



**APPENDIX 1 TO THE EMA'S FINAL DETERMINATION PAPER ON
IMPLEMENTING DEMAND RESPONSE IN
THE NATIONAL ELECTRICITY MARKET OF SINGAPORE:**

**RESPONSE TO FEEDBACK ON IMPLEMENTING DEMAND RESPONSE IN
THE NATIONAL ELECTRICITY MARKET OF SINGAPORE**

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Comments/Feedback	EMA's Response
General	
<p>Independent Consultants¹</p> <p>The consultation paper appears to be proposing that demand response be implemented without any discussion of how it is related to Singapore's energy and other related policy goals. Market participants should understand the linkages between demand response and overarching policy goals because there is no reason to implement demand response for its own sake.</p> <p>The primary purpose of any demand response program should be a reduction in the need for generating plants that are operated only infrequently by motivating demand elasticity. To the extent price-responsive demand reduces the need for infrequently used peaking plants, lower average wholesale prices are an outcome rather than an explicit goal. Making market price reductions an explicit goal of demand response could have the undesirable effect of prematurely driving inframarginal suppliers out of the market.</p> <p>If an objective is to encourage consumer demand elasticity, then the most effective way to implement demand response is by exposing consumers to spot prices. This can be done by having consumers pay the spot price for all of their consumption, or by having them purchase fixed volume/fixed price contracts and using the half-hourly spot price to charge for consumption above the contract amount and issue credits for consumption below the contract amount.</p>	<p>The objectives of the proposed Demand Response programme have been clearly articulated in the Section 1.2 and 1.3 of the Consultation Paper. In addition, Section 2.3 of the consultant's report appended in the Consultation Paper provides a high level overview on how the Demand Response programme complements the existing market design of Singapore. Specifically, the proposed Demand Response programme is intended to improve the overall efficiency in the market by allowing consumers to respond in real-time to market pricing signals. In addition, such a programme increases the options available for contestable consumers to participate in the electricity market, which is aligned with the EMA's overall objective to promote greater variety of choices as part of a competitive electricity market. Reducing the need for generation plants, as correctly pointed out, is a potential benefit, but not necessarily the only objective of a demand response programme.</p> <p>We agree that lowering average wholesale prices is an outcome of demand response rather than an explicit goal. As such, the Demand Response programme is designed such that payment is made to demand response loads only when benefits for electricity consumers has been generated as a result of the curtailment of load as part of the programme. This typically occurs when the marginal generation set is displaced by the demand response load in the supply curve. Therefore, this will fulfill the longer term objective of the demand response programme to promote more efficient long-run investments in the system by reducing peak energy demand.</p> <p>Contestable consumers currently can already buy at wholesale prices directly or through SP Services. The proposed Demand Response programme, through the demand-side bidding, will further encourage demand elasticity and enhance the price discovery process.</p>

¹ Submission prepared by Dr Barbara R. Barkovich (Barkovich & Yap, Inc.), Jack Ellis (Independent Consultant) and Roger Levy (Levy and Associates).

Comments/Feedback	EMA's Response
<p>Senoko Energy</p> <p>In summary, Senoko does not support the DR scheme as currently proposed by the EMA. As always, we would request the EMA to consider the proposal in the context of a holistic view of the future development of the market, taking into account other market design activities which have already been committed or are being considered (including but not limited to the development of an electricity forward/futures market, and the consideration of further steps towards full retail competition).</p> <p>We are in favour of demand response. Our retail teams have offered it in the past, and will continue to develop products which offer appropriate real-time pricing exposure for customers. We believe, however, that the DR scheme as currently proposed is:</p> <ul style="list-style-type: none"> a. unproven (including with respect to its “self-declared baseline” concept); b. unnecessarily complex and not “fit for purpose” taking into account the characteristics of the Singapore market in general terms and the (over)capacity cycle this market is entering into specifically; c. unlikely to work, including among others as a result of the proposed staging of the scheme, which affects design predictability; and d. as indicated above, results in (cross)subsidies which are not justified on economic grounds. <p>Senoko is supportive of amendments to the NEMS to remove barriers to DR participation if the DR enabling scheme is both efficient and effective. Our analysis shows that the scheme proposed by the EMA is unlikely to achieve either criterion.</p>	<p>The EMA agrees that considering a holistic view of the future development of the electricity market is important for any new initiative to be introduced. Our assessment is that these developments are complementary to each other. For instance, the development of an electricity futures market provides an avenue for potential demand response aggregators (DRAs) and consumers to hedge their risks and at the same time potentially benefit from the futures contract when participating in the demand response programme. Further details have been provided in Section 5 of the consultant’s report appended in the EMA’s Consultation Paper.</p> <p>We disagree with Senoko Energy’s comments. As indicated in 3.1.4 of the Consultation Paper, the EMA, together with the Consultants, have studied a wide range of methods for the setting of baseline, taking into consideration the challenges in Singapore’s energy-only market, with no capacity market or day-ahead market which can form a natural baseline. The proposed approach is a preferred approach as the load reduction is verifiable and the risk of gaming is mitigated.</p> <p>It is not clear from Senoko Energy’s submission how the proposed Demand Response scheme is a form of subsidy. Rather, the EMA is of the view that the proposed incentive payment is a consumer surplus sharing mechanism, where payouts are made only when there are proven benefits to the market, i.e. payment is made to demand response loads only when additional consumer surplus has been generated as a result of the curtailment of load as part of the programme. In the event that no benefit is generated by the Demand Response programme, there will be no additional costs to consumers.</p> <p>Contrary to Senoko Energy’s view that the proposed Demand Response scheme is inefficient or distortionary, the proposed demand side bidding mechanism will improve the overall efficiency of the market by allowing consumers to respond in real-time to market pricing signals. Conceptually, this</p>

Comments/Feedback	EMA's Response
<p>Senoko's view is that the EMA has not provided sufficient justification for subsidising DR in the manner proposed. Furthermore, the proposal appears to be at odds with the 2007 Singapore National Energy Policy Report which states "[w]hile ensuring that electricity supplies remain affordable, we should not subsidise energy consumption as this will distort markets and lower incentives for users to conserve energy."</p> <p>A key statutory function of the EMA is to create a market framework for the supply of electricity "which promotes and maintains fair and efficient market conduct and effective competition". Policies that are demonstrably inefficient and/or focus on wealth transfer, such as the proposed DR scheme, are inconsistent with this mandate.</p>	<p>allows consumers to indicate their "willingness to consume" at various price points, thereby improving the interaction between both supply and demand. The outcome is a more efficient wholesale market with an improved price discovery process.</p>
<p>Senoko Energy</p> <p>The CCL Report envisages a two-stage implementation of DR with the following characteristics:</p> <ul style="list-style-type: none"> • Stage One: Subsidised DR that rewards scheduled loads • Stage Two: Customers use hedge markets to manage their load fluctuations and therefore are not required to schedule their load to receive DR benefits <p>The transitional nature of the scheme introduces uncertainty and creates stranding risks which is not conducive for investments. Arguably, the scheduled status of DR in stage one is superior to stage two. Therefore it is ironic that, if the market evolves to CCL's desired second stage, then the DR would not be scheduled or reflected in the wholesale market price which in turn would diminish the potential for material economic benefits.</p> <p>When taken together, the above features of the DR scheme make it unattractive and therefore unlikely to be effective in achieving the EMA's objectives. Therefore, there is little justification for a distortionary regulatory</p>	<p>We disagree completely with Senoko Energy's comment that the scheme introduces uncertainty and create standing risks which are not conducive for investment. Participation in demand response is voluntary for demand response aggregators and consumers. Investment decisions by aggregators and consumers should be based on commercial consideration based on the overall design of the programme and relevant timeline. Existing market participants buying on behalf of contestable consumers can also participate in the programme and offer demand response as part of their retail contracts if they see benefits of the programme for their consumers.</p> <p>In addition, it should be noted that a passive demand response (Stage 2) is complementary to a dynamic demand response (Stage 1) and both may co-exist during the transition process from Stage 1 and Stage 2. Specifically, the demand side bidding mechanism will continue to be in place both in Stages 1 and 2 which means that the demand response load will be scheduled and reflected in the wholesale market price, with a view that such a mechanism will improve the overall efficiency of the market.</p>

Comments/Feedback	EMA's Response
intervention.	
Demand Side Bidding Mechanism and the Setting of the Baseline	
<p>CPvT Energy Asia</p> <p>It is proposed that the Baseline should be self declared by Demand Side Load Provider (DSLPP) for both the scenarios for each time block, in case of event and in case of non event for each customer enrolled under the program, instead of 10 by 10 methodology followed by CPvT. However, there is no methodology is suggested on how DSLPP should establish their own 'self-declared baseline'.</p> <p>As load consumption is dynamic in nature and not same for two time blocks, hence it cannot be predicted. Only way to define the baseline is to look the historical data. Although even after taking historical data, there is a possibility that actual normal consumption during the event hours without curtailment may differ from baseline so calculated given that day weather conditions and other business factors.</p> <p>After analyzing both the approaches outlined under this clause, CPvT believes a scientifically structured 10-in-10 day baseline methodology with in-built "Baseline Adjustment Factor (BAF)" computation methodology would be a much better solution. This approach of integrating the BAF in establishing consumer baseline does take care of the potential gaming as it is practically not possible for a consumer to game over the 10 previous days and that too when the consumer is not sure when his DR NegaWatt capacity would be scheduled on a particular day. The Pilot project undertaken by CPvT for EMA has successfully established the 10-in-10 day baseline for those customers whose load profiles are reasonably even 24 x 7.</p> <p>Alternatively, EMA may also consider a T -30; T being the event time and the reference would be 30 minutes (1 period) prior to the event for certain class of consumers like Educational Institutes, where -in the load profile is very un-</p>	<p>The setting of baseline and the measurement of load reduction are issues central to demand side bidding, which are particularly challenging in Singapore's context of an energy-only market, with no capacity market or day-ahead market. The latter markets are advantageous for demand response programmes as they inherently support the formulation of a natural baseline to measure the load reduction against. The EMA notes that the methodology for the calculation of baseline has worked well in other jurisdictions such as the United States but the EMA also recognises the fundamental difference between the day-ahead markets prevalent in jurisdictions such as the United States and the energy-only market in Singapore. For example, under a typical day-ahead markets, participants are required to put in binding offers a day ahead of time, with financial implications should there be deviations when comparing the actual output (or consumption) and the day-ahead offers. The binding offers can form a natural baseline to measure the load reduction against, and hence this provides the incentives for demand response providers to be accurate about the baseline formulation. This is however not true for an energy-only market like Singapore's, and hence the EMA favours the approach where the baseline is set based on what the licensed load providers bid into the market, because the load reduction is verifiable and the risk of gaming is mitigated.</p> <p>We note there are other methods in setting the baseline, but it is unclear how these proposed methods can resolve the measurement issue and reduce the risk of gaming given the nature of the Singapore's energy-only market. Furthermore, as highlighted by CPvT, there is a possibility that actual normal consumption during the dispatch period may differ from the historical baseline given weather conditions and other business factors. In addition, the use of the baseline methodology provides incorrect incentives for consumer loads to</p>

Comments/Feedback	EMA's Response
<p>even considering the academic curriculum of such facilities.</p> <p>The proposed "self declared baseline" may lead to intolerable penalties. Energy usage patterns vary for many reasons and most entities cannot perfectly predict their usage at every period. If an entity can estimate its average usage fairly well over several hours but can only predict the usage to plus or minus 20% in any given period than one can assume that the entity will pay a penalty under section 4.2.27 half the time for an apparent "curtailment" representing 20% of its predicted load. If the objective of the entity was to bid a relatively high price, to clear say 70 hours a year, it's gains and the consumer benefit would be high for those periods but the total of all of the small penalties for half of the periods of the year when the entity was not dispatched, but used less energy than it declared, would far outweigh the gains.</p> <p>CPvT has collected baseline and curtailment data as part of the EMA sponsored pilot. We suggest that baseline and penalty proposals be analyzed with this data to fully understand the real world implications.</p>	<p>artificially inflate their baseline consumption, in order to be paid more during periods of demand response. A case in point is the recent case where US Federal Energy Regulatory Commission (FERC) imposed a penalty of US\$780,000 on a licensed load provider for artificially increasing the baseline consumption of a consumer (by turning on the stadium lights of a baseball park when the lights were not required) prior to the period of curtailment in order to inflate the load reduction and the corresponding payments. Furthermore, the baseline methodology raises the question of potential gaming, such as that raised in the EMA's Consultation Paper. For example, a manufacturing customer whose machinery is undergoing maintenance and therefore not consuming electricity would have been eligible for payments under the scheme which uses the baseline methodology.</p> <p>The "self-declared" baseline approach thus enables the licensed load providers to use their preferred methodology in estimating their baseline and adjust their bids, based on commercial considerations, when bidding into the market. This provides the licensed load provider greater flexibility in managing their load by bidding in only the load that can be curtailed during specific periods. As the market during periods of stress (hence the need for demand to respond) requires dependable sources of both generation and load reductions, the baseline approach enables demand response to fulfil such a role in the market. The EMA notes the concerns from potential licensed load providers on the compliance regime and the associated penalties for non-compliance, but is of the view that such a treatment is conceptually symmetrical to that of generators, who will be penalised if they do not comply to dispatch orders arising from their offers into the market.</p> <p>We note CPvt's comments and has analysed the data collected as part of the pilot. We note however that there is a fundamental difference between a sponsored pilot and an actual market framework as the latter impacts prices for the wholesale electricity market, while this is not so for the pilot.</p>

