Asia Pacific Data Centres

SPOTLIGHT
Savills Research

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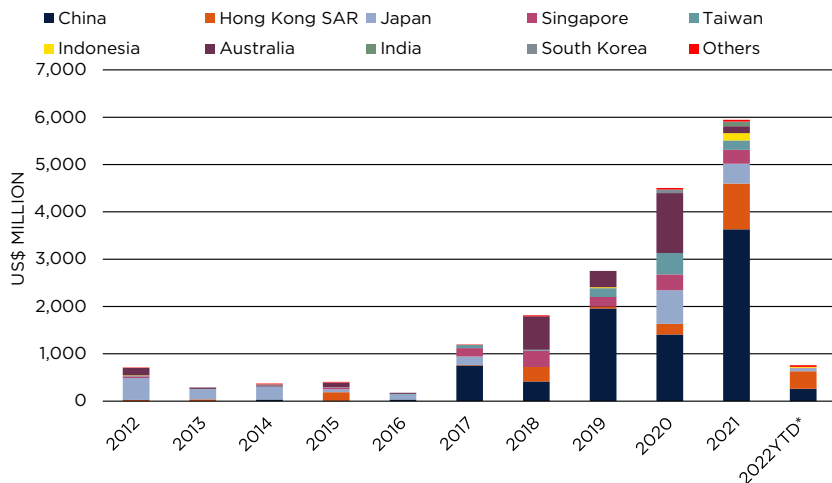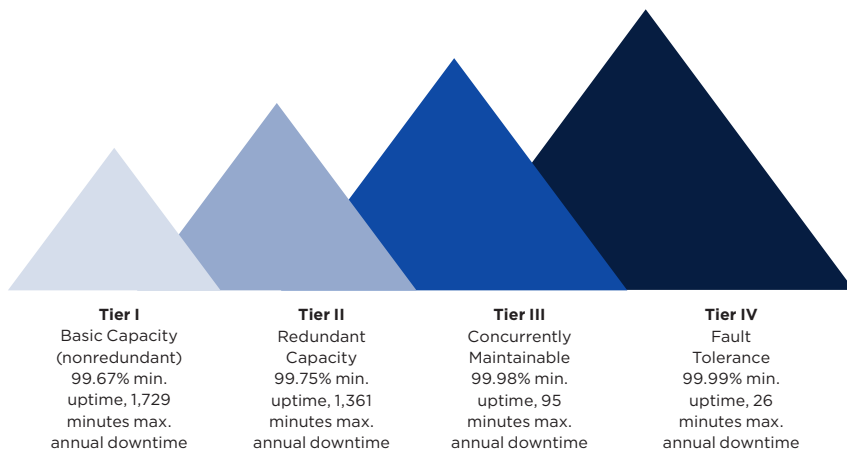
Strong demand continues to support data centre growth across Asia Pacific

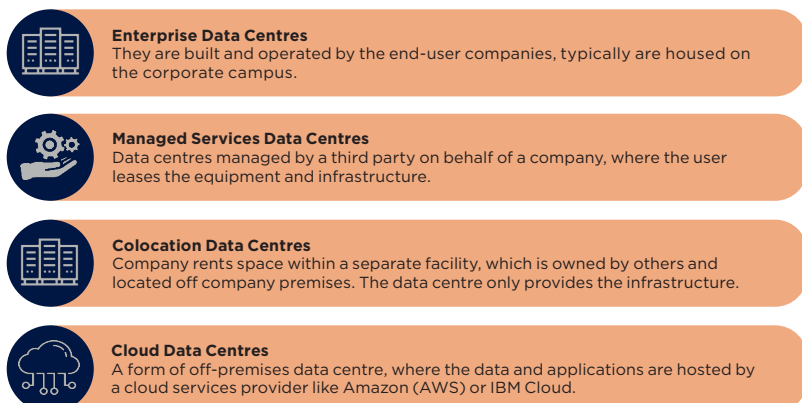**GRAPH 1: Data Centre Transaction Volume by Market, 2012 to 2022YTD**

Legend:
- ■ China
- ■ Hong Kong SAR
- ■ Japan
- ■ Singapore
- ■ Taiwan
- ■ Indonesia
- ■ Australia
- ■ India
- ■ South Korea
- ■ Others

Y-axis: US$ MILLION (0 to 7,000)

