



**REVIEW OF THE VESTING CONTRACT LEVEL  
FOR THE PERIOD 1 JANUARY 2015 TO 31 DECEMBER 2016**

**FINAL DETERMINATION PAPER**

**22 SEPTEMBER 2014**

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**1. Introduction**

1.1. The Energy Market Authority ('EMA') implemented Vesting Contracts on 1 January 2004. The objective of the vesting regime is to mitigate the exercise of market power by the generation companies ('gencos') in the wholesale electricity market. 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), which in turn removes the incentives for gencos to exercise their market power by withholding their generation capacity to push up spot prices in the wholesale electricity market.

1.2. EMA conducts biennial reviews of the vesting contract level ('VCL') in accordance with the procedures set out in the document "EMA's Procedures for Calculating the Components of the Vesting Contracts" ('Procedures').

**2. Consultation on EMA's Draft Determination Paper**

2.1 EMA issued its Draft Determination Paper on 23 July 2014. We have since received comments from 8 respondents including the 5 vested gencos, viz. Tuas Power Generation ('Tuas'), Senoko Energy ('Senoko'), YTL PowerSeraya ('Seraya'), Keppel Merlimau Cogen ('Keppel') and PacificLight Power ('PLP'), and the respective shareholders of Tuas, Senoko and Seraya. EMA's responses to their comments are set out in ***Appendix 1***.

2.2 Tuas, Senoko, Seraya and PLP have also engaged NERA Economic Consulting ('NERA') to appraise EMA's Draft Determination paper. Our responses to NERA's report are set out in ***Appendix 2***.

**3. EMA's Final Determination**

3.1 During the consultation process, the large gencos and their respective shareholders objected to reducing the VCL steeply to the LNG vesting level, and requested for the VCL to be lowered as gradually as possible. They also suggested that the VCL for 2015-2016 should be higher than 30% of total electricity demand, so as to provide revenue support for the large gencos in a highly competitive market environment. On the other hand, the smaller gencos (viz. Keppel and Sembcorp) did not object to reducing the VCL to the LNG vesting level for 2015-2016, while PLP suggested that the VCL should be set to fully hedge non-contestable load.

3.2 The Procedures clearly provide for EMA to increase or decrease the VCL as and when necessary to curb the exercise of market power in the wholesale

electricity market. The Procedures express no intent for Vesting Contracts to provide revenue certainty to the gencos nor is the sustainability of gencos' revenue a factor that should be taken into account when setting the VCL. The Procedures also do not require the VCL to be set to fully hedge non-contestable load.

3.3 Simulation results from EMA's consultant, The Lantau Group ('TLG') have shown that the VCL can be lowered to the LNG vesting level for 2015-2016 without market power concerns. However, the LNG vesting level, by its nature, will fluctuate every quarter. To provide greater market certainty, EMA has therefore decided to set the minimum VCL for 2015-2016 at 20% of total demand.

3.4 EMA is also mindful that gencos and their respective retail arms ('gentailers') need time to adjust their hedging portfolios and contract cover as the VCL is reduced from the current 40% to 20%. EMA will therefore phase the VCL reduction over the two-year period by lowering the VCL to an intermediate level of 30% for 1H 2015 and 25% for 2H 2015, before lowering to 20% for 2016.

3.5 With respect to the period weighting factors ('PWF'), TLG's analysis shows that the peak PWF has marginal effect on pool price in 2015-2016. EMA will therefore retain the peak PWF at 1.1 and the shoulder PWF at 1.0, with the off-peak PWF as balancing factor.

3.6 **Table 1** below summarises EMA's final determination of the VCL and the associated PWF for 2015-2016.

**Table 1: Final VCL and PWF for 1 January 2015 to 31 December 2016**

Period	Vesting Contract Level	Period Weighting Factors		
		Peak	Shoulder	Off-Peak
1 January 2015 – 30 June 2015	30%	1.1	1.0	Balancing Factor
1 July 2015 – 31 December 2015	25%			
1 January 2016 – 31 December 2016	20%			

\* \* \*

**Response to Comments to EMA’s Draft Determination of Vesting Contract Level (“VCL”) for 2015/16**

No.	Industry Comments	Response
1	<b>Comments on the Design and Intent of Vesting Contract Regime</b>	
Tuas Power (“Tuas”)	<p>(a) <u>The EMA’s proposed approach to setting the VCL systematically prevents generation companies from recovering their costs and therefore distorts incentives for efficient investment.</u> Specifically, the EMA’s draft determination envisages reducing the VCL during 2015/16 when there is surplus capacity in the market and prices are below the Long-Run Marginal Cost (LRMC) of new entry. However, at the same time, it is suggesting that it will increase the VCL if/when the electricity market tightens in the future, and thus the likelihood of generators exercising market power increases.</p> <p><u>By allowing prices to drop below LRMC in periods of surplus, and increasing the VCL to target LRMC when the market tightens, EMA is effectively capping prices at LRMC, or in other words, setting the average or expected prices captured by generation investors at a level below LRMC over the long-term.</u> Continuation of this policy by EMA would therefore systematically prevent investors in new generation capacity from recovering their costs through the market. In the long-run, such a policy would raise the costs of electricity faced by consumers in Singapore and reduce security of supply.</p>	<p>The published Procedures for setting the VCL clearly state that the objective of Vesting Contracts is to curb the exercise of market power by gencos in the wholesale electricity market. The Procedures express no intent for Vesting Contracts to provide revenue certainty for gencos, <i>nor</i> is the sustainability of gencos’ revenue a factor that should be taken into account when setting the VCL.</p> <p>In accordance with the Procedures, EMA sets the VCL taking into account the degree of market power of gencos in the wholesale electricity market, more specifically to remove their incentives to withhold generation capacity to push up pool price. The VCL does not cap the pool price at the Vesting Price (or LRMC), as pool prices can rise above the Vesting Price under tight market condition as observed in 2011 and 2012, with the USEP averaging at 10.1% and 3.7% above the Vesting Price respectively. In any case, Vesting Contracts do not compel any genco to compete unsustainably below its cost in the wholesale electricity market.</p>

