DATA CENTRE UPDATE

HONG KONG

SPRING 2020

> *A number of projects remain underway signifying continued strong interest in the local data centre market, as local companies seek to diversify their IT strategies."*

MORE INFORMATION

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GLOBAL DATA CENTER ADVISORY GROUP

Cushman & Wakefield's Data Center Advisory Group is a global team of elite professionals delivering specialized real estate solutions for mission critical users, owners, and environments. With scalability, reliability, and security as a driving force, our highly knowledgeable and responsive professionals guide clients to make effective financial decisions. Our expertise ranges includes colocation facilities, control centers, greenfields, powered shell, and trading floors. We lend additional value through our understanding of global dynamics and their impact on local markets.

Market Overview

Hong Kong remains of interest as a key regional data centre market, albeit one that has suffered through twin external shocks of late on both the political and viral fronts. Despite these challenges, development continues on data centre projects for several operators, including global REIT Equinix, Australian operator AirTrunk, locally traded CITIC and pan-China developer GDS. While Equinix and CITIC have continued with new phases on existing campuses, AirTrunk is at work on their 20 MW initial entry to the market, having done well in Australia and already working on development in Singapore. Shanghai-based GDS, which has in recent years focused on expanding operations in Mainland China with the construction of several large campuses in major cities, has also recently entered Hong Kong. Its first project, HK1, will be completed by the end of 2022, and represents the first of two scheduled projects that will offer over 35 MW at full build-out. GDS closed on a site for their upcoming HK2 campus in the fourth quarter, purchasing the former Milo's Industrial Building for HK$880 million. SUNeVision has started basic construction on two sites in Tsuen Wan and Tseung Kwan O, with both sites scheduled for first-phase completion in 2022. The market eagerly awaits further land to be released for data centre usage, preferably in the severely supply-constrained TKO but truly anywhere near power and fibre.

Ecosystem Developments

- **Amazon** announced that Hong Kong is one of seven new markets that can access AWS Outposts, with the new service extending AWS Infrastructure into any data center facility. Outposts is an option for those pursuing a hybrid IT strategy.
- **Gaw Capital Partners** has elected to enter the data center market in mainland China, forming a joint venture with established player Centrin Data to build and acquire properties across the country. The initial project will be located in Kunshan, with additional development to follow. Centrin has already constructed several facilities in Beijing, Wuhan, Yantai, and Shanghai.

Clouds Remain in the Forecast

Just as their peers throughout the United States and Europe are reviewing, many large enterprises throughout Asia are examining their current IT structure and determining how best to modernize while maintaining reasonable expenditure. For those who have maintained on-premises facilities to this point, most are discovering that the answer comes in a hybrid-IT format; some workload may remain on-premises, while other portions will migrate to one of the major cloud services providers and some will wind up in a colocation facility. As a global financial and business hub, Hong Kong remains in a very good position to take advantage of these trends; Azure, Google Cloud, and AWS are all present (with AWS increasing their operations as noted above), there are a multitude of undersea cables connecting to other major markets, and several multinationals that have regional presences locally. All considered, Hong Kong has an opportunity to remain a key data centre market even as the shape of the market changes.

Major Construction Update

OPERATOR	LOCATION	PROJECT	STAGE / EST. DELIVERY
Equinix	Shek Mun, Shatin	HK4 (Phase III)	Under Construction / Q2 2020
AirTrunk	Tsuen Wan	HKG1	Under Construction / Q4 2020
CITIC	Kwai Chung	CTT (Phase III B)	Under Construction / Q1 2021
GDS	Kwai Chung	HK1	Under Construction / Q4 2022
SUNeVision	Tsuen Wan	TWTL 428	Under Construction / Q4 2022
	Tseung Kwan O	TKOTL 131	Under Construction / Q4 2022

DATA CENTRE UPDATE

SINGAPORE

SPRING 2020

Key Indicators

Under Construction
286 MW

MORE INFORMATION
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Market Overview
Singapore has seen plenty of action over the last six months, with Keppel Data Centre REIT increasing their portfolio and several development projects continuing on. STT has a major build in Loyang that will be completed by mid-year, and international operators AirTrunk (on their initial in-country build), Digital Realty, and Equinix are progressing on their own expansions. Singapore is not only a source of investment for data centres but is also rapidly becoming a research hub thanks to the continued work by Keppel and others to innovate in the sector. Cloud services operators continue to enter the local market to service regional clients, drawn by the local business environment and excellent connectivity. Although Singapore has suffered less than other areas of the world from COVID-19, the global connectivity requirements of those working from home make the local market attractive for current and future deployment, with the considerable number of subsea cables that link Singapore to the rest of the region and world.

