future) with either SRMC or avoidable cost of the initial new entrant CCGT, it should be noted that any CCGT owner should be able to reasonably forecast and plan in advance before shutting down the plant and make operational decisions not to continue incurring fixed costs that can be avoided in the event of a shutdown (e.g. cease renewal of non-critical contracts/equipment)." which appears to support the use of avoidable cost instead of SRMC despite PB stating "Hence, the investor is expected to base on SRMC (rather than the avoidable cost) when deciding whether to continue operating the existing plant or build a new plant in future."</p> <p>At the plenary session on 5 Aug 2016, PB mentioned doing an economic life estimate based on H-class technology, details of that estimate are requested as well as what would be the economic lifetime estimated if avoidable cost is used instead of SRMC.</p> <p>YTL PowerSeraya reiterates the previous comments submitted on 7 July 2016 on economic lifetime and again requests that economic lifetime be fixed at 20 years as was the case for the 2009-2010 review and before.</p>	<p>From the point where decision is made to shut down the plant, a prudent owner should be able to plan and strip out certain minor fixed operating and maintenance cost and still incur the main bulk of the cost to keep the plant running until it is retired, thereby leaving only SRMC to be considered. Thus, there is no contradiction in the reply.</p> <p>On the selection of CCGT technology, PB has performed the analysis using both F-class and H-class technology* against the incumbent F-class SRMC. This is on the basis that it is uncertain whether investors would continue to adopt the F-class in Singapore or switch to more advanced (e.g. H-class) CCGTs in future, as the latter have significantly larger unit size which results in higher reserve cost allocation in the wholesale market. As such, the derived estimate based solely on H-class technology is not relevant to this review.</p> <p><i>*The H-class machines considered were GE 9HA.02, MHPS 701J and Siemens 8000H. GTPro modelling and PEACE software results were used to generate the H-class performance and cost estimates. The average net plant output is 612.3MW and the average net plant heat rate (HHV) is 6,704.8 kJ/kWh.</i></p>

Financial Parameters

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1.	Debt Premium	<p>Senoko:</p> <p>Senoko continues to believe that it would be very challenging for a new entrant generator into the Singapore market with 100% merchant exposure to be able to raise finance on a stand-alone in basis via a corporate bond. The recent performance of Hyflux's generation asset, which started commercial operations in March 2016, provides support for this. In its announcement of its 2Q2016 results, the company guided that it expects weak financial performance from its Tuaspring power plant for the second half of 2016 and that weak electricity prices would have an adverse impact on profitability. This gloomy performance outlook occurs despite "non merchant" incentives income being earned by the company from being a market-making participant in the Singapore Electricity Futures Market. Therefore, overall the financing assumptions in the draft determination appear optimistic.</p>	<p>KPMG has taken into account market information including the Moody's Bond Utility Index for US utilities and available bank quotes for project financing by several local and foreign financial institutions active in the Singapore power market. We have assessed the cost of debt of 5.15% to be reasonable, which yields a debt premium of 2.61% over the risk free rate.</p>
2.	Overall WACC	<p>Singapore Power:</p> <p>We agree with EMA's adoption of a medium to long term view in its latest Ke determination.</p> <p>Notwithstanding the update on the financial parameters, we suggest that EMA can also consider a long-term averaging period for RFR to stabilise Ke and preserve investor confidence.</p>	<p>We note the feedback.</p>

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