

DATA CENTRE UPDATE

APAC:

Tokyo , Hong Kong,
Jakarta, Singapore,
Sydney



Key Indicator



Under Construction

78+ MW

MORE INFORMATION

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Market Overview

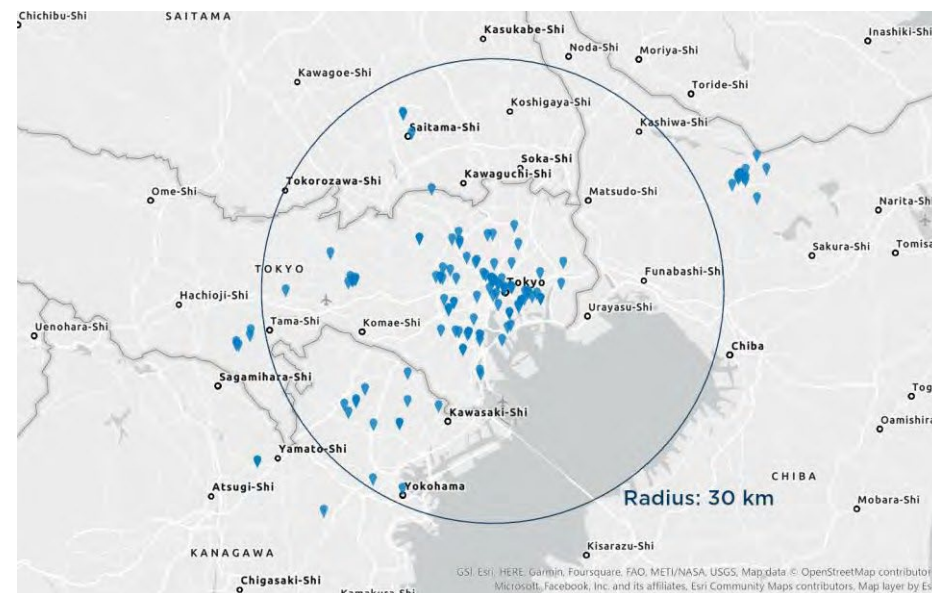
Since our last report, investment and development in the Tokyo market have continued at a rapid pace. New entrants ESR and Gaw Capital have made major announcements. Existing players such as @TOKYO brought online a new facility the greater Osaka area, while STACK Infrastructure and Internet Initiative Japan have all released plans for new facilities or expansions. Currently, the total capacity under construction is estimated to be at least 78 MW, with potential upside risk from many developments yet to be announced. While land availability remains limited in Central Tokyo, outlying areas have continued to provide sufficient land options for the development of hyperscale campuses. Tokyo remains underserved in terms of data centre stock per capita relative to other global peer cities, equivalent to less than 5% of that in Singapore. This supports robust demand ahead from major cloud service operators. As options increase for the growing tenant demand in the market, the coming years should have impressive performance for the rest of this year and continuing into 2023, both for investors and operators.

Ecosystem Developments

- Singapore-based **GLP** is expecting the first building in its development portfolio to be complete in 2024. As was previously reported, the logistics developer is planning to develop a 600 MW campus as its initial project for the Tokyo market.
- **Princeton Digital Group and Lendlease** have initiated construction of a 100 MW facility in Saitama City. The data centre is expected to be completed in 2024.
- **AirTrunk** is following up the completion of its initial 60 MW phase (300 MW at full buildout) TOK1 project in Tokyo with a planned 110 MW TOK2 campus in West Tokyo. AirTrunk will continue to partner with Daiwa House for the construction of this second facility.
- **ESR** announced its first project for the Tokyo market. The REIT plans to convert a recently acquired office campus in Higashi Kurume into a 20 MW facility. ESR already is developing a data centre project in Osaka.
- **Gaw Capital** announced its first data centre project for Tokyo. Located in Fuchu City, the multiphase project will total 39 MW at full buildout.
- **STACK Infrastructure and Oaktree Capital** have broken ground on a 36 MW campus in Inzai, East of Tokyo.
- **Internet Initiative Japan** has plans to develop a Phase 2 for its Shiroy data centre campus in East Tokyo. Construction of the 10 MW commenced in May 2022.
- **Hulic**, a Japanese developer, is expanding an existing office building under its ownership to include a data centre buildout.
- The Japanese Government announced a plan to expand undersea cable connection and construction of rural data centres throughout Japan. The government has committed JPY 50 (\$440B USD) to the project over the next three years.

