



*Smart Energy, Sustainable Future*

## **REVIEW OF THE DEMAND RESPONSE PROGRAMME**

### **INFORMATION AND CONSULTATION PAPER**

Closing date for submission of comments and feedback:

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# REVIEW OF THE DEMAND RESPONSE PROGRAMME

## 1. Executive Summary

- 1.1. The Energy Market Authority (“EMA”) is conducting a review of the Demand Response (DR) Programme to determine the effectiveness of the programme since its implementation in 2016. EMA continuously strives to ensure that our programme frameworks remain relevant to facilitate participation by market players and consumers in support of broader demand side management initiatives for Singapore.
- 1.2. From the data gathered, EMA identified the DR price floor as a potential factor that may be affecting programme participation. In that regard, EMA is proposing to conduct two testing regimes to isolate and examine the impact of the price floor, while keeping the other programme mechanisms constant.
- 1.3. Hence this paper aims to:
  - 1.3.1. Inform the industry on the proposed testing regimes and adjustments to the DR programme;
  - 1.3.2. Seek industry views on proposed testing regimes and the regulatory changes required to support its implementation;
  - 1.3.3. Seek industry feedback on proposed enhancements to the Market Rules to facilitate the implementation of the testing regimes; and
  - 1.3.4. Any other suggestions and feedback on the DR programme which can benefit the industry and facilitate participation.

## 2. Background

- 2.1. In 2016, EMA implemented the DR Programme to enhance competition in the National Electricity Market of Singapore (“NEMS”). The DR programme allows consumers to participate in the NEMS through voluntarily reducing electricity demand via demand-side bidding, in exchange for a share in the system-wide benefits as a result of their actions. The DR programme also benefits the energy system as it provides an additional resource to help the system manage demand during peak consumption periods<sup>1</sup>. EMA had also said that a review would be conducted after 3 years upon the implementation of the programme.

## 3. Review of the DR Programme

- 3.1. Participation in the DR programme has been low since its implementation in 2016, with only 2 instances of DR bids being dispatched. This could be attributed to a combination of the current low Uniform Singapore Energy Price (USEP), and the DR price floor that EMA had put in place. Based on data in 2018, only an estimated 2.35% of the total number of periods qualified for DR bids. The low participation has prompted this review of the DR programme, in particular, the anti-gaming mechanisms and current price floor in place.
- 3.2. The DR price floor was introduced as a safeguard to mitigate potential gaming behaviour. It was set at 1.5 times the Balance Vesting Price (BVP)<sup>2</sup> following earlier industry consultation. The price floor was intended to avoid payment to licensed providers for reductions in load which would have occurred in absence of the DR programme or in “business-as-usual” (BAU) conditions. The BVP<sup>3</sup> was also chosen as a reference price, recognising the need for a dynamic price floor that accounted for changing market conditions.
- 3.3. In this review, EMA wishes to introduce two testing regimes namely, (a) varying of price floor levels and (b) adopting data-driven anti-gaming measures for a set

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1

[https://www.ema.gov.sg/cmsmedia/Electricity/Demand\\_Response/Final\\_Determination\\_Demand\\_Response\\_28\\_Oct\\_2013\\_Final.pdf](https://www.ema.gov.sg/cmsmedia/Electricity/Demand_Response/Final_Determination_Demand_Response_28_Oct_2013_Final.pdf)

2

While the BVP has been phased out from 1 July 2019, the Energy Market Company (EMC) will continue to publish the BVP on their website till Q4 2019. The BVP phase out is detailed in “Review of the Vesting Contract Regime Final Determination Paper”, 30 September 2016.

3

The BVP 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.

duration. Impact to the market is likely to be limited due to current low USEP and the low activity and participation<sup>4</sup> in the DR market today.

- 3.4. EMA reserves the right to terminate the proposed testing regimes at EMA's discretion.

For Information: Varying of price floor levels

- 3.5. Analysis to determine the price floor level was conducted by Cybele Capital Limited in 2012 where market conditions differed from today and USEP averaged at \$222.49/MWh. The BVP in 2012 averaged \$214.65/MWh. 2012 also saw the highest average USEP in a decade according to data from 2008 to 2018. In 2018, USEP averaged at \$110.29/MWh, whereas the BVP in 2018 averaged \$162.42/MWh.
- 3.6. Given the relative differences between BVP and USEP across different time periods, EMA is of the view that setting the price floor at 1.5 x BVP was fit-for-purpose back in 2012 when the mechanism was first designed, but may be prohibitive in today's climate. Therefore, EMA intends to implement a testing phase where the price floor is varied under a trial period. Specifically, to set the price floor at 1.3 x BVP for three months. Depending on the interim results from the test phase, including frequency of DR bids and instances of DR dispatch, EMA may decide to implement a second test phase at 1.1 x BVP for three months. The details of the proposed test phases are illustrated in Table 1.
- 3.7. EMA will review the data gathered following the conclusion of the test phases<sup>5</sup>, at which point the price floor will revert to 1.5 x BVP.

