



**ENABLING BATTERY ENERGY STORAGE SYSTEMS TO
PARTICIPATE IN THE DEMAND RESPONSE AND
INTERRUPTIBLE LOAD PROGRAMMES**

DRAFT DETERMINATION PAPER

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1 Background

- 1.1 The Energy Market Authority (“EMA”) supports participation from electricity consumers in the Demand Response (“DR”) and Interruptible Load (“IL”) programmes to increase system flexibility and enhance grid resilience. EMA has been facilitating the entry of DR/IL capacity into the Singapore Wholesale Electricity Market (“SWEM”). Since the DR/IL sandbox commenced in January 2023, the registered DR/IL capacity has increased to more than 100MW.¹
- 1.2 With system peak demand forecasted to grow at annual rate of between 3.1% to 5.5% from 2024 to 2033 and increasing domestic solar generation capacity, the DR/IL programmes play an increasingly important role in balancing electricity demand and supply.

2 Industry Consultation on Enabling Load Facilities with Embedded Generators to Participate in the DR/IL Programmes

- 2.1 Embedded generation facilities (“EGs”) can participate in DR/IL, by activating the EGs for their internal consumption and reducing their load draw from the grid during times of system need.²
- 2.2 However, EGs with a nameplate capacity of 1MW and above are required to register with the Energy Market Company (“EMC”) as a generation facility and are unable to participate in DR/IL (see **Table 1**).

Table 1: Current DR/IL participation eligibility for EGs

S/N	EG capacity	DR/IL participation eligibility
1	<1MW	No requirement for Facility Registration. <u>Can participate in DR/IL.</u>
2	1MW to less than 10MW	Requires Facility Registration as a generator (e.g. Generation Settlement Facility (“GSF”)) with the Energy Market Company (“EMC”) or registered under the Enhanced Central Intermediary Scheme administered by SP Services. <u>Cannot participate in DR/IL.</u>
3	≥ 10MW	Requires Generation Registered Facility (“GRF”) registration with EMC. <u>Cannot participate in DR/IL.</u>

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

² EGs refer to facilities with onsite generation and supply of electricity primarily for internal loads. Such EG facilities could include but are not limited to Battery Energy Storage Systems. See <https://www.ema.gov.sg/content/dam/corporate/licences/content-files/EMA-Industry-Licences-Info-Guide-for-Embedded-Generators.pdf.coredownload.pdf> for more information.

2.3 On 16 Feb 2024, EMA conducted an industry consultation that sought feedback on allowing EGs with capacity of 1MW or more and less than 10MW within load facilities (i.e. S/N 2 in **Table 1**) to participate in DR/IL, subject to conditions stated in paragraph 2.3 of the Consultation Paper.

3 Comments and Feedback Received

3.1 Following the close of the consultation on 8 Mar 2024, EMA received feedback from 11 respondents as shown in **Table 2**.

Table 2: List of respondents

S/N	Respondents
1	Crystal Clear Environmental Pte Ltd
2	Engie South East Asia Pte Ltd
3	EqualEnergie Pte Ltd
4	Keppel DHCS Pte Ltd
5	Market Surveillance and Compliance Panel
6	Mitsubishi Corporation (Singapore Branch)
7	Sembcorp Cogen Pte Ltd
8	Senoko Energy Pte Ltd
9	SP Group
10	The Energy Market Company
11	YTL PowerSeraya Pte Ltd

3.2 A summary of the feedback is as follows:

3.2.1 Industry supported the proposed change, as the entry of new business models such as Battery-as-a-Service can increase the total DR/IL registered capacity, which can help to enhance system resilience.

3.2.2 There were concerns that the proposed change might distort market signals by allowing EGs to earn higher revenue compared to status quo, as DR payouts are typically higher than nodal prices. This might inadvertently deter investment in more efficient thermal generation plants and encourage the entry of less efficient generation capacity such as diesel generators and small steam turbines to earn more attractive DR payments.

4 Draft Determination

4.1 EMA recognises that allowing thermal EGs to participate in DR/IL has the potential to disincentivise investments in thermal generation plants.

- 4.2 This concern will not apply to Battery Energy Storage System (“BESS”) EGs, as they enable load shifting, and do not affect the overall supply of electricity generated by thermal generation plants.
- 4.3 Allowing BESS EGs to participate in DR/IL can bring about system benefits, as they can augment the ability of load facilities to shift their demand and contribute to the needs of the power system.
- 4.4 To unlock these benefits, EMA will enable BESS EGs with nameplate rating of 1MW or more and below 10MW to participate in DR/IL, subject to a cap of 150MW for the overall BESS capacity that can be registered as DR assets. Grid-connected thermal EGs such as diesel generators and steam turbines will be excluded.
- 4.5 In lieu of the conditions proposed in paragraph 2.3 of the Consultation Paper, BESS EGs’ participation in DR/IL will be subject to the following parameters:
- 4.5.1 BESS with nameplate rating of 1MW or more and less than 10MW participating in DR/IL will continue to be registered as GSF under the Market Rules and be levied the prevailing market/reserve charges where applicable.
- 4.5.2 The BESS GSF will be tagged to an identified Load Registered Facility (“LRF”). For fair market treatment, BESS that participate in DR/IL will not receive payments for their injection energy quantity. This ensures that the BESS will not earn both DR and energy payouts. Such BESS will continue to pay for their withdrawal energy quantity and fair share of prevailing market/reserve charges.
- 4.5.3 The LRF with BESS will be subject to the prevailing Market Rules for DR/IL participation in the SWEM.
- 4.6 EMA will review if (a) the change should be allowed for BESS EGs with nameplate rating of 10MW and above, and (b) the cap stated in paragraph 4.4 should be lifted in the future, considering the benefits and the impact of these assets to the market.

5 Request for Comments and Feedback

- 5.1 EMA invites written comments and feedback on the Draft Determination Paper. Please submit written feedback 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.

- 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.