Decisions on Future Developments
As Singapore ponders lowering national emissions and how best to combat climate change, the major power requirements of data centres have drawn considerable concern locally as they have around the globe. While other markets have been able to utilize hydroelectric or wind power to accommodate these issues, Singapore traditionally has had limited scope for change and relied on natural gas for most energy requirements. Current government plans to alleviate concerns by integrating more solar power are a start, but execution will prove difficult; the limited space for large solar deployments will do little for data centres that use the power of thousands of homes.

Losing the massive regional edge Singapore enjoys would be unacceptable to local business, so the way forward will likely involve a mix of solutions. Solar power, liquid cooling, and the continued research into both hardware and software to lower power usage effectiveness will all be involved, as is the much-discussed prospect of offshore data centres for their cooling potential. The future can still be bright for the local industry, but it will require some further consideration.
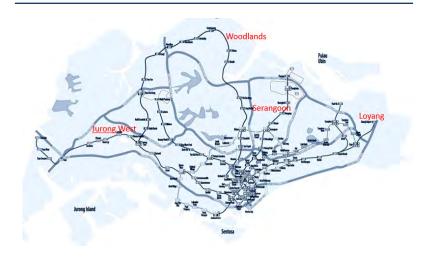
> *New cloud services, a new internet exchange, a new cable and plenty of construction continue to push Singapore ahead despite the current concerns over further development.*

Ecosystem Developments
- **StarHub** has announced their early occupancy in the upcoming AirTrunk campus, with their new facility to be called StarHub Data Centre @ Loyang and enabling dense deployments of up to 24 kW per rack. StarHub clients will be able to access multiple public cloud services and enjoy energy efficiency with the low power usage effectiveness (PUE) of 1.3 on offer.
- **SAP** launched a local data centre in October, with the facility to allow faster local access to the SAP Commerce Cloud for businesses. The suite offers a flexible e-commerce platform for business to business or direct to consumer solutions.
- **The National University of Singapore**, **Keppel Data Centres**, and **Singapore LNG Corp** have joined forces to research new data centre cooling technology. An initial application (known as Semiclathrate Thermal Energy Carrier System) has the potential to boost data centre PUE by 20%, and further innovations will be studied.
- **Deutsche Telekom** has opened a local security operations centre (SOC), with plans to review 2.5 billion events each day to protect client operations. The site mirrors the telecom giant's initial facility in Bonn, which acts as Europe's largest SOC.
- **DE-CIX** is planning to launch a new internet exchange in Singapore by late 2020, with the new venture to be directly operated by the exchange and offer new interconnection opportunities for cloud services.
- **Equinix** has added a group of new participants to its foreign exchange trading program, with Euronext FX, Lucera, and many others signing on to participate. Interconnections at their local International Business Exchange have stimulated these sorts of trades for some time.

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SINGAPORE MARKET MAP

ECOSYSTEM DEVELOPMENTS

- **Packet** upgraded its Singapore data centre at the end of 2019, moving the site from edge to core status for local clientele. The bare metal cloud provider was then acquired by global REIT Equinix in March for S$468M.

- **GovTech** announced that the upcoming National Digital Identity (NDI) will be built on a multi-cloud platform, with services from Google utilized for management. The architecture will assist in any information sharing that needs to happen across government systems.

- **NTT** has begun construction on the MIST cable, linking Singapore to Chennai, Mumbai, and Myanmar, with the 11,000-kilometre cable scheduled to go live in 2022. At the Singapore end the cable will connect to two other NTT cables that connect throughout East Asia.

- **Amazon** announced that Singapore is one of seven new markets that can access AWS Outposts, with the new service extending AWS Infrastructure into any data center facility. Outposts is an option for those pursuing a hybrid IT strategy.

> *Five projects will complete in 2020, with the Facebook mega-development continuing thereafter.*

Construction Update

OPERATOR	LOCATION	GFA SIZE (SQM)	TOTAL POWER (MW)	STAGE / EST. DELIVERY
Google	Jurong West	21,410	25 (est)	Under Construction / Q2 2020
STT	Loyang	27,000	30	Under Construction / Q2 2020
AirTrunk	SGP1	40,000 (est)	60	Under Construction / Q2 2020
Digital Realty	Digital Loyang II	32,035	13.5	Under Construction / Q3 2020
Equinix	SG5 (Phase I)	3,809	7 (est)	Under Construction / Q3 2020
Facebook	Tanjong Kling	170,000	150	Under Construction / Q2 2022

Recent Singapore Property Sales

PROPERTY	SIZE (SQM)	SALE DATE	SALE PRICE (S$)	BUYER	SELLER
20 Tampines St 91	7,854 (IT space)	Nov-19	$384,900,000	Keppel Data Centre REIT	Alpha Data Centre Fund, Keppel Data Centres
18 Riverside Rd	19,864 (GFA)	Nov-19	$200,200,000	Keppel Data Centre REIT	Keppel Infrastructure Trust, Shimizu Corp