X-axis: 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022YTD*

Source Real Capital Analytics
Note 2022YTD* only includes transaction volume up to 20 May 2022

GRAPH 2: Tiers of Data Centres

Tier I	Tier II	Tier III	Tier IV
Basic Capacity (nonredundant) 99.67% min. uptime, 1,729 minutes max. annual downtime	Redundant Capacity 99.75% min. uptime, 1,361 minutes max. annual downtime	Concurrently Maintainable 99.98% min. uptime, 95 minutes max. annual downtime	Fault Tolerance 99.99% min. uptime, 26 minutes max. annual downtime

Source Uptime Institute, Zenlayer

GRAPH 3: Types of Service Model

Enterprise Data Centres
They are built and operated by the end-user companies, typically are housed on the corporate campus.

Managed Services Data Centres
Data centres managed by a third party on behalf of a company, where the user leases the equipment and infrastructure.

Colocation Data Centres
Company rents space within a separate facility, which is owned by others and located off company premises. The data centre only provides the infrastructure.

Cloud Data Centres
A form of off-premises data centre, where the data and applications are hosted by a cloud services provider like Amazon (AWS) or IBM Cloud.

Source Cisco

ASIA PACIFIC

The regional boom in data centres is showing no signs of slowing as data usage and storage demand continue to rise. Compared to other parts of the world, the data centre market in Asia Pacific is still relatively new and has seen a rapid growth spur over the past five years. Yet the region's huge population base, accounting for 50% of the estimated global count, is ultimately the key driver for data centre services and facilities. This was further accelerated amid the pandemic, as many businesses have shifted to working from home during the sporadic lockdowns. The importance of digital infrastructure to the global economy is more prevalent than ever. Riding on the back of this support, Asia Pacific data centre transaction volume hit to US$5.9 billion, up 32% YoY from 2021, with China still the most active market since 2017.

Data centres are typically classified either based on infrastructure capability ranging from tiers of one to four, or type of service model, including enterprise, managed service, colocation and cloud providers. At the moment, the market is mostly dominated by colocation providers, followed by cloud service providers. International cloud service providers, such as Amazon, Microsoft, Google, Alibaba, Tencent, and Facebook, have also been driving expansion activity in recent years, as they start to build their own hyperscale data centres, a type of large-scale facility, typically with a minimum of 5,000 servers and at least 10,000 sq ft in size, owned and operated by cloud service providers and offering scalable applications and storage services to businesses.

Asia Pacific has a diverse data centre landscape, comprising markets at various stages of maturity, ranging from the more developed markets such as Australia, Japan, mainland China, Hong Kong and Singapore to emerging markets such as India, Malaysia, South Korea and Indonesia. China has the most data centre stock with 447 facilities, followed by Australia and Japan, at 279 and 207 each respectively. Meanwhile, growing urbanisation alongside greater digital penetration in emerging markets such as India and Indonesia are expected to drive the next wave of growth. According to Structure Research, the regional data centre market is forecast to grow at a CAGR of 12.2% from 2019 to 2024, with the colocation market size standing at US$28 billion by 2024, surpassing EMEA and North America.

MAJOR MARKETS
China

China is the second-largest data centre market globally after the USA, owning 10% of the global share. According to IDC Quan, the Chinese market size totalled RMB223.9 billion in 2020, up 43.3% YoY, partly due to increased online demand during COVID. The market is largely dominated by telecom carriers, as the three local players China Telecom, China Unicorn and China Mobile account for 63% of total market share. However, carrier-neutral services are gaining more popularity over the years, as third-party service providers continue to expand their capacity, especially with hyperscale facilities.

Fuelled by substantial user demand, major data centre markets such as China, Japan and South Korea have pulled in substantial investment, while emerging markets India and Indonesia are set to lead the next wave of growth.

