

## Fact Sheet

( 19 JULY, 2017)

### **IMDA, HUAWEI AND KEPPEL DATA CENTRES SIGN MEMORANDUM OF INTENT TO CONDUCT A JOINT-FEASIBILITY STUDY FOR A FIRST-OF-ITS-KIND HIGH-RISE GREEN DATA CENTRE BUILDING**

The Infocomm Media Development Authority (IMDA), together with Huawei International and Keppel Data Centres, have signed a Memorandum of Intent (MOI) to explore the technical feasibility of a first-of-its-kind high-rise green data centre building.

The partnership will leverage IMDA's programmes to support the development of an iconic high-rise Green Data Centre in Singapore; Huawei's technological expertise to develop innovative green data centre solutions; and Keppel Data Centres' capabilities to construct and operate a high-rise Green Data Centre.

#### **Challenges for Data Centres**

Globally, data centres face several major environmental issues, two of which Singapore is looking to tackle with this MOI: Energy and land usage.

Data centres (DC) worldwide account for a significant portion of global electricity demand for three main reasons: Firstly, they need to be kept consistently cooled in a tightly-controlled and always-on environment; alongside fully redundant back-up systems for emergency system failure/maintenance. Energy-related costs can constitute as much as 49 percent<sup>1</sup> of a typical data centre's operating expenditure.

Singapore's leading role as the DC hub of Southeast Asia, with 50 percent of the region's DC capacity<sup>2</sup>, has resulted in DCs accounting for nine percent of our total electricity demand in 2015. With strong demand for services such as cloud computing, Internet of Things and Artificial Intelligence, electricity demands are projected to reach 12 percent by 2020 as the sector grows.

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<sup>1</sup> Forrester, 2013, Global Green Data Centre Best Practices in Action

<sup>2</sup> Broadgroup, 2016, Data Centres South East Asia

Secondly, Singapore's tropical, humid climate means more energy must be expended here to keep DCs as cool as those in more temperate climates. As an example, a typical 20MW DC here consumes an equivalent amount of electricity daily as about 60,000 HDB households.

Third, given that DCs are so energy-intensive, it is important to know how efficiently energy is being utilised to deliver the digital services it provides, be it in computing power, storage or networking. Singapore's current best-in-class multi-tenant DCs report an annual Power Usage Effectiveness<sup>3</sup> (PUE) rating of as low as 1.4<sup>4</sup>; while in the USA, a large multi-tenant DC in Nevada is able to achieve an annual PUE rating of 1.18<sup>5</sup>.

The earlier example of a typical Singapore DC would also need about one hectare of land – about the space of three to four HDB blocks – and be housed in a six to eight storey building. This is the second major environmental issue facing growth of DC capacity here: Land scarcity. The Nevada DC in comparison – the largest in the world - has a power capacity of 130MW and spans across 13 hectares of land area – about the size of MacRitchie Reservoir Park.

Due to such challenges, DCs here cap out at about 20 to 25 MW of power capacity, or about 5,000 server racks. The Nevada facility can host up to 26,000 server racks in comparison.

To sustainably support the growth in DC capacity, new innovation initiatives are needed that help to optimise the land space usage and at the same time significantly improve DC energy efficiency.

### **About High-rise Green Data Centre**

The innovations which Singapore are proposing are currently in the theoretical stage. The MOI sets out to explore the technical feasibility of a first-of-its-kind **high-rise data centre building**; with **best-in-class green data centre technologies**; to support the IT needs of

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<sup>3</sup> The PUE indicates the ratio between energy consumed by a data centre (inclusive of the facility itself and its IT equipment) against how much is utilized by the equipment. A PUE of 1 is the ideal, but impossible to achieve due to power losses during cooling and delivery.

<sup>4</sup>Green Mark Platinum-rated Data Centres, BCA Awards 2016.

<sup>5</sup> Clicking Clean Report, Greenpeace, 2017

**multiple tenants.** The feasibility study will be conducted in collaboration between IMDA, Huawei and Keppel Data Centres to test and trial this viability over the next two years.