DATA CENTRE UPDATE

SYDNEY

FIRST HALF 2020

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Key Indicators

Under Construction

170 MW

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Market Overview

Sydney has continued to welcome investment over the past several months, with new funding, new developments, and new service providers launching national operations from the local market. On the development front, AirTrunk has led the charge in recent months with the acquisition of a site in Lane Cove and beginning construction on the first phase of what will be a 110 MW campus at full build. This site combined with additional potential development options at SYD1 and international expansion in Hong Kong, Singapore and possibly Tokyo will keep the operator moving in coming months. Canberra Data Centres remains under construction on their project in Eastern Creek, with Keppel DC REIT and Alpha DC Fund both constructing smaller projects with scheduled completion dates in 2020 and 2021, respectively. On the American REIT front, Digital Realty is under construction on an additional base building in Erskine Park, though Equinix has no plans to expand at this moment after completing their A$270M SY5 build in November.

The battle against COVID-19 continues worldwide and at the time of this writing New South Wales leads the nation in confirmed cases. Despite this, local construction and infrastructure projects are continuing with safety precautions taken on-site. No large data centre projects have yet to be affected, reflecting the mission critical nature of such work.

Politics occasionally intervene in the data center realm, and an intriguing situation is under development between international operator Global Switch and the Australian federal government. Five organizations (Home Affairs, Foreign Affairs and Trade, Defence, ATO, and the SIC) all have deployments in the Ultimo campus of Global Switch, who despite being headquartered in London is now wholly owned by a group of Chinese companies. Concerned regarding national security, the government has issued a deadline of September 2020 to migrate all operations to other operators, though it is widely suspected that the move will not be completed by this date. Estimates to move this capacity is in the realm of A$500 million, and Canberra Data Centres might be the beneficiary based on their recent success in winning government business. The situation has received a fair amount of coverage in the global data centre press, and it may portend future moves by other international government entities concerned about data security and localization.

> *Sydney continues to attract initial Australian deployments, with international cloud service providers servicing the country from the local market.*

Ecosystem Developments

- **NextDC** announced Microsoft ExpressRoute connectivity at their S1 data centre, providing higher level support for Azure and building on their already strong cloud services platform. The announcement followed recent access to AWS Direct Connect, and the operator remains in planning on their proposed S3 campus.
- **5G Networks** has completed another acquisition, purchasing the St Leonards space from Servers Australia for A$2 million. At time of purchase the 1 MW facility was only 32% utilized, and is located in a leased office suite on Herbert Street.
- **DXN** announced a new tenant at their SYD01 data centre, with Business Communications Australia (BCA) signing a three-year colocation deal in February. DXN offers a module solution for wholesale and retail purposes.
- German cloud software provider **commercetools** has entered Australia, opening a data centre in Sydney to service clients across Australia and New Zealand. commercetools offers a suite of services across multiple touchpoints and recently received a large investment from private equity firm Insight Partners to aid expansion.
- American CRM firm **Zoho** has signed for space in Equinix data centres in Sydney and Melbourne, launching an official ANZ region to serve regional customers. Zoho is aiming to add public sector business to their current local client roster.
- **The Southern Cross NEXT Cable** began construction in October, with plans to connect Sydney, Auckland, and Los Angeles by early 2022. Spanning 16,148 kilometres, the A$500 million cable is being funded by a consortium including Spark NZ, Singtel, Verizon, and Telstra.
- **Packet** expanded their local footprint in Sydney late in 2019, deploying additional capacity to service regional clients. The bare metal cloud provider was then acquired by global REIT Equinix in March for A$561M.
- **RTI** confirmed that their JGA cable connecting Tokyo, Guam, and Sydney will terminate directly into Equinix data centres in both Tokyo (TY2) and Sydney (SY4). Both North and South portions of the cable are scheduled to go live by mid-year.

Fresh Funding For Australian Data Centres

Local data centre operators AirTrunk and Canberra Data Centres have both received new funding of late, as large investment organizations continue to find the growing data centre sector attractive. Macquarie Infrastructure and Real Assets (the infrastructure arm of the listed A$500 billion assets under management Macquarie Group) has signed to acquire a majority stake in AirTrunk, valuing the firm at A$3 billion. The operator launched in 2017 with backing from Goldman Sachs and TSSP, building initial sites in Sydney and Melbourne and now expanding internationally to Singapore, Hong Kong, and likely Tokyo. As referenced earlier in this update, AirTrunk is now underway on a second campus in Sydney that will provide 110 MW at full buildout.

