



INDUSTRY CONSULTATION: SINGAPORE'S VISION FOR ENERGY STORAGE

Scaling Deployment, Unlocking Value



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1. Singapore's Next Flexibility Opportunity

Singapore expects its need for flexibility in the power system to grow. Energy storage will be one part of the solution. Our aim is to enable more energy storage where it creates system and economic value, while ensuring every storage resource can deliver as much value as possible.

Singapore's power system is entering a new phase.

Our electricity needs are evolving. New and large loads may require more capacity during peak periods than the electricity network can provide. At the same time, a growing share of resources across the power system are weather-dependent or distributed.

Singapore must continue to maintain a highly reliable power system, manage temporary network capacity shortfalls, and make the best use of limited land and existing infrastructure.

These developments will increase the value of flexibility – the ability of the power system to respond quickly as supply and demand change.

Energy storage can respond within seconds and be deployed across the electricity system to support power system, grid and consumer needs.

Singapore has already laid some of the foundations.

Future Grid Capabilities Roadmap

The 2025 Future Grid Capabilities Roadmap set out how the grid must evolve to support a more distributed, digitalised and low-carbon future.

Demand-Side Flexibility Roadmap

The 2025 Demand-Side Flexibility Roadmap set out how consumers and distributed resources can respond to system needs.

Energy storage sits at the intersection of both.

2. Learning from Singapore's BESS Experience

Singapore has gained experience with both utility-scale and distributed battery energy storage systems (BESS).

The **326 MWh** BESS on Jurong Island, deployed in 2022, has provided practical experience in operating storage at scale and participating in the electricity market.

Distributed BESS is also beginning to play a role. Singapore now has an estimated **18 MWh** of residential, commercial and industrial BESS, with early deployments providing experience in how storage can support consumers and businesses.

Beyond individual installations, BESS can participate in Demand Response, while EMA's virtual power plant (VPP) pilots are exploring how distributed BESS and other resources can provide energy and ancillary services through aggregation and coordination.

3. Our Vision

Singapore's vision is for energy storage to be deployed where it creates value and contributes to multiple compatible needs where feasible.

1 Deploy ESS where it creates system and economic value

ESS should be deployed where it provides system and economic value, taking into account other available solutions such as flexible generation, demand response, and network reinforcement.

2 Get more value from every ESS resource

ESS should support multiple compatible applications where technically and operationally feasible. Before securing additional standalone capacity, we should consider whether existing or committed resources can provide the required capability, taking into account their availability, technical capabilities and other system requirements.

3 Keep the market open to better technologies and business models

Singapore will remain open to solutions that offer better performance, lower costs, smaller footprints, faster deployment or new capabilities, while maintaining appropriate safety, reliability and technical standards.

4. Where Energy Storage Can Create Value

We have identified three key areas where ESS can create value in Singapore.

Potential area of value	How ESS could contribute	Key question for Singapore
Strengthen power system reliability	Provide fast response during supply disruptions and changes in solar output, and potentially support regulation, reserves, and other system services.	Where can ESS provide these capabilities most effectively, taking into account other available solutions?
Bridge temporary capacity shortfalls	Some new and expanding loads may require more capacity during peak periods than the network can provide. ESS can be charged during off-peak periods when there is spare capacity and later discharged during peak periods. This helps to bridge temporary network capacity shortfalls while network upgrades are underway. ESS can also support local network needs arising from solar and electric vehicle (EV) adoption.	Where can ESS bridge temporary network capacity shortfalls, or support local network needs?
Unlock distributed storage and VPPs	Residential and commercial ESS, EV batteries and other distributed storage resources can be aggregated to participate in markets and system services through vehicle-to-grid arrangements and VPPs.	What commercial, operational and settlement arrangements are needed to move from pilots to scale?

5. What EMA Will Do to Support Scaling

EMA has identified four areas to support ESS deployment at scale.

1 Improve access to information and data

EMA will publish regular ESS deployment statistics and explore improving access to electricity market information. Better information will help industry assess investment opportunities and participate more effectively in electricity markets and system services.

2 Ensure market and regulatory frameworks remain responsive

EMA will review market, regulatory and infrastructure arrangements to identify and address unnecessary barriers relating to the deployment and scaling of viable ESS solutions. These include requirements related to market participation, registration, metering, settlement, aggregation and grid connection.

3 Enable new ways for ESS to provide value

EMA will use pilots and industry engagement to explore new deployment, operating and participation models and assess whether existing market arrangements allow ESS and other flexible resources to realise their full value.

4 Enable ESS to be observable and controllable

EMA will develop graduated requirements for ESS to be observable or controllable, depending on the size, role and system significance of each resource. These could range from basic registration to observability requirements for larger or market-active resources, and control or dispatch requirements where justified by system needs.

6. What We Want from Industry

We welcome views from industry and academia on how ESS can be deployed and scaled in Singapore.

1 What ESS solutions could work and scale in Singapore?

We invite industry to propose ESS-related solutions that:

- strengthen power system reliability;
- bridge temporary grid capacity shortfalls;
- unlock flexibility from distributed ESS, EV batteries and VPPs; or
- enable a single storage resource to provide multiple compatible services.

Where relevant, promising proposals featuring pre-commercial technologies may be considered under the Singapore Pilots for Energy & Enterprise Decarbonisation (SPEED) programme.

2 What changes would help these solutions scale?

We invite industry to identify barriers relating to:

- fire safety and land requirements;
- licensing and approvals;
- grid connection and commissioning;
- metering and market registration;
- access to market information and data; and
- market products, rules and participation arrangements.

Where possible, respondents should explain how these barriers affect deployment and scaling of ESS solutions, and suggest practical changes that could enable commercially scalable projects in Singapore.

3

Building the ESS Ecosystem Together

Many of these opportunities cannot be addressed by a single participant.

EMA will engage industry on how the ESS ecosystem can collaborate more effectively. This could include an ESS workgroup or another suitable platform to share deployment experience, identify common barriers, develop solutions, and engage the Government.

How to Respond

Industry stakeholders are invited to submit their views on the consultation questions and may also indicate their interest in participating in the proposed workgroup.

Submissions and expressions of interest should be sent to **EMA_Energy_Storage@ema.gov.sg** by 29 January 2027.

EMA may subsequently invite selected stakeholders to participate in further engagements.

7. From Opportunity to Action

EMA will use submissions from this consultation, together with ongoing pilots and further system studies, to identify priority ESS applications, assess changes to market and regulatory frameworks, and develop the next phase of Singapore's ESS roadmap.

Together, we can move from individual projects and pilots towards an energy storage ecosystem that is scalable, flexible and commercially sustainable.



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