



OUTCOMES OF THE DEMAND RESPONSE AND INTERRUPTIBLE LOAD REGULATORY SANDBOX AND PROPOSED ENHANCEMENTS TO THE PROGRAMMES

CONSULTATION PAPER

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1 Background

- 1.1 The Demand Response (“DR”) and Interruptible Load (“IL”) programmes increase system flexibility and enhance grid resilience. In January 2023, the Energy Market Authority (“EMA”) launched a two-year regulatory sandbox to enhance the DR and IL programmes and encourage consumer participation (see [Table 1](#)). The regulatory sandbox will end on 31 December 2024.

Table 1.

DR Sandbox parameters
<ol style="list-style-type: none">1. The threshold for non-compliance was lowered from 95% to 80% for both delivery and baseline load consumption deviations.2. The penalty regime is revised such that no penalties are incurred for the first two instances of under-delivery. Upon the fifth instance of under-delivery, the DR participant will be administratively suspended from the sandbox.
IL Sandbox parameters
<ol style="list-style-type: none">1. The maximum duration of an IL activation is limited to no more than four hours. Previously, no such limit was stipulated.2. The revised penalty regime for the DR sandbox will also apply to IL i.e., the clawback of IL revenue would only apply from the third instance of under-delivery onwards.

2 Outcomes of the Regulatory Sandbox

- 2.1 Since the announcement of the regulatory sandbox, the number of DR facilities has doubled and the DR registered capacity increased from 46MW to 84MW.¹ We have seen significant benefits between 2023 and the first half of 2024, when DR activations allowed buyers of energy in the Singapore Wholesale Electricity Market to pay around \$700 million less due to reduced wholesale electricity prices. The instances of non-compliance compared to the total number of scheduled DR bids during the sandbox period has also remained low at about 1%.

¹ See <https://www.ema.gov.sg/our-energy-story/energy-demand/non-residential-consumers> for more information.

- 2.2 On the other hand, interest in the IL programme did not see a significant improvement despite the revised sandbox parameters. The IL capacity only increased from 24.9MW to 28.7MW.

3 Regulatory Enhancements to DR Programme Post-Sandbox

- 3.1 The results from the sandbox showed that the DR scheme could thrive under the revised parameters while not impacting system stability. Given its benefits to the system, EMA aims to increase DR participation by providing certainty on the sandbox DR parameters when the sandbox ends. The proposed regulatory enhancements aim to balance the considerations of addressing key operational challenges faced by DR participants, promoting active participation, and deterring gaming behaviours.

Introducing a Trial Period of up to Six Months for New Load Registered Facilities

- 3.2 The four-strikes penalty regime trialled under the DR sandbox has encouraged new participants to join the programme. At the same time, there needs to be a limit to these concessions, to ensure that these participants contribute to the needs of the power system after they have gained experience. Therefore, EMA proposes to provide two concessions for new load registered facilities (“LRF”) in the first six months of participation. The trial period will give new LRFs time to be familiar with the DR framework.
- 3.3 To recognise the efforts of early entrants under the DR sandbox, EMA will grandfather the remaining concessions for existing DR participants. New DR participants that register as LRF after the DR sandbox ends but before the Energy Market Company (“EMC”) rolls out the system changes to the DR framework will also receive two concessions that will be grandfathered.

Maintaining the 80% Non-Compliance Threshold, with Recalcitrant Participants Referred to Market Surveillance Compliance Panel for Investigation

- 3.4 EMA proposes to maintain the non-compliance threshold for delivery when DR is activated, and load deviation when DR is not activated, at 80%. This addresses the key challenge that consumers face in forecasting their consumption accurately due to their business operations. The lowered compliance threshold has been effective in encouraging DR participants to participate more frequently, and has brought about a significant increase in DR participation under the sandbox, while maintaining a low rate of non-compliance.
- 3.5 As an anti-gaming measure, EMA will refer recalcitrant DR participants that display overt gaming tendencies or have persistent poor performances to the Market Surveillance Compliance Panel for investigations.

Maintaining the DR Penalty Formula, with Adjustments to Account for RUSEP During TPC Periods

- 3.6 EMA proposes maintaining the Uniform Singapore Electricity Price (“USEP”) based penalty formula trialled under the DR sandbox. The penalty formula has been effective in increasing DR participation and addressing DR participants’ concerns on uncertainty over penalties, while deterring gaming behaviour. EMA will also revise the penalty formula such that the during Temporary Price Cap (“TPC”) activations, DR participants pay the Reference USEP (“RUSEP”) (and not the capped USEP) when scheduled and non-compliant. This revision is in accordance with the policy intent of the TPC Final Determination Paper.²
- 3.7 The proposed change to the DR penalty formula is shown below in Table 2.

Table 2.

	DR sandbox penalty mechanism	Proposed changes post-sandbox
If activated:	<ul style="list-style-type: none"> • (USEP + Hourly Energy Uplift Charge (“HEUC”)) x (Quantity not delivered) • Penalty floor of \$5,000 	<ul style="list-style-type: none"> • Correct sandbox formula to (Max(USEP, RUSEP) + HEUC) x (Quantity not delivered) • Penalty floor of \$5,000
If bid submitted but not activated:	<ul style="list-style-type: none"> • 1 x (USEP + HEUC) x (Forecasted Load - Actual Load) • Penalty floor of \$5,000 	<ul style="list-style-type: none"> • Retain sandbox formula of (USEP + HEUC) x (Forecasted Load – Actual Load) • Penalty floor of \$5,000

4 Retaining the Original IL Parameters Post-Sandbox

- 4.1 EMA proposes reverting to the original IL programme parameters post-sandbox, with no limit to the duration of activation (i.e., restoration of load will depend on system conditions) and no concessions for under-delivery, as the revised parameters under the IL sandbox have not been effective in increasing the IL capacity. The original parameters will enhance system reliability by ensuring the availability of IL participants when they are activated for system needs.

5 Request for Comments and Feedback

- 5.1 EMA invites written comments and feedback on Sections 3 and 4 of the consultation paper to the EMA Energy Capabilities Development Department at the following email address:

EMA_ECDD_Demand@ema.gov.sg

- 5.2 The closing date for feedback submissions is 7 August 2024, 2359 hrs Singapore time.

² See <https://www.ema.gov.sg/content/dam/corporate/partnerships/consultations/consultation-on-temporary-price-cap/decision/EMA-Consultation-Final-Determination-Temporary-Price-Cap.pdf> for more information.

- 5.3 EMA will acknowledge receipt of each submission via email. If you did not receive an acknowledgement of your submission within two business days, please contact EMA_ECDD_Demand@ema.gov.sg.
- 5.4 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 this into account regarding the disclosure of information submitted. EMA may also approach respondents for clarification while the consultation is ongoing.