OPPORTUNITIES AWAIT OUTSIDE OF INZAI

With increasing projects being announced for the Inzai cluster over the past year, there has also been growing questions as to what other submarkets of the Greater Tokyo market can be ideal for data centre development. Most developments remain within 30 km radius from the city center, Otemachi in Tokyo CBD, to prevent an unintended delay in data transmission speed. The West Tokyo area continues to attract the future demand due to the available land/labor/power supply. Over the past quarter, sizable institutionally-backed facilities have been announced across several sites to the West of Tokyo. AirTrunk, which recently launched its 60 MW TOK1 facility in Inzai, announced that its TOK2 centre would be 110 MW located in West Tokyo. This is joined by the previously mentioned 20 MW data centre planned by ESR for Mitaka. Both NTT and Digital Realty already have established facilities in Mitaka. Several other data centres also exist in these submarkets, including Telehouse's Tama 3 & 5 facilities built in 2014 and 2020. Vantage also continues work on its HND1 development in Sagami-hara. At completion of all phases, the facility will offer 80 MW of power. While Inzai will continue to see rising development, there remain opportunities across other areas of Tokyo.



Recent Property Sales

PROPERTY	SIZE (SQM)	SALE DATE	BUYER	SELLER
1-43 Nikkocho, Fuchu, Japan 183-0044	14,166 (+5,497 sqm land)	Jan-22	Gaw Capital	United Urban REIT, Japan Steel Works

Construction Update

OPERATOR	SITE	SIZE (SQM)	POWER (MW)	STAGE / EST. DELIVERY
@ Tokyo	CC3		32,000	N/A In Planning / Q4 2023
Colt	Tokyo Inzai 4		N/A	N/A In Planning / 2024
Equinix	TY11 (Phase III)	1,853		3 (est) Under Construction / Q2 2022
	TY11 (Phase IV)	N/A		N/A In Planning / Q4 2023
Google	Kaguro Building	99,600		N/A Under Construction / Q3 2022
IJJ	Shiroi	N/A		N/A Under Construction / Q2 2023
nextDC	Chiba 3	12,919		N/A Completed / Q2 2022
Princeton Digital Group	Saitama	29,430		48.5 Under Construction / Q2 2024
ST Telemedia Global Data Centres	Inzai (Phase 1)	N/A		N/A In Planning / Q2 2024
STACK Infrastructure	Inzai	23,000		18 Under Construction / Q4 2023
Vantage	HND1	28,000		8 Under Construction / Q2 2024

Key Indicators



Under Construction
348 MW



Vacancy
15%

Hong Kong Market Map



Market Overview

Expansion of established players and new entrants into Hong Kong continued through 2022. Institutions such as Nuveen, China Mobile, GDS and others have announced further expansions in the market since the beginning of the year. Despite limitations on available land and geopolitical tensions, investors have been unwavering in their dedication to the market, continuing to make substantial commitments. This year, Nuveen and ESR Cayman joined recent institutional players such as GDS and Mapletree in making a foray into Hong Kong. Nuveen’s Asia Pacific Cities Fund (APCF) acquired a 14 MW centre in Kwai Chung. Confirming rumors from 2021, GDS continued its planned expansion in Hong Kong. The firm added a third and fourth (HK3 & HK4) data centre to its pipeline. Neither are traditional ground-up developments for GDS, as HK3 is a shell currently being developed by a landlord and HK4 is an existing industrial building which will be adaptively reused. These point to a market landscape where competitors are increasingly getting more creative to expand their portfolios.

The rapidity of newly announced projects points to the continued demand by hyperscalers for significant scaling options. Despite vacancy remaining at a respectable 15%, availability of large-capacity options remains limited and will continue to drive larger builds that can satisfy the requirements of hyperscalers from both Mainland China and the United States, including Amazon Web Services, Microsoft Azure, Google Cloud, Alibaba, Tencent, Huawei Cloud and Kingsoft. Projects from Equinix, Digital Realty, SUNeVision and Vantage continue to make progress on delivery of their respective pipelines. With new projects from these providers continually being announced, coupled with new capital entrants every year, expect the amount of capacity under construction to increase throughout the rest of the year.

