Thermal energy storage st george

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SINGAPORE - An energy storage facility to hold cool energy for use when there is a high demand for air-conditioning will be set up at the George Street Substation.

This energy will be used to cool the Marina Bay district, reducing the need for electricity during peak demand periods, said the statutory board Energy Market Authority (EMA) and utilities company SP Group on Monday (Aug 29).

Cool energy storage systems work by using electricity - usually when demand is at its lowest - to freeze a tank of water. Melting the stored ice can then provide cooling to buildings when demand for air-conditioning is high.

This reduces the amount of energy that is consumed from the grid for cooling purposes. The freed up electricity can be used to replace or substitute renewable energy like solar, when it is rainy or cloudy, for example.

George Street"s ice thermal energy storage system (ESS) will add up to 1,500 refrigeration ton-hour (RTH) of energy to the Marina Bay district cooling network operated by SP, saving up to 2 megawatts (MW) of electricity a day - which is equivalent to the electricity needs of 170 four-room HDB flats in one day.

The Marina Bay district cooling network provides energy to cool buildings, including malls, offices and MRT stations, in the Marina Bay vicinity and surrounding areas such as Boat Quay.

Centralised chiller plants help members in the network optimise energy consumption by doing away with the need for individual plants. By sharing the load of cooling in the network, energy consumption is optimised and members lower carbon emissions and save costs.

The pilot storage facility, set to be completed in the third quarter of 2026 as part of the substation"s renewal works, will contribute towards EMA"s target of deploying at least 200 megawatts of energy storage systems beyond 2025.

"Energy storage systems can help to address the issue of supply intermittency, as renewable energy such as solar power fluctuates due to weather conditions," said both agencies in a statement.

"The stored thermal energy can be discharged to power the district cooling plant and shave peak load demand. This will help to balance the electricity load, thereby reducing intermittency and enabling the grid to be more resilient," they added.

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As part of the pilot, SP will install 3,000 refrigeration tons (RT) of chiller capacity at the substation to support the future expansion of the Marina Bay district cooling network, bringing the total installed capacity of the network to 73,000 RT.

As at April, the Marina Bay district cooling network comprises 28 buildings. The cooling network is projected to help the district reduce carbon emissions by almost 20,000 tonnes annually.

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