<p>(b) <u>While we recognise the vesting contract regime is not intended primarily as a revenue stabilisation mechanism, EMA should also recognise that in practice, the vesting contract has served to stabilise revenues to generation companies as well as provided a significant hedge against exposure to significant price volatility especially to consumers over the last couple of years.</u> There are therefore considerable merits to consider whether price stabilisation should be supported as the Vesting Contract Level falls/terminate. In well-functioning energy-only markets, correct price signals encourage players to operate assets and invest efficiently.</p> <p>However <u>with the current oversupply in capacity brought on by the LNG Vesting Scheme, and a proposed drastic concurrent reduction in Vesting level, and where gas TOP cannot be managed commercially without regulatory approval, prices are likely to fall to unsustainable/market failure level where wrong price signals are given out.</u> Investment in power generation are characterised by large, long-lived and sunk investments. These characteristics mean investors are exposed to significant risks, and will need to have a reasonable prospect of cost recovery before investing to support the efficient development of the industry. A reasonable prospect of cost recovery is most likely to result from a stable regulatory environment. Nearly 3000MW of new CCPs have been invested in the industry in the last few years as a result of the introduction of LNG into Singapore but also with the resulting gas TOP issue. <u>The industry’s gas TOP issue will only be resolved if gas can be taken freely out of the Singapore to balance the market or when demand finally catches up with supply over time. Given the restriction currently in place with regards to the first point, and the huge recent investment made in the industry, arguments for a more graduated</u></p>	<p>The objective of Vesting Contracts is to curb the exercise of market power by gencos in the wholesale electricity market. The VCL is set accordingly taking into account the degree of market power of gencos in the wholesale electricity market, more specifically to remove their incentives to withhold generation capacity to push up pool price. The amount of revenue/price certainty is consequential to the VCL to be set as such, rather than as a factor that should be taken into account to set the VCL.</p> <p>Investments in new/repowered generation capacity in Singapore have always been commercially driven. Even with LNG Vesting Contracts, gencos had voluntarily signed up for them together with LNG supply contracts with BG as part of their commercial planting decisions. Gencos have applied to EMA to reduce their contracted gas supply for 2014 to manage their contractual gas take-or-pay (“TOP”) obligations. EMA has approved all the applications after assessing that the system-wide impact of all proposed reduction would not affect Singapore’s energy security.</p>
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	<u>reduction that is spaced out in line with market development should be considered.</u>	
<b>Huaneng Power International (“HPI”)</b>	(c) Under the Singapore electricity market’s vesting contract regime, the Gencos contract to sell a specified amount of electricity (being the vested contract level) at a specified price (being the vesting contract price), to SP Services Ltd. The vesting contract is a contract imposed or vested by the EMA on the Gencos by condition of their electricity licences. EMA implemented vesting contracts on 1 January 2004. According to the EMA, the objective of the vesting contract regime is to control the market power of the Gencos. <u>However we also believe the vesting contract provided market stability to all stakeholders, stable prices to consumers and stable revenue for the investors.</u>	As noted by HPI, EMA has the right to increase or decrease the VCL taking into account the degree of gencos’ market power in the wholesale electricity market, to achieve the stated objective of Vesting Contracts which is to curb gencos’ exercise of their market power if any. While Vesting Contracts provide some revenue/price certainty, this is consequential to the VCL set to achieve the objective of controlling market power, rather than as a factor that should be taken into account to set the VCL.
<b>YTL PowerSeraya (“Seraya”)</b>	(d) <u>It has from the initial vesting, been a professed aim of the vesting contracts not only to curb generators’ market power, but also to provide a degree of stability in terms of revenues and cash flows for the generators.</u> This is stated explicitly in the Temasek Information Memoranda for investors in the three large gencos being divested. Moreover, this objective is clearly demonstrated by EMA’s administration of the regime. In 2002, EMA issued a paper titled “Vesting Contracts for Island Power Company and Keppel Merlimau Cogen”. <u>In this paper, EMA stated the following – “IPC and Keppel currently do not have any generation plants. They were granted the generation licences before the vesting regime was contemplated. On this consideration, they will be given an irrevocable option to take up vesting contracts.</u> The gencos would have certainty in revenue for the part of the generation output that is vested. With market power of the large gencos removed, IPC and Keppel would have a stronger business case to plant with vesting contracts allocated to them. This	There is absolutely no basis for Seraya to assert that giving Keppel Merlimau Cogen and PacificLight Power (then known as Island Power Company) the option to sign up for Vesting Contracts constitutes a “professed aim of the vesting contracts” to provide revenue certainty for gencos in addition to the objective of controlling market power. Vesting Contracts were originally conceived as a mandatory imposition on the three large dominant gencos viz. Seraya, Senoko and Tuas to control their market power. At that time, there were 3 small gencos viz. Sembcorp Cogen, Keppel Merlimau Cogen and PacificLight Power (then known as Island Power Company) which were granted generation licences. As noted in Seraya’s comments, <b>it was on this consideration</b> that EMA offered each of the small gencos an irrevocable option to be allocated Vesting Contracts up to their respective licensed

is a desirable outcome as the entry of new gencos will dilute the market power currently held by the three large gencos.” It is clear that by giving Island Power and Keppel Merlimau an option, EMA was not and could not be seeking to curb market power. Rather, it was demonstrably seeking to fulfil the second objective of vesting contracts to provide to these generators (in common with others) a degree of stability of revenue and cashflow. It is PowerSeraya’s contention that if EMA now ignores this second objective, it will do long-term damage to the future security of electricity supply in Singapore.

generation capacity before the commencement of the Vesting Contracts. EMA was being fair and equitable to all the small gencos by offering them this option to be given the same treatment as the three large dominant gencos under Vesting Contracts, since they had already invested or decided to invest in new generation capacity before the start of the vesting regime. All this clearly stated in EMA’s 2002 paper as follows:

*“Vesting contracts will be imposed on the three large generation licensees, viz. Senoko Power, PowerSeraya and Tuas Power, to curb their market power. It has also been decided that the other existing generation licensees, viz. SembCorp Cogen, Island Power Company (IPC) and Keppel Merlimau Cogen (Keppel), will be given an irrevocable option to take up vesting contracts prior to the commencement of the vesting regime. The allocation of vesting contracts will be in proportion to the installed capacity of each licensee. Potential new entrants will enter the electricity market based on the economic signals from the market. They will not be allocated vesting contracts.”*

Seraya’s misguided interpretation of the above to contend that there is a “second objective” of providing revenue certainty to gencos under Vesting Contracts, and that “if EMA now ignores this second objective, it will do long-term damage to the future security of electricity supply in Singapore” are totally baseless and unjustified.

<p><b>Seraya</b></p>	<p>(e) <u>The power generation investment horizon is longer than 2 years given the long term contracts entered into to underpin power generation investments in Singapore. Investors therefore look for a certain degree of revenue certainty. Determining the Vesting Contract Level on a two year basis is inconsistent with such revenue certainty.</u> An uncertain investment climate would lead investors to demand higher returns to compensate for such certainty, significantly higher than reflected by the Vesting Price. <u>If the Vesting Contract Level has to be determined on a two yearly basis, to mitigate investment uncertainty, it should be determined within a certain range. We view the range of 50%+/- 15% as being appropriate.</u> The floor of 35% provides a degree of revenue certainty and consequently investment certainty, while a cap of 65% allows for raising the Vesting Contract Level to control market power when warranted. <u>This range should be maintained as long as there are long term legacy gas contracts to provide the revenue certainty to fulfil those contracts.</u></p>	<p>It is unreasonable for Seraya to argue for less frequent review or for floors and caps on the VCL to provide revenue certainty based on investors' investment horizon or the presence of long term gas contracts. The published Procedures for setting the VCL clearly state that the objective of Vesting Contracts is to curb the exercise of market power by gencos in the wholesale electricity market. The Procedures express no intent for Vesting Contracts to provide revenue certainty for gencos, <i>nor</i> is the sustainability of gencos' revenue a factor that should be taken into account when setting the VCL. In each biennial review, the VCL is set accordingly taking into account the degree of market power of gencos in the wholesale electricity market, more specifically to remove their incentives to withhold generation capacity to push up pool price. The amount of revenue/price certainty is consequential to the VCL to be set as such, rather than as a factor that should be taken into account to set the VCL.</p>
<p><b>Seraya</b></p>	<p>(f) Whatever the original intention behind the setting of the VCL in the vesting contracts, these contracts have in practice served to provide a degree of price stability. This must be in consumers' long term interests. The EMA has to balance its statutory duty in s.6 of its founding Act to promote competition and prevent misuse of market power with its co-equal duties to 'secure' (a very demanding test) that all reasonable demands for the supply of electricity are satisfied; to promote the development of the electricity and gas industries; and to protect the interests of the public in respect of the supply and use of electricity and gas. <u>It is entirely consistent with these duties – indeed essential to their fulfilment – to maintain a much more</u></p>	<p>Investments in new/repowered generation capacity in Singapore have always been commercially driven. EMA implemented Vesting Contracts specifically to control market power of the dominant gencos who may otherwise distort economic price signals and deter new entrants from entering the market to compete with them. EMA did not introduce Vesting Contracts to provide revenue certainty for the vested gencos.</p>