Ecosystem Developments

- **Nuveen** acquired a 270,000 sf data centre asset in Hong Kong’s Kowloon West area for \$371M. The asset is currently leased to Digital Bridge’s Vantage Data centres.
- **China Mobile** is building a new facility on a 1M sf site in the Fo Tan area of Sha Tin, New Territories, which it said will be completed in 2025.
- **SUNeVision** has acquired land in Hong Kong designated for a cable landing station (CLS) or ground station. It said the site will be used to develop SUNeVision’s second landing station for international submarine cables, following its first landing station—HKIS-1—launched last year nearby to the newly-acquired plot.
- Hong Kong property firm **Carrianna Group** has launched a new data centre (28,000 sf) in the Kwai Chung Industrial Area.
- **ESR Cayman** announced its intentions to expand its Hong Kong footprint in the wake of a record-setting earnings of \$377M in 2021.

Ecosystem Developments Continued

- **Digital Realty** launched its HKG11 facility in Kwai Chung. As the second data centre in the market for Digital Realty, the initial phase will provide 7.5 MW while the asset should reach 24 MW of critical capacity at full buildout.
- **GDS** announced further expansion for its pipeline of data centres in Hong Kong. The firm entered into a definitive agreement to lease an under construction shell in Kowloon West. This asset, dubbed HK3, is expected to deliver in the second half of 2024. Another asset, HK4, located in Kwai Chung is planned for delivery in 2025.

Construction Update

OPERATOR	LOCATION	PROJECT	TOTAL POWER (MW)	STAGE / EST. DELIVERY
Equinix	Tsuen Wan	Sha Tsui Road Project	40 (est)	Under Construction / Q4 2022
	Kwai Chung	HK1	7.9	Under Construction / Q2 2022
GDS	Kwai Chung	HK2	20 (est)	Under Construction / Q1 2024
	Kowloon West	HK3	20 (est)	Under Construction / Q3 2024
	Kwai Chung	HK4	20 (est)	Under Construction / Q4 2025
	Tsuen Wan	TWTL 428	10 (est)	Under Construction / Q4 2022
SUNeVision	Fanling	11 On Chuen St	10	Under Construction / Q4 2022
	Tseung Kwan O	TKOTL 131 (Phase 1)	50	Under Construction / Q2 2023
	Tseung Kwan O	TKOTL 131 (Phase 2)	130	Under Construction / Q4 2023
Vantage Data centres	Tsuen Wan	Tsuen Wan	40	Under Construction / Q4 2022
	Shatin	Goodman Logistics Ctr	20 (est)	Under Construction / Q4 2022
Mapletree	Fanling	FSSTL 268	50	In Planning / Q4 2024
ESR	Kwai Chung	ESR Kwai Chung	40	In Planning / Q4 2024
China Mobile	Shatin	STTL 613	80 (est)	In Planning / Q4 2024

Recent Hong Kong Data centre Sales

PROPERTY	SALE DATE	LOCATION	PRICE (HKD MILLION)	UNIT PRICE (HKD PSF, GFA)	PURCHASER
43 Container Port Rd	April-22	Kwai Chung	2,880	10,667	Nuveen

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Key Indicator



Under Construction
127 MW

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Market Overview

Driven by high undersea cable connectivity, a central geographic location in Southeast Asia and immense population growth undergoing digital transformation, Jakarta has been catapulting itself to a global data centre market. Major cloud services and institutional capital have increasingly made inroads into the market. All major cloud services are now present or will soon be, vying for businesses serving the top-five global population throughout Indonesia, along with the potential growth of a further 100 million people getting online for the first time over the coming decades. This has allowed Jakarta to leap ahead of the small builds that exist in many similar cities and straight to hyperscale, with 127 MW currently under construction through this year and further operators looking for entry points. While active development in the market has fallen slightly since mid-2021, the number of planned projects and expansions has surged. Together, the current projects will grow the Jakarta market by over 900 MW, with little unattractive legacy infrastructure holding back large-scale deployment. It is safe to expect further positive headlines with many of these announced projects transitioning to active construction through 2022.