GRAPH 4: Number of Data Centres by Market, 2021

Source Cloudscene
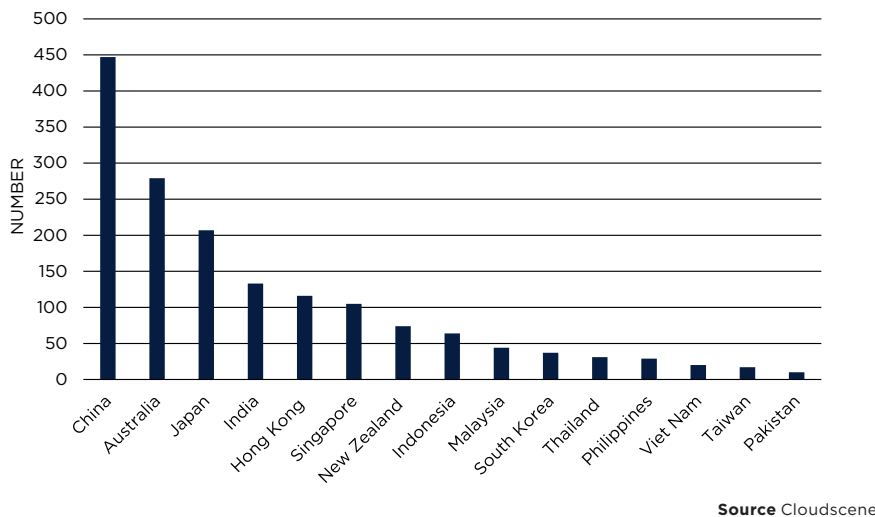
GRAPH 5: China Carrier-neutral IDC Rental Range by Scale of Operator and Market, 2021

Source Savills Research & Consultancy
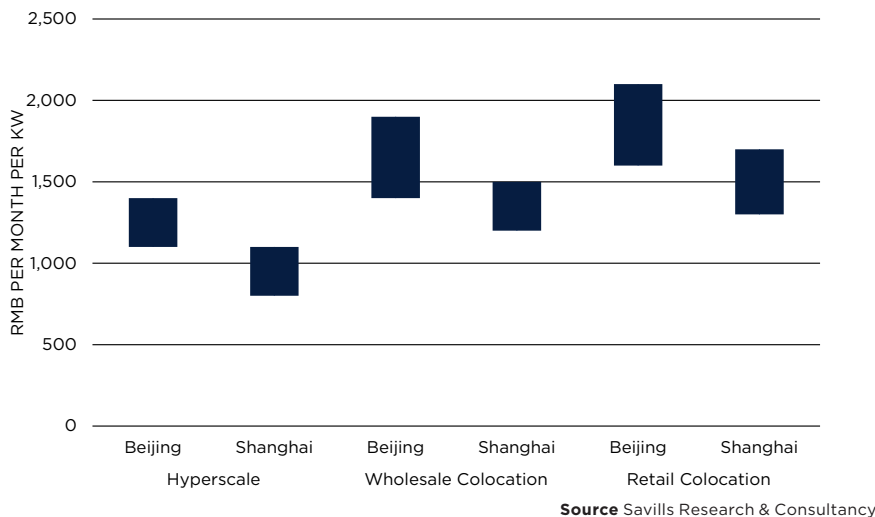
As for rental performance, first-tier cities significantly outperform the rest of the country in both rents and utilisation rates. First-tier city rates average around RMB1,500 per month per KW, while more remote locations usually stay in the range of RMB400 to RMB500 per month per KW. The estimated utilisation is low for ultra-large data centres located in mid-west China, floating around 30% to 50%, whereas those located in the first-tier and surrounding cities often reach 70% or above.

In terms of policy and regulations, the Cybersecurity Law, Data Security Law and Personal Information Protection law all restrict cross-border data flows and enforce data localisation, which in turn supports demand in the domestic data centre market. For example, under the Cybersecurity Law, companies considered critical information infrastructure operators, such as public communications, information systems, energy, water, transport, finance, health care and other public services must store their data in mainland China locally. Some foreign companies such as Tesla and Apple, have thus announced plans to build data centres for Chinese user data.

The government continues to tighten policies in first-tier cities, meanwhile encouraging more energy-efficient green developments in approved regions. The Chinese government has issued the Three-year Action Plan for the Development of New Data Centres (2021-2023), calling for a national average utilisation rate[1] of 55% by the end of 2021, further rising to more than 60% by the end of 2023. Power usage effectiveness (PUE)[2] meanwhile, will fall from below 1.35 this year to under 1.3 in 2023. These regulations essentially demand that new facilities become more energy efficient.