gradual approach to the reduction of the VCL over time. This will send the necessary signals to the market, on which the market has so far relied, to encourage investment and ultimately to ensure that demand is satisfied. If not, then Singapore faces the kind of shift from overinvestment to underinvestment that has followed similarly sharp and sudden regulatory interventions elsewhere, notably in Europe. Liberalised power markets globally have become increasingly risky as political interference has increased. Decisions to cap prices in good times, but not support them in bad times (most notably caused by erosion of demand by highly subsidised non-capacity providing renewable) highlight the dangers of changing the application of rules without consideration of the long term effects. Across Europe, for example, regulators have inadvertently created a situation which has deterred potential investors from investing in gas-fired generation which provides dispatchable capacity. These markets are having difficulties in luring investors back, such that 14 countries out of 28 in the EU either have, or are planning to introduce, capacity markets in order to underpin security of supply. The UK, for many the forerunner of global liberalised markets, will introduce a capacity market from winter 2018 (with the first tender being launched later this year). The UK model will provide for investment in new capacity to be eligible for 15 year contracts which is explicitly recognizing the long-term horizon over which investment decisions are considered. EMA should therefore also recognize the role that Vesting Contracts play in providing the revenue certainty asked for by investors to put in new generation capacity investment and/or retain existing generation capacity.

<p><b>Seraya</b></p>	<p>(g) Vesting contracts are two-way contracts with the state owned power retailer, which both cap wholesale power prices for the benefit of consumers, and provide a floor for the benefit of generators. <u>Vesting contracts have been the bedrock on which lenders and equity investors have based their investment decisions and the current proposals radically change this basis and introduce serious instability into the electricity market.</u> In the consultation, now in its second round, EMA is proposing to reduce vesting from 40% to 0%, other than for an estimated 16% share of the market using LNG. EMA believes that the current overcapacity in power generation and gas take or pay gas obligations will lead to reduced prices; however EMA’s desire to reduce prices in the short term must be balanced with EMA’s legal duty to promote the development of the electricity and gas industries. Low prices in an unstable market with weak players would not achieve the long term objectives of the country. The drastic reduction in vesting would ignore the very long term nature of investment in power stations, where the return on investment is realised only through a stable regulatory regime over 20-25 years, and the commitments to purchase gas under take or pay contracts stretch for a similar period. <u>The envisaged reduction would almost certainly lead to the insolvency of the three recently privatised Singapore power generation companies affecting the entire supply chain.</u> In particular Singapore’s status as a financial centre would be at risk as many local banks such as DBS have been lending heavily to the power generation sector believing that it is a stable and secure long term business. We respectfully ask your Government to review the direction in which EMA’s consultation is heading. Such review should take into account the impact on future long term investment in the power and gas markets, as well as the legitimate long term expectations of investors both at the time of</p>	<p>It is factually incorrect for Seraya to claim that EMA’s proposals to reduce the VCL for 2015-2016 constitute a change in policy that goes against investors’/lenders’ legitimate expectations of Vesting Contracts and would destabilise the electricity market. This is an unfair and baseless allegation. The industry stakeholders, including the vested gencos and their investors/lenders, are well aware that EMA implemented Vesting Contracts specifically to curb the exercise of market power by the gencos in the wholesale electricity market, and that EMA did not introduce Vesting Contracts to provide revenue certainty for the vested gencos. All these are clearly documented in published EMA papers, not least the Procedures for reviewing and setting the VCL. Accordingly, EMA has the right to increase or decrease the VCL taking into account the degree of gencos’ market power in the wholesale electricity market. The amount of revenue certainty is consequential to the VCL to be set as such, rather than as a factor that should be taken into account to set the VCL. Notwithstanding the reduced revenue certainty due from the VCL in 2015-2016, Vesting Contracts do not in any way compel any vested genco, big or small, to compete unsustainably below its cost in the wholesale electricity market. In this light, Seraya’s claim that the proposed lowering of the VCL for 2015-2016 “would almost certainly lead to the insolvency” of the three large gencos is clearly a gross exaggeration. EMA has observed that the gencos are still making profits, albeit less than what they earned in 2011 and 2012 when electricity prices were higher. In many other industries, it</p>
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	<p>privatisation and at the time of contracting for LNG.</p>	<p>is not uncommon for companies to experience ups and downs in their profit levels, including some years of losses.</p>
<p><b>Senoko</b></p>	<p>(h) It is important to note that EMA has made significant changes to the Vesting Contract Procedures since its inception. The introduction of the LNG Vesting scheme is one noticeable example in this respect. <u>For EMA to now propose to proceed on the basis of an extremely narrow implementation of the current Vesting Contract Procedures in setting the Vesting Contract Level for 2015/2016 would perpetuate a design which creates clear "asymmetries" (by, in simplified terms, setting a cap but not a floor at the LRMC) and is therefore demonstrably unsustainable.</u></p>	<p>EMA introduced LNG Vesting Contracts to encourage gencos to sign up for regasified LNG if they need more gas to proceed with investing in their new/repowered CCGT capacity on a commercial basis. There is no change in the objective of Vesting Contracts i.e. to curb the exercise of market power by the gencos in the wholesale electricity market. In accordance with the published Procedures, EMA sets the VCL (with the LNG Vesting Level as the floor) taking into account the degree of market power of gencos in the wholesale electricity market, more specifically to remove their incentives to withhold generation capacity to push up pool price. The VCL does not cap the pool price at the Vesting Price (or LRMC), as pool prices can rise above the Vesting Price under tight market condition as observed in 2011 and 2012, with the USEP averaging at 10.1% and 3.7% above the Vesting Price respectively. It is therefore factually wrong for Senoko to claim that Vesting Contracts and/or LNG Vesting Contracts create "asymmetries" by capping prices.</p>

2	Comments on Proposed VCL for 2015 – 2016	
<p><b>PacificLight Power (“PLP”)</b></p>	<p>(a) In Q4 2013, after consultation and feedback from the gencos, the <u>EMA took the decision to tender 6% of demand rather than the originally intended level of 12%, thereby reducing the vesting contract level from 40% to 34%.</u> At the time this decision was made, assurances were given by the industry to the EMA that they would continue to focus on maintaining high levels of operational reliability, which can only be achieved through ongoing plant maintenance as well as retaining a skilled workforce. All parties acknowledged that these important issues should not be compromised to meet short term objectives. We would therefore request that the EMA review the vesting level for the period 2015-2016 in light of the data that was presented to the EMA in Q4 2013 and the conclusions that were reached at that time.</p> <p><u>PLP acknowledges that the vesting regime does not require the VCL to fully hedge the NCC load.</u></p> <p><u>However we would advocate that it be set at the NCC load in order to ensure gencos can meet long term requirements and fulfil the commitments made to the EMA.</u></p>	<p>The VCL is not reduced by the Vesting Tender. The Vesting Tender quantities are taken from the Vesting Contract quantities for re-allocation to the awarded gencos. The remaining Vesting Contract quantities are allocated to all the vested gencos in proportion to their eligible generation capacity.</p> <p>Noted PLP’s comment that the vesting regime does not require the VCL to be set to fully hedge non-contestable load.</p> <p>There is no basis in PLP’s proposal to set the VCL to fully hedge non-contestable load in order for gencos to be responsible stakeholders. There is no logic to this statement. Regardless of the VCL which EMA will set to achieve the objective of controlling gencos’ market power, all gencos are expected to adopt a longer term perspective in assessing the overall returns of their investments. As long term investors, it is in the gencos’ interest to be responsible stakeholders by continuing to maintain a high level of operational reliability, perform proper</p>