Comments/Feedback	EMA's Response
<p>EnerNoc</p> <p>The proposed approach to baselines is superficially appealing, because it seems simple to implement: no algorithms and no analysis required by the PSO. However, it has the devastating side-effect of restricting participation to only the most predictable loads.</p> <p>For a customer who does not have completely predictable consumption – e.g. one who has a plant with multiple different pieces of equipment, rather than just one – calculating the baseline above which they are sure they will consume if they do not deliberately curtail load would be a complex and error-prone process. Some customers, for example, have consumption that is variable and hard to predict, but can reliably reduce their demand by a specified amount by shutting off specific processes.</p> <p>It is suggested in the consultant's report that requiring the customer to nominate a baseline in this manner somehow reduces the potential for gaming. We do not agree.</p> <p>The whole point of modern data-driven baseline methodologies is that they use actual meter data from recent history to build up a stable estimate of business-as-usual consumption patterns. If a customer were to attempt to change their behaviour purely to alter the baseline, they would have to do so for multiple days or weeks to have an effect. As a result, the cost of this behaviour change is likely to exceed any benefit they might accrue from a gaming attempt, should a suitable dispatch opportunity arise.</p> <p>In contrast, since there is no attempt to model business-as-usual behaviour, the proposed self-nominated baseline is trivially gameable. For example, when the customer expects prices to be high during an interval, they could nominate an unusually high baseline. If their price forecast proves incorrect, they could then remain compliant by starting unnecessary plant. Since they need only take this action when they guess wrongly, the cost to them will be minimal. This is a highly inefficient outcome.</p>	<p>We note EnerNoc's comments and agree that it is good business practice for consumers (when economically sensible and technically possible to do so) to schedule outages and other periods of reduced consumption during periods when demand and prices are elevated. The load that is curtailed or shifted would have benefited from an avoided or lower energy cost.</p>

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<p>The failure to capture business-as-usual behaviour also leads to the apparent requirement for a price floor on demand response bids. Standard baseline methodologies are more robust to such issues, as maintenance outages affect the baseline. However, if customers choose to consider price forecasts when planning maintenance, and hence schedule their maintenance outages at times when prices are likely to be high, this is generally regarded not as gaming, but rather as a very good outcome: beneficial, correctly-timed demand response, without any economic costs from lost production.</p> <p>Kiwi Power</p> <p>We are very concerned about the baseline approach described in the consultation (3.1.3). We believe the program should utilise a tested and confirmed baseline methodology that minimises risk of gaming. A baseline that is based on previous like days which demonstrates a reasonable approximation of what the demand would have been “but for” the enactment of Demand Response is based on real, historical data. The accuracy of these approaches have been scrutinised and reviewed by many parties and have been demonstrated to be accurate and impartial. There are a number of papers available on this subject.² While gaming by inflation of baseline during baseline periods is theoretically possible, we do not believe that this is likely to occur or should present a major concern.</p> <p>The proposed method runs the risk of creating a new baseline methodology to avoid one potential problem only to create another problematic outcome. We are concerned that the approach discussed in the consultation document would make it extremely difficult for volatile load to participate in this program, thereby leaving many MWs of Demand Response on the table, unable to take part. (4.1.8)</p>	

² KEMA report prepared for PJM, “PJM Empirical Analysis of Demand Response Baseline Methods”, April 20, 2011: <http://pjm.com/~media/committees-groups/committees/mic/20110510/20110510-item-09a-cbl-analysis-report.ashx>

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<p>Senoko Energy</p> <p>The EMA's proposed demand response scheme (DR scheme) has two key attributes: (1) demand-side bidding and (2) incentive/subsidy payments to demand responsive loads. While demand-side bidding is a conventional feature of liberalised electricity markets the implementation details need careful consideration to ensure effective integration with other features of the NEMS.</p> <p>The basis for determination of the DR baseline demand has been debated by international policy makers. We understand that the DR schemes in the US and the scheme proposed for Australia involve the DR baseline being set by a party other than the DR provider. We are not aware of the self-determined DR baseline proposed by the EMA being implemented in other markets and hence it is unproven. As stated above, the requirement for a DR provider to precisely forecast and control their demand is likely to limit the attractiveness of the scheme to many customer segments.</p> <p>Viridity Energy</p> <p>In Section 3.1.4 EMA suggests that the customer baseline be based on "what the licensed load providers bid into the market with the quantity of electricity they would use at various price levels to form a downward sloping demand curve. The demand bids forms a self-declared baseline which can be used to compare against actual consumption data for verification of load reduction."</p> <p>The proposal is explained further explained at Section 4.13: "The licensed load provider will need to bid into the market the total load of the registered facility for that period, i.e. both the load it intends to consume and the load it intends to reduce (with its associated prices) for that period. The total load then forms the baseline to measure load reductions for purpose of measurement, compliance and verification. ... the licensed load providers will be held against the total load (including the reduction quantities) of that consumer for that half-hour, which will require the licensed load providers to be accurate about the consumption levels of that consumer when submitting the bids."</p>	

Comments/Feedback	EMA's Response
<p>The proposal includes a provision to penalize customers who reduce load even if their reductions are not dispatched. Section 4.2.27. We respectfully suggest that this formulation is counterproductive and will inhibit participation in the program because it requires consumption at a stated level. It holds the customer to a stated consumption level, not just a stated curtailment level. While the proposal may permit verification of load reductions as intended, it also requires the customer to consume a minimum quantity of electricity or pay a penalty for non-consumption, as described in Section 4.2.27. The forced consumption seems at odds with the desire to foster demand response.</p> <p>The rule assumes an unrealistic ability to forecast load. No load forecast can be as precise as the rule suggests. Consumption can vary for a variety of legitimate reasons including changes in weather and changes in production schedules. If customers that submit a demand response bid, but are not dispatched, are penalized for curtailing anyway, they will choose to simply not offer their bids.</p> <p>It is counter-productive to eliminate (or penalize) a customer's choice to reduce consumption. A customer will rationally choose not to submit a load management offer if doing so exposes the customer to a mandatory consumption level. The proposed structure will lead customers to refrain from making offers to curtail rather than run the risk of paying more for consumption they don't need.</p> <p>There are a number of reasonable baseline calculation methods available to EMA which can prevent gaming without discouraging legitimate demand response. A reasonable base line calculation which has worked well in the United States has been to calculate the baseline using 4 or 5 recent days load on which curtailment has not occurred, and adjusting that calculation to reflect more or less real time weather conditions on the day of curtailment. This method has not been subjected to gaming and has produced very accurate</p>	

Comments/Feedback	EMA's Response
<p>calculations. In addition, the EMA should remain open to exploring other CBL methods as well. For example, Viridity has developed an engineering /econometric approach to calculating baselines which is predictive (not historical) and which also cannot be gamed because all of the inputs and algorithms are reviewable by the grid operator and government. We would be pleased to present this method in detail at any time for your consideration.</p>	
<p>PacificLight Power GMR consider that the EMA should increase the proposed minimum bid size of 0.1MW on the basis that any benefit obtained from the price reduction should outweigh the monitoring and administrative costs incurred. As a result, an appropriate entry threshold is required to ensure real economic benefit is achieved from participating in the programme.</p>	<p>The proposed minimum tranche of load reduction is 0.1MW, as per current arrangement for the IL scheme. As mentioned in 4.1.2 of the Consultation Paper, licensed load aggregators will be allowed to aggregate up to 10 tranches of price-quantity pairs in a single bid. The EMA is of the view that the design of the Demand Response programme should not restrict participation of potential load due to its size as long as the requirement of 0.1MW is met. As licensed load providers will be paid only if additional consumer surplus (from the lowering of the USEP) as a result of the Demand Response programme can be demonstrated, the decision to participate and the quantity to bid in will be based on the commercial considerations on the part of licensed load provider keeping in mind that smaller bids will be less likely to have an impact on USEP.</p>
<p>Panasonic Corporation Entire architecture should be based on Demand Response for "Energy Market" rather than "Reliability" which requires fast response and high accuracy. Energy market demand response resource need NOT to be dispatchable as "generators", because requirement for Demand Response aggregators should be practical to be achievable at reasonable cost.</p>	<p>Under the proposed Demand Response programme, the demand response loads need to be dispatchable as they are essentially competing with the generators which has a compliance regime for dispatch orders. Given that the treatment of loads under such a programme should be symmetrical to that of generators, as far as practicable, the demand response loads would be required to be dispatchable. For loads that are not dispatchable, there is always the option for them to reduce load in response to high prices (without bidding into the market) and therefore save on the avoided costs, which can</p>

Comments/Feedback	EMA's Response
	already be carried out by consumers today.
<p>Senoko Energy</p> <p>A full analysis of the benefits of a nodal versus zonal demand-side bidding scheme should be undertaken to ensure that a zonal simplification does not create unexpected distortions or impact the symmetry of treatment between bids and offers.</p> <p>In addition, there should be a full analysis of how the scheme would impact the treatment of embedded generators (and similar facilities) to ensure that a level playing field between the various types of market participants is maintained.</p> <p>With the incorporation of demand-side bids into the market-clearing process it will be important to ensure that the PSO's load forecast is as accurate as possible. It is unclear how this would be achieved, but it may be that PSO would need to change its methodology so that the forecast that it provides to EMC only relates to non-DR loads. Furthermore, EMC may need to consider how the nodal load participation factors are applied to the PSO forecast. In addition, EMC may need to consider preparing additional load scenarios (reflecting potential DR) as part of the dispatch forecasts.</p>	<p>We note Senoko Energy's comments. The way in which zonal limits are recognised by the market clearing engine (MCE) when clearing the bids and determining the dispatch schedule would be similar to how the IL Scheme operates today.</p> <p>It is unclear from Senoko Energy's submission how the Demand Response programme would impact the treatment of embedded generators.</p> <p>The EMA agrees with Senoko Energy's comments on ensuring the accuracy of demand forecast and will work with the Energy Market Company (EMC) to ensure that an appropriate feedback loop between demand side bids and demand load forecast are established.</p>

Comments/Feedback	EMA's Response
<p>Singapore Oxygen Air Liquide Private Limited (SOXAL)</p> <p>Unlike Interruptible Load (IL), this scheme is not designed to face some short term imbalances on the grid. Demand side bidding enables to better match offer and demand in energy market and take into account the elasticity of demand. In that perspective, Demand side scheme and IL must not overlap and the dispatch quantities must be defined successively. In other words, firm quantities to be dispatched with the proposed scheme has to be published with Short Term Schedule (25min ahead is the minimum required in order to bring some significant volumes to the market) or even earlier (day ahead like in Europe and US). Then on the real time basis the reserves and regulation come to adjust the frequency on grid.</p> <p>If there is 2 consecutive periods of dispatch and non-dispatch. There could be a physical issue for the load provider although the intent to shed load for an extended period of time. For example, at Period T, a load provider is scheduled for dispatched and within 10 mins, have to activate load shed. However, within 20 mins, the load provider will have to start up the unit entering period T+1 which this load provider is not dispatched.</p> <p>Provider must have the option to provide continuous blocks (all or nothing)</p> <p>Possibility of partial dispatch. As illustrated in Demand Side Bidding- Example 1 in appendix 2, the offered load submitted was 3MW. However, after EMC ran the MCE, the load provider was only scheduled for 1.5MW of load reduction.</p> <p>Physically, the load block may not be separable into smaller load blocks. It could mean that a load provider would still have to shed a 3 MW load in order to meet the dispatched requirement of 1.5MW. However, in this case the load provider is only paid 1.5MW demand response. Kindly clarify. The provider must have the option to provide a load volume (all or nothing).</p> <p>As illustrated in Demand Side Bidding- Example 2 in appendix 2, the offered</p>	<p>The EMA is of the view that there should not be restrictions on the participation of load in either scheme, whether demand response or IL, as long as the technical requirements are satisfied. We agree that demand response and IL should not overlap (i.e. the total amount of IL and demand response reductions dispatched in the same period will be less than the load's total registered capacity for IL and demand response) and this is currently the case in the NEMS, where the MCE co-optimises the energy, reserve and regulation products to derive the least-cost combination. In addition, the MCE shall only schedule each load facility in either the reserves (IL) or energy (Demand Response) market, but not both during a single dispatch period.</p> <p>We disagree with SOXAL's proposed dispatch. It is unclear how the proposed dispatch schedule notice can be implemented in Singapore's energy-only market with no capacity or day-ahead market. The intent of the Demand Response programme is to encourage load reduction by consumers in addition to their business-as-usual consumption. Payment to load providers (in addition to their cost savings for reduction in load) for reduction in load in a business-as-usual condition would be a double payment.</p> <p>Similar to the generators and the IL providers, dispatch of licensed load providers' load is based on the dispatch schedule produced by the MCE, where there may be partial dispatch at the marginal bid. Licensed load provider is expected to have the flexibility to manage their load for dispatch in such cases.</p>