Moreover, China's National Development and Reform Commission (NDRC) has designated 'national computing hubs' to

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1 Utilisation rate measures the extent to which data centre servers are being used.
2 Power Usage Effectiveness (PUE) Ratio measures the energy usage of data centres. It is the total amount of energy used by a data centre divided by the energy delivered to computing equipment in said facility. The closer the ratio is to the ideal 1.0, the more energy-efficient the facility is.

boost data centre development in energy-rich western provinces under the initiative 'Eastern Data Western Calculation'. Four clusters were announced in 2021, namely the northern Inner Mongolia region, northwestern Ningxia region, Gansu province and southwestern Guizhou province, all of which enjoy the benefit of plentiful renewable energy, colder climate, and favourable local regulations. For example, Guizhou province continues to promote the development of data centres and it has lowered the price of electricity to around 0.46 yuan/kWh since 2016, while the price of electricity for large data centres has even dropped to 0.35 yuan/kWh. Now, NDRC has added four other hubs covering China's key economic regions and main source of computing demand including the Beijing-Tianjin-Hebei region, the Yangtze River Delta,

the Guangdong-Hong Kong-Macao Greater Bay Area, and the Chengdu-Chongqing economic circle. On top of these hubs, ten smaller data centre hubs could be planned.

Yet all four first-tier cities are limiting the construction of data centres. Beijing has been at the forefront of regulations in the country as early as 2014. It has already prohibited the building and expansion of data centres in central urban areas while diverting activity to surrounding Tianjin and Hebei. The city's local government has released a draft plan to mandate that data centres completed in 2021 and after must include renewable energy in their power sources and incrementally increase the share of renewables by 10% each year to 100% by 2030. Existing data centres which do not meet the efficiency standards will be hit by higher power tariffs. Facilities

with a utilisation rate of less than 80% two years after the operation will have to file for new energy consumption quotas. The city is also planning to phase out older facilities with PUE levels of over 2.0.

Shanghai issued an industry guideline named 'Guiding Opinions on Strengthening the Coordinated Construction of Internet Data Centers in this Municipality' in 2019, with regulation of industry development. Under its auspices, new constructs are banned within the middle ring road of the city. It also requires new projects to have a PUE of 1.3 or lower, where the scale of a single project should be no less than 3,000 racks in principle, and the average single rack power should not be less than 6 kilowatts, as well as restricting new racks to under 60,000 for the city.

Guangdong province is also very active in this process of restricting new construction while pushing for higher efficiency. Under its 'Notice on the overall layout plan of 5G base stations and data centres in Guangdong Province (2021-2025), Guangzhou and Shenzhen can only build medium-sized and below data centres in principle. New construction and expansion should have a PUE of 1.3 or lower, among which data centres with a PUE of less than 1.25 are preferred. On top of this, Guangdong province has announced that power allocation for new projects (except for small-scale project for corporate self-use) before 2023 would be suspended, and approved projects which have not started construction after two years or more will have their power quota revoked. Shaoguan, is the only exception in the province. The city is approved to build a data centre cluster with 500,000 cabinets by 2025 to serve the data need of the Greater Bay Area.

The local governments of Guangzhou and Shenzhen also have more detailed citywide policies to regulate industry development. For example, Guangzhou is also planning to upgrade its existing data centres to a PUE of 1.3 or lower by 2022. Meanwhile, in Shenzhen, the government is pushing for greener operations. Data centres with a PUE of 1.4 or higher will not receive any extra power quotas for new energy consumption, whereas data centres with a PUE of less than 1.25 can be given up to 40% of power quota.
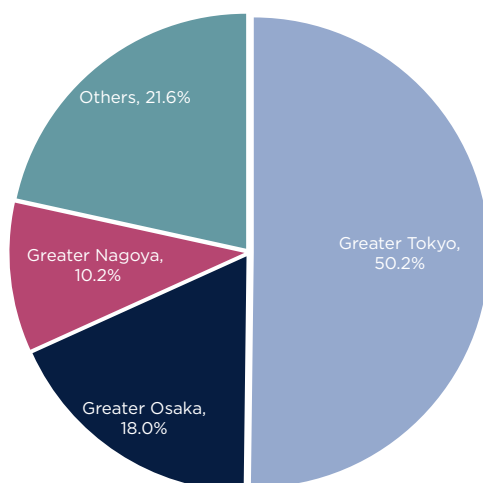
JAPAN