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<sup>4</sup> There is currently only one registered DR load capacity of 7.2MW.

<sup>5</sup> Price floor will revert to 1.5 x BVP after test phase I, should EMA decide not to continue with test phase II.

Table 1: Variable Price Floor Test Details

DR Price Floor <sup>6</sup>	Duration <sup>7</sup>	Remarks
<b>1.5 x BVP</b>	Current arrangement	
<b>Testing phase I: 1.3 x BVP</b>	1 January – 31 March 2020	Phase I will last for a period of 3 months
<b>Testing phase II: 1.1 x BVP (to be confirmed)</b>	<i>1 April – 30 June 2020</i>	Decision to implement phase II will be determined by the EMA following the review of the interim results of testing phase I

For Consultation: Adopting data-driven anti-gaming measures

- 3.8. Beyond using price floors, EMA is considering alternative anti-gaming measures in place of the price floor which aim to address the fundamental concern that DR providers could profit from incentive payments by bidding in loads which would have been reduced under BAU conditions. Such providers would be unduly earning revenue from the DR programme, as their load reduction would have happened anyway, instead of being a specific reduction of demand in response to a successfully dispatched DR bid.
- 3.9. EMA notes that one way to detect if DR providers are offering to reduce loads which would have occurred under BAU conditions, would be to selectively choose not to dispatch certain DR bids, and see if such loads chose to reduce demand anyway. Building on this, EMA proposes to implement a “Safeguard Mechanism” which serves as a means to eliminate dispatch certainty. The mechanism operates by **randomly** removing a DR bid during the final Look Ahead Run (LAR) prior to the Dispatch Run (DPR). The aim is to mitigate the submission of false DR bids at very low prices in an attempt to guarantee dispatch and potentially identify dishonest providers.
- 3.10. Notwithstanding the benefits of demand side management, EMA recognises that persistent load curtailment through DR, even during periods of very low USEP, might further depress prices and negatively impact market players. In that regard, during the adoption of the “Safeguard Mechanism”, the price floor will be set at 1 x BVP.

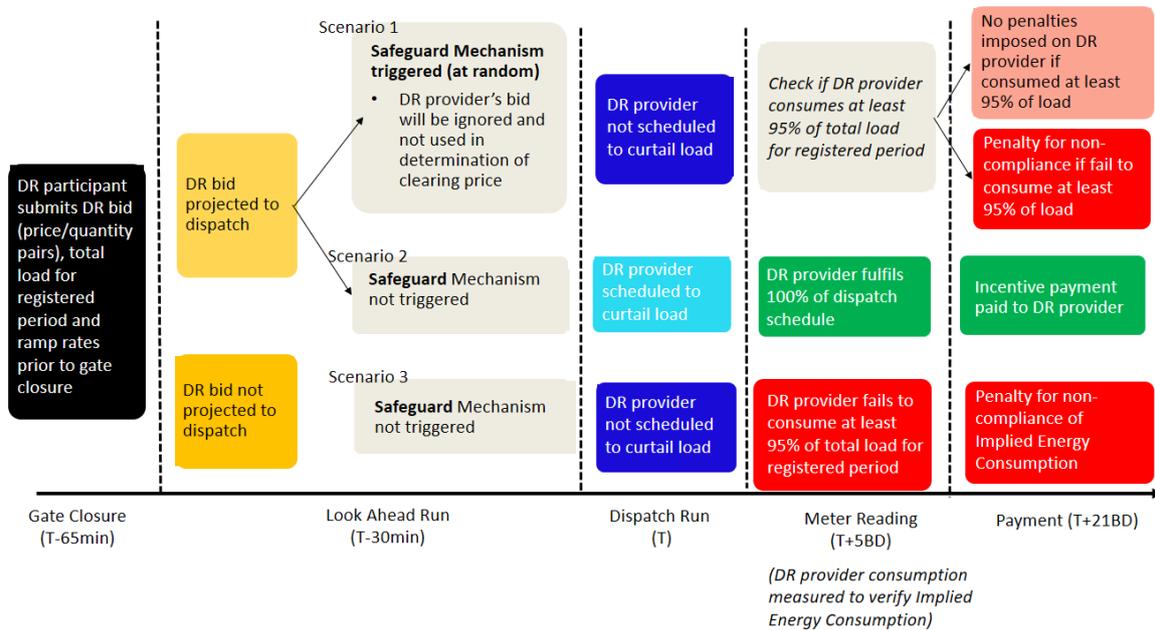
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<sup>6</sup> EMA may choose to use the BVP or an alternative reference price as appropriate.