Comments/Feedback	EMA's Response
<p>load submitted was 15MW nominal load with 3MW load shed on offer. After EMC ran the MCE, the load provider was not scheduled for any load reduction. Through the full 30 min period he load provider was not dispatched or the metered consumption must be at least 7.5MWh.</p> <p>This does not offer any allowance for nominal load fluctuations due to process changes. However, the load provider can be more conservative by bidding a lower nominal load. For example, a load provided and submit a 12MW nominal load during the bidding process while the projected load is 15MW. This will provide some margin for nominal process fluctuations. Is this the intend?</p>	<p>Fluctuations and other variations are not provided for. For the purpose of the illustration raised by SOXAL, if the load is not dispatched, the licensed load provider will be required to consume at least 15MW (even though the nominal load is 12MW). This is to prevent gaming and to provide incentives to ensure load providers only bid in their true baseline.</p>
Volume Cap	
<p>Kiwi Power We agree that Demand Response resources should be able to take part in both this program as well as IL at the same time. (4.1.4).</p> <p>The consultation mentions a maximum of 200 MW that could sign up to Demand Response, inclusive of the IL program (4.1.10). It would be helpful to know how many MWs are currently enrolled in IL and what the future outlook is for this program.</p> <p>Viridity Energy At section 4.1.10 a volume cap on the amount of demand response that can be dispatched is proposed. We believe that the proposed 200MW is arbitrary and may well deprive that market of socially beneficial demand response. There is no evidence to suggest that more than 200MW of demand response will jeopardize grid operations. Rather than indulging in an arbitrary speculation, we suggest that real time monitoring of grid conditions can be</p>	<p>The total amount of IL registered is available on the EMC's website. The IL scheme will continue to complement the Demand Response programme to provide load in the reserve market.</p> <p>The volume cap has been set based on the technical assessment provided by the PSO to ensure system security and stability. For clarity, the volume cap applies to the amount of load reduction that can be scheduled for dispatch in any half-hour period. There is no limit on the amount of load that can be licensed and registered for the Demand Response programme and IL scheme. For power system operation and security reasons, the amount of load curtailment that can be cleared by the MCE will be capped at 200 MW, for both the Demand Response and the IL scheme.³ The current caps and zonal limits for IL for the 3 classes of reserves (i.e. primary, secondary and contingency) will remain unchanged. The cap will be reviewed under relevant circumstances such as when there are significant changes to the power system.</p>

³ The cap applies only for the load curtailment volumes, and not the entire load of the facility.

Comments/Feedback	EMA's Response
<p>employed to address any security concerns, should any arise. Indeed, real time monitoring of the grid occurs now, and is the most effective way to maintain reliable operations.</p>	
Anti-Gaming Measures/Price Floor	
<p>EMC Price floor should be reviewed annually to adjust to market price movements.</p> <p>GMR Energy We agree with EMA that a price floor needs to be set to prevent gaming. Rather than a fixed absolute price, GMR would propose that a dynamic floor price be adopted that is pegged to fluctuating oil prices. This dynamic floor price will serve as a better safeguard, especially in a high oil price scenario.</p> <p>Keppel Energy We would like to seek clarification on how S\$300/MWh price floor is able to address gaming issue by Cybele.</p> <p>Kiwi Power While we are not opposed to the suggested floor price, we believe that there are potentially other solutions than the proposed floor price mechanism (4.1.15). For instance, this may be addressed by holding back Demand Response resources that would otherwise be economically dispatched in order to test if the reduction would happen anyway. A proper baseline methodology should address the gaming concern outlined in the paper (4.1.14).</p> <p>We would like to understand how the \$300 price has been decided. It may not be best to have a static price for this floor price, since the market may change significantly and the floor price should take into account possible changes in</p>	<p>The EMA notes the suggestions and comments and have further reviewed the price floor. It is necessary to put in safeguards such as the proposed price floor to ensure that the licensed load providers are paid only for explicit actions, and not for load curtailments which would have occurred anyway. For illustration, suppose a manufacturing plant does not operate during the weekends and hence has no electricity consumption in those periods. Without the safeguard in place, a licensed load provider can always offer that load at very low bids during the weekends which effectively ensures dispatch. Under such circumstances, the EMA is of the view that this does not constitute demand response and the licensed load provider should not be paid. The price floor essentially reduces the certainty of dispatch as the licensed load provider bears the risk of having to ensure that there is load consumption should the demand response offers not be cleared. Hence, the price floor provides the incentives for licensed load providers to offer only genuine load reductions to be considered for dispatch.</p> <p>Alternative suggestions to the price floor revolve around establishing a baseline to consider what the "business-as-usual" loads are. As mentioned above, the EMA does not agree that a pre-established baseline is an appropriate mechanism for an energy-only market like Singapore's.</p> <p>The price floor of \$300/MWh in the EMA's Consultation Paper was set based on the analysis of historical prices, calibrated in such a way that the pricing signals to licensed load providers to curtail load in response to high prices is preserved, while not guaranteeing the dispatch of curtailed loads. Taking into</p>

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<p>the greater market. There may be existing calculated figured based on market price that are already in use that may be applicable here. Also, this does not account for contracts that consumers might have with their retailer, and how those prices may interact with this floor price value.</p> <p>Panasonic Corporation This price floor seriously limits the periods that DR can participate. It is not recommended to reduce DR gaming by reducing DR participation chance. Even with such price floor, the same gaming can happen in periods that USEP will exceed 300 with high probability (ex. period 23, 24).</p> <p>Referring to international experience a base line for “business as usual load” will be considered to compare DR behavior against that base line and reduce such gaming probability, not a price floor.</p> <p>Though that base line might be argued as not “very precise” but it is a better option compared to reducing DR participation in order to reduce DR gaming.</p> <p>In order to achieve high participation, it is recommended to remove price floor limitation. Instead DR resources, suspicious of doing gaming, can be asked to provide historical “business as usual” load profile of suspected periods for a relevant duration. Such “business as usual” load profile can be used for checking the gaming behavior.</p> <p>Senoko Energy The DR scheme includes a proposed bid price floor of \$300/MWh. This is an anti-gaming provision that is intended to prevent DR providers submitting bids that assure them of dispatch. The basis of the proposed floor value is unclear. It important that the bid floor level is set high enough so as not to</p>	<p>consideration the feedback received, the revised price floor will be set dynamically at 1.5 times the prevailing Balance Vesting Price (BVP).⁴ This methodology is more robust and can cater for changes in fuel prices which have a material impact on wholesale electricity prices. Demand bids with price tranches below the price floor will not be accepted. This is conceptually similar to that used by the US FERC as pointed out by Viridity Energy.</p>

⁴ The BVP, as used in the EMA's Procedures for Calculating the Components of the Vesting Contracts, approximates the long run marginal cost of a theoretical new entrant that uses the most economic generating technology in operation in Singapore and contributes to more than 25% of total demand. The calculation of the BVP will follow the prevailing methodology under the procedures for Vesting Contracts.

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<p>displace or strand peaking generation capacity unless it is optimal from a generation supply mix perspective to do so.</p> <p>Viridity Energy</p> <p>At sections 4.1.14- 4.1.16 the possibility of imposing a price floor on demand response bids is discussed. We respectfully suggest that the entire discussion of price floors is misguided. First, there is no public policy reason to only encourage curtailment at high prices. If customers are willing to be price takers, or to curtail at low prices, they should be allowed to do so—society will benefit from the curtailment. Active demand response can be more than a peaking shaving device. It can prevent peak conditions from ever arising—as individual customers choose to curtail at different prices as the utility climbs both the load and price curves.</p> <p>Moreover, there is nothing wrong with 'licensed load providers being effectively guarantee the dispatch of their curtailment' if they bid a low price or even if they choose to bid zero and be a price taker. Again, society will benefit from the load reduction under these circumstances. Third, the issue addressed in this section of the EMA draft is the need to avoid paying for load reductions that would have been taken in any event- that are actually business as usual. This is an entirely appropriate concern of course, but it is better addressed through development of a robust baseline methodology and periodic audits to ensure that payments are not made for phantom curtailments. The imposition of price floor will deprive the market of legitimate curtailments that customers may be willing to offer at a variety of prices.</p> <p>We note that the U.S. Federal Energy Regulatory Commission has established a regime where at the beginning of each month the grid operator calculates the clearing price at which demand response produces a consumer surplus (referred to as the net benefit threshold) and then publishes this number. Demand Response is compensated only when clearing price exceeds this level. We respectfully suggest that the EMA consider this approach. It assures that load management is socially valuable and avoids</p>	

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<p>the arbitrary imposition of a load floor.</p> <p>YTL Power Seraya The price formulae should take fuel prices into consideration. If Brent or HSFO prices rise high enough, the "normal" pool price could end up above \$300/MWh and a floor of \$300/MWh would be too low to deter gaming. A clear methodology is required for this floor price setting, and more details on the analysis done by Cybele needs to be revealed.</p>	
<p>SOXAL Bidding for an "assured dispatched price" during a planned shutdown is not gaming. For example, a load provider to have the flexibility to postpone the scheduled maintenance if the price of DR is in favour. This only provided the information of potential shutdown beyond a given price to the market. Putting any constraints (price floor/max volumes) will deprive the market to better assess the real demand and anticipate any imbalance on the grid.</p> <p>How does the Market Clearing Engine determine fairly on which load provider to pick given that there is a possibility that more than one load provider is submitting an offer at the same price floor?</p>	<p>The proposed methodology of setting the price floor of 1.5 times the BVP should preserve the price signals and incentives for licensed load providers to enter the market when prices are high.</p> <p>In the event that load reductions are offered at the same price, a tie-break mechanism in the MCE would be used to determine the load to be dispatched. The tie-break mechanism would be similar to that for the generation bids in the MCE. Section 8.2.1 of the Consultant's report appended in the EMA's Consultation Paper provides details of a tie-break mechanism that can be applied for loads with the same price. In addition, as registered loads will be required to submit the relevant ramp rates which can serve as a factor in the tie-break mechanism. For example, all things being equal, a licensed load provider with a faster ramp rate will be preferred over one with a slower ramp rate.</p>
<p>Pwee Foundation In terms of setting incentives for consumers to help relieve some of the load</p>	<p>The EMA agrees with the comments from the Pwee Foundation that</p>

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<p>during peak hours, other developed countries have educated consumers when the peak hours are, and ways to save energy. Also the electricity generators have established a tiered tariff fee, a lower tariff during low usage periods, which are typically at night, and a higher one during high peak hours, which are typically during the day, when electricity is used by commercial customers. These two-tiered tariffs along with the education of consumers can level the demand from the generators over the full day, saving the generators significant capital expenditure, as their investment is linked to the peak demand.</p>	<p>differential pricing can provide the incentives for consumers to shift their loads. In the electricity retail market, this is already possible through commercial arrangements between retailers and contestable consumers, including multi-tier pricing for retail contracts.</p>
<p>YTL Power Seraya To prevent gaming, load providing Demand Response should also be prevented from entering into Non-Pool Variable Contracts.</p>	<p>The rationale and basis for not allowing consumers participating in the Demand Response programme to enter into Non-Pool Variable Contracts is unclear. The EMA is of the view that while demand response can be part of consumers' retail package, it can be structured and provided separately from the retail contractual agreement of participating consumers through the licensed load providers.</p>
Load Benefitting from Demand Response	
<p>Changi Airport Group Contestable consumers who have already entered into fixed price contracts with retailers for specified volume of consumption will not be able to benefit from the DR programme and should not be required to bear the cost of the DR incentive scheme.</p> <p>Also, in the longer term, while the DR programme may put downward pressure on wholesale prices, contestable consumers with limited load shedding capability who chooses to enter into LNG/PNG/fuel oil-indexed price contracts with retailers instead of buying at wholesale prices (given the high volatility of wholesale prices as compared to indexed or fixed price contracts)</p>	<p>As mentioned in Section 4.2 of the Consultation Paper, the EMA is of the view that all contestable consumers would ultimately benefit from the demand response programme due to the following:</p> <ul style="list-style-type: none"> i. Contestable consumers subjected to the wholesale price, or have retail contracts that are pegged to the wholesale price would benefit directly from the potential drop in average wholesale price as a result of demand response. ii. Contestable consumers on fixed price contracts, including those on retail