Given the proliferation of internet usage and the advent of 5G, Japan's data centre market is already set for rapid expansion. The COVID-19 pandemic has further accelerated this trend as domestic firms have been compelled to modernise their IT infrastructure. The market has traditionally been very insular, led by domestic systems integrators and IT companies such as Fujitsu, Hitachi, Mitsubishi Electric and NEC, although there is no dominant domestic player. Greater Tokyo is not surprisingly Japan's top data centre market, accounting for 50% of the data centre

GRAPH 6: Japan Data Centre Market Value by Region, 2018 vs 2023
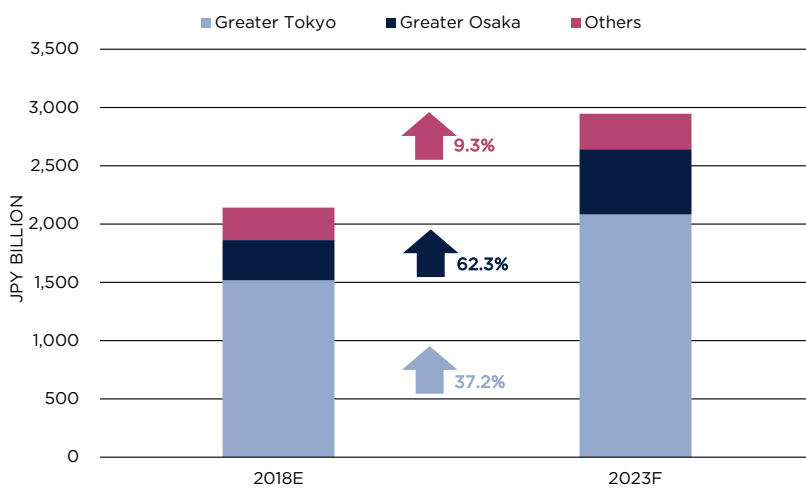
Source Fuji Chimera Research Institute

GRAPH 7: Distribution of Data Centres in Japan by Region, 2020

Source Japan Data Centre Council

capacity in the country as of 2020, followed by Greater Osaka and Greater Nagoya at 18% and 10%. Inzai City in Chiba prefecture has emerged as a hub for large-scale data centres servicing the region.

The data centre sector has seen a myriad of investments over the past two years as demand soars, mainly for the hyperscale data centres which cloud-based technologies require. The absence of a dominant domestic player presents Japan as an ideal market for international hyperscale cloud platform providers from both the U.S. and China to break into. On top of this, Japan's strategic location as a connection and distribution hub for submarine cables from the west coast of the U.S. which extend to the Asia Pacific region also plays in its favour. The recent wave of investment has also come on the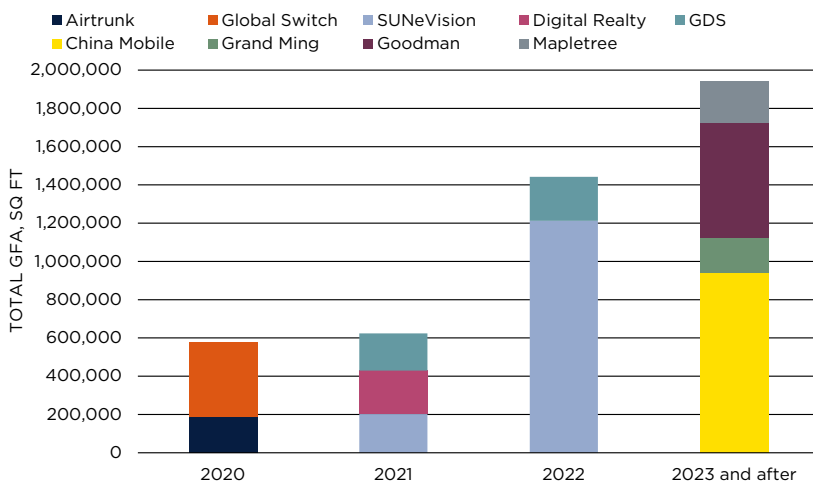 back of increased support from the government. Building data centres requires government planning and assistance for national security measures and electrical grid improvements, given the impact which they have on the technological and security infrastructure of a country.