<sup>7</sup> EMA reserves the right to vary the dates as deemed appropriate.

3.11. An illustration of how the Safeguard Mechanism functions in the MCE in three dispatch scenarios is in Figure 1 below.

**Figure 1: Illustration of Safeguard Mechanism**



3.12. EMA would like to seek industry feedback with regards to an appropriate frequency in terms of the activation of the mechanism. EMA is considering the following options and welcome further suggestions.

- 3.12.1. Option 1: To subject all DR bids submitted to a flat percentage of 10% to be ignored via the mechanism. EMA views this as a reasonable percentage given the current low participation rate in the DR market.
- 3.12.2. Option 2: To take a tiered approach with regards to percentage of submitted DR bids to be ignored via the mechanism. The proposed approach is illustrated in Table 2. The rationale for higher frequency of activation for bids below BVP is also to guard against providers submitting false DR bids at low prices to ensure dispatch.

**Table 2: Frequency of Safeguard Mechanism**

DR bids	Frequency of activation
DR bids at 1 x BVP	30%
DR bids above 1 x BVP	10%

- 3.13. If implemented, EMA will continue to monitor the performance of the DR programme and calibrate the frequency of activation if necessary.
- 3.14. As an additional measure, EMA is also considering to establish a baseline profile for registered loads based on historical non-DR metered loads. Submitted bids that exhibit a significant reduction from baseline consumption – curtailment exceeding 50% of demand for the period - would be subject to higher incidence of the Safeguard Mechanism.
- 3.15. This use of baseline methodology in this instance is not to determine the incentive payment for DR bids, but to complement the Safeguard Mechanism. EMA stands by our earlier view<sup>8</sup> that use of historical baselines to reward licensed load providers may be susceptible to gaming behaviour.
- 3.16. EMA would like to seek industry views on the Safeguard Mechanism, as well as suggestions for alternative anti-gaming mechanisms in place of a price floor.

#### **4. Testing of Proposed Anti-Gaming Measures**

##### Testing of Different Price Floor Levels

- 4.1. As detailed in section 3, EMA intends to conduct a three-month testing phase setting the DR price floor at 1.3 x BVP, with the option to conduct a second three-month testing phase with the DR price floor at 1.1 x BVP. The 1.3 x BVP test phase will commence on 1 January till 31 March 2020.
- 4.2. During the testing phases, the other regulatory and licensing frameworks for the DR programme remains unchanged. DR providers will need to go through the necessary licensing and market registration with EMC and comply with the market rules, as well as obtain the necessary approvals from the Power System Operator (“PSO”). The demand side bidding, scheduling and dispatch process remains the same with the exception of the intervention by the Safeguard Mechanism. DR providers would also have to adhere to the existing compliance mechanisms and verification checks, and be penalised accordingly if compliance requirements are not met.

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<sup>8</sup> Section 4.4.5, Implementing Demand Response in the National Electricity Market of Singapore – Final Determination Paper, 2013

### Trial of Safeguard Mechanism under a Regulatory Sandbox

- 4.3. In 2017, EMA launched the Regulation Sandbox framework to provide a safe space where existing regulations could be tested so that promising innovations can be tested in the market and assessed for feasibility for wider adoption in Singapore's energy market.
- 4.4. The Safeguard Mechanism is one such innovation which EMA is considering to complement the DR price floor as an anti-gaming measure. Given the mechanism is a novel idea and effectiveness has yet to be proven under market conditions, the Safeguard Mechanism should first be tested under a regulatory sandbox and its operational feasibility and impact measured in a controlled environment.
- 4.5. To examine the effectiveness of the Safeguard Mechanism, EMA will assess various areas such as: the participation rates by DR providers (frequency of bids submitted, increase in registered DR load capacity etc.), occurrences of DR dispatch and impact on USEP.
- 4.6. Under the sandbox, the other regulatory and licensing frameworks for the DR programme remains unchanged. DR providers will need to go through the necessary licensing and market registration with EMC and comply with the market rules, as well as obtain the necessary approvals from the PSO. The demand side bidding, scheduling and dispatch process remains the same with the exception of the intervention by the Safeguard Mechanism. DR providers would also have to adhere to the existing compliance mechanisms and verification checks, and be penalised accordingly if compliance requirements are not met.
- 4.7. EMA proposes to launch this sandbox for a period of six months to gather data and examine the market impact. EMA is open to feedback on the proposed timeframe. We also seek interest from the industry to participate in this sandbox.

