

Data centre test bed on Jurong Island to trial use of green energy sources

It is among new projects in push for fossil fuel-reliant island to reinvent itself

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A data centre test bed will be built on Jurong Island for researchers and operators to trial the use of green technologies in powering such energy-guzzling facilities, the authorities announced on Nov 24.

This builds on an earlier announcement about how the industrial island will host Singapore's largest low-carbon data centre park on 20ha of land there. This is about the size of 25 football fields.

The pilot-scale data centre is expected to be powered by green energy sources like solar power and biofuels, while being equipped to support the intensive computing needs of artificial intelligence (AI).

The test bed will be located within the area set aside for the low-carbon data centre park, and JTC and the National University of Singapore will commence a study in 2026 on establishing the facility.

The tie-up between industrial developer JTC and NUS was one of six new partnerships announced by JTC and the Economic Development Board on Nov 24, to mark Jurong Island's 25th anniversary.

Deputy Prime Minister and Minister for Trade and Industry Gan Kim Yong said at the anniversary event: "The global energy and chemicals industry, once built around scale and cost-efficiency, is being reshaped by new technologies, the pressure to decarbonise and rising demand for higher-quality and greener products."

The industrial island must therefore reinvent itself to stay competitive and relevant, said DPM Gan at the Pan Pacific Orchard.

Data centres are the physical infrastructure that shapes the virtual world, allowing people to stream Netflix, scroll social media and ask AI-driven chatbots questions.

They are considered a key driver of economic growth. Prime Minister Lawrence Wong had said on Nov 23 that Singapore is creating regulatory sandboxes and test beds where companies can experiment safely, trial new ideas, and bring cutting-edge AI solutions to market more quickly.

But such facilities are also huge energy guzzlers. The International Energy Agency projects that electricity demand from data centres worldwide is set to more than double by 2030 to around 945 terawatt-hours, slightly more than the entire electricity consumption of Japan today.

The test bed will help to address some technology gaps before commercial data centres are set up in the park.

For example, one aim is to find out how AI data centres can interact with hydrogen-ready power plants, low-carbon fuels, batteries and other alternative energies on the island, said NUS and JTC.

Singapore is the world's third-largest oil trading hub. Around a third of the country's greenhouse gas emissions come from the refining and petrochemicals sector, with more than 100 companies located on Jurong Island.

Hydrogen is considered a clean fuel as it does not produce any planet-warming gases when burned.

Data centres also need to be cooled to prevent the equipment from getting overheated, and huge amounts of energy are needed to cool the facilities.

Liquid cooling solutions are an efficient way to cool racks compared with air cooling, and one option is to submerge servers in fluid. But due to climate and water constraints in Singapore, there is a need to look at seawater-based cooling, said JTC and NUS.

News of the new partnerships follows an Oct 27 announcement on how the fossil fuel-reliant Jurong Island will be taking steps to make the green shift.

Other than the land set aside for the low-carbon data centre park, close to 300ha – about 10 per cent of its land, or an area slightly bigger than 400 football fields – will be set aside for new energies such as greener fuels.

The six partnerships are focused on reducing industrial emissions and furthering innovation, while preparing the workforce for the energy transition and green jobs.

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The global petrochemical sector has been facing a down cycle amid oversupply and tightening climate regulations.

Another partnership involves JTC and Keppel partnering with the Energy Market Authority to study the pilot deployment of a microgrid test bed on Jurong Island. A microgrid is a small-scale power grid.

This partnership will test out the integration of renewable energy, battery storage systems and smart grid technologies.

To speed up the adoption of low-carbon tech on Jurong Island and other industrial estates, JTC is also partnering US-headquartered think-tank Rocky Mountain Institute. The energy-focused institute runs an accelerator with a network of over 280 start-ups and solution providers.

The partnership will enable companies here to crowdsource fresh ideas to pilot new clean energy solutions, said JTC.

Workforce development will also be a focus on one of the new partnerships.

Chemicals storage company Advorio Singapore will collaborate with Workforce Singapore to redesign jobs and upskill 150 personnel with capabilities to support Advorio's energy transition plans, including handling emerging fuels like ammonia.

The data centre test bed between JTC and NUS will also host training programmes and internships for students and workers to gain skills in building sustainable infrastructure.

DPM Gan said: "As Jurong Island evolves, we must prepare our workforce for new opportunities in sustainable manufacturing, clean energy and advanced industrial systems."

He noted emerging roles in industrial biotech, carbon and energy management, and decarbonisation technologies.

DPM Gan said: "I hope more companies will also take the initiative to redesign jobs and upskill their workforce as they transform their product mix."

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