Still, identifying available land which also has access to the appropriate energy and fibre optic infrastructure remains a key challenge. This has been a roadblock for major cloud providers in particular, as they generally prefer to develop and operate their own out-of-the-box facilities. Instead, they have had to rely heavily on third-party colocation centres to deploy and strengthen the capacity of their cloud regions. Even major colocation operators such as Equinix have largely leased their Japan facilities from domestic corporates. Joint ventures with entities which have existing platforms in Japan appear to be the new modus operandi for operators looking to secure hard assets and property investors aiming to get a slice of the pie.

Looking ahead, demand for data centre capacity in Japan at large and Tokyo in particular, should continue to outstrip supply. Overall country capacity is expected to rise significantly, and IDC Japan expects that the size of the Japanese data centre market will exceed JPY2 trillion in 2024 from JPY1.5 trillion in 2020. In terms of submarket performance, the Greater Tokyo area will increase by 37% in data centre service market value between 2018 and 2023, with the Greater Osaka area seeing a 62% jump. The government is also looking to decentralise data centre distribution from the key metropolitan regions, as it is planning to building a dozen data centres in rural areas over the next five years through the 'Digital Garden City Nation Scheme'.

HONG KONG

Hong Kong is seen as a desirable data centre location within Asia Pacific, benefiting from its proximity to Mainland China, the city's pro-business environment, sound legal system, sophisticated telecommunications infrastructure, reliable power supply and low risk of natural calamities.

The Hong Kong government has introduced three measures to facilitate the development of data centres: (a) Changing part of an industrial building to data centre use: Building owners of an industrial building, located in "Industrial", "Commercial" or "Other Specified Uses (Business)" zones, may apply for a special waiver to change parts of eligible industrial buildings into data centre use at nil waiver fee. The proposed data centre use must be in industrial buildings aged 15 years or more.

(b) Redevelopment of existing industrial lots: For the development of high-tier data centres on industrial lots through lease modification, the land premium will be assessed on the basis of actual development intensity and high-tier data centre use, instead of optimal use and maximum development intensity. The data centre part of the redevelopment should not be less than 40% of the maximum permissible development GFA or a plot ratio of 2.5, whichever is higher.

(c) Land acquisitions from the government land sales programme: Investors can acquire government sites from its land sales programme.

SINGAPORE

Singapore is often considered a top data centre hotspot in Asia Pacific and one of the leading markets globally. The majority of existing data centres are Tier 3 or 3+ carrier-neutral facilities, with a handful of Tier 4s. There are several existing data centre clusters on the island including Tai Seng, Jurong

GRAPH 8: Hong Kong En-bloc Data Centre Supply, 2020 to 2023 after

Source Buildings Department, Savills Research & Consultancy

TABLE 1: Singapore Data Centre Market Future Supply, 2022 to 2023

PROJECT NAME	NAME OF DEVELOPER	ESTIMATED GFA (SQ M)	CAPACITY (MW)	ESTIMATED COMPLETION
AirTrunk SGP 1 (2nd Phase)	AirTrunk Singapore Holding	215,000	30 (1st Phase: 30)	2022
Facebook Singapore Tanjong Kling	Malkoha (Facebook)	171,000	150	2022
Single-user Data Centre	ST Telemedia Global Data Centres	14,000	15	2022
Google Data Centre	Google Asia Pacific	120,000	100 (1st Phase: 25)	2023

Source URA, Savills Research & Consultancy

West, IBP, Tampines/Changi and Science Park, as well as Loyang. In terms of operators, local entities such as Keppel DC REIT, Singtel and ST Telemedia still dominate the market, but foreign players such as Equinix and Digital Realty are also expanding over time.

As for the rental situation, fixed gross rents of a fully fitted-out data centre stood at around S$45 to S$50 per sq ft per month in 2020. Rents have been increasing by 20% to 30% in recent years due to the tight supply and are expected to see double-digit growth going forward. Looking ahead, four projects, with a total of 300 MW additional capacity will be added to the pipeline over the next two years among which, two are hyperscale namely the Facebook Singapore Tanjong Kling project (171,000 sq m) and Google Data Centre (120,000 sq m).

The data centre market consumes a significant amount of energy during operation and accounted for over 7% of the total electrical consumption in Singapore. In light of sustainability concerns, the government placed a moratorium on new data centre developments in early 2019. However, it will

begin to accept applications for new data centres by the second quarter of 2022. Under this new pilot programme, the Singaporean government will approve construction of no more than three new data centres with a total IT load of not more than 60 megawatts over an interval expected to last 12 to 18 months.