		<p>maintenance of their generation facilities, support power sector manpower development efforts and focus on ensuring the safety and well-being of their employees.</p>														
<b>Tuas</b>	<p>(b) EMA proposed reduction from the current 40% to the LNG Vesting Level is significant and is premised on a modelling approach which carry the risk that not all factors at play in the market are captured. In reality, <u>gencos/retailers interact with each other and consumers on a repeated basis and given the significant economic material changes due to the drastic drop in VCL level, there may be significant scope for outcomes to materially differ from that produced by the modelling.</u></p>	<p>The modelling approach adopted by EMA’s consultant, The Lantau Group (“TLG”), is in line with the published Procedures which require the use of a market gaming model to derive the overall expected annual market prices for different VCLs. To analyse market power and bidding behaviour, TLG uses a measure of market concentration – the ratio of generation by the three dominant gencos to their total available capacity (which TLG defines as the “net load /capacity ratio”) and this ratio is computed for each half-hour period. The underlying modelling assumption is that gencos would act similarly in the future under similar market supply and demand conditions.</p>														
<b>Seraya</b>	<p>(c) <u>The proposed reduction of the Vesting Contract Level (VCL) from the current 40% to only the LNG Vesting Level for 2015-2016 (equivalent to a VCL of about 16%) represents an unprecedentedly sharp change in the vesting contract level.</u></p> <p>Historically, over any two year review period, the biggest change was a drop of 15% which occurred in the review period for 2013 – 2014. The table below shows the historical vesting contract levels.</p> <table border="1"> <thead> <tr> <th>Time Period</th> <th>Jan 2004 to Jun 2007</th> <th>Jul 2007 to Dec 2010</th> <th>Jan 2012 to Dec 2011</th> <th>Jan 2012 to Jun 2013</th> <th>Jul 2013 to Dec 2013</th> <th>Jan 2014 to Dec 2014</th> </tr> </thead> <tbody> <tr> <td>Vesting Contract Level</td> <td>65%</td> <td>55%</td> <td>60%</td> <td>55%</td> <td>50%</td> <td>40%</td> </tr> </tbody> </table>	Time Period	Jan 2004 to Jun 2007	Jul 2007 to Dec 2010	Jan 2012 to Dec 2011	Jan 2012 to Jun 2013	Jul 2013 to Dec 2013	Jan 2014 to Dec 2014	Vesting Contract Level	65%	55%	60%	55%	50%	40%	<p>In accordance with the published Procedures, EMA will set the VCL biennially taking into account the degree of market power of gencos in the wholesale electricity market. The published Procedures express no intent for the VCL to be set <i>subject</i> to limiting any reduction or increase in the VCL to no more than 15% across or within biennial periods. There is no basis for gencos and investors to expect EMA to reduce or increase the VCL in a particular fashion other than to control expected market power of the gencos in each biennial period. In each biennial review, EMA will calibrate changes in the VCL after taking into account relevant industry comments and feedback. This is the clearly stated intent of Vesting</p>
Time Period	Jan 2004 to Jun 2007	Jul 2007 to Dec 2010	Jan 2012 to Dec 2011	Jan 2012 to Jun 2013	Jul 2013 to Dec 2013	Jan 2014 to Dec 2014										
Vesting Contract Level	65%	55%	60%	55%	50%	40%										

	<p>Up to 2013, the VCL was subject to a minimum roll-back schedule which was included in the contracts themselves.</p> <p>The minimum roll-back schedule that applied till 2013 also showed a maximum reduction of 15% over any 2 year period as show in the table below.</p> <table border="1" data-bbox="378 427 1323 504"> <thead> <tr> <th>Year</th> <th>2004</th> <th>2005</th> <th>2006</th> <th>2007</th> <th>2008</th> <th>2009</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>Coverage</td> <td>65%</td> <td>50%</td> <td>50%</td> <td>50%</td> <td>50%</td> <td>40%</td> <td>40%</td> <td>40%</td> <td>40%</td> <td>40%</td> </tr> </tbody> </table> <p><u>All the documentary evidence concerning the intent of the VCL, including the EMA's procedures for calculating the VCL, made clear that the aim was to effect a gradual reduction in the VCL and to avoid sharp fluctuations from year to year. The EMA's proposed reduction of the VCL from 40% to only LNG vesting level for 2015-2016 is therefore against investors' expectations. It is, moreover, evident both from the historical figures above (and even more so from the initial proposals that the EMA made in each case) that the EMA is not only prepared to seek to increase the VCL when market prices are high and decrease it when they are low, but to do so sharply. PowerSeraya contends that this will undermine regulatory stability and predictability, leading to perceptions of greater regulatory risk and consequently raising the financial costs of participation in Singapore's electricity market, leading to lower investment and higher electricity costs and therefore prices in the long-term</u></p>	Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Coverage	65%	50%	50%	50%	50%	40%	40%	40%	40%	40%	<p>Contracts which all gencos and their shareholders are well aware of. Seraya should not be making up its own interpretation of these rules to suit its commercial interests.</p>
Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013														
Coverage	65%	50%	50%	50%	50%	40%	40%	40%	40%	40%														
<b>Seraya</b>	(d) The EMA's proposal to so drastically reduce the VCL from 40% to only LNG vesting level is incompatible with a sustainable electricity	EMA sets the VCL on an ex-ante basis to remove gencos' incentives to withhold their generation capacity to push																						

	<p>market. EMA has moved to suppress electricity prices at the vesting price which represents the Long Run Marginal Cost (LRMC) of a new entrant, as clearly evidenced by raising the VCL from 55% in 2010 to 60% in 2011. <u>The EMA's actions are asymmetric if it takes steps to suppress electricity prices at the LRMC of a new entrant but does nothing to help provide revenue support when electricity prices fall below LRMC. If companies can only expect to have electricity prices no higher than LRMC but can have electricity price lower than LRMC, then on average over the long term, the electricity prices faced would be below LRMC and therefore the electricity market would be unsustainable.</u> We note the EMA's assertion that it would again be prepared to raise the VCL in the future, as indicated both at the meeting on 14 May 2014 and in the EMA's responses to feedback contained in the EMA's draft determination paper dated 23 July 2014.</p>	<p>up pool prices. The VCL does not cap the pool price at the Vesting Price (or LRMC), as pool prices can rise above the Vesting Price under tight market condition as observed in 2011 and 2012 with the USEP averaging at 10.1% and 3.7% above the Vesting Price respectively. There is no basis for Seraya to make such unfair allegations which are not backed by facts.</p>
<p><b>HPI</b></p>	<p>(e) In the draft determination, EMA proposes to reduce the vesting contract level imposed on some of the generation companies ("Gencos") including our subsidiary, Tuas Power Generation Pte Ltd ("Tuas Power"), from the current 40% of the total electricity demand for 2013 and 2014 to 16% of the total electricity demand for 2015 and 2016. This is a steep reduction of 24% in one year. Over the past decade, the vesting contract level has only been gradually reduced from 65% in 2004 to 40% in 2013/2014. Despite the various representations made by Tuas Power and gencos to EMA for a gradual reduction in the vesting contract level during the consultation process, EMA intends to proceed with the steep reduction in the vesting contract level to 16% as set out in the draft determination...<u>Pool and retail prices are now below the long run marginal cost of capital. This is not sustainable in the long term. Our</u></p>	<p>The published Procedures for setting the VCL clearly state that the objective of Vesting Contracts is to curb the exercise of market power by gencos in the wholesale electricity market. The Procedures express no intent for Vesting Contracts to provide revenue certainty for gencos, <i>nor</i> is the sustainability of gencos' revenue a factor that should be taken into account when setting the VCL. In 2011-2012, electricity prices were above LRMC due to tight market conditions. This attracted investments in new/repowered CCGT capacity resulting in ample efficient generation capacity and in turn resulted in electricity prices below LRMC currently. Over time, electricity prices would start to rise as demand grows, eventually above LRMC to attract the next round of new capacity</p>

