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NUS, NTU and industry partners launch S$23m research programme for green data centre solutions

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An artist's impression of the STDCT facility, which will be housed on NUS' Kent Ridge campus PHOTO: FACEBOOK

THE National University of Singapore (NUS), Nanyang Technological University (NTU), along with stakeholders in Singapore's data centre industry, have established a new S$23 million research programme to develop innovative and sustainable cooling solutions for data centres located in tropical locations.

Under this, a testbed facility located at the NUS Kent Ridge campus will be set up "to promote co-creation and demonstration of such advanced cooling technologies", said the two universities in a joint statement on Wednesday.

Called the Sustainable Tropical Data Centre Testbed (STDCT), the facility is expected to be operational come October this year. It will serve as an innovation hub for the academia and industry to work together to future-proof the region's data centre industry, added the statement.

"This programme will see researchers develop and demonstrate energy-efficient cooling technologies to achieve breakthroughs in the tropical data centre environment."

Curated by the Cooling Energy Science and Technology Singapore Consortium hosted at NUS, the programme is jointly funded by the National Research Foundation Singapore and Facebook.

Research activities will be led by NUS and NTU, with support from the Infocomm Media Development Authority (IMDA). Additionally, the industry partners involved in the project are: Ascenix, CoolestDC, Keppel Data Centres, New Media Express, and Red Dot Analytics.

Professor Lam Khin Yong, NTU's senior vice president (research), said: "Data centres are the backbone of Singapore's national digital transformation, and there is a need to improve their energy efficiency and sustainability as we continue to grow as a data centre hub."

In Singapore, data centres here consume almost 7 per cent of the country's total energy needs - a figure which is projected to reach 12 per cent by 2030. These assets are also currently air-cooled at temperatures of 23-27 degrees Celsius, and at ambient humidity of 50-60 per cent as the industrial practice.

However, maintaining such controlled environments require high energy consumption, resulting in high costs and carbon emissions - particularly for tropical countries such as Singapore, noted the statement.

Added Prof Lam: "The initiative is a national open innovation platform where academia and industry players jointly develop and testbed new cooling technologies that will benefit the entire data centre ecosystem."

At the STDCT facility, research activities will be organised under four work packages, and will look at various cooling solutions, their optimisation, as well as integration with one another.

A combination of these cooling technologies, once successfully deployed and tested, could reduce energy consumption and greenhouse gas emissions by up to 25 per cent as compared to conventional data centres which are traditionally air-cooled. If adopted industry-wide across the entire tropical region, energy usage of the data centre industry could potentially be lowered by at least 40 per cent, said the statement.

In the longer term, the STDCT also envisions recommending operating guidelines, and setting new standards based on proven findings from the new technologies to drive greener data centre operations.

Said Yeo Tiong Yeow, cluster director (infrastructure planning and facilitation) at IMDA: "The digital economy continues to generate and use data at exponential rates. We will work closely with industry to push technological boundaries to bring about more energy efficient data centres and encourage the adoption of best-in-class technologies, solutions and standards.

"This will enable us to grow our data centre ecosystem sustainably and further entrench Singapore as one of the world's leading data centre hubs."

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