Future Fund has also elected to make an investment, acquiring a 24.1% stake in Canberra Data Centres (CDC) in December. CDC launched in 2007 with initial sites in the Canberra area and is now under construction on a major campus in Eastern Creek. Future Fund joins a powerful group of investors including New Zealand-based infrastructure group Infratil and the Commonwealth Superannuation Corporation, the latter selling a portion of their stake to make the deal happen. Estimates at the time of deal placed a total value on the firm of roughly A$3 billion, thanks to the continued growth in government business for the operator and a partnership with Microsoft Azure to service these and other clients.

Operators both local and global are underway on construction throughout the Sydney market, with large infrastructure and pension funds deploying considerable capital to make it all transpire.

Construction Update

OPERATOR	PROJECT	SIZE (SQM)	POWER (MW)	STAGE / EST. DELIVERY
Canberra Data Centres	Eastern Creek	20,000 (est)	25	Under Construction / Q2 2020
Keppel DC REIT	Intellicentre 3 East	13,400	16	Under Construction / Q3 2020
AirTrunk	SYD2 SYD1 (Phase 2)	32,000 12,000 (est)	110 40	Under Construction / Q4 2020 In Planning
Alpha DC Fund	KDC Sydney 1	5,300	7 (est)	Under Construction / Q2 2021
Digital Realty	Erskine Park III	8,234	12	Under Construction
NextDC	S3	70,000 (est)	80	In Planning

Recent Sydney Land Sales

PROPERTY	SIZE (SQM)	SALE DATE	SALE PRICE (A$)	BUYER	SELLER
1 Sirius Rd, Lane Cove	40,000	Sep-19	$46,900,000	AirTrunk	Lane Cove Estate Trust (Charbel Demian)

DATA CENTRE UPDATE

TOKYO

SPRING 2020

CUSHMAN & WAKEFIELD

> *Several major operators are working on new phases, with nearly 100,000 square metres of new buildings in progress across greater Tokyo."*

MORE INFORMATION

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Market Overview

Tokyo has enjoyed the launch of several new projects over the past six months, with Equinix, MC Digital Realty, Colt, SoftBank, and KDDI all in progress on expansion to be completed by mid-2021. These projects are well-placed to coordinate with the recent increase in cloud software spend by large companies globally and including throughout Asia, as mid- and large-size enterprises modernize older infrastructure and scale accordingly. In the best-case scenario these enterprises will continue to move ahead with said expenditure, though unfortunate virus-driven economic headwinds have led to a national economy to a likely recession scenario. However, no significant postponements of the operators currently in development have been observed. Large players are still interested in obtaining better connectivity both to Greater Tokyo and throughout the country, with a new cable coming online shortly and data centre giant Megaport beginning service in-country.

Ecosystem Developments

- Australian data center operator **AirTrunk** confirmed that it is searching for a site in Tokyo, adding the market to its projects in Singapore and Hong Kong. The company launched with large campuses in Sydney and Melbourne and plans to expand throughout Asia.
- **Megaport** has launched operations in Tokyo, with the connectivity provider beginning services at two Equinix locations and the @Tokyo CC1 facility. Further expansion is planned at other Tokyo data centres, with Osaka following.
- **RTI** confirmed that their JGA cable connecting Tokyo, Guam, and Sydney will terminate directly into Equinix data centres in both Tokyo (TY2) and Sydney (SY4). Both North and South portions of the cable are scheduled to go live within the year.

Osaka on the Rise

As referenced in our last report, Osaka has emerged as a strong regional secondary market in comparison to the global powerhouse market in Tokyo. Osaka offers more affordable land (though good sites are rapidly becoming difficult to find), a large metropolitan area with many locally based clients, and a location as a possible disaster relief location for enterprises with their main facilities in Tokyo. AWS has announced their plan to expand its Osaka Local Region into a full suite of AWS Region by 2021, and NTT, MC Digital Realty, and @Tokyo have all announced new facilities in-market with similar amenities as to their Tokyo locations. As growing secondary markets in Asia, Osaka has been treated alongside Jakarta, Kuala Lumpur, Mumbai, Melbourne, and Seoul but the city might soon to receive its primary position in the near future.

Major Construction Update

OPERATOR	SITE	SIZE (SQM)	STAGE / EST. DELIVERY
KDDI	TAMA 5	3,800 (est)	Under Construction / Q2 2020
SoftBank	Fuchu	36,853	Under Construction / Q2 2020
Equinix	TY12x (Phase I)	2,787 (est)	Under Construction / Q4 2020
	TY11 (Phase II)	3,594 (est)	Under Construction / Q1 2021
Colt	INZAI 3	8,000	Under Construction / Q4 2020
MC Digital Realty	NRT10	37,780	Under Construction / Q2 2021