



SINGAPORE INTERNATIONAL ENERGY WEEK

Singapore seeks proposals on regulatory sandbox for virtual power plants

Such platforms could supply electricity to the grid by bundling distributed small energy systems

By Janice Lim

janicelim@sph.com.sg

THE Energy Market Authority (EMA) is proposing that a regulatory sandbox be set up to explore whether virtual power plants would be able to supply electricity to the grid, as conventional power plants do.

It is also working with SP Group on developing a virtual power plant that could take part in the regulatory sandbox.

A virtual power plant is essentially a digital platform that bundles many small-scale energy systems spread across locations to operate as a single power generator.

Known as distributed energy resources, these small energy assets – such as solar panels, battery-energy storage systems or electric vehicle (EV) chargers in residential homes – are typically not commercially viable to provide services to the grid on their own.

By aggregating these individual energy resources, virtual power plants could unlock their potential to play a greater and broader range of roles in supporting Singapore's energy transition, said EMA in a statement on Monday (Oct 21). The power sector has set a target of net-zero emissions by 2050.

The virtual power plant being developed by EMA and SP Group will have a generation capacity of 15 megawatts (MW) that is produced by solar photovoltaic sources and battery-energy storage systems in the initial phase.

It will also participate in the electricity market to evaluate its benefits to the power system.

Businesses that are interested



By aggregating small energy assets, such as solar panels in residential properties (above), virtual power plants could unlock their potential in supporting Singapore's energy transition. PHOTO: BT FILE

are invited to submit their proposals by the end of this year.

Upgrading the grid's capabilities

The regulatory sandbox for power plants is among the new initiatives by the EMA to develop Singapore's future grid capabilities, and it is working with SP Group to chart out a road map.

Slated to be launched later this year, some of the road map's focus areas will include harnessing distributed energy resources, improving grid planning, control and maintenance efforts, as well as maintaining grid stability as the

share of renewable-energy sources goes up in Singapore's energy mix.

Announcing these initiatives at the Singapore International Energy Week on Monday, Deputy Prime Minister Gan Kim Yong added that Singapore is reviewing its investments in grid connections so that companies can continue to have timely access to power. This comes as there are fewer greenfield sites available in the city-state, which may affect infrastructure development timelines.

He also said that Singapore's grid infrastructure needs to be more responsive to changes in sup-

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Deputy Prime Minister Gan Kim Yong

ply and demand.

To this end, EMA is expanding its demand-response programme to companies with battery-energy storage systems, and to EV charging operators. This programme was previously open only to companies with flexible production processes, or those with high-voltage air-conditioning, compressors, chillers or pumps.

Businesses with battery-energy storage systems with a maximum production capability below 10MW can apply to EMA by Feb 28, 2025, to get on board the demand response programme.

As for EV charging operators, EMA is collaborating with transport company ComfortDelGro via a regulatory sandbox for its EV charging stations so it can be part of the programme.

It will explore how ComfortDelGro's network of nearly 1,000 charging stations can adjust charg-

ing volumes during demand-response events, and possibly help to balance demand and supply in the electricity grid.

Launched as part of a regulatory sandbox in 2023, the demand-response programme allows participating companies to reduce their electricity usage when wholesale electricity prices are high during peak periods, and receive incentive payments based on the energy savings arising from a drop in these prices when energy demand falls.

EMA has previously said that Singapore has more than 400 MW of demand flexibility potential that is going untapped. Commercial sectors, such as those reliant on heating, ventilation and air-conditioning, show potential for load shifting; and certain industrial processes, such as those involving gas production, offer opportunities for rescheduling operations to off-peak times.

Based on the pilot sandbox, EMA said that the programme has resulted in over S\$700 million in savings for electricity buyers in Singapore's wholesale electricity market through reduced wholesale prices.

Carbon capture and storage study

Another initiative Gan announced on Monday related to grants for power-generation companies to conduct feasibility studies on

Continued on Page 2

Fossil fuels needed in equitable energy transition: panellists, Page 2

Step shift to a low-carbon future, Page 17

Singapore seeks proposals on regulatory sandbox for virtual power plants

Continued from Page 1

whether carbon capture and storage (CCS) facilities can be developed on their sites.

The aim is to study two CCS pathways for the power sector – post-combustion carbon capture for combined-cycle gas turbines (CCGT), and pre-combustion carbon capture to produce hydrogen for power generation.

Post-combustion carbon capture refers to the installation of an

on-site unit to capture carbon dioxide from waste gas produced during the combustion of natural gas in CCGTs. Pre-combustion carbon capture refers to the installation of a facility that can capture carbon dioxide generated during the production of hydrogen from natural gas. The hydrogen is then combusted in CCGTs to generate power.

Both pathways involve capturing the carbon dioxide produced and storing it in underground storage sites.

The use of CCS is being explored as a possible solution to decarbonise Singapore's natural gas sector, a fossil fuel on which the city-state is still reliant, because of its lack of renewable energy resources. The government is already working on CCS projects to aggregate carbon emissions – at least two million tonnes – on Jurong Island for overseas storage; its first phase is likely to start around 2030.

If proven feasible, these power-sector CCS pathways could poten-

tially leverage future phases of the Jurong Island cross-border CCS project.

They would also enable Singapore to use its existing natural gas infrastructure to achieve the country's decarbonisation goals, unlike other low-carbon alternatives.

Power generation companies eligible for the grant need to be operating or bidding to operate an advanced CCGT on Jurong Island or Tuas by 2035. They must also have completed a pre-feasibility study

for either of the two CCS pathways. Those interested have to submit their proposals by Jan 31, 2025.

Their proposals will be evaluated based on the amount of additional land required, the quality of the proposal, and the funding requested from EMA.

As energy transition is central for the global economy to be low-carbon in the future, Gan said there is a need to speed up the deployment of commercially mature low-carbon solutions, invest in the commercial-

isation of technologically feasible solutions, and to drive further research and development into less-mature technologies.

He added that Singapore will do its part, even though it is not a major contributor to global carbon emissions.

“To increase the sustainability of our power supply, we will need to develop and study every possible decarbonisation pathway, while safeguarding our energy security and cost competitiveness,” he said.