Ecosystem Developments

- **Big Data Exchange (BDx)** announced the launch of BDx Indonesia, assuming operations for four existing data centres in the Jakarta market. BDx plans to upgrade these existing centres as well as develop greenfield sites, with a goal of reaching 70 MW by 2023 and 250 MW in the next five years. The set of data centres will be offer connectivity to BDx's cluster in China and Singapore.
- **EdgeConneX** enters the Jakarta market with the acquisition of a local 7 MW data centre owned by GTN and the development of adjacent land that will total 90MW in capacity once fully developed.
- **NTT** has launched its Jakarta 3 data centre. The facility will offer 15.2 MW of initial capacity and eventually will attain 40 MW once fully built out. Jakarta 3 will be connected to the upcoming APRICOT cable system that will arrive in 2024, which link all of NTT's major data centres in the area.
- **DCI** opened the first phase of a planned data centre in Karawang, East of Jakarta. The first phase of the project, H2-01, has 15 MW in capacity. When fully built out, the campus will reach a total capacity of 600 MW.
- **Indonet**, recently acquired by Digital Edge, opened a 6MW facility in downtown Jakarta. The firm has acquired two sites in Kuningan to further help build out a further 40 MW capacity for the market.

Ecosystem Developments (continued)

- **AWS** launched a new cloud region, ap-southeast-3, in Jakarta at the end of 2021. The facility joins two Direct Connect and one CloudFront edge location that AWS currently operates in the market.
- **Indosat** announced a partnership with Tech Mahindra to establish itself as the top telecommunications provider in Indonesia. The partnership is aimed at integrating 5G, cloud services and IoT across Indonesian networks.
- The Indonesian Government reiterated its commitment towards the digital transformation of the country's infrastructure. 360,000 kilometers of cable have been installed, with 12,000 kilometers under development. The government is also planning two multifunctional satellites, each with a 150 GBps capacity.

Latest developments from Batam

While Jakarta continues to expand, the data centre moratorium in Singapore has led to some creative solutions, including at the nearby recently-designated special economic zone (SEZ) of Batam. Batam Island is located 30 kilometres across the Singapore Strait, and the Nongsa Digital Park has rapidly drawn interest thanks to the business and income tax breaks available. Initially, the Gaw Capital-backed Data Centre First secured a 2.75-hectare site for data centre development, and a partnership between Telkom Indonesia (Telin) and Etisalat is reportedly making plans in the same area. At the end of 2021, GDS announced a purchase of a site in Batam for the development of two data centre buildings that would total 28 MW of IT capacity upon completion. GDS has also announced that it will be the strategic partner of a major Chinese cloud provider for the region. As 2022 continues, expect further purchase announcements at the Batam market continues to grow.

Recent Site Sales

PROPERTY	SIZE (SQM)	SALE DATE	BUYER	SELLER
Mataram, Lippo Cikarang	40,000	Feb-22	EdgeConnex	Multipolar Technology

Construction Update

OPERATOR	LOCATION	SIZE (SQM)	POWER (MW)	STAGE / EST. DELIVERY
Pure Data Centres	Jakarta	20,000	20	Under Construction / Q2 2022
Princeton Digital	JC2	22,800	35	Under Construction / Q3 2022
STT	Bekasi	60,000 (est)	72	Under Construction / Q1 2023

Key Indicators



Under Construction

165 MW



Vacancy

1%

MORE INFORMATION

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Market Overview

Singapore's moratorium on data centre construction concluded at the start of 2022. However, the Trade and Industry Ministry has clarified that it will be more selective with approvals of new developments going forward. With the aim of reaching climate goals, the government will "seek to anchor data centres that are best-in-class in terms of resource efficiency, which can contribute towards Singapore's economic and strategic objectives" as well as aiming to "raise the efficiency of existing data centres over time."

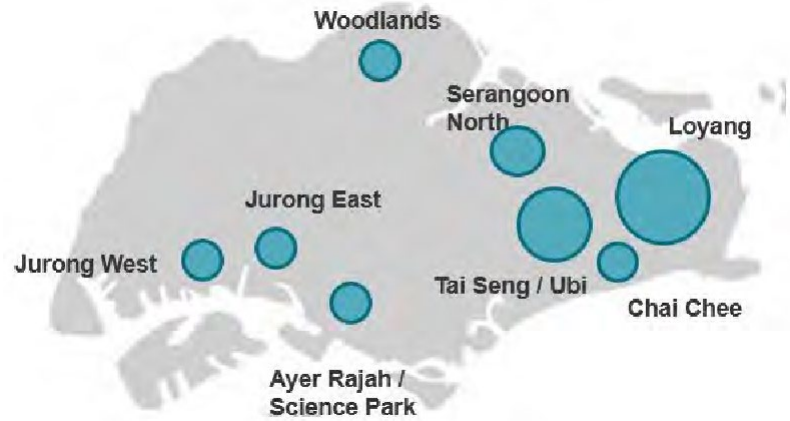
The government has announced a 12-to-18-month pilot program starting in Q2 2022 that will accept three developments from an application pool. These developments will be required to be 10-30 MW and 1.3 PUE or less. Developments with sponsors that have strong track records of developing data centres in Singapore as well as demonstrated commitment towards sustainability will be prioritized for approval. This capacity restriction will continue to drive larger hyperscale deployments to nearby markets such as Jakarta, Kuala Lumpur, Johor Bahru and Batam.