Comments/Feedback	EMA's Response
<p>will not be able to benefit from reduced wholesale prices and should not be required to bear the cost of the DR incentive scheme.</p> <p>Contestable consumers are already bearing part of the vested load. The proposal to pass on the cost of the DR incentive payout to contestable consumers would create more uncertainty in electricity retail price (versus a clean Contract-for-Difference arrangement between retailer and consumer) that could translate into consumers bearing the risk premium from retailers</p> <p>Keppel Energy Due to long-term fixed price contracts secured with customers, such schemes pose high volumetric risk to gencos/retailers. For retailers who have given flexibility to customers without constraints on their power consumption, this scheme will penalize such retailers unfairly.</p> <p>PacificLight Power Consistent with previous comments that GMR have provided to the EMA, we would like to emphasize that the contestable loads which are already fully hedged do not directly benefit from the DR scheme. Thus, we do not believe that these parties should incur the costs of the DR program. It is disruptive to a company which has secured a fixed operating budget and entered into a fixed price electricity contract with a retailer to be impacted by DR charges that it has no control over.</p> <p>As highlighted by the EMA, a fixed price customer might benefit from the demand response program in the long term. However, it would seem inequitable that a customer is required to pay for the scheme when any accrued benefits are not realisable in the near term.</p> <p>The proposed collection methodology will result in the non-beneficiaries subsidising the pool exposed consumers. Hence, we would request that EMA</p>	<p>contracts pegged to gas or fuel oil price, would indirectly benefit through more competitive retail prices in the long-run (i.e. the next time they renegotiate their retail contracts).</p> <p>Contestable consumers with retail contracts pegged to gas or fuel oil price will have the choice to opt for wholesale price indexed contract if it is commercially more advantageous. The negotiation of retail contracts is separate from the availability of providing curtailable load to participate in the Demand Response programme.</p> <p>An effective Demand Response programme would therefore benefit all contestable consumers through the downward pressure in wholesale price, regardless of their retail contract arrangements and their participation in the Demand Response programme. Given that all contestable consumers would be the ultimate beneficiaries of the programme, the EMA assess that the demand response payment should be borne by all contestable consumers.</p> <p>In response to the comments from some consumers and retailers on the beneficiaries of the Demand Response programme, the framework has been adjusted to allow retailers buying on behalf of contestable consumers, to opt out of paying the uplift charges arising from the programme and at the same time forgo the Implicit Demand Response Rebate. This means that consumers buying from such retailers will be paying the same price and hence are essentially no worse off than if the Demand Response programme had not been in place. The forgone Implicit Demand Response Rebate from such retailers will then be allocated to market participants who have not chosen to opt out of the payment of the uplift charges. Details on the revised collection mechanism are provided in Section 5 of the EMA's Final Determination Paper.</p>

Comments/Feedback	EMA's Response
<p>review the proposed collection methodology.</p> <p>Independent Consultants Although we haven't taken the time to gain an in-depth understanding of Singapore's electricity market, once goals have been clearly articulated, we think demand response will benefit all consumers, not just those that are contestable.</p> <p>SOXAL In SOXAL's opinion, not all contestable consumers will benefit from the potential reduction in USEP in view of the offered load. For electricity contracts which is indexed base of HSFO formulation, there is no direct correlation between the dynamics of HSFO and USEP. Eventually, the retailer would pass on the payouts to their consumers who do not benefit from this program.</p> <p>Tuas Power The view was expressed that the benefits brought about by a consumer participating in the demand side bidding is not just limited to that consumer, but also applicable to a broader consumer base. While future retail contract prices may reduce as a result of a lower wholesale market price, the fact today that retailer and gencos are essentially the same entities through some form of hedging arrangement mean that there is no impact short term. Similarly consumers who have hedged their pool price exposure through retailers also do not see short-term benefits.</p> <p>However, because the incentive payments have to be/are funded by through a market uplift charge, this will result in an increase in cost and a subsequent wealth transfer from the bulk of the market to presumably a small fraction of the total load.</p> <p>For retailers/customers who face real time prices (i.e unhedged market exposure), there is already direct incentive to reduce their demand at times</p>	

Comments/Feedback	EMA's Response
<p>when pool prices are above the value that they place on electricity usage.</p> <p>YTL Power Seraya</p> <p>The proposed sharing factor of one-third appears excessive as due to the quantity of non-vested load not being exposed to pool price due to having entered into retail contracts, payment for demand response would be a lot higher than the actual additional consumer surplus generated. It is extremely doubtful that retail consumers would agree that the possible longer term benefit of lower retail prices would justify the difference. A possible alternative would be $\frac{1}{2}$* (total pool exposed volume / total system demand) % for a fifty-fifty split of additional consumer surplus generated between demand response providers and consumers. The benefit provided by demand response is of a lesser magnitude for retail customers as compared to consumers exposed to pool price. Retail customers should therefore rightfully pay less for demand response as compared to consumers exposed to pool price. The rate paid by retail customers could be set at half that paid by consumers exposed to pool price.</p>	<p>We disagree with YTL Power Seraya's comments. Compliant licensed load providers whose loads have been cleared for reduction will only be paid when there is a verifiable decrease in USEP. In addition, the one-third sharing factor will ensure that majority of the benefits (i.e. two-thirds of the additional consumer surplus generated) accrue to the rest of the consumer base, specifically for the non-regulatory load, while providing a fair return to the licensed load providers for the services (and benefits) they provide in the market.</p> <p>With respect to the view that retail customers may not benefit from the Demand Response programme, the EMA is of the view that <i>all</i> contestable consumers can benefit directly and indirectly from the programme. Given that USEP serves as check on retail price, contestable consumers including those on fixed price retail contracts will benefit from the downward pressure on USEP in the long run. Contestable consumers buying electricity at USEP prices will benefit directly from the potential lower spot prices as a result of demand response, while those on fixed price contracts will benefit from their next retail contract negotiation as spot price is generally considered as a reference price for retail contracts. Nevertheless, in response to the feedback that some contestable consumers who have hedged their electricity purchases through fixed price contracts may not find the Demand Response programme beneficial, the framework has been adjusted to allow for the retailers buying on behalf of such consumers to choose to opt out of the payment of the uplift charges arising from the programme, and in return forgo the Implicit Demand Response Rebate. This means that such retailers who have chosen to opt out will be paying the same level as if the Demand Response programme had not been in place. Details on the revised collection mechanism are provided in Section 5 of the EMA's Final Determination Paper.</p>

Comments/Feedback	EMA's Response
<p>Panasonic Corporation</p> <p>Consumer surplus calculation from “contestable load”, in the Cybele “industry presentation”, has changed into “non-vested load” in the consultation draft. This will reduce DR provider benefit. The former consumer surplus calculation is recommended since all the contestable loads can attend in market.</p>	<p>As mentioned in Section 4.2 of the Consultation Paper, the beneficiaries of the proposed Demand Response programme are consumers whose load are not exposed to the regulated, i.e. vesting price (which is regulated by EMA), and would therefore benefit from the lowering of USEP due to the Demand Response programme. Given that the regulated contract after being allocated to all non-contestable loads is allocated equally to the contestable load, the consumer surplus calculation should be calculated using the non-regulatory load.</p>
<p>Payment to Licensed Load Providers</p>	
<p>EnerNoc</p> <p>A small amount of demand response is unlikely to affect the spot price, and hence create consumer surplus, whereas a large quantity is very likely to do so. This introduces a peculiar nonlinearity to the incentive payments under the proposed scheme: during the early stages, there are unlikely to be any incentive payments; incentive payments will only become significant once the programme has grown to considerable scale (if such scale is achievable, given the issues raised above).</p> <p>Without access to historical bidstack data, it is not possible for prospective demand response providers to model this effect, and hence to judge whether participation is likely to be worthwhile. It is therefore important that at least a few years of bidstack data be published. If necessary, the data can be stripped of identifying information.</p>	<p>Whether load reduction is likely to affect spot price is also dependent on the offer curve and the clearing price in each period, in addition to the quantity of the load reduction. In general, the offer stack is usually flatter at lower prices, and steeper at higher prices. As the design of the Demand Response programme seeks to encourage the reduction or shifting of load during peak periods when prices are high, load offered for reduction during this period is likely to affect price compared to load reduction offered during non-peak periods.</p> <p>The EMA agrees that allowing all participants to have access to the relevant market information is necessary. The EMA will be consulting the industry in due course on the provision of market information to support both the Demand Response programme and the development of a liquid electricity futures market.</p>

Comments/Feedback	EMA's Response
<p>PacificLight Power</p> <p>GMR would propose that the EMA take a holistic view when determining the incentive payment to be paid to any DR participant. Rather than reducing demand a customer is likely to shift demand from the peak to another period in the day. While it will bring down the prices at the peak, it would cause the price to increase in off peak period. This increase in off peak price due to the load shifting should be factored into the calculation of the net consumer surplus. GMR will also like to ask EMA the basis for giving 1/3 of consumer surplus to the DR providers.</p> <p>To maintain symmetry with a generator, the maximum payment to a DR provider should be capped at the market energy price cleared at the time DR is despatched, rather than at a fixed value of \$4,500/MWh. The original intent is maintained as the market energy price is capped at \$4,500/MWh.</p> <p>Kiwi Power</p> <p>We agree that Demand Response should be treated as fair and equitable in comparison to Generation. As such, as would like to understand why the consultation paper seems to suggest that payment due to Demand Response would be calculated in a different manner than payment for generation (3.1.7). We would like to better understand why it is proposed that the payment for Demand Response be calculated in a different way than the payment is calculated for generation (4.2.11).</p>	<p>First, the increase in price in the off peak period, if any, due to the shift in load may be disproportionately related (i.e. much lower) to the reduction in USEP in the peak period due to the shape of the offer curve. Second, it is not possible to identify the increased in consumption in the off peak period by a licensed load provider that is due to demand response in the peak period. Therefore, it is both theoretically and practically not reasonable to factor the change in price in the off peak period, if any, due to demand response in the payment mechanism.</p> <p>The EMA notes the views on the demand response payments. As indicated in the EMA's consultation paper, with respect to the payment mechanism, several methods have been considered. One way is to pay the licensed load providers in the same way as generators are paid. Loads which are scheduled for curtailment (or dispatch) would be paid the prevailing Uniform Singapore Energy Price (USEP) for the half-hour period. The EMA is of the view that this will result in over-compensation as there will be double payment made to the licensed load providers (i.e. an additional payment on top of the savings for the electricity consumption reduced which would have been otherwise realised). Furthermore, there may be cases where the licensed load providers will be paid for curtailment even when there is no corresponding increase in consumer surplus (i.e. no reduction in the USEP) and no direct benefits generated for the market.</p> <p>As mentioned in 4.2.9 of the EMA's Consultation Paper, the payment mechanism is designed to ensure fair remuneration to licensed load providers, while avoiding overpayment to safeguard the interests of the rest of the consumers. The one third sharing factor is a sharing factor recommended by the consultants based on simulation of historical prices, and at the same time derived to emphasize that majority of the benefits should accrued to the rest</p>