	<p><u>proposed gradual reduction of vesting level to 30~35% is intended to be a transitional arrangement to enable the market to absorb the excessive overcapacity. This will help to provide some revenue stability to Gencos without threatening the financial viability of the Gencos.</u></p>	<p>investments. The cycle repeats and this is how electricity markets work to sustain the financial viability of gencos. Overlaying this is the VCL which EMA will continue to set to ensure that price signals would not be distorted by gencos exercising market power, rather than to provide revenue certainty to gencos during the current market cycle.</p>
<p><b>Senoko</b></p>	<p>(f) It is unclear to us how EMA justifies retaining its Option 1 for the purpose of the Draft Determination, when (i) <u>Senoko Energy and many of the other respondents have advocated for a significantly more gradual roll-back of the Vesting Contract Level than the one outlined in either of the Options proposed by EMA;</u> and (ii) EMA itself, in its initial consultation paper on this matter, was proposing Option 2 to make the roll-back somewhat (but, in our view, clearly insufficiently) more gradual. We believe this sequence of events is not reflective of genuine consultation and engagement with the industry.</p> <p><u>We maintain the comments we have outlined in our letter dated 23 May 2014 (which we will not re-iterate in this letter).</u> We also maintain our recommendation i.e. to reduce the peak vesting level from its current level to 34% for 2015/2016 (and, for the avoidance of doubt, not to call any “vesting tenders” during such period). This would constitute a significant, but measured, reduction in the VCL.</p>	<p>While the three big gencos argued for a more gradual reduction in VCL for 2015-2016, the small gencos did not object to setting the VCL at the LNG Vesting level. EMA will take into account the comments and feedback from all stakeholders before making the final determination.</p> <p>EMA has in the Draft Determination Paper provided its responses to the comments in Senoko’s 23<sup>rd</sup> May letter and will not reiterate here.</p>
<p><b>Senoko/ Marubeni</b></p>	<p>(g) The electricity sector in Singapore has entered a challenging period. A flux of new capacity (which itself has been triggered by, among others, the “LNG Vesting” scheme) has resulted in severe pressure on volumes and margins in the deregulated part of the market. As</p>	<p>EMA introduced LNG Vesting Contracts to encourage gencos to sign up for regasified LNG if they need more gas to proceed with investing in their new/repowered CCGT capacity on a commercial basis. There is no change in the</p>

	<p>experienced international investors we understand that any deregulated market will go through cycles. We do note that the current stage of the cycle reflects an extreme outcome, and we believe that, especially in this environment, it is of the essence that our expectations with respect to, among others, regulatory certainty and predictability are met. <u>The severe reduction in the vesting contract level for 2015/2016 which is currently being considered by EMA would, we believe, not be in line with those expectations: if implemented it would constitute a sudden and drastic change which market participants could not reasonably be expected to have predicted.</u> This could ultimately lead to adverse outcomes for Singapore and Singaporean consumers, by <u>creating a significant risk of financial distress (in the period from 2015 onwards) for market participants</u>, which in turn could result in negative impacts on investor and lender confidence, and on the availability of good and stable jobs in the electricity sector. <u>We respectfully request that, instead, a significantly more gradual reduction of the vesting contract level be implemented for the period 2015/2016,</u> and that a constructive dialogue take place with respect to the longer term roadmap for, among others, the vesting contract regime.</p>	<p>objective of Vesting Contracts i.e. to curb the exercise of market power by the gencos in the wholesale electricity market. In accordance with the published Procedures, EMA sets the VCL (with the LNG Vesting Level as the floor) taking into account the degree of market power of gencos in the wholesale electricity market, more specifically to remove their incentives to withhold generation capacity to push up pool price. The published Procedures express no intent for the VCL to be set to provide revenue certainty to gencos. The amount of revenue certainty is consequential to the VCL to be set to control market power, rather than as a factor that should be taken into account to set the VCL. It is factually wrong for Senoko to claim that EMA's proposals to reduce the VCL for 2015-2016 constitute "a sudden and drastic change which market participants could not reasonably be expected to have predicted". Senoko is also wrong to assert that the proposed lowering of the VCL for 2015-2016 would cause "financial distress" for gencos. Vesting Contracts do not in any way compel any genco to compete unsustainably below its cost in the wholesale electricity market. EMA has observed that the gencos are still making profits, albeit less than what they earned in 2011 and 2012 when electricity prices were higher. In many other industries, it is not uncommon for companies to experience ups and downs in their profit levels, including some years of losses.</p>
3	<b>Comments on setting the Period Weighting Factor ("PWF")</b>	

<p><b>Keppel</b></p>	<p>(a) Taking reference to Keppel’s earlier comments submitted in the earlier consultation paper, <u>Keppel wishes to reiterate its recommendation for a peak PWF of 1.15 to be set if VCL is set above the LNG vesting level.</u> This would not only allow a flatter profile for the hedging of unvested NCC load which would benefit the NCCs, and a higher PWF would also help to mitigate any residual market power during the peak hours.</p>	<p>TLG has assessed that the effect of the peak PWF on pool price in 2015-2016 is marginal.</p>
<p><b>4 Comments on impact on gas market</b></p>		
<p><b>Seraya</b></p>	<p>(a) To maintain support for the electricity industry in this way is also consistent with the EMA’s introduction of the LNG Vesting Scheme to ensure enough LNG offtake to ensure sufficient seed volumes for the stable operation of the LNG terminal in its initial years. This has, however, also resulted in too much gas being supported resulting in unsustainably low electricity prices and Take-or-Pay (“TOP”) for gas being a problem. <u>We note that the LNG Vesting Scheme is another instance of a Vesting arrangements made not only for the purpose of the control of market power.</u> We view market sustainability as a valid objective that Vesting should take into account.</p> <p><u>Due to LNG Vesting, limitations have also been placed on gencos’ ability to divert/sell gas to alleviate the TOP problem faced.</u> We have brought the TOP problem to EMA’s attention but we are still faced with limitations. In commercially driven purchase of LNG, buyers of LNG would prudently put in measures to allow for cargo diversion to address events such as fuel oversupply. This was not the case faced by gencos who had to sign on terms agreed to between the LNG Aggregator and EMA. <u>After the gencos signed up for LNG Vesting, Singapore put in measures to promote embedded generation and solar as well as bolstered energy efficiency efforts which have</u></p>	<p>EMA introduced LNG Vesting Contracts to encourage gencos to sign up for regasified LNG if they need more gas to proceed with investing in their new/repowered CCGT capacity on a commercial basis. There is no change in the objective of Vesting Contracts i.e. to curb the exercise of market power by the gencos in the wholesale electricity market.</p> <p>Investments in new/repowered generation capacity (including embedded generation) in Singapore have always been commercially driven. Even with LNG Vesting Contracts, gencos had voluntarily signed up for them together with LNG supply contracts with BG as part of their commercial planting decisions. Gencos have applied to EMA to reduce their contracted gas supply for 2014 to manage their contractual gas take-or-pay (“TOP”) obligations. EMA has approved all the applications after assessing that the system-wide impact of all proposed</p>