The limited development pipeline will continue to place downward pressure on vacancy which recently fell below 1% in Q2 2022. Singapore has also been connected to other major moves in the data centre space. BDx confirmed their HQ relocation to Singapore in March. Singapore's CapitaLand also announced a USD \$1.5B investment in expanding data centres across India. The government's plans to improve its technical infrastructure also came to fruition with the announcement of a formal partnership with Microsoft.

Ecosystem Developments

- Singapore's Home Team Science and Technology Agency announced a strategic agreement with Microsoft to establish a sovereign cloud utilizing Microsoft Azure to support non-sensitive computational infrastructure. Microsoft has had an established cloud region in Singapore since 2010.
- **Microsoft and Oracle Cloud** launched an interconnection node in Singapore. This will be the 11th such node for the partnership and the third in the APAC region.
- **Digital Realty** completed an IPO listing of its Digital Core REIT on the Singapore Exchange (SGX) for USD \$600M.
- **Equinix** completed an expansion of its fifth data centre in the market, SG5, in April 2022. The USD \$86M project raises the facility's total space to 83,000 sf.
- **Empyrion DC**, a portfolio company of Seraya Partners, acquired Dodid—a Singapore-based data centre operator—for USD \$147M. Dodid's assets include a 12.5 MW data centre in Singapore, where it acted as both owner and operator.
- **CoolestDC**, a Singapore-based startup focusing on a hybrid cooling patent, entered a strategic partnership with Digital Realty to deploy patented hybrid cooling technology into existing air-cooled data centres.
- **Wasabi**, a cloud storage provider, opened a new storage node in Singapore. The location will be its fourth, with previous regional locations including Osaka, Sydney and Tokyo.
- **BDx** relocated its headquarters from Hong Kong to Singapore in March 2022. The move highlights Singapore's strengths in terms of connectivity, talent and sustainability commitments and the high growth opportunities for data centres throughout Southeast Asia.
- **STACK Infrastructure** opened its APAC regional HQ in Singapore. The company has active projects in Inzai, Japan and also Melbourne, Canberra and Perth. Other APAC target markets for development include Singapore, Hong Kong and South Korea.
- **DigitalBridge and Columbia Capital** closed on the acquisition of a portfolio of assets from Superloop located in Singapore and Hong Kong for USD \$102M.

SINGAPORE MARKET MAP



The largest cluster of data centres in Singapore can be found in the Loyang and Tai Seng areas, with other locations scattered throughout.

ECOSYSTEM DEVELOPMENTS

- **Keppel** closed fundraising for a partnership with Asia Pac Technology. The fund reached \$1.1B in commitments, including \$150M from AIB, to develop hybrid and multi-cloud solutions across the region.
- **Princeton Digital Group** raised USD \$500M of equity from Mubadala, Warburg Pincus and Ontario Teachers Pension Plan (OTPP).
- Construction began on the **SEA-ME-WE 6** that will connect Singapore to Marseille, and include landing points at Egypt, Saudi Arabi, Djibouti, Pakistan, Mumbai, The Maldives, Sri Lanka, Bangladesh and Malaysia. Construction should be complete in Q1 2025.
- The **Pakistan and East Africa Connecting Europe (PEACE)** subsea cable is planned to be extended to Singapore by 2023. The existing cable network connects Marseille, Malta, Cyprus and Egypt, with progress toward connections to Pakistan and Kenya.
- The US-based **Subsea Cloud** has announced that it will deploy subsea data centre pods near Singapore in partnership with the government. The company claims these pods will help address some of the land and sustainability issues faced by the industry in Singapore and many other markets. The underwater pods are claimed to reduce power requirements by 40% and reduce emissions and operating costs.
- **NTU Singapore and Red Dot Analytics** are collaborating to develop technologies utilizing AI and digital twins to emulate and evaluate data centre operations. The partnership is aiming to reduce energy usage and emissions from data centres.
- **Kaspersky** has opened a Transparency centre in Singapore, providing trusted facilities where customers and partners can review code, software updates, threat detection rules and other activities. The company is also opening similar facilities in Japan and the US.