Comments/Feedback	EMA's Response
<p>Senoko Energy</p> <p>A key weakness of the DR scheme from an economic efficiency perspective is that the quantum of the DR subsidy is not linked to the quantum of market efficiency (net benefit) created by the DR activity. Therefore, the scheme risks over-incentivising DR compared to the efficient level. Given the current low levels of customer pool exposure the immediate potential gain to consumers from the DR scheme is limited. Furthermore, the DR subsidy that will be paid by consumers to DR providers is likely to be significantly higher than both the net benefit and the immediate increase in consumer benefit available to customers with pool exposure. In addition, the subsidy will impact the demand response function whereby DR providers will bid in their load at a price below the level they would have in the absence of the subsidy. This will distort market outcomes as demand response may be scheduled even though the unsubsidised value of the responsive load is higher than the marginal generation cost. Clearly this is an inefficient market outcome.</p> <p>The EMA's justification for the DR subsidy is that it is expected to stimulate an increase in consumer surplus. The quantum of consumer surplus does not indicate the quantum of market efficiency created, it simply represents a wealth transfer between market participants. The proposal to base the subsidy on 33% of a theoretical consumer surplus value appears arbitrary and is not related to any estimate of the strength of incentive necessary to incentivise consumers to provide DR. Even though other DR payment constraints are applied (e.g., the maximum value of \$4,500/MWh) this does not provide a justification for selecting the 33% value as a starting point.</p>	<p>of the consumer base.</p> <p>It is unclear why the maximum payment to a licensed load provider should be capped at the market energy price cleared at the time the demand response is dispatched. The maximum payment to licensed load providers for each MWh of load curtailed is to be pegged at the existing cap for USEP, which is currently set at \$4,500/MWh.</p> <p>The net benefit to the consumers as a result of demand response is the additional consumer surplus generated as a result of load reductions being dispatched. As such, the payment is designed to be directly linked to these benefits by paying for the load reduction when such benefits have been generated. In the event that no benefit was generated as a result of demand response (i.e. no change in wholesale electricity price), no payment will be made to the load providers even though load reductions have been dispatched.</p> <p>The necessary safeguards such as a price floor for the demand bids will be put in place to prevent load providers from bidding in load reduction that would have occurred in absence of the Demand Response programme.</p>

Comments/Feedback	EMA's Response
<p>Tuas Power</p> <p>We note the significant implementation difference between the scheme proposed by the consultant for Singapore relative to other jurisdictions with Demand Response bidding – primarily in the level and certainty of incentive payments. The basis for the proposed sharing factor of 33% is not well supported other than reference to the consultant report- use of “sufficient incentives instead of expected payments (given uncertainty of payment) against assumed cost of providing DR and assumed payback period given transitional nature of payment.</p> <p>Our understanding of other jurisdictions treat DR resources in the same manner as generation and therefore are compensated at the wholesale spot price for each MWh of load abatement delivered to the market or that under other consumer benefit sharing is related to avoided supply-side costs (i.e. overall resource efficiency benefits) rather than being an estimate of consumer surplus.</p> <p>Independent Consultants</p> <p>The consultation paper's proposal to distribute a portion of the consumer surplus to providers of demand response introduces unnecessary complexity. Moreover, if all contestable consumers participate, distributing any consumer surplus appears to be a zero-sum game.</p>	
<p>Kiwi Power</p> <p>Based on our experience in the UK, as well as the significant volume of Demand Response participation in other markets, most notably, in the US, Demand Response is best incentivised by a two-part revenue stream: one based on availability (payment for being available to be dispatched) and the other based on utilisation (payment for delivery of load reduction). In most markets where Demand Response participates, the availability payment represents the majority of the value that Demand Response derives from</p>	<p>We note Kiwi Power's comments and would like to highlight that availability payment is already provided for in the reserves market through the IL scheme. IL can participate in the reserves market to cater for contingency events; while demand response is provided in the energy market and treated in a similar manner as generation capacity. As IL and demand response effectively serves different markets and purposes, we are of the view that availability payments are only necessary for the reserves market, while demand</p>

Comments/Feedback	EMA's Response
<p>participation. It appears from the consultation that there will not be an availability payment available for Demand Response. The implication of this may be that the utilisation price would have to be sufficiently high to encourage Demand Response to come forward.</p> <p>We are encouraged by sharing the market efficiency gains with the aggregator. However, we would like to understand how the 30% is derived (4.2.13). We would request access to work and analysis done by Cybele in order to properly assess the viability of this program.</p>	<p>response will be paid based on delivery of load reductions when benefits to the market has been generated.</p> <p>The sharing factor is based on recommendations from the Consultant, Cybele, after analysing historical prices and the relevant price simulations.</p>
<p>Panasonic Corporation</p> <p>In cases that DR utilization cannot reduce USEP, DR should not be scheduled since there will be 0 payment(s) to them. It is not recommended to use DR service in cases that there will (be) no payment to them. Zero payment will demotivate DR participant. Zero payment should be avoided. In case USEP reduction cannot be achieved by DR resources, DR resources should not be scheduled and utilized.</p> <p>Providing DR will have some costs for DR providers. In the proposed plan, DR resources will not be paid based on their marginal cost (as it is done for generators). In cases that DR participants conduct DR successfully, their marginal cost recovery should be ensured. Otherwise this will demotivate them from participating. A price floor which is the price floor for payments should be introduced.</p> <p>High risk for aggregator if the fund move(s) from consumer surplus. In consideration to promote Energy Efficiency & Energy Conservation and make Demand Response sustainable, funding of consumer surplus should remain in some extent.</p>	<p>We are of the view that participating load will be paid only if additional consumer surplus (from the lowering of the USEP) as a result of the Demand Response programme can be demonstrated. Effectively, this is a surplus sharing mechanism between the load providers and the rest of the consumer base and ensures that benefits accrue to the consumers before a payout occurs. There will be no payment to participating load if no benefit to the consumer base in terms of additional consumer surplus has been demonstrated. Furthermore, the payment is constrained by the cap on USEP, and the 33% sharing ratio is proposed to ensure that the majority of benefits goes to the wider market and not the licensed load providers.</p> <p>It is unclear the justification for payment when there is no corresponding increase in consumer surplus (i.e. no reduction in the USEP) and no direct benefits generated for the market. As mentioned in 4.2.9 of the Consultation Paper, the EMA has carefully considered various methods of payments, taking into consideration how to ensure fair remuneration to licensed load providers, while avoiding overpayment to safeguard the interests of the rest of the consumer base. In any case, licensed load providers can also utilise Contract-for-Differences (CfD) arrangements in the retail market to ensure the receipt of payments (to cover their marginal cost) even if there is no consumer</p>

Comments/Feedback	EMA's Response
<p>Senoko Energy</p> <p>The EMA should recognise that the over-incentivising of DR via subsidy is not costless. Firstly, it will be consumers that fund the subsidy thereby increasing their cost of electricity procurement which may have further downstream impacts on the efficiency of the broader economy. Secondly, the wealth transfer from generators will impact generator viability, affect supply-side investment patterns and risk premia. It is worth emphasising that the EMA's advisor, Cybele Capital Limited (CCL), observes that the subsidy "payments are a form of market "distortion", as they increase the payoffs to demand response providers above the level that would naturally occur. This puts demand response in an advantageous position relative to peaking generation."</p> <p>From an economic efficiency perspective, Senoko has a number of concerns with the DR scheme. At a conceptual level, the primary economic benefits from DR arise from a reduction in either energy supply investment or operation costs. Under the proposed scheme, DR is unlikely to be able to secure a predictable and stable revenue stream. This will limit the willingness of potential DR providers to invest in enabling systems and processes. In addition, with the significant surplus in generation capacity relative to peak demand which is projected to be in place for the medium term, there does not seem to be a strong case to invest in additional capacity at this time. Therefore, the DR scheme is unlikely to achieve material ongoing economic benefits. In light of this, the EMA could consider including DR incentives as part of its capacity assurance scheme, which would trigger DR incentivisation if the system reserve margin drops below a pre-defined level.</p> <p>The EMA states that one of the overall objectives of the DR scheme is to promote a greater variety of choices among contestable consumers. While expansion of choice via demand-side bidding is welcome the skewing of incentives via the DR subsidy certainly is not. Choice should be used to promote market efficiency rather than being an end in itself.</p>	<p>surplus generated.</p> <p>The EMA is of the view that the dynamic demand response (Stage 1) is designed to provide a transition to a passive demand response (Stage 2) to provide sufficient incentives for the uptake of demand response by consumers. We will review at the end of the Stage 1 (i.e. 3 years) whether the market has reached sufficient maturity to support passive demand response in an effective and efficient manner.</p> <p>It is also useful to note that licensed load provider may also provide load for participation in the IL scheme (subject to the relevant technical requirements). in return for reserve payments. The Demand Response programme is intended to complement the IL scheme.</p> <p>In any case, the participation in the Demand Response programme is entirely dependent on commercial decisions by licensed load provider. Licensed load providers and consumers should consider whether the scheme is commercially viable when deciding whether to participate in the programme.</p>

Comments/Feedback	EMA's Response
<p>Tuas Power</p> <p>The proposed mechanism provides no inherent links between the level of DR incentivised by the proposal and the efficient level of DR that would benefit the market. For example if a DR provider utilizes his backup power supplies to reduce his “deemed” demand supplied originally by the market – first, there is actually no net reduction in demand; second, the cost of the electricity using his backup could be higher than that provided by the market.</p> <p>The proposed incentive payment for DR is explicitly based on the estimated consumer surplus, rather than efficiency benefit. DR incentive payments in excess of the benefits to the market represents a wealth transfer from generators to customers, and risks of over-incentivising DR compared with efficient level which would be delivered by the market where consumers are exposed to real-time pricing. Wealth transfer(s) from generators have implications for generators profitability and incentives for future generation investments, given the energy-only market design of NEMS. The consultant report already acknowledge(s) the market distortion nature of DR payment and the advantageous position [of DR providers] relative to peaking generation.</p> <p>Viridity Energy</p> <p>EMA has proposed to compensate demand response at 1/3 of the additional consumer surplus generated by load curtailment. We respectfully suggest that this is an arbitrary proposal which will over compensate demand response in some scenarios and under compensate in others as demonstrated below. We suggest that compensation at the clearing price will incent the provision of demand response; will reflect the value of the service provided; and will provide the bulk of the consumer surplus to the general body of ratepayers.</p> <p>EMA notes the possibility of paying cleared demand response the clearing price but rejects this suggestion because “this will result in over-compensation as there will be double payment made to the licensed load providers (i.e. an</p>	

Comments/Feedback	EMA's Response
<p>additional payment on top of the savings for electricity consumption reduced which would have otherwise been realised). Furthermore, there may be cases where the licensed load providers will be paid for curtailment even when there is no corresponding increase in consumer surplus (i.e. no reduction in USEP) and no direct benefits generated for the market.” Section 3.17. We respectfully disagree with the first proposition – there is no double payment made. The avoided cost of not consuming the electricity is not compensation. By choosing to curtail, the customer foregoes the value it would have achieved by consuming the electricity -- and it avoids the cost of electricity. The state is clean -- the market value of the curtailment – and it is the only compensation received by the customer. Thus, paying the customer the clearing price pays the market value of the curtailment – and it is the only compensation received by the customer. Demand response is a service provided to the grid by customers – and the value of that service is the clearing price produced in the competitive auction process.</p> <p>We do agree with the second proposition noted above. If the demand response does not produce societal value by reducing the clearing price, it is appropriate to not provide compensation. However, it is worth noting that experience in the United States establishes that even quite small quantities of demand response do in fact reduce clearing prices and produce consumer surplus.</p> <p>Payment of the clearing price to demand response reflects the correct economic value of the service being provided. And it leaves the bulk of the consumer surplus with the general body of ratepayers. This is so because a small quantity of demand response (which gives rise to a small total payment to demand response, even at the clearing price), can produce a large number of consumed kwh. That is, paying the clearing price to 10kwhs. This phenomenon has been demonstrated in PJM where a small quantity of demand response (paid the clearing price) has produced a \$650million increase in consumer surplus -- while paying only \$5million to demand response. Payment of 1/3 of the consumer surplus to demand response, as</p>	

Comments/Feedback	EMA's Response
<p>proposed, will over compensate demand response in situations like that set forth above. And it will under compensate demand response in other scenarios, as discussed below.</p> <p>The payment of 1/3 of the consumer surplus to demand response is ultimately an arbitrary choice. And as demonstrated above it can over compensate demand response when small quantities of curtailment produce big changes in the clearing price. Similarly, it under compensates demand response under a different set of circumstances. Payment of the clearing price is economically efficient and produces reasonable results under all scenarios.</p>	
Collection of Payment	
<p>Senoko Energy</p> <p>As stated in the foregoing, Senoko does not believe that there is a case to support subsidizing DR. Furthermore, if a subsidy was imposed, then we do not support the proposed uplift via the Hourly Energy Uplift Charge (HEUC) from only unvested consumers for the following reasons:</p> <ol style="list-style-type: none"> a. As all consumers would potentially indirectly benefit from lower pool prices, the subsidy recovery should be from the broadest possible base. With the roll-off of vesting contracts and the prospect of full retail competition there are no strong grounds to focus the recovery of the subsidy only on those customers that are currently unvested. Except for customers who have opted for pool-indexed contracts, all contestable consumers are in exactly the same position as non-contestable consumers. Both are future beneficiaries of any lower pool prices that DR may stimulate. Therefore, it is reasonable that both types of consumer are treated on the same basis. b. The HEUC is designed as a wholesale market balancing charge. It was not designed to recover funds for subsidies. It is regulatory best practice to itemise individual charges rather than co-mingle charges of a different 	<p>The EMA is of the view that only beneficiaries of the Demand Response programme should be used when determining the additional consumer surplus derived from the licensed load providers and when determining the market participants to be charged for the uplift from the programme. As non-contestable consumers are charged the regulated tariff and are fully covered under the Vesting Contracts, it is unclear why they are considered part of the beneficiaries of the programme. On the other hand, as mentioned in 4.2 of the Consultation Paper, the EMA is of the view that all contestable consumers would benefit (whether directly or indirectly) from the Demand Response programme. Unlike the non-contestable consumers, contestable consumers have a choice on their retail contracts (whether fixed price or price pegged to gas or fuel oil price, or pool price contracts) each time they negotiate their retail contracts. Given that this choice is not available to non-contestable consumers, they should not be treated on the same basis as the contestable consumers.</p> <p>We have further reviewed the collection mechanism to incorporate an additional component for DR uplift in the HEUC, i.e. HEUC (DR). To ensure</p>