INDIA

The Indian data centre industry is witnessing robust growth in an era of virtualisation and cloud computing. The size of this market is estimated at US$7 billion, making up 3.5% of the global market of US$200 billion and 12.7% of APAC (US$55 billion) according to Gartner, IDC & Cyber Media Research. The country holds immense potential to become a regional hub in APAC owing to the availability of high bandwidth speeds, lower power tariffs and the presence of hyperscale data centres.

Strong policy and fiscal support is another driver propelling industry growth and attracting investment. The proposed Data Protection Act should ensure data protection and localisation, which is set to increase the demand for data
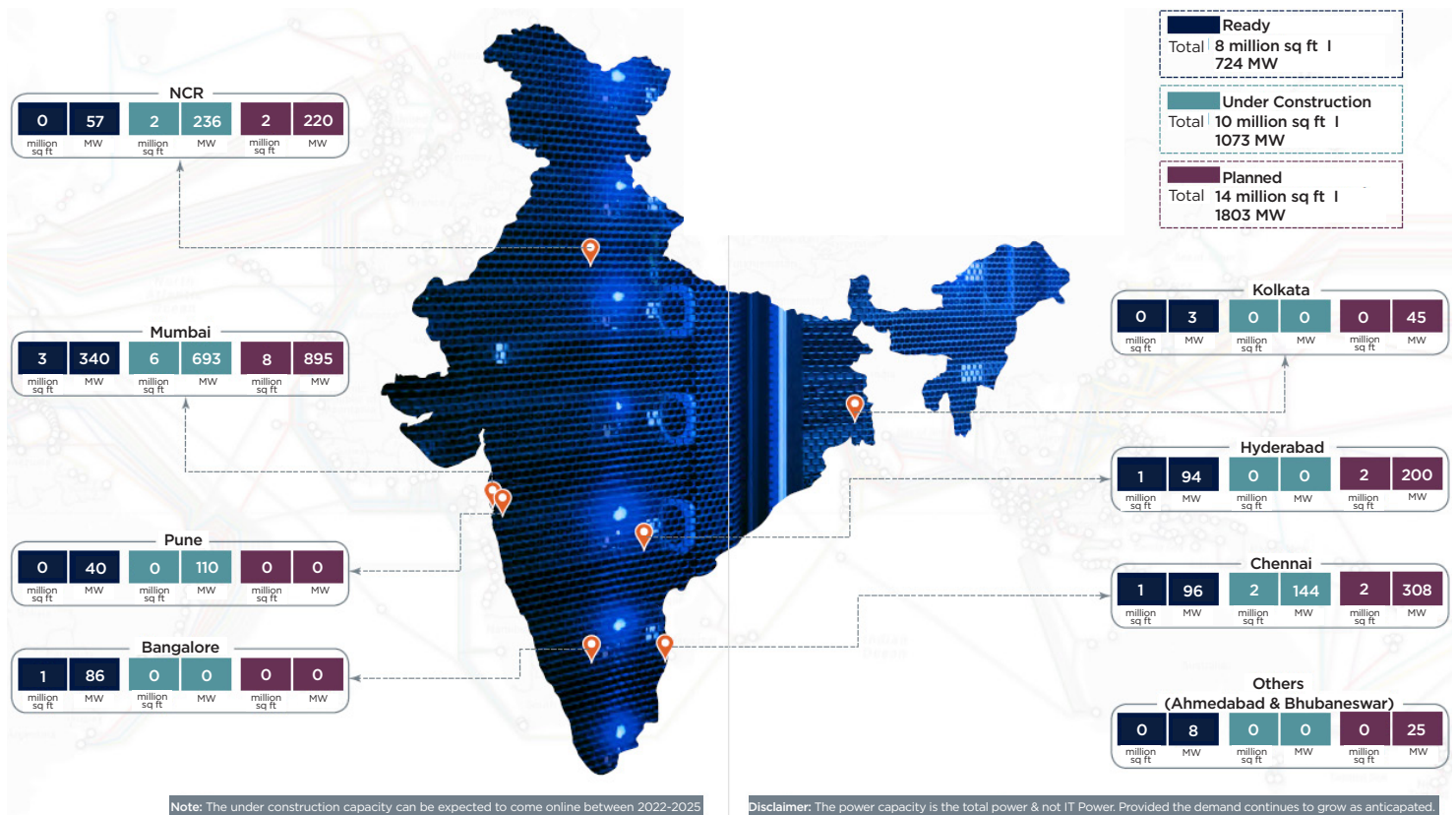
centre services and facilities. The country is also actively building new infrastructure, such as undersea cables, to fuel the growth of the industry. Furthermore, the Indian government's Ministry of Electronics and Information Technology released the Draft Data Centre Policy 2020 to ensure viable as well as reliable data centre capability for the country. Other initiatives such as Digital India and the Smart City Initiatives should provide an impetus for further growth.