### For Consultation: Changes to the Market Rules to Facilitate Testing Regimes

- 4.8. EMA is of the view that to facilitate the above testing regimes, the following changes to the market rules will be necessary and welcomes industry views on the proposals:

- 4.8.1. Currently, the DR price floor is stated in the Market Rules as 1.5 x BVP.<sup>9</sup> To facilitate the testing regime and to streamline potential enhancements to the DR programme as market circumstances evolve, EMA is considering to redefine this to an appropriate reference price and price floor as determined by EMA. This is similar to the treatment of the Risk Adjustment Factor (RAF) in the MCE. EMA will give sufficient notice to the industry prior to changing such parameters.
- 4.8.2. To facilitate the testing of the Safeguard Mechanism as well as streamline future sandbox applications, which may involve market rule changes, EMA is considering introducing a new provision that exempts EMC/MP from compliance with the market rule(s), to the extent that the EMC/MP is directed by EMA, under an approved regulatory sandbox project.

## 5. Indicative Review Timeline

- 5.1. Table 3 summarises the indicative timeline of EMA's consultation for the review of the DR programme.

Table 3: Indicative Timeline<sup>10</sup>

<b>Milestone</b>	<b>Date</b>
Closing date for submission of comments and feedback	9 October 2019
1st phase of variable price floor test (1.3 x BVP)	<i>1 January – 31 March 2020</i>
Final determination on anti-gaming measures	January 2020
<i>2nd phase of variable price floor test (1.1 x BVP) (implementation subject to results from previous test)</i>	<i>1 April – 30 June 2020</i>
<i>Safeguard Mechanism regulatory sandbox (subject to consultation outcomes)</i>	<i>1 July – 31 December 2020</i>
<i>Results from the regulatory sandbox</i>	<i>1H-2021</i>

<sup>9</sup> Market Rules Chapter 6, Appendix J (Price Limits and Constraint Violation Penalties), J.1.7 Price bound values as REBPriceMin<sup>9</sup> = 1.5 x BVP

<sup>10</sup> EMA reserves the right to vary the dates as deemed appropriate.

## 6. Summary

- 6.1. The EMA is conducting a review of the DR programme with a focus on its anti-gaming measures in view of the current low participation.
- 6.2. This paper puts forward the suggested approach in terms of measures to facilitate participation in the DR programme with the implementation of a lower DR price floor at 1.3 x BVP.
- 6.3. This paper also seeks views/comments from the industry, including but not limited to the following:
  - 6.3.1. The proposed Safeguard Mechanism and its operational viability;
  - 6.3.2. The appropriate frequency for the Safeguard Mechanism along with referencing of historical baseline consumption to determine incidence of activation;
  - 6.3.3. Seek interest from the industry to participate in a regulatory sandbox to test the efficacy of the Safeguard Mechanism;
  - 6.3.4. The proposed approach to add new provision in Market Rules to facilitate the implementation of sandbox projects;
  - 6.3.5. The proposed approach on the specification of the DR price floor within the Market Rules;
  - 6.3.6. Feedback on the compliance mechanisms of the DR programme; and;
  - 6.3.7. Any other suggestions and feedback on the DR programme which can benefit the industry and facilitate participation.

## REQUEST FOR COMMENTS AND FEEDBACK

The EMA invites comments and feedback to Sections 3 to 5 of the consultation paper.

Please submit your written response via [go.gov.sg/dr-review](https://go.gov.sg/dr-review) or through the QR code link appended below by **9 October 2019**. Anonymous submissions will not be considered.



For clarifications, please contact EMA Policy and Planning Department (PPD) at [ema\\_policy@ema.gov.sg](mailto:ema_policy@ema.gov.sg).

The EMA reserves the right to make public all or parts of any written submissions made in response to this consultation paper and to disclose the identity of the source. Any part of the submission, which is considered by respondents to be confidential, should be clearly marked. EMA will take it into account regarding the disclosure of the information submitted. EMA may also approach the respondents for clarification while the consultation is ongoing.

~ End ~