The technical feasibility study would look to explore:

- The possibility of a high-rise DC building (e.g. more than 20 stories) with “Designed for data centre” building architecture and innovations that can significantly reduce energy use or increase efficiency to achieve a 10 to 20 percent improvement in the current best-in-class PUE rating of service provider data centres in Singapore.
- Internal design elements for DC layouts in the context of high-rise data centre buildings in a tropical climate such as:
  - Server rack design, data hall design and intelligent controls enabled through a network of sensors
  - New approaches using physics for energy efficient cooling (E.g. through natural ventilation or passive cooling methods)

If the concept is found to be feasible and scalable, this would significantly cut down the land space requirements of DCs and contribute towards Singapore’s 2030 climate pledge. It could also apply various new approaches in data centre design and construction methods, processes and applications both locally and globally.

### **About Green Data Centre Programme**

IMDA embarked on the Green Data Centre Programme (GDCCP) after the launch of the Green Data Centre Roadmap in late 2014. Funded under National Research Foundation (NRF) Urban Solutions and Sustainability domain, the GDCCP aims to boost overall data centre energy efficiency through innovation, pilot emerging technologies, and formulate new guidelines for sustainable computing. These would go beyond the application of best-in-class technologies and processes today. Its recommendations are intended to guide the research community, technology companies and the data centre industry in charting their technology directions. The GDCCP also reaffirms Singapore’s commitment to protect the environment.



The programme intends to:

- **Direct local R&D efforts** in green data centre technologies by providing research funding for key areas of research through the Green Data Centre Research Grant Call.
- **Demonstrate emerging technologies and spur innovation** which could be adopted by data centres in the future through Green Data Centre Hub proof-of-concept trials.
- **Develop policies and guidelines** related to resource efficiency such as energy use by data centres in Singapore to achieve a sustainable computing infrastructure.

#### **About Infocomm Media Development Authority (IMDA)**

*The Infocomm Media Development Authority (IMDA) will develop a vibrant, world-class infocomm media sector that drives the economy, connects people, bonds communities and powers Singapore's Smart Nation vision. IMDA does this by developing talent, strengthening business capabilities, and enhancing Singapore's ICT and media infrastructure. IMDA also regulates the telecommunications and media sectors to safeguard consumer interests while fostering a pro-business environment. IMDA also enhances Singapore's data protection regime through the Personal Data Protection Commission. For more news and information, visit [www.imda.gov.sg](http://www.imda.gov.sg) or follow IMDA on Facebook IMDAsg and Twitter @IMDAsg.*

#### **About Huawei**

*Huawei is a leading global information and communications technology (ICT) solutions provider. Our aim is to enrich life and improve efficiency through a better connected world, acting as a responsible corporate citizen, innovative enabler for the information society, and collaborative contributor to the industry. Driven by customer-centric innovation and open partnerships, Huawei has established an end-to-end ICT solutions portfolio that gives customers competitive advantages in telecom and enterprise networks, devices and cloud computing. Huawei's 180,000 employees worldwide are committed to creating maximum value for telecom operators, enterprises and consumers. Our innovative ICT solutions, products and services are used in more than 170 countries and regions, serving over one-third of the world's population. Founded in 1987, Huawei is a private company fully owned by its employees. For more information, please visit Huawei online at [www.huawei.com](http://www.huawei.com) or follow us on Facebook, LinkedIn, Twitter, Google+ and Youtube at Huawei.*

#### **About Keppel Data Centres Holding**

*Keppel Data Centres Holding was formed in January 2011 as a 70-30 joint venture company between Keppel T&T and Keppel Land to consolidate their data centre assets and position the business for further growth. The company has a track record of more than a decade in owning, developing and managing high quality carrier-neutral data centre facilities that support mission-critical computer systems. It currently manages and operates a gross floor area of more than 648,500 sq ft in data centre, business continuity and disaster recovery centre space in Singapore as well as a global portfolio of 17 data centres located in key data centre hubs across Asia Pacific and Europe through Keppel DC REIT. <http://www.keppeldatacentres.com>*



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