Comments/Feedback	EMA's Response
<p>nature. Not only does this promote transparency, it would also allow the recovery of the DR subsidy to be easily decoupled from the recovery of HEUC.</p> <p>c. The use of HEUC for uplift from all wholesale load and then rebating a portion of the charge back to vested consumers is unnecessarily complicated. Senoko prefers that the DR subsidy is specified as a discrete item in the Market Rules rather than subsumed in the HEUC. This will ensure that all settlement charges are clearly identified.</p> <p>d. Another strong argument against using HEUC for uplift of the subsidy is that existing retail contracts have been structured and priced on the basis of the existing HEUC formulation. Inclusion of a new element into the HEUC creates regulatory uncertainty and impacts existing retail contracts. It would be desirable for the levy only to be applied to retail contracts signed after the EMA's final decision to implement the DR scheme, and for all contracts signed prior to that point to be exempt. If not, consumers that thought they had hedged away their exposures to the pool price would be charged a levy. Counter intuitively, they would be required to pay for a reduction in pool prices that was created by DR which they are unable to benefit from.</p> <p>YTL Power Seraya For retail contracts, where the HEUC component is absorbed by gencos when retailers hedge with their associated gencos, such as fixed price and fuel indexed contracts, the application of HEUC (DR) as part of HEUC would negatively impact gencos/retailers due to the widening of the basis difference between the Market Energy Price paid to gencos for electricity generated and USEP+HEUC paid by consumers for electricity consumed. In the event that HEUC (DR) is significant, retailers may need to revise the retail prices of existing contracts upward by activating existing retail contract provisions which allow for revisions to the retail price due to changes in cost arising from modifications to the framework for trading in the wholesale electricity market.</p>	<p>transparency, EMC will publish the HEUC (original) and HEUC (DR), so that market participants and consumers are informed of the cost of the Demand Response programme. In addition, the mechanism has been revised such that retailers buying on behalf of contestable consumers can choose to opt out of the Demand Response programme. The revised collection mechanism is detailed in Section 5 of the Final Determination Paper.</p>

Comments/Feedback	EMA's Response
<p>The payment for DR is a new cost and therefore a change in costs, no matter which fee component is used to collect it. It would be better to clearly identify the payment to DR as a separate fee component for easier communication to customers.</p>	
<p>Tuas Power As there will be system implementation costs and ongoing operational and support costs if the proposed DR initiative is adopted, it is only equitable participants in the DR scheme bear market administration costs like other market participants whether they are cleared or not. The determined baseline demand would be a suitable starting point for cost allocation.</p>	<p>We have revised the collection mechanism for the Demand Response programme. The payments to load providers will only be recovered from market participants who have not choose to opt out of the programme.</p> <p>The relevant administrative costs will be recovered from the market participants as per current processes.</p>
Penalties	
<p>CPvT Energy Asia This clause is not clear on the limit of % deviation that will be allowed for penalty calculation from the baseline committed. It should be capped at 20% based on the FERC for both down side and upside as prediction of load is very difficult and can be assumed only.</p> <p>The proposed penalty for non-compliance should be the actual USEP prices as applicable for that specific period of non-compliance.</p> <p>Keppel Energy On the penalty imposed if licensed load provider curtails its load when they are not being dispatched to do so, from a consumer angle, this looks rigid as power consumption fluctuates on a half hourly basis. How would EMC determine if the lower power consumption when consumer is not dispatched to do so is actually "business-as-usual" and should not be penalized?</p>	<p>As the baseline methodology for the Demand Response programme is fundamentally different from that of FERC, CPvT's proposed 20% deviation is inadequate for compliance purpose and will increase the risk of gaming. The EMA will instead allow 5% tolerance threshold, i.e. licensed load providers who are compliant for at least 95% of the dispatch schedule will not be penalised. As the baseline is a "self-declared" one, licensed load providers should factor the potential deviation in the load reduction when they bid into the wholesale electricity market. This is to ensure that the curtailment of the loads offered under the programme must be an explicit action taken by the licensed load providers, which would not have otherwise occurred under "business-as-usual" circumstances.</p> <p>As indicated in 4.2.26 of the Consultation Paper, the level of penalty should be commensurate with the potential payouts to the licensed load providers, i.e. one-third of any additional consumer surplus demonstrated to be</p>

Comments/Feedback	EMA's Response
<p>Panasonic Corporation</p> <p>Penalty seems extremely high for DR compared to IL. It was not apparent from the report that the perceived DR market value is consistently higher than IL. DR has a maximum penalty rate of a factor USEP+HEUC for the amount of deviated dispatched quantity, however small the deviated quantity is and cap at min of \$5000. Whilst IL provider penalty is in the form of Reserve Effectiveness downgrading.</p> <p>A penalty equal to 33% of generator detriment is very high for new DR participants attending in this new market. Such high penalty might demotivate loads from entering.</p> <p>Penalty could be lower since DR scheme is new in the energy market. It is recommended to reduce the penalty for non compliance from "33% of generator detriment".</p> <p>In Singapore generators less than 10 MW have a different scheduling mechanism that enjoys more freedom. Even an outage of generators with nameplate less than 10 MW is not registered. The same degree of operation freedom should be given to DR resources less than 10 MW. Specifically there should be less penalty for their non-compliance with dispatch order compared to larger resources.</p> <p>The penalty calculation for DR resources above 10 MW and less than 10 MW should be separated. DR resources under 10 MW should have lower penalty. Penalty scheme of DR resources less than 10 MW should be fair compared to generators smaller than 10 MW.</p>	<p>generated, capped at the USEP price cap of \$4,500/MWh. Unlike the generation companies who are paid USEP for their generation, licensed load providers are paid one-third of the additional consumer surplus generated (capped at \$4,500/MWh). The intention of the penalty is to prevent gaming as offers made by licensed load provider can potentially change the USEP and impact market participants. Nevertheless, we recognise that there might be valid reasons where a licensed load provider is unable to comply with the scheduled curtailment. As such, provisions will be in place in the market rules where affected license load provider can appeal to the Market Surveillance and Compliance Panel (MSCP) for the MSCP's consideration to reduce (or waive) the penalty.</p> <p>We disagree with Panasonic's comments and it is unclear why there should be different treatment for demand response with loads that are less than 10 MW. EGs that are less than 10 MW are not required to be dispatched and are not able to influence market prices through offers into the market. This is unlike load providers who have the ability to influence prices through the demand-side bidding process. As such, the treatment of load reduction should be similar to dispatchable generation</p>
<p>PacificLight Power</p> <p>We would request that the EMA clarify the proposed penalty regime in those</p>	<p>In the event that licensed load provider is partially compliant with their</p>

Comments/Feedback	EMA's Response
<p>instances where a load provider curtails load but not up to the amount that was dispatched. It is not clear to GMR if the party would be penalised partially or fully under this scenario.</p>	<p>dispatch schedule, it is deemed to be non-compliant and will be subject to the full penalty. This is incorporated in Section 5 of the EMA's Final Determination Paper.</p>
<p>Kiwi Power</p> <p>Further, we would like to note that Demand Response is not one single resource (as is a power plant), but is comprised of multiple end user consumers. This means that Demand Response may be more reliable, particularly as delivering at least some portion of the expected capacity. A power station may either be able to run or not (binary), but a portfolio of Demand Response resources is likely be able to at least partially deliver, even if one part of the aggregation fails to deliver. As such, we believe it is crucial the Demand Response be paid for being partially compliant (4.2.14.). Of course, a penal mechanism should be instituted for failures, particularly repeated failures, but the premise still holds that Demand Response that has delivered some of its obligation should be rewarded for what it has delivered.</p> <p>Also significant is the risk of penalties, and who will be expected to take on these penalties. It is not clear whether penalties are to be borne by the customers or the aggregator under this design. We would recommend that the penalties as well as the payments should accrue directly to the aggregator, and the aggregator should be able to negotiate its own commercial arrangements with end users, provided that it is compliant with the code of conduct.</p> <p>In either case, it is very important to ensure that penalties are not punitive in nature. That is, Demand Response should not be subject to penalties for a particular event that could be greater than what Demand Response may earn for participation in that single event (4.2.26.).</p>	<p>The "self-declared" baseline approach enables the licensed load providers to use their preferred methodology in estimating their baseline and adjust their bids based on commercial considerations, when bidding into the market. This provides the licensed load provider greater flexibility in managing their load by bidding in only the load that can be curtailed during specific periods. As the licensed load provider only needs to bid in the load it is confident in delivering, and taking into consideration that the wholesale prices are set based on the offers in Singapore's ex-ante market pricing (with the assumption that all market participants comply with their dispatch orders), the EMA is of the view that partial compliance will be deemed to be non-complaint and subjected to the full penalty. The EMA will however provide a 5% tolerance threshold, i.e. licensed load providers who are compliant for at least 95% of the dispatch schedule will not be penalised.</p> <p>As indicated in 4.2.26 of the Consultation Paper, the penalties are borne by the licensed load providers, which can be aggregators or consumers who are directly participating in the programme. We agree with Kiwi Power and it is our intention to allow the licensed load provider to negotiate its own commercial arrangements, for both the benefits and penalties, with end consumers if the licensed load provider is participating in the programme on behalf of its consumers.</p> <p>We agree with Kiwi Power. The level of penalty commensurates with the potential payouts to the licensed load providers, i.e. one-third of any additional consumer surplus demonstrated to be generated, capped at \$4,500/MWh. This means that the level of penalty would not be greater than what the</p>

Comments/Feedback	EMA's Response
	licensed load providers would have earned if it has delivered the scheduled curtailment load during the period of dispatch.
Eligibility of Load	
<p>Kiwi Power</p> <p>Aggregators typically sign up customers of all sizes in order to build a large portfolio that meets the deminimus requirements of the system operator. The paper seems to suggest that customers who sign up to the scheme must have a minimum demand of 100 kW (4.1.2.), and it is not clear whether this refers to the minimum size of the individual customer or the size of the portfolio that may be constructed by the aggregator. Further, there is mention of a limit of 10 aggregator portfolios, without a supporting rationale for this.</p>	<p>The minimum 0.1MW for each tranche of load reduction refers to the minimum amount of load reductions that needs to be offered by load providers at each facility. As indicated in 4.1.2 of the EMA's Consultation Paper, this is the same as current arrangements for the IL scheme and load reduction smaller than this threshold is unlikely to have material impact in the wholesale electricity market.</p> <p>Licensed load provider will be allowed to aggregate up to 10 tranches of price-quantity pairs tranches in a single bid. This also follows the current arrangement (of up to 10 tranches of price-quantity pairs) for each generation unit offering into the wholesale electricity market. The rationale is to align the bidding tranches of licensed load provider to that of the generation companies. For clarity, there is no limit to the number of customer sites a licensed load provider can aggregate on behalf of end-consumers.</p>
<p>Pwee Foundation</p> <p>In the implementation of such a scheme, would the Authority consider allowing the formation of consumer associations or bodies which represent consumers in the submission of demand bidding? Companies may be formed in which average consumers may join and for a nominal fee participate in bulk purchases of electricity and then enjoy any cost savings that come with the exercise. Businesses may also do the same and commercial associations may form their own bodies to bid for such bulk purchases. These middlemen or brokers can be incentivised on the basis that the cheaper the electricity that they can obtain for their customers, the more they get paid.</p>	<p>Similar to the current IL scheme, the Demand Response programme is open for contestable consumers to participate either directly as a Direct Market Participant or through market participants such as retailers or licensed load providers. All load providers participating in the programme will be required to apply for a new class of license.</p>