At present, the data centre industry is buoyant in cities such as Mumbai, Chennai, Delhi NCR, Bangalore and Hyderabad. We expect demand for data centre space to increase by around 15 to 18 million sq ft across the major cities over the next 4 to 5 years. McKinsey has identified India as the second fastest-growing digital economy and projects that the IT and Communications Sector will double in size by 2025 to contribute US$355 to US$435 billion to GDP.

INDONESIA

Indonesia is now the growth engine for the data centre market in Southeast Asia. With an

MAP 1: India Data Centre Stock and Supply, 2021

	Ready	Under Construction	Planned
Total	8 million sq ft / 724 MW	10 million sq ft / 1073 MW	14 million sq ft / 1803 MW

NCR

million sq ft	MW	million sq ft	MW	million sq ft	MW
0	57	2	236	2	220

Mumbai

million sq ft	MW	million sq ft	MW	million sq ft	MW
3	340	6	693	8	895

Pune

million sq ft	MW	million sq ft	MW	million sq ft	MW
0	40	0	110	0	0

Bangalore

million sq ft	MW	million sq ft	MW	million sq ft	MW
1	86	0	0	0	0

Kolkata

million sq ft	MW	million sq ft	MW	million sq ft	MW
0	3	0	0	0	45

Hyderabad

million sq ft	MW	million sq ft	MW	million sq ft	MW
1	94	0	0	2	200

Chennai

million sq ft	MW	million sq ft	MW	million sq ft	MW
1	96	2	144	2	308

Others
(Ahmedabad & Bhubaneswar)

million sq ft	MW	million sq ft	MW	million sq ft	MW
0	8	0	0	0	25

Note: The under construction capacity can be expected to come online between 2022-2025

Disclaimer: The power capacity is the total power & not IT Power. Provided the demand continues to grow as anticapated.

Source Savills Research & Consultancy

MAP 2: Distribution of Major Data Centre Clusters in Indonesia, 2021

Source Savills Research & Consultancy

ambitious national vision, aiming to capture 40% of the ASEAN digital economy by 2025, the market is expecting to see more data centre developments as digital transformation gathers pace. In addition to this push, Indonesia's favourable demographic combined with supporting policies have also accelerated the growth of the local data centre market among which, two regulations are particularly influential. Regulation (PP) 71/2019 states that all firms, particularly financial institutions, are required to store personal data in data centres located inside the country. The central bank through Bank Indonesia Regulation No 9/15/PBI/2007 also states that all banks and financial institutions must own a backup mechanism through a Disaster Recovery Center (DRC), a replacement facility which allows firms to recover data and resume operations in case of emergency.

While existing data centre projects are still largely concentrated in the Greater Jakarta region, often located inside industrial estates, other major cities such as Surabaya, Bandung, Bali, and Batam are attracting investor interest. Major constraints hindering data centre investment in Indonesia include a lack of network infrastructure and an unstable power supply, particularly in rural areas. As such, developments have so far been concentrated only in the major cities. Nonetheless, the market still demonstrates huge growth potential. According to a report by Mordor Intelligence, the Indonesian data centre market was valued at US\$1.53 billion in 2020 and is expected to double by 2026 to US\$3.07 billion. Looking ahead, we expect to see more local and international players entering the market. Existing industrial estates will need to upgrade their networks and power supply infrastructure to meet the growing technical requirements and compete for tenancies. Currently, Indonesia's state-owned electricity company (PLN) is intensively collaborating with industrial estates to provide a constant supply of electricity to international standards.

VIETNAM MARKET RESEARCH x MARKET REPORT COMMUNITY

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