	<p><u>affected the electricity demand faced by commercial power generation, which has contributed to the situation of gas oversupply faced by the gencos.</u></p> <p>Surplus take-or-pay contracted gas and generation capacity has arisen from the Government’s desire to create support for the new LNG terminal. <u>The generators cooperated with this objective, on the basis that a reasonable degree of long term protection will be maintained</u> both for the new offtake of LNG and also for the existing piped gas purchases and generation, which are equally impacted by the new surplus. Without continued vesting, there will be unmanageable risks in the power market. Investors will withdraw, damaging Singapore’s reputation for privatisation, treatment of investors, and efforts to become the leading power and gas hub in the region.</p>	<p>reduction would not affect Singapore’s energy security.</p> <p>Gencos had made their own commercial decisions on whether and how much regasified LNG to buy from BG. EMA’s commitment was to maintain for 10 years the LNG Vesting Contracts allocated to gencos for signing up seed LNG volume. There is no basis for any genco to expect “long term protection” under Vesting Contracts. It is unreasonable for Seraya to expect Singapore consumers to pay more than necessary to protect its commercial profits. As regulator, EMA will not allow this to happen in Singapore.</p>
<p><b>Tuas Power</b></p>	<p>(b) <u>With the proposed VCL reduction and market outlook, the industry will see significant revenue drop which will compound to its ability to manage its gas TOP issues</u> (as acknowledged briefly in the report). As the industry do not have a free hand/pure market-based approach in managing their gas TOP issue, an alternative mechanism could be considered by EMA. This is not out of line with EMA’s statutory duties of promoting the efficient development of the electricity and gas markets. The Vesting contracts have capped the revenues of the incumbent dominant gencos who were using primarily PNG when the market was tight. Today, LNG gas is primarily used by new entrants. On the other hand, in this grossly oversupplied market, EMA’s consultant report does not really addresses the PNG’s TOP issue other than by merely saying it can be banked for 5 years. More detailed modelling would have indicated this as a significant issue for</p>	<p>Some gencos have applied to EMA to reduce their contracted gas supply for 2014 to manage their contractual gas take-or-pay (“TOP”) obligations. EMA has approved these applications after assessing that the system-wide impact of all proposed reduction would not affect Singapore’s energy security.</p>

	<p>the industry which may not be resolved via taking the PNG banking route. <u>Alternative means of managing TOP via the LNG route carries significant regulatory risks and therefore a balanced/holistic approach to the setting of the VCL may be warranted.</u></p>	
<b>5</b>	<b>General comments on tender for unvested non-contestable load and its impact on retail market</b>	
<b>Seraya</b>	<p>(a) Vesting Contract Quantities are fully allocated to non-contestable with remaining quantities allocated to contestable demand. Setting the Vesting Contract Level at just LNG Vesting would mean that non-contestable demand cannot be met by Vesting Contract Quantities. <u>EMA is looking at a tender to make up for the shortfall with SP Services entering into the tender on behalf of non-contestable demand</u> and a consultation paper has been issued on 4 Aug 2014 with deadline for comments of 22 Aug 2014. With this tender, SP Services would in effect be competing with retailers for consumers who can become contestable. Non-contestable consumers who are eligible to become contestable look at the regulated tariffs they face when deciding whether or not to become contestable. <u>A tender would be expected to result in lower regulated tariffs and make it more attractive to remain non-contestable.</u> For the tender, given its expected scale, SP Services would be likely be able to secure more attractive prices than what retailers can offer to consumers, given the smaller scale faced by the retailers. <u>This means that retailers will be at a disadvantage in competing for consumers who can be contestable. This would make it even more difficult to persuade consumers to opt to become contestable.</u></p>	<p>In accordance with the published Procedures, EMA will set the VCL taking into account the degree of market power of gencos in the wholesale electricity market. The Procedures express no intent for the VCL to be set to fully hedge non-contestable load. The amount of non-contestable load not covered by Vesting Contracts, and therefore any tender that may be conducted to hedge the exposed non-contestable load, including the resultant regulated tariff, are consequential to the VCL being set to control market power of gencos in the wholesale electricity market.</p>

<b>Tuas Power</b>	<p>(b) EMA’s proposed reduction also will result in a large proportion of non-contestable segment being exposed to potential pool price hikes should there be a supply/demand imbalance. For this <u>EMA proposes a tender approach for the balance of the non-contestable segment not covered by the reduced VCL. Our concerns is that impact of this on our retail business via the published tariffs which is effective being benchmark via consumers for the contestable segment.</u> While there have been precedents in earlier tenders, the volume is now expected to be significantly larger and the impact on the published tariff will be very significant. <u>A reduction in published tariffs as a result of lower tender prices discourages some contestable consumers from switching to retailers while impacting our retail business where a proportion may have been locked in/benchmarked against published tariffs for up to 2 years in advance.</u></p>	<p>In accordance with the published Procedures, EMA will set the VCL taking into account the degree of market power of gencos in the wholesale electricity market. The Procedures express no intent for the VCL to be set to fully hedge non-contestable load. The amount of non-contestable load not covered by Vesting Contracts, and therefore any tender that may be conducted to hedge the exposed non-contestable load including the resultant regulated tariff, are consequential to the VCL being set to control market power of gencos in the wholesale electricity market. Retailers have to factor all these in making their commercial decisions on offering retail contracts with prices that are indexed to regulated tariff.</p>
<b>6 Miscellaneous Comments</b>		
<b>Tuas Power</b>	<p>(a) If reduction to minimum contract level is prescribed on account of no market power and efficient market outcome, then by the same arguments:</p> <ul style="list-style-type: none"> <li>(i) the industry should not be constrained by EMA but instead have a free hand in managing their gas TOP issue</li> <li>(ii) EMA cannot intervene via the VCL if the pool prices start to rise again but instead allow prices to settle at competitive market levels</li> <li>(iii) the retail market should be fully competitive at the same time in the sense genco/retailer do not have to compete effectively with a monopoly buyer who indirectly exerts price pressure on the</li> </ul>	<p>The excess gas issue is not relevant for setting the VCL. In accordance with the published Procedure, EMA will set the VCL on an ex-ante basis to remove gencos’ incentives to withhold their generation capacity to push up pool prices. If there is no market power, EMA will reduce the VCL accordingly. The amount of non-contestable load not covered by Vesting Contracts, and therefore any tender that may be conducted to hedge the exposed non-contestable load, including the resultant regulated tariff, are consequential to the VCL being as such. Gencos and their retailers have to factor all these in their commercial decisions.</p> <p>In any case, the VCL does not cap the pool price at the</p>

	<p>retail market via its published tariffs.</p> <p><u>Given that the above are not in place, a more graduated reduction in the VCL could be supported instead of a drastic drop from the current 40% level to only the LNG Vesting Level.</u></p>	<p>Vesting Price, as pool prices can rise above the Vesting Price under tight market condition as observed in 2011 and 2012 with the USEP averaging at 10.1% and 3.7% above the Vesting Price respectively.</p>
<b>Seraya</b>	<p>(b) <u>A further consequence of EMA’s proposal is that Singapore’s oil fired reserve generation capacity will be decommissioned</u> with large reductions in employment, leaving the sector entirely reliant on gas fired generation. Security of supply will be compromised in an industry entirely dependent on a single fuel source.</p>	<p>EMA notes that in the previous review of the VCL for 2013-2014, Seraya had requested for a lower VCL and stated that a higher VCL would result in “perverse inefficient outcomes such as forcing the use of steam plant capacity to meet vesting contract obligations given that the proposed vesting price for 2013-2014 is below the SRMC and fixed annual operating costs of steam plants”. This clearly contradicts its current assertion that Vesting Contracts are necessary to incentivise gencos to keep their uneconomic steam plants.</p>

