



REGULATORY ENHANCEMENTS TO THE DEMAND RESPONSE AND INTERRUPTIBLE LOAD PROGRAMMES

FINAL DETERMINATION PAPER

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1. Background

- 1.1. The Energy Market Authority (“**EMA**”) introduced the Demand Response (“**DR**”) and Interruptible Load (“**IL**”) programmes in 2016 and 2004 respectively, to encourage consumers to reduce their electricity demand when wholesale electricity prices are high and during times of system needs, in exchange for an incentive payment. On 1 Jan 2023, EMA launched a two-year regulatory sandbox to enhance participation in the programmes.
- 1.2. Demand-side resources play an important role in our power system as we scale up the deployment of solar and electricity imports. They can step in during peak periods so that more expensive generation units need not be scheduled to run as much and as often. They can also complement supply-side measures to address system shortfalls during generation outages and seasonal peaks at potentially lower cost.

2. Comments and Feedback Received to Industry Consultation

- 2.1. On 17 Jul 2024, EMA conducted an industry consultation that sought feedback on the outcomes of the DR and IL regulatory sandbox and proposed enhancements to the programme.¹
- 2.2. EMA had received feedback from 12 respondents as shown in (**Table 1**).

Table 1: List of Respondents

S/N	Respondents
1	Air Liquide Singapore Pte Ltd
2	Crystal Clear Environmental Pte Ltd
3	Diamond Electric Pte Ltd
4	Energy Market Company
5	Engie South East Asia
6	Just Electric Pte Ltd
7	PacificLight Energy Pte Ltd
8	PUB
9	Sembcorp Cogen Pte Ltd

¹ See <https://www.ema.gov.sg/partnerships/consultations/2024/proposed-enhancements-to-demand-response-interruptible-load-programmes> for more information.

10	Senoko Energy Pte Ltd
11	Singapore District Cooling Pte Ltd
12	United Microelectronics Corporation (Singapore Branch)

2.3. A summary of the feedback is as follows:

2.3.1. On regularising measures under the DR regulatory sandbox,

2.3.1.1. Industry supported maintaining the 80% compliance threshold (below which penalties would be applied), which provides continuity for DR participants and addresses industry's feedback on the difficulties forecasting their electricity consumption to 95% accuracy. There were concerns from Generation Companies ("**Gencos**") that the revised compliance threshold might compromise the performance standard of DR participants and impact market prices and generator costs.

2.3.1.2. Load providers supported introducing a trial period of up to six months for new Load Registered Facilities ("**LRF**"), although some load providers requested for a further relaxation of the compliance framework either through regular waiver "resets" after a certain time period or allowing load providers to retain the two concessions beyond the initial six-month trial period.

2.3.1.3. Industry did not comment on maintaining the DR penalty formula, with adjustments to account for Reference USEP ("**RUSEP**") during the Temporary Price Cap ("**TPC**").²

2.3.2. On the proposed reversion to the original IL framework,

2.3.2.1. Industry requested to maintain or reduce the four-hour activation duration cap introduced under the IL sandbox, as having a defined time window for IL activation provides certainty for loads to plan their operations and enhances the feasibility for more loads to participate in IL.

2.3.2.2. Other feedback includes requests to (i) provide concessions for non-compliance, (ii) make IL payouts more attractive, and (iii) align the requirements for contingency reserves and IL.

² RUSEP is the counterfactual USEP that would have been cleared in the market if the TPC, which capped USEP at 3 x Long Run Marginal Cost ("**LRMC**"), was not imposed. For example, if the market conditions led to a clearing price of \$1000/MWh during a TPC activation period, the RUSEP would be \$1000/MWh, while the capped USEP would be ~\$550/MWh (3 x LRMC).

3. EMA's Determination

Regularising measures under the DR regulatory sandbox

- 3.1. EMA notes the concerns raised by Gencos about maintaining the 80% compliance threshold for the DR programme. EMA has assessed that DR loads are held to high standards, as they are only paid if they are scheduled and 100% compliant. There is no payment for partial delivery (i.e., between 80 and 100%). Below 80%, a penalty is levied. Furthermore, the 80% threshold is important for DR facilities to address challenges in forecasting their consumption.
- 3.2. EMA reserves the rights to refer recalcitrant DR participants that display gaming tendencies (e.g., consistently curtail at or around 80% when scheduled, or consume at or around 80% when not scheduled) or have persistent poor performances (e.g., consistently fail to meet compliance threshold) to the Market Surveillance Compliance Panel for investigations.
- 3.3. On the requests for a further relaxation of the DR compliance framework, EMA has assessed that the six-month trial period is sufficient for new LRFs to familiarise themselves with the DR programme and firm up their activation and compliance protocols. After the trial, the 80% compliance threshold will provide LRFs some leeway. Further relaxing the compliance framework will weaken the reliability of demand-side resources.
- 3.4. Nonetheless, existing and new load facilities in the pipeline, who are early adopters and have invested in the necessary retrofitting and communications infrastructure to make their LRF DR-ready before the regular DR parameters are implemented, should have their remaining concessions 'grandfathered' and not be required to forfeit them. This will encourage continued participation after the sandbox ends and incentivise new load facilities to register in DR as soon as possible instead of waiting for system changes which will take time to roll out.
- 3.5. To facilitate the entry of more DR capacity into the SWEM, EMA will enhance the DR programme based on the parameters set out in Section 3 of the Consultation Paper.³ **Table 2** summarises the modifications that EMA will implement for the DR programme post-sandbox. The current DR sandbox parameters will remain in place until Energy Market Company is ready to roll out the system changes required for these modifications to the DR programme.

Table 2: Modifications to the DR programme

1.	Maintain the 80% compliance threshold for both delivery and load deviation.
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³ See <https://www.ema.gov.sg/partnerships/consultations/2024/proposed-enhancements-to-demand-response-interruptible-load-programmes> for more information.

2.	<p>(i) For new DR participants, to introduce a trial period of up to six months with two concessions for non-compliance for new LRF; and</p> <p>(ii) Grandfather remaining concessions for existing DR participants and LRFs that join after the DR sandbox ends but before the regular DR parameters are rolled out.</p>
3.	<p>(i) Maintain the USEP-based penalty formula and penalty floor; and</p> <p>(ii) Revise the penalty formula such that during TPC activations, it mirrors the DR payout formula which is based on RUSEP rather than the capped USEP.</p>

Discontinuing measures that were implemented under the IL regulatory sandbox

3.6. EMA has assessed that it is not meaningful to continue the IL sandbox because the revised parameters have not been effective in increasing the IL capacity. Instead, EMA will undertake a comprehensive review of the IL product, so that it would better complement supply-side measures to address system shortfalls.

3.7. As such, the IL sandbox will end on 31 Dec 2024 and the original IL framework will come into effect on 1 Jan 2025. **Table 3** summarises the modifications that EMA will reverse for the IL programme post-sandbox.

Table 3:		
	Modifications under IL sandbox	Original framework that IL programme will return to from 1 Jan 2025
1.	Four-hour limit on IL activation duration	No limit on IL activation duration
2.	Relaxed penalty regime where clawback of IL revenue only applies from the third instance of under-delivery onwards	No concessions for non-compliance. IL loads will not be paid for scheduled reserve quantity if non-compliant

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