Comments/Feedback	EMA's Response
Class of Licensed Load Providers	
<p>CPvT Energy Asia As Singapore Energy Market is 30 minutes time market, payment should be calculated based on the actual consumption against the baseline for each time block. There should not be any condition as stipulated in section 5.3.1 as in case customer delays the load curtailment by say 10 minute, it will automatically reduce the overall kWh reduction for the time block due to delay in action, for which penalty mechanism has been proposed. This will result in two-time penalty to the participating customer. Moreover all the participating customers may not have Building Management System (BMS) and manually reducing the load may take some time.</p> <p>EnerNoc The proposed mechanism does not allow for participation by demand-side resources which take more than 10 minutes to respond.</p> <p>We understand that this programme is intended to involve demand-side resources in price discovery, so as to achieve a more efficient supply-demand balance. It is not an ancillary service programme seeking to solve a particular technical issue requiring fast response. As such, the requirement for sub-10-minute response is unwarranted. It would greatly limit participation, and significantly reduce the potential economic benefit to Singapore from the programme.</p> <p>To find the optimal balance of supply and demand during peak periods involves comparing the offers from peaking generation and from demand-side resources to find the lowest cost combination.</p> <p>Peaking generation is not required to respond within 10 minutes. Instead, it is set a target to reach by the end of the 30 minute dispatch interval, subject to any maximum ramp rates declared by the generator.</p>	<p>The EMA has further reviewed the class of licensed load providers. The classification of load providers into Classes A and B will no longer be required. Instead, load providers will have to submit linear ramp rates of the load facility/block during their registration for the MCE to generate the least-cost solution.</p> <p>The ramp rates serve several purposes: first as an input for the MCE for the purpose of producing the dispatch orders based on the co-optimisation principle and second as an input for verifications checks for compliance. The EMA notes that some load may require a longer response time. Therefore, the replacement of load classification with ramp rates will increase the amount of load that can potentially participate in the Demand Response programme. Furthermore, the inclusion of ramp rates in the MCE will allow a more accurate least-cost solution to be generated for dispatch in each period.</p>

Comments/Feedback	EMA's Response
<p>It is not clear why this unequal treatment is thought necessary. The consultation paper indicates that it is due to “system security considerations”, but does not explain why those same considerations do not apply to generators. The consultant’s report suggests that it is due to unspecified “potential gaming issues”. We believe that any gaming issues that might arise could be avoided by the use of a different baseline methodology.</p> <p>Response time is one of the most important parameters of a demand response programme. It has a major impact both on cost and on the breadth of potential participation. If a long notice period is given (e.g. 2-4 hours), then almost any industry can participate, and high levels of demand response penetration can be achieved – e.g. over 6% of system peak in PJM, NYISO, ISO-NE, and the Western Australian WEM. As the notice period is reduced, fewer industries, and fewer specific loads within those industries, are able to participate. This is typically because there is insufficient time for an orderly shut-down, or the modifications to control systems necessary to achieve a fast shutdown without causing damage are prohibitively expensive.</p> <p>The market in Texas provides evidence of this. From its introduction in 2008 through to July 2012, the Emergency Interruptible Load Service (now known as the Emergency Response Service) required a 10 minute response. The level of participation stagnated at around 0.6% of system peak – much lower than the efficient levels found in markets which allow longer lead times. In July 2012, ERCOT began to allow participation with a 30 minute response time. This immediately stimulated growth, mostly driven by new customers who were previously unable to participate. This growth is not yet showing any sign of plateauing.</p> <p>Based on our experience with these and other markets, we would summarise the expected effect of response time requirements on potential demand response penetration as follows:</p>	

Comments/Feedback					EMA's Response
Response time (minutes)	10	30	60	120	
<hr/>					
Typical eventual penetration, as	0.6%	2%	4%	6%	
proportion of system peak					
NEMS equivalent MW	39 MW	130 MW	260 MW	390 MW	
<hr/>					
<p>It is worth noting that the Singaporean contingency reserves market also requires a 10 minute response. Participation in that market is arguably less complex and more rewarding than in the proposed programme. However, we understand that, despite the programme being quite mature, the participation by demand-side resources has remained at a very low level. There is no reason to expect an energy market programme requiring 10 minute response to be any more popular than this ancillary services one.</p>					
<p>Kiwi Power</p> <p>The consultation document refers to a response period of 10 minutes (5.3.1.). While we understand that this is what is currently done in the existing IL programme, this is generally a very short response period for Demand Response. While there will undoubtedly be some Demand Response that will come forward and be able to take part in a program with such a short response time, this will effectively lock out a significant portion of Demand Response that will not be able to take action in this short window. Many programs in which Demand Response participates provides options for participation, recognising that different types of resources are able to benefit the system. For example, PJM in the US has had 10 minute response times and 30 minute response time options. In New York, the System Operator provides a notification 24 hours in advance of the likelihood of Demand Response dispatch, with an actual notification sent 2 hours in advance. In the</p>					

Comments/Feedback	EMA's Response
<p>UK, Demand Response can offer response times into the Short Term Operating Reserves market between 4 hours and 20 minutes, however, response times of below 20 minutes are valued significantly higher than those than are unable to respond in 20 minutes or less.</p> <p>EnerNoc As well as the prohibition of slower-than-10-minute resources, the treatment of 5-10 minute resources is troubling. It is proposed that their payments should be reduced by 25% compared to sub-5-minute resources. This seems to be entirely arbitrary. The consultant's report suggests that it is due to impacts on frequency regulation, but provides no economic justification for the reduced payments. Unless we have misunderstood the normal operation of the market, generators that take more than 5 minutes to respond (which would have the same impact on frequency regulation) do not have their payments arbitrarily scaled down.</p> <p>If payments to more slowly responding resources do need to be scaled down, this should clearly only apply to the first interval of any dispatch: in subsequent consecutive intervals, no ramping takes place.</p> <p>Panasonic Corporation In "IL" which is specifically for system security, 10 minute ramp rate is accepted and paid in full, however new DR is in energy market and not for the security, so 10 minute rate should be acceptable for full payment. Different payment due to ramp rate in reserve DR is acceptable, but not for energy market DR. For loads with 10 minute ramp rate also 100% of payment be considered.</p>	
Metering Requirements	
<p>CPvT Energy Asia The Licensed Load Providers (LLPs), the shadow meters and the</p>	<p>The EMA agrees with CPvT and have further reviewed the metering</p>

Comments/Feedback	EMA's Response
<p>communication infrastructure that they would use should have a meter data-sampling rate of not more than 5 minutes. Any higher frequency of meter data sampling would only increase the data base requirement and communication bandwidth requirement. Based on the actual implementation experience by CPvT it is very well established that the 5 minutes meter data sampling rate and use of the existing GSM communication network does provide a robust Measurement and Verification basis.</p> <p>As commented under Clause 4.1.9 above, CPvT proposes that a % deviation shall be allowed from a contracted capacity level for M&V purpose as well which shall be established through an agreed upon baseline methodology. It should be capped at 20% based on the FERC for both down side and upside as prediction of load is very difficult and can be assumed only.</p>	<p>requirement. Further assessment indicated that 5 minute sampling is adequate for PSO to monitor system operation and stability for the Demand Response programme. This is also aligned with Demand Response programme in other jurisdictions. This is incorporated in the EMA's Final Determination Paper.</p> <p>As the baseline methodology for the Demand Response programme is fundamentally different from that of FERC, CPvT's proposed 20% deviation is inadequate for compliance purpose and will increase the risk of gaming. The EMA will instead allow 5% tolerance threshold, i.e. licensed load providers who are compliant for at least 95% of the dispatch schedule will not be penalised. As the baseline is a "self-declared" one, licensed load providers should factor the potential deviation in the load reduction when they bid into the wholesale electricity market. This is to ensure that the curtailment of the loads offered under the programme is an explicit action taken by the licensed load providers, which would not have otherwise occurred under "business-as-usual" circumstances.</p>
<p>Panasonic Corporation</p> <p>DR load/s participation per site assumes an average usage of 0.1 MW consists of an aggregate of multiple loads.</p> <p>Could an aggregated load, comprised of plural number of loads, be permitted? Eg. One Meter for a building. Loads can be curtailed from a number of loads within the building. Some of these loads may be from non-contestable consumer.</p> <p>Rules should motivate aggregators and assets registration as Demand Response Aggregator should be reasonably simple and practical instead of registering each and every DR assets, just the main revenue meter should be registered.</p>	<p>Licensed load provider will be able to aggregate loads from more than one facility or site, subject to the requirement that each registered load facility is able to provide load reduction of at least 0.1MW. Licensed load providers aggregating loads from other load providers have to put in place the required metering infrastructure for each load facility to ensure performance of the loads that they are aggregating. As per the IL scheme arrangement, registration of all load facilities or assets, regardless of whether they will be aggregated or not, is required for the monitoring of system operation and stability by the PSO.</p> <p>We agree with Panasonic and have further reviewed the metering requirement. Further assessment indicated that 5 minute sampling is</p>

Comments/Feedback	EMA's Response
<p>Just the main revenue meter should be registered and not each and every DR asset of an aggregator.</p> <p>Assumption large load and based on current IL metering. IL has provided for "Reliability Market" whilst DR is targeted at "Energy Market". Note: High Precision is required in "Reliability Market". There's no need of very severe and short term monitoring in "DR for Energy Market", 5 min interval is sufficient for metering instead of 30 Sec meant for IL. Moreover, current IES Smart Meter is capable to meter 5 mins interval at the most precise measurement.</p>	<p>adequate for PSO to monitor system operation and stability for the demand response programme. This is incorporated in the EMA's Final Determination Paper.</p>
Retailers' Code of Conduct	
<p>PacificLight Power</p> <p>The contestable electricity market in Singapore is highly competitive and retailers, licensed load providers and consumers alike operating in a business environment. In a competitive market, all commercial arrangements are on a "willing-buyer-willing-seller" basis. All market participants, including consumers, have to manage risks as part of their business.</p> <p>We do not therefore consider that a change to the Retailer Code of Conduct is necessary.</p> <p>If changes are made then a similar compliance obligation should also be passed to licensed load providers to ensure that a consistent approach is applied across the market. If argued in the same light, the licensed load providers can also discourage or prohibit consumers from signing up retail contracts with the retailers.</p> <p>Retailers as well as Wholesalers will, in time, devise pricing products that will provide product differentiation while managing volume risk (eg. Fixed Volume</p>	<p>The EMA disagrees with PacificLight Power's comments. As indicated in 5.6 of the EMA's Consultation Paper, given that there is a potential conflict of commercial incentives between the licensed load provides and electricity retailers, there is a strong possibility that electricity retailers may through representations to the consumers discourage or prohibit consumers from participating in the demand response programme, since electricity retailers typically earn more through the higher sales of electricity to consumers. Our assessment is that the change in Retailer's Code of Conduct is necessary to create a competitive electricity market and to promote greater variety of choices among the contestable consumers for related electricity services, given the introduction of the Demand Response programme.</p> <p>On the other hand, because the proposed design of the Demand Response programme allows participating contestable consumers to sign contracts with licensed load providers on top of their retail contracts, it is not clear that licensed load providers have the incentives to discourage or prohibit consumers from signing up retail contracts with the retailers, since all</p>

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<p>Fixed Price). Such approach and plans should not be regarded as a way to discourage the demand response programme.</p> <p>Senoko Energy The EMA has proposed to amend the Retailer Code of Conduct to ensure that retailers do not discourage or prohibit consumers from participating in demand response and energy efficiency initiatives. Senoko believes that the expression of this new requirement is too broad and hence unworkable. To prudently manage volume and other commercial risks, retailers may decline to offer certain contract structures or at the very least price in the value of the risk or optionalities given to the customer. Not doing so would be uncommercial. Therefore, changes to the Code should be carefully thought through and while requiring that retailers offer fair and reasonable terms, not to go so far as to prevent retailers from managing their risks in a commercial manner.</p> <p>The EMA appears concerned that retailers may misrepresent the DR scheme when explaining its structure to consumers. The EMA as the promoter of the DR scheme will have to take a lead role in communicating any new arrangement to consumers. The simplest way to avoid any miscommunication would be for the DR subsidy to be recovered as a third party charge from all customers, in much the same way that metering and transmission charges are recovered.</p> <p>YTL Power Seraya What exactly does this prohibit? Such modification can be ambiguous and too wide. Please provide example of situation that a Retailer is deemed to have discourage or prohibited contestable customers from participating in demand response or energy efficiency.</p>	<p>contestable consumers will have to source for a supplier for their electricity purchases. Hence, the EMA does not see the need to require licensed load providers to be under similar compliance obligation.</p> <p>We note that the provision of product differentiation through fixed volume fixed price contracts is in line with the longer term objective of a passive demand response programme. Retailers have the flexibility to come up with mutually agreeable commercial arrangements with end consumers.</p> <p>As there is a potential conflict of commercial incentive between the licensed load providers and electricity retailers, we recognise the possibility that electricity retailers may through representation to the consumers discourage or prohibit consumers from participating in the Demand Response programme. As mentioned in 4.2.25 of the Consultation Paper, the EMA takes a strong view on how retailers communicate the implementation of the demand response programme to consumers and hence proposes the change in the Code of Conduct. Retailers are required to avoid misrepresentation when presenting or explaining the programme to their consumers, particularly on the benefits to consumers and the corresponding charging mechanism.</p> <p>The demand response payment will be collected through the Hourly Energy Uplift Charge (HUEC) to market participants buying on behalf of contestable consumer loads. Market participants may choose to pass on the HEUC component to their consumers or to absorb the charges, similar to how retailers may currently choose to pass on vesting credits or debits to their consumers or absorb these charges. Such option provides market participants the flexibility in designing contracts for demand response participation, should it be in market participants' commercial interest to do so.</p> <p>As explained above, the modification of Retailer's Code of Conduct is to ensure that consumers are not denied participation for demand response due to their retail contract arrangement. An example of how a retailer is deemed to have prohibited contestable consumers from participating in the Demand</p>