Response to NERA's report

Issues raised by NERA	Response
<p><b>Issue #1: EMA's approach to set VCL based on the key objective of vesting contract – mitigating market power – is too narrow and conflict with EMA's wider duties.</b></p> <p><b>Page 3:</b> <i>Instead of this narrow view of the VCL and mechanistic implementation of the current modelling prescribed by the VC Procedures, we believe that the EMA should consider its broader range of responsibilities under the EMA Act, and set the VCL from the perspective of protecting the public interest and promoting the efficient development of the industry.</i></p> <p><b>Page 5:</b> <i>To date, EMA's assessment of the appropriate VCL has placed significant focus on the effects of the scheme on competition in the power market, and the role of vesting contracts in mitigating market power. While this is clearly the key objective of vesting contracts, EMA's wider duties under the Act require its decisions to promote the efficient development of the electricity industry, and protect the public interest. In order for the EMA to fulfil these duties successfully, we believe it should focus on the wider role of the VCs, and their wide-ranging impact on market outcomes.</i></p> <p><b>Page 6:</b> <i>VCs are not intended to ensure revenue stability, but EMA's decision should recognise their material effect on gencos' economic incentives ...</i></p> <p><b>Page 11:</b> <i>It is clear, therefore, that these Procedures are very narrow and overlook the EMA's</i></p>	<p>EMA implemented vesting contracts to achieve the specific policy objective of mitigating the exercise of market power by gencos in the wholesale electricity market. The published Procedures for setting the VCL clearly state this objective of vesting contracts. The Procedures express no intent for vesting contracts to provide revenue certainty for gencos, <i>nor</i> is the sustainability of gencos' revenue a factor that should be taken into account when setting the VCL. This will provide regulatory certainty for all investors to make sound investment decisions which will in turn promote competition and economically efficient outcomes. There is no conflict or inconsistency with EMA's role as the regulator.</p>

Issues raised by NERA	Response
<p><i>broader obligation to promote economic efficiency, Specifically, the Procedures ignore:</i></p> <ul style="list-style-type: none"> <li>• <i>The question of whether, following a decision to reduce the VCL, gencos (or their affiliated retail businesses) would have the ability and incentive to exert market power in the forward contracts or retail markets, which would expand as the VCL falls; and</i></li> <li>• <i>The potential impact of the proposed reduction in the VCL on the efficiency of market outcomes, and in particular on the investment required for the efficient development of the industry and to meet consumers' reasonable demand for electricity.</i></li> </ul>	
<p><b>Issue #2: EMA's approach to setting the VCL <u>systematically</u> prevents generation companies from recovering their costs and therefore distorts incentives for efficient investment.</b></p> <p><b>Page 2-3:</b>  <i>The EMA's proposed approach to setting the VCL <b>systematically</b> prevents generation companies from recovering their costs and therefore distorts incentives for efficient investment. Specifically, the EMA's draft determination envisages reducing the VCL during 2015/16 when there is surplus capacity in the market and prices are below the Long-Run Marginal Cost (LRMC) of new entry. However, at the same time, it is suggesting that it will increase the VCL if/when the electricity market tightens in the future, and thus the likelihood of generators exercising market power increases. By allowing prices to drop below LRMC in periods of surplus, and increasing the VCL to target LRMC when the market tightens, EMA is <b>effectively capping prices at LRMC</b>, or in other words, setting the average or expected prices captured by generation investors at a level below LRMC over the long-term. Continuation of this policy by EMA would therefore systematically prevent investors in new generation capacity from recovering their costs through the market. In the long-run, such a policy would raise the costs of electricity faced by consumers in Singapore and reduce security of supply.</i></p>	<p>In accordance with the Procedures, EMA sets the VCL taking into account the degree of market power of gencos in the wholesale electricity market, more specifically to remove their incentives to withhold generation capacity to push up pool price. The VCL does not cap the pool price at the Vesting Price (or LRMC), as pool prices can rise above the Vesting Price under tight market conditions as observed in 2011 and 2012, with the USEP averaging 10.1% and 3.7% above the Vesting Price respectively. In any case, vesting contracts do not compel any genco to compete unsustainably below its cost in the wholesale electricity market.</p>

Issues raised by NERA	Response
<p><b>Page 8:</b>  <i>These recent events illustrate that:</i></p> <ul style="list-style-type: none"> <li>• <i>When the market is relatively tight, the EMA has set the VCL to target, over a period of several years, pool prices equal to LRMC. This means that generators received a price roughly equal to LRMC for both their sales under VCs and their non-vested sales into the pool.</i></li> <li>• <i>For the 2015/16 period, the market is expected to have surplus capacity, and EMA is proposing to set a materially lower VCL, so generators will capture an average price below LRMC for their output.</i></li> </ul> <p><b>Page 9:</b>  <i>It is clear, therefore, that based on EMA’s current (and expected future) approach to setting the VCL, generators would expect to earn a price for their output that is, on average, below LRMC. This practice systematically under-remunerates investment in new thermal generation assets over the long-term, which indicates a fundamental flaw in the ability of the market to attract capital for ongoing efficient levels of investment. This approach to setting the VCL therefore runs counter to EMA’s statutory responsibilities to promote the development of the electricity industry and act in the public interest.</i></p>	
<p><b>Issue #3: EMA should not reduce the VCL to LNG vesting if there is any risk of market power being exercised in the NEMS in 2015/16.</b></p> <p><b>Page 2:</b>  <i>We therefore compute and analyse two well-known structural indicators of market power, the HHI and the RSI, and conclude that there remains some risk of market power being exercised in the NEMS during 2015/16 without regulatory intervention, such as a higher VCL than currently envisaged by the EMA.</i></p>	<p>The modelling approach adopted by TLG is in line with the published Procedures which require the use of a market gaming model to assess the degree of market power of the gencos and to set the VCL based on whether there is material risk (rather than “some risk”) of market power being exercised. NERA’s HHI and RSI analyses do not provide any clear justification why there are market power concerns in 2015-2016.</p>

Issues raised by NERA	Response
<p><b>Issue #4: Reducing the VCL quickly exposes NCCs to unknown market risks through the use of competitive tendering.</b></p> <p><b>Pages 12-13:</b></p> <ul style="list-style-type: none"> <li>• <i>Reducing the VCL to a level materially lower than non-contestable customers' share of demand creates a need for a significant amount of power to be procured through a competitive tender. This decision will therefore make a large proportion of the NCC regulated tariff in 2015/16 dependent on the outcomes of this auction, which has no track record of producing competitive and efficient outcomes. Reducing VCL more slowly would allow EMA to test the auction's ability to procure hedging contracts efficiently, whilst limiting the impact on NCCs if it does not achieve its aims in the short-term.</i></li> </ul>	<p>Tenders can be called to supply electricity to the portion of non-contestable load not covered by vesting contracts. There is no basis for NERA to claim that such tenders would not produce competitive and efficient outcomes.</p>
<p><b>Issue #5: TLG's modelling analyses the wholesale power market as if it were a "one-shot game", and it may understate the potential for generators to exert market power to raise prices and profits when strategic interactions are repeated continuously.</b></p> <p><b>Page 11-12:</b></p> <p><i>The TLG's modelling, which seeks to implement the VC Procedures, analyses the wholesale power market as if it were a "one-shot game"...</i></p> <p><i>...In other words, modelling the one shot game may understate the potential for generators to exert market power to raise prices and profits when strategic interactions are repeated continuously.</i></p>	<p>NERA's comment reflects a simplistic and inadequate understanding of TLG's modelling approach. TLG's model is calibrated using historical data which reflects the outcomes of the generators' repeated strategic interactions in the past to project pool price assuming that they would act similarly in the future under similar market demand and supply conditions.</p>
<p><b>Issue #6: TLG's base case assumptions are not credible.</b></p> <p><b>Page 3:</b></p> <p><i>TLG's base case modelling assumptions rely on a combination of assumptions that is implausible. The TLG modelling shows that the steam units are not needed to meet energy demand and, following the EMA's proposed determination of the VCL, would no longer attract a share of VCs. Hence, it is implausible to assume they will remain</i></p>	<p>It is reasonable to include steam plants in TLG's base case modelling since no genco has applied to EMA to retire any steam plant in 2015-2016. In any case, TLG has done sensitivity analysis with the assumption that all steam units are retired in January 2015 and the conclusion remains the same as the base case i.e. no market power</p>