Construction Update

OPERATOR	LOCATION	GFA SIZE (SQM)	TOTAL POWER (MW)	STAGE / EST. DELIVERY
Meta	Tanjong Kling	170,000	150	Under Construction / Q2 2022
STT	Defu 3	14,500	15	Under Construction / Q3 2022

Key Indicators



Under Construction

76 MW



Vacancy

7%

MORE INFORMATION

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Market Overview

The Sydney market continues to grow at a rapid pace. Multiple hyperscale facilities have been announced across the market, with some already entering construction. Amazon, Microsoft and Google have all either been attached to new projects or at least have increased investment toward digital infrastructure in Australia. The scope of new data centres is also astonishing, with multiple projects estimated to exceed 300 MW at full buildout.

While planned projects continue to deepen Sydney's data centre pipeline, the projects actively under construction have remained relatively stable at 76 MW (this value was at 80 MW in the H2 2021 edition of this report). Many of the players actively under construction on facilities are the same names doubling down on planning for future projects. NextDC, Stockland, MacQuarie and AirTrunk have all announced further projects with major projects under construction or recently delivered. So far, vacancy has not sizably varied since the H2 2021 report, holding steady at a tight 7%. This figure could oscillate quickly, as new projects come online and are quickly absorbed by the high demand from both private and public sources.

Operational capacity is spread nearly evenly among Equinix, AirTrunk, NextDC, and Global Switch, with Canberra Data Centres and Digital Realty closing in. This allows for continued pricing and offering competition, unlike other markets globally that are occasionally dominated by a single provider.

The investment market has continued to be quiet since the last edition of this report. Cap rates remain in the low 4s, while funds remain hungry for the long leases and stability offered in Sydney. Expect continued strength in coming months from the local market, with the familiar mix of global and local operators competing for hyperscale, government and large enterprise business across a variety of new projects.

Ecosystem Developments

- **AirTrunk** announced a 320 MW hyperscale facility in Western Sydney, proximal to AirTrunk initial hyperscale data centre. This will bring the total capacity for AirTrunk's Western Sydney region to 450 MW when complete.
- **Stockland** received government approval for the construction of a \$264M AUD data centre in North Sydney totaling 6,300 sqm. The facility is to be leased to a major cloud computing provider, reportedly AWS.
- **Microsoft**, in partnership with Frasers Property and Altis Property Partners, is seeking government permission for a 190 MW, 122k sqm data centre campus in Western Sydney.
- **MacQuarie Data Centres** completed its 16 MW facility at the MacQuarie Park Data Centre Campus in Sydney's North Zone. The project sourced an initial investment of \$85M AUD and has a 10 MW lease signed with a confidential customer. MacQuarie is already working on a follow-up 32 MW facility on the campus.
- **Leading Edge Data Centres (LEDC)** has secured \$30M AUD equity from DigitalBridge for a 15 MW pipeline across New South Wales, Victoria and Queensland
- **NEXTDC and Multiplex** plan to open the first phase of their S3 Sydney data centre to customers in H2 2022. This planned data centre will consist of 26,770 sqm and will aim to attain the highest standards of sustainability and energy efficiency.

Sydney Potential



While many primary global markets have struggled with ever-increasing data centre capacity of late, Sydney has the potential to surpass many others on its way to being a 1 GW city. If all potential phases on all land currently banked by operators is completed over time (reflected in the “in planning” number on this chart for a longer-term outlook than the Construction Update below), Sydney and Tokyo will continue to thrive as destinations for hyperscalers.

Construction Update

OPERATOR	PROJECT	SIZE (SQM)	POWER (MW)	STAGE / EST. DELIVERY
Digital Realty	Erskine Park III	6,279	7.2	Under Construction / Q4 2021
NextDC	S3	20,000	12	Under Construction / Q2 2022
	S4	200,000 (est)	300	In Planning
DCI	SYD02	35,000	36	Under Construction / Q4 2022
Stockland	Athena	22,515	25 (est)	Under Construction / Q1 2023
Macquarie	IC3 Super West	30,000 (est)	32	In Planning / Q4 2023
AirTrunk	SYD1 (Phase 2)	12,000 (est)	40	In Planning
	SYD3	220,000 (est)	320	In Planning