

World's first data centre test bed for tropics launched

Scientists can develop, test cooling tech that uses up to 40% less energy and water

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The world's first tropical climate data centre test bed was launched here on Nov 29 for researchers and industry partners to develop and test cooling technologies that use up to 40 per cent less energy and water.

At the 770 sq m Sustainable Tropical Data Centre Testbed (STDCT), scientists can experiment with innovative cooling ideas tailored for a tropical climate, which companies can test and optimise for adoption.

Data centres are centralised facilities that house computer servers and equipment, and typically maintain internal temperatures of 22 deg C or lower to prevent the hardware from overheating.

Cooling systems account for more than 40 per cent of a typical data centre's total energy consumption, noted Minister of State for Trade and Industry Alvin Tan at STDCT's launch at the National University of Singapore's (NUS) University Cultural Centre.

"In tropical climates like Singapore, we need more energy to cool our servers," he added.

Such cutting-edge research on data centre innovation will support the growth of data centres in a sustainable manner aligned with Singapore's climate change commitments, Mr Tan said.

STDCT is sited at NUS College of Design and Engineering, and is led by NUS and the Nanyang Technological University. It is jointly funded by the National Research Foundation Singapore (NRF) and anchor industry partner Facebook.

Twenty industry partners including Dell Technologies, Intel

and Keppel Data Centres have contributed to the project by aiding construction, providing technical advice, supplying equipment for research and providing funding and scholarships for researchers.

The initiative hopes to reduce cooling energy consumption by up to 40 per cent, cut water usage by 30 to 40 per cent, and reduce carbon dioxide emissions by about 40 per cent.

The current power usage effectiveness (PUE) for data centres here is 1.3 – the ratio of a facility's total electricity used to how much powers the IT equipment. The closer the PUE is to 1, the more efficient the data centre is as less energy goes towards cooling.

Singapore currently requires data centres to have a PUE of 1.3, while the global average in 2022 was 1.5.

STDCT aims to create combined air and liquid cooling technologies with a PUE of less than 1.2.

To date, STDCT has attracted more than \$30 million in investments for the facility and the five research projects, which will include identifying ways to raise the recommended temperature of data centres.

Singapore halted the development of new data centres between 2019 and 2022 to review how the industry can grow in a sustainable manner and reduce its carbon footprint.

As at January 2022, there were more than 70 operational data centres in Singapore.

Four new data centres were approved in July 2023.

Many data centre operators operate their equipment at temperatures of 22 deg C and below, the Infocomm Media Development Authority said in June 2023.

Data centres were responsible for about 7 per cent of Singapore's total electricity consumption in 2020, according to the Ministry of Trade and Industry.

Professor Liu Bin, NUS deputy president of research and technology, said that the launch of the STDCT facility is timely and supports strategic national goals.

"The NUS and NTU research teams will now be able to bridge research solutions into practical applications to fast-track the adoption of innovative and sustainable cooling solutions tailored to the tropical climate," said Prof Liu.

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TIMELY LAUNCH

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