Issues raised by NERA	Response
<p><i>online throughout 2015/16.</i></p> <p><b>Pages 17-18:</b> <i>TLG should repeat the sensitivity analyses under the assumption of retirement of all steam units as steam unit retirement is likely after the VCL is reduced to LNG vesting;</i></p> <p><b>Page 18:</b> <i>TLG’s choice of retail contract coverage is arbitrary and does not include a scenario with the retirement of steam plants;</i></p> <p><b>Page 19:</b> <i>Running a scenario in which steam plants retire and retail cover ratio is materially lower than 80% would therefore constitute a more credible base case than the modelling scenario used by TLG to inform EMA’s draft determination. In addition, given that TLG acknowledges that transmission constraints may affect the despatch of generators within the NEMS, we suggest that this case described here be modelled including the effects of these constraints.</i></p>	<p>concern in 2015-2016. TLG’s modelling also incorporates transmission constraints consistent with the information provided by EMA. With regard to the retail coverage ratio which TLG assumed at 80 percent for the base case, NERA viewed this assumption as “arbitrary” but did not provide any alternative solution. For the record, TLG did run cases with materially lower retail coverage ratio of 40 percent which showed that there would still be no market power concerns in 2015-2016.</p>
<p><b>Issue #7: TLG calibrated its model to a historical period that is no longer representative.</b></p> <p><b>Page 20:</b> <i>By calibrating the model primarily over the period before this structural shift occurred, and extrapolating to the period after it occurred, the TLG model risks modelling statistical relationships between bidding behaviour and market conditions that are no longer valid and do not reflect market participants’ economic incentives in current conditions</i></p>	<p>TLG took considerable care in the model calibration which is based on the relationship between actual USEP and SRMCs, and the net load/capacity ratio in each half hour. A key structural shift was that gas supply was constrained prior to the operation of the LNG terminal and unconstrained afterwards. To account for the impact of this structural shift, TLG calibrated its model using SRMCs which included the opportunity cost of gas based on supply constraints observed in the 2010-2012 period. These constraints produced “shadow prices” that elevated the SRMCs above the levels that would be implied by the contracted gas prices. Another structural shift was the reduction in market concentration and the increase in the reserve margin associated with the entry of new/repowered CCGT capacity. Consequently, the net</p>

Issues raised by NERA	Response
	<p>load/capacity ratio prior to the entry of LNG was, on average, quite different from what it is and will be afterwards. However, TLG also assessed that there are many pre-LNG half hours in which the ratio are equal or close to post-LNG half hours. EMA is of the view that TLG’s calibrated modelling is not subject to any obvious or identifiable bias.</p>
<p><b>Issue #8: TLG’s model is neither transparent nor verifiable.</b></p> <p><b>Page 3:</b> <i>TLG’s model calibration process is not transparent, with no results published in its report.</i></p> <p><b>Page 21:</b> <i>TLG has not provided any verifiable evidence of how well its model performs.</i></p>	<p>TLG’s report (section 3.2) contains a discussion of its calibration process. The calibration process is based on the relationship between historical USEP and SRMC, and tested for accuracy with “back-casting”.</p>
<p><b>Issue #9: EMA’s proposed implementation is inconsistent with its mandate to produce a “monotonic” decline.</b></p> <p><b>Page 10:</b> <i>Possibly recognising the need of investors for certainty and predictability, the EMA states in its VC Procedures that in setting the VCL and the transition away from VCs, it will make use “if possible, of a monotonic rollback schedule and thus avoidance of fluctuations in the Vesting Contract level percentage from year to year”. EMA’s draft determination fails to implement this guidance, as it notes that the VCL may increase again once the pool prices start to rise again, depending on the degree of market power (see above). Hence, the EMA’s draft determination prescribes a rate of decline in VCL that is not “monotonic”, with the possibility of year-to-year fluctuations in the VCL, and thus contradicts EMA’s own VC Procedures.</i></p> <p><b>Page 13:</b></p>	<p>In accordance with the published Procedures, EMA will set the VCL biennially taking into account the degree of market power of gencos in the wholesale electricity market. The published Procedures express no intent for the VCL to be set <i>subject</i> to a limit on any reduction or increase in the VCL across or within biennial periods. There is no basis for gencos and investors to expect EMA to reduce or increase the VCL in a particular fashion other than to control expected market power of the gencos in each biennial period.</p>

Issues raised by NERA	Response
<p><i>As noted above, by reducing the VCL rapidly in 2015/16, and retaining the possibility that the VCL could be increased again if prices rise, EMA risks undermining investor confidence in the sector. EMA is reneging on previous statements that it intends to reduce the VCL monotonically, whilst avoiding year-to-year fluctuations. This deviation is likely to increase (perceived) regulatory risk and, by extension, the rate of return that investors will require in the Singapore power sector in the future. This ultimately raises costs to consumers.</i></p>	
<p><b>Issue #10: Reducing the VCL quickly creates arbitrary gains and losses.</b>  <b>Page 13:</b>  Reducing the VCL more gradually would give generators and retailers more time to adjust their contract positions, which may be set already for the next 1-2 years. This would prevent arbitrary windfall gains and losses to some retailers, generators and consumers;</p>	<p>Noted NERA’s comment.</p>
<p><b>Issue #11: EMA should consider the need for alternative measures to stabilise revenues as the VCL falls.</b></p> <p><b>Page 14:</b>  While we recognise that the vesting regime is not intended as a revenue stabilisation measure, EMA should recognise that, in practice, vesting contracts have served to stabilise revenues to generation companies for a number of years. We therefore see considerable merit in considering whether alternative schemes are required to stabilise revenue in the NEMS as the VCL falls.</p> <p><b>Page 15:</b>  One means of mitigating these regulatory risks that has been adopted in other jurisdictions, and is being considered by a number of EU Member States, is side-payments for capacity that operate alongside the energy market. These side-payments compensate for the “missing money” associated with (real or perceived) constraints on peak power prices. This situation has a number of parallels to the</p>	<p>The objective of vesting contracts is to curb the exercise of market power by gencos in the wholesale electricity market. Revenue certainty is not the objective but rather a consequence of the VCL set to achieve the stated objective.</p>

Issues raised by NERA	Response
<p>Singaporean case, where regulatory interventions to set the VCL and to determine the supply of gas into the Singaporean market have reduced the prices captured by existing thermal generators. While consideration of whether a capacity payment mechanism is appropriate in the NEMS is beyond the scope of this report, the EMA may wish to consider whether it is appropriate to reduce the VCL without assessing whether other revenue stabilisation mechanisms are needed to ensure efficient outcomes in the NEMS.</p>	