

Kuala Lumpur-based multi-utility group YTL Power International announced in December last year that it had acquired Singapore company Dodid, which owned a 12.5 megawatt, Tier 3 data centre in Tagore Lane. The shift online by businesses has increased their dependency on data centres. PHOTO: COURTESY OF DODID



significant environmental footprint, and said they should become climate neutral by 2030. China is developing high-quality green DCs for its 5G networks, while in Australia a system has been set up to help businesses make their DCs more sustainable. These businesses can invite assessors to evaluate the energy efficiency of their facilities. Meanwhile, the Japanese government announced two years ago that it will subsidise half of the building costs towards new zero carbon-emissions DCs, as well as upgrades to existing facilities.

HOW TO GO GREEN

There are several steps to transition towards greener DCs. First, DC owners or developers must ensure that an energy-efficient design is being adopted right from the start, and fitted with the latest technology. These early changes can create a massive difference in energy consumption and waste.

Second, companies should use any renewable energy that is present locally, such as wind, hydro, or solar energy to power the DCs and to cool machines. These practices can greatly reduce the carbon intensity of the DCs.

Third, given that DCs produce a lot of heat, for which substantial amounts of energy is required to cool their servers, multinational companies which use large amounts of data should relocate their DCs to colder countries.

This can help optimise energy usage, as demonstrated by Meta, which has moved some DCs to Lulea, Sweden, to leverage its natural cooling systems.

The ideal? New DCs should be able to operate solely on renewable sources of energy, and be fitted with the latest technologies for energy and water efficient systems.

Some have suggested that Singapore should outsource DCs to countries that are richer in natural resources, but doing so could cause Singapore to lose out on both its competitive advantage and foreign direct investment.

It would also be more costly and challenging for companies here to monitor their operations remotely, to ensure that energy usage is being optimised.

Instead, as Mr Gan said, Singapore seeks to anchor DCs that are best in class in terms of resource efficiency, which can contribute towards its economic and strategic objectives.

Overall, DCs not only play an integral role for the economy and businesses, but also have a significant impact on the climate and environment. Hence, it is important to balance the ever-increasing demand for DCs, with operating them in a sustainable manner.

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The greening of data centres

There is a need to balance the ever-increasing demand for data centres with operating them in a sustainable manner.

Liang Hao, Anvesha Agarwal and Caleb Low Wei Sheng

For The Straits Times

Data centres (DCs) – used by organisations to store, process and transmit large amounts of data – are an indispensable part of today's world. They are used in our daily lives, especially for cyber security and storing critical information.

There are two key factors driving demand for them. With technological advancements, businesses are increasingly turning towards virtual networks to pool their data into a multi-cloud environment, making data more interconnected globally.

Another factor is the shift online by businesses, especially since the onset of Covid-19. Schools, entertainment and recreational activities have also taken on a virtual form. This has increased their dependency on DCs.

All this has led to a spike in demand for co-location DCs or "colos" – large facilities that rent out rack space to third parties for their servers or other network equipment – and hyperscale vendors, especially in Europe and the Asia-Pacific regions.

A hyperscale centre is typically built by a large company such as Amazon or Facebook, and designed specifically to meet the needs of that company.

HARM TO THE CLIMATE

The increased dependence on DCs has had negative effects such as harm to the climate.

In 2016, total global DC energy consumption – at 416.2 terawatt-hours – added up to more than Britain's energy consumption of 300 terawatt-hours. By 2025, DCs are predicted to consume one-fifth of the world's electricity, and to be responsible for 3.2 per cent of the global carbon emissions.

Sustainability will therefore continue to be an area of concern. As traditional DCs are carbon, energy and water-intensive, they will need to, and are starting to invest in, greener methods of operation.

Green DCs function in a similar way to traditional ones, but they minimise impact on the environment through elements within their designs. These include power and water utilisation, carbon dioxide creation, and materials required to produce the equipment within the facility.

STEPS TAKEN BY SINGAPORE

Singapore ties with the United States' Silicon Valley region for second place in the league of top markets for DCs, according to real estate consultancy Cushman &

Wakefield's 2022 Global Data Centre Market Comparison report.

The Republic is now the top-ranked market for DCs in the Asia-Pacific, ahead of Hong Kong, which ranks sixth. The report scored Singapore highly on key criteria such as market size, fibre connectivity and availability of cloud services.

As of last year, there are more than 70 operational DCs in Singapore with a total available IT capacity of about 1,000 megawatts.

Today, DCs use around 7 per cent of the country's electricity. And with electricity accounting for more than half of the operating expenditure in a typical DC, there is still room to drive down their costs and environmental impact.

The Government took steps in 2014 to address such issues, as outlined in the green data centre technology roadmap by the National Climate Change Secretariat.

Five years later, an industry review led to a moratorium on new DCs, so as to find a way to support the growth of this multibillion-dollar market in a more sustainable way consistent

with Singapore's climate change commitments.

The moratorium was lifted this year. But Trade and Industry Minister Gan Kim Yong signalled in a written reply to a parliamentary question in January that the Government intends to be more selective of which DCs it can accommodate. He also noted that the Government will put in place measures to raise the efficiency of existing DCs over time.

To support the green transition of DCs, the Government has provided incentives such as the BCA-IMDA Green Mark for Data Centres Scheme, which comprises a green building rating system that is designed to encourage the adoption of energy efficient design, operation and management of DCs.

But there is some way to go when it comes to the greening of Singapore's DCs. As of 2019, only about 13 per cent of data centres here had been certified under the Green Mark.

Greening efforts will put Singapore in line with the global pivot towards green DCs.

The European Commission has identified DCs as responsible for a