
DCByte
Global
Data Centre
Index
2024

Contents

Executive Summary

Live Supply grew by 20GW globally from 2018 to 2023. Pipeline and Early Stage Supply experienced stronger growth in terms of both net supply and percentage growth across all regions, with APAC leading in two of the three supply categories analysed in Section I.

APAC has experienced the largest supply growth rates in Live and Early Stage Supply growth, and ranks second in Pipeline Supply growth. This is attributed to a smaller base market size at the start of the observed period and an influx of investment from new and established operators into the region. The growth trajectory of Live Supply is expected to continue to place the region as a strong second.

Although the Americas is seeing smaller numbers in terms of percentage growth, the region remains the largest in net supply as Northern Virginia remains the largest data centre market by both Live and Total Supply globally. The region is expected to maintain its lead on Live Supply by a significant margin in the next five years.

EMEA observed the slowest growth in Live Supply historically, but leads in Pipeline Supply growth. Majority of this growth in Pipeline Supply is concentrated in Europe, however the Middle East and African subregions also began to experience accelerated growth from the early years of the observed period. As a result, actual growth of Live Supply is expected to outstrip historical growth rates.

Introduction

Data centre markets around the world continue to grow at breakneck speed.

Tapping upon the quantitative and qualitative insights amassed whilst tracking nearly 7,000 individual data centres across globe, the Global Index provides insights into data centre market activity on a global, regional, and market-level.

Section I examines historical data on global data centre supply to look at the pace of developments regionally through nuanced supply categories and discussions surrounding what may lie in the future. This is followed by coverage of a selection of representative developed, developing, and interest markets regionally which are supplemented by analyst insights for more in-depth perspectives on the activity and trends in these markets.

Section II provides a regional focus on APAC, as the region's growth has shown to outpace the Americas and EMEA in two out of the three supply categories covered in Section I.

Methodology

DC Byte adopts a bottom-up approach in generating market-level analytics built from coverage of each individual facility.

A unique range of sources are used and triangulated, ranging from satellite observation imagery to parsing official earnings releases and public planning documents, speaking with stakeholders, and physical 'shoe leather' inspections. All data collected and presented in this publication is to the best of DC Byte's knowledge and experience.

The Global Index tracks the growth of supply across the three major regions of the Americas, APAC, and EMEA, and discusses representative highlight markets across these regions. The index tracks growth over a five year timeline from 2018 to 2023.

* Data for Mainland China is referential, and based on key operators in the major metros only.

* Coverage of Russia has halted since the Russia-Ukraine war. New developments since, if any, will not have been captured in the data.

Key Definitions

Live Supply

Determined IT power that is operational whether it is let or not.

Under Construction (U/C) Supply

Under Construction Supply is the estimated IT power that is currently having the mechanical and electrical plant installed to support it.

Committed Supply

Committed Supply is the estimated IT Load that we are highly confident will be added to a market's overall supply. To the best of our knowledge, this supply has the required elements (government, land, power, etc.) secured, or will be developed by an operator with a strong and reliable track record. Committed Supply could take the form of a data centre scheme which has yet to start construction, or it may refer to shell space in an existing data centre. The difference being that shell space can be fitted out normally in a matter of 3-6 months, while a data centre scheme that has yet to start construction might take 1-2 years. Committed Supply does not mean sold space.

Pipeline Supply

Pipeline Supply is the sum of Under Construction and Committed Supply.

Qualified Supply