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	Response programme is to have a contractual clause which explicitly prohibits that consumer from entering into a separate contractual agreement with another licensed load provider.
<p>Kiwi Power We support the the proposed modification to the Code of Conduct for Retail Electricity Licensees (5.6.).</p>	We note Kiwi's support for the change in the Retailer's Code of Conduct.
<p>Viridity Energy EMA has proposed an amendment to the Code of Conduct for Retail Electricity Licensees (Code) prohibiting retailers from 'discouraging or prohibiting consumers from participation in demand response-related or energy efficiency-related initiatives.' The proposed addition to the Code is entirely reasonable but the proposed customer baseline will have exactly the effect that the Code is designed to prevent: The proposed CBL places a burden (to consumer) on customers who wish to participate in demand response related initiatives that is not placed on Non-participating customers. Rational customers will choose to opt out of the programme given this situation.</p>	We note Viridity Energy's support for the change in the Retailer's Code of Conduct. It is unclear why the proposed consumer baseline places a burden on consumers who wish to participate in demand response related initiatives.
Others	
<p>PacificLight Power We would request the EMA to estimate the implementation costs of establishing the DR program and confirm how it intends it to be recovered.</p> <p>We would request that the EMA clarify whether loads covered under the Forward Sales Contract ("FSC") are treated as Vested Load and therefore will</p>	The indicative costs provided in the Consultant's report appended in the EMA's Consultation Paper are based on the experience of other markets that have undertaken such reforms. Upon the release of the EMA's Final Determination paper, the market operator, EMC, will proceed to undertake the implementation and the costs will be recovered through the EMC fees, similar to how other implementation costs in the market are recovered.

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<p>not be considered in the incentive payment calculation.</p>	<p>The EMA agrees with PacificLight Power's comments. As the FSCs are regulated contracts, they will not be factored in computation of the payment to licensed load providers based on the additional consumer surplus.</p>
<p>Independent Consultants</p> <p>Consumers require some time to adjust to changes in spot prices, therefore the market systems should be modified so that they provides actionable half-hour prices for at least a few market intervals forward of delivery. ERCOT in the US has been examining the possibility of changing its market systems in this way. Cazalet and Ellis proposed a more expansive version of this idea for California's electricity market that called for running multiple forward intervals in parallel over different time scales.⁵</p> <p>From an operational perspective, tracking load changes for customers that sign up with one provider for electricity and another for demand response introduces substantial additional complexity and cost, particularly if there is no real-time metering.</p>	<p>It is unclear (1) why consumers require time to adjust to changes in spot prices when the spot price is likely to trend downwards for the benefit of contestable consumers, and (2) how the proposed actionable half-hour prices for market intervals forward of delivery can be introduced to the NEMS for the benefit for consumers and the market. In fact, in an ex ante market like Singapore's, which differs fundamentally from day-ahead markets prevalent in the United States, consumers adjusting their consumptions in response to the real-time prices will not have an impact on the wholesale prices in those same periods, unless a demand-side bidding mechanism like what is proposed in the Demand Response programme is established</p> <p>The EMA notes the comments on the infrastructure required and would like to highlight that the Demand Response programme requires real time metering as per the current arrangement for the IL scheme. As indicated in Section 5.4 of the EMA's Final Determination Paper, for licensed load providers aggregating loads from other load providers, they will be required to put in the required metering infrastructure on their own to ensure performance of the loads that they are aggregating on behalf of.</p>
<p>Kiwi Power</p> <p>We support the establishment of a Demand Response programme for Singapore. We understand that this Demand Response programme is envisioned to be a long term feature of the market rather than a pilot</p>	<p>The EMA will review the programme alongside other initiatives during the three year period as part of our normal processes. The first holistic review will however be conducted at the end of the three year period to allow time for the</p>

⁵ See "Simplified Bidding for WEPEX", Cazalet, E. and Jack Ellis, 1996. A copy can be found at http://www.cazalet.com/images/Simplified_Bidding_for_WEPEX.pdf

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<p>programme. Therefore, while we agree that a 3 year minimum run of the programme is a good start, we believe that the programme should undergo regular and period review, rather than wait for a 3 year anniversary. Further, we believe that any review should be conducted through a formal process, through existing or new workgroups or governance panel so that changes are managed and implemented with transparency to the market.</p> <p>We are encouraged by the positive steps and the work that the EMA has undertaken to build a robust and sustainable program for Demand Response participation. We look forward to the next iteration of the market design, which we hope will allow for maximum benefits for all stakeholders to be realized from Demand Response participation in this market.</p>	<p>market to stabilise before considering further steps. The EMA however retains the right to review any aspect of the Demand Response programme within the 3 year period.</p>
<p>Panasonic Corporation</p> <p>It is recommended not to ignore the residential, small commercial and industrial loads (non-contestable loads) in new DR market. The road map and timing of integrating small to medium loads into new DR market is requested</p> <p>The price information which will be provided to market participants is unclear. It should be described that three prices (USEP without curtailment, USEP with curtailment and payment to licensed load provider based on consumer surplus) will be provided to market participants in the outlook-scenarios and pre-dispatch /short term schedules, not only real-time dispatch.</p> <p>Pwee Foundation</p> <p>In general, there should be criteria and metrics (eg electricity cost per kWh, average load per consumer household, load volatility, peak to valley load, % outage, etc) that track the consequence and result from this implementation so that tweaks to the system can be managed in a disciplined approach. Does this result in cheaper electricity for the average household consumer? Are the educational training helpful in reducing the rate of required investment from</p>	<p>We would like to highlight that the demand response programme is complementary to the gradual liberalisation of the electricity retail market, where non-residential consumers with an average monthly consumption above 10,000kWh can choose to be contestable. There are also plans to further expand retail contestability threshold to 8,000kWh (in April 2014) and 4,000kWh (in October 2014).</p> <p>The EMA will consider the relevant information to be provided to the market participants.</p> <p>The EMA is looking at the progressive liberalisation of the retail market, including how to allow residential consumers to be contestable. The benefit-sharing mechanism should benefit all contestable consumers.</p> <p>The design of the Demand Response programme is such that licensed load providers can aggregate demand on behalf of various groups of consumers.</p>

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<p>the generators? Are they able to sustain their profitability, while making electricity cheaper for consumers?</p> <p>In the implementation of demand side bidding, has the Authority considered allowing average domestic consumers only to band together to form their own associations and bypass the retailers and deal directly with the electricity generators? Retailers being profit oriented have no incentive to sell electricity to consumers at low prices.</p>	
<p>Petrolchemical Corporation of Singapore (PCS)</p> <p>As this scheme works basis on varying demand particularly during peak hours, it is unlikely to be useful for our 24/7 process plants operation mode. Nevertheless, we hope EMA can look at other demand response opportunities that could help such 24/7 process operation plants to benefit from lower electricity prices during, say scheduled maintenance shut down periods.</p>	<p>We encourage PCS to work with the retailers and/or licensed load providers on retail (and demand response) packages that will most appropriately fit the needs of PCS and at the same time achieve lower energy costs. The Demand Response programme, when implemented, should result in benefits for contestable consumers.</p>
<p>Senoko Energy</p> <p>From an effectiveness perspective, we consider that the proposed scheme is only likely to appeal to a very narrow range of potential DR providers for a variety of reasons. To participate in the proposed scheme effectively, customers will need to be able to (a) accurately forecast their demand needs and (b) accurately control their consumption in real-time. There are very few customers that have these attributes without significant investment in systems and processes and many others that may be prepared to manage their consumption but not in the timeframe of real-time dispatch. Consequently, the proposal imposes costs and creates a subsidy that is targeted to only part of the possible DR market and as noted is not expected to be effective in its target segment in any event.</p> <p>A critical flaw is that for the DR provider to receive the subsidy payment the</p>	<p>The take-up of the Demand Response programme will need to be market-driven. The EMA had received feedback from potential licensed load providers on their interests to participate in the Demand Response programme. As participation in the Demand Response programme is entirely based on commercial decisions, the licensed load providers will have to make their assessment on whether it is commercially viable to participate in the programme, after factoring in the relevant changes in potential load providers' systems and processes, e.g. required metering infrastructure, for their participation in the programme.</p> <p>We disagree with Senoko Energy's comments and are of the view that the dispatch of licensed load providers' load is not guaranteed in each period, with or without aggregation. The presence of a dynamic price floor will provide</p>

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<p>quantum of DR available at any particular time would need to be of sufficient size to affect the market price. If not, the DR providers would forego consumption without any offsetting payment. Aggregation may give DR providers more certainty that they will receive a payment before submitting their bids. However, this also creates an incentive for collusion which should be monitored carefully by the EMA. Further, contrary to the normal situation in a market attempting to balance demand and supply, returns incrementally increase with increasing volume, whereas it would be usual for incremental benefits to decrease until finally reaching a breakeven point where there is no further benefit. Thus, the supply-demand characteristic could lead to perverse outcomes.</p> <p>If DR is active in the NEMS, the EMA and EMC need to consider what DR related information needs to be made available to market participants. At a minimum, there needs to be symmetry in information available about both demand and supply side capabilities to ensure a level playing field.</p>	<p>a safeguard against potential gaming, where licensed load provider submits very low price bids to ensure dispatch. Another safeguard is the compliance regime which requires the licensed load providers to fulfill their obligations to the market when dispatched. In any case, the EMA takes a serious view of anti-competitive behavior including collusion and will take firm actions against such offences.</p> <p>The EMA agrees that allowing all participants to have access to the relevant market information is necessary. We will consult the industry in due course on the provision of market information to support both the Demand Response programme and the development of a liquid electricity futures market.</p>
<p>Tuas Power</p> <p>The consultant report expresses the view that the objective of the DR arrangements should be the eventual transition to a situation in which customers enters into CfD contracts, and manage the risk associated with unhedged volumes via demand response. Although this is one contractual approach customers may choose to adopt, it is by no means the only contractual arrangement that should be viewed as appropriate in the Singapore market.</p> <p>It would be important to note that continuing consumers' preference in Singapore for fixed price, variable volume contracts with retailers does not necessarily represent a market failure that needs to be addressed by intervention. Customers may have valid reasons to prefer to continue to have</p>	<p>Fixed price fixed volume (FPFV) contract is just one of the retail contracts that can be offered to consumers. Contestable consumers will ultimately have to decide on the type of electricity procurement mechanism best suits their needs. The Demand Response programme essentially provides another option for contestable consumers to participate in the wholesale market, and does not restrict the options for such consumers, including existing retail arrangements. As participation in the Demand Response programme is entirely based on commercial decisions, the licensed load providers and interested consumers will have to make their assessment on whether it is commercially viable to participate in the programme.</p>

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<p>pool price risk managed on their behalf by retailers, and to pay a premium over the expected wholesale price for this service. For example, given the high component value of fuel in the electricity price in Singapore, entering into a fixed price, fixed volume contract entails taking some speculative position on the movement of fuel prices if off-take volume is uncertain in the first place or assuming the risk on the high level of uncertainty associated with wholesale market exposure which are unique to Singapore like vesting credit/debits.</p> <p>The consultant's view is the development of a demand side bidding regime is a "necessary" development in the Singapore electricity market. However, both retailers and customers today are already able to pursue contractual approaches involving DR under the current Singapore market arrangements. Both customers and retailers can save directly with mutually negotiated DR arrangements without intervention from the market. The limited extent where DR is incorporated into the retail contracts currently is the challenge of getting consumers to reveal the value the customers place on electricity to their retailers. The proposed DR mechanism similarly does not incentivize the customer to do so and does little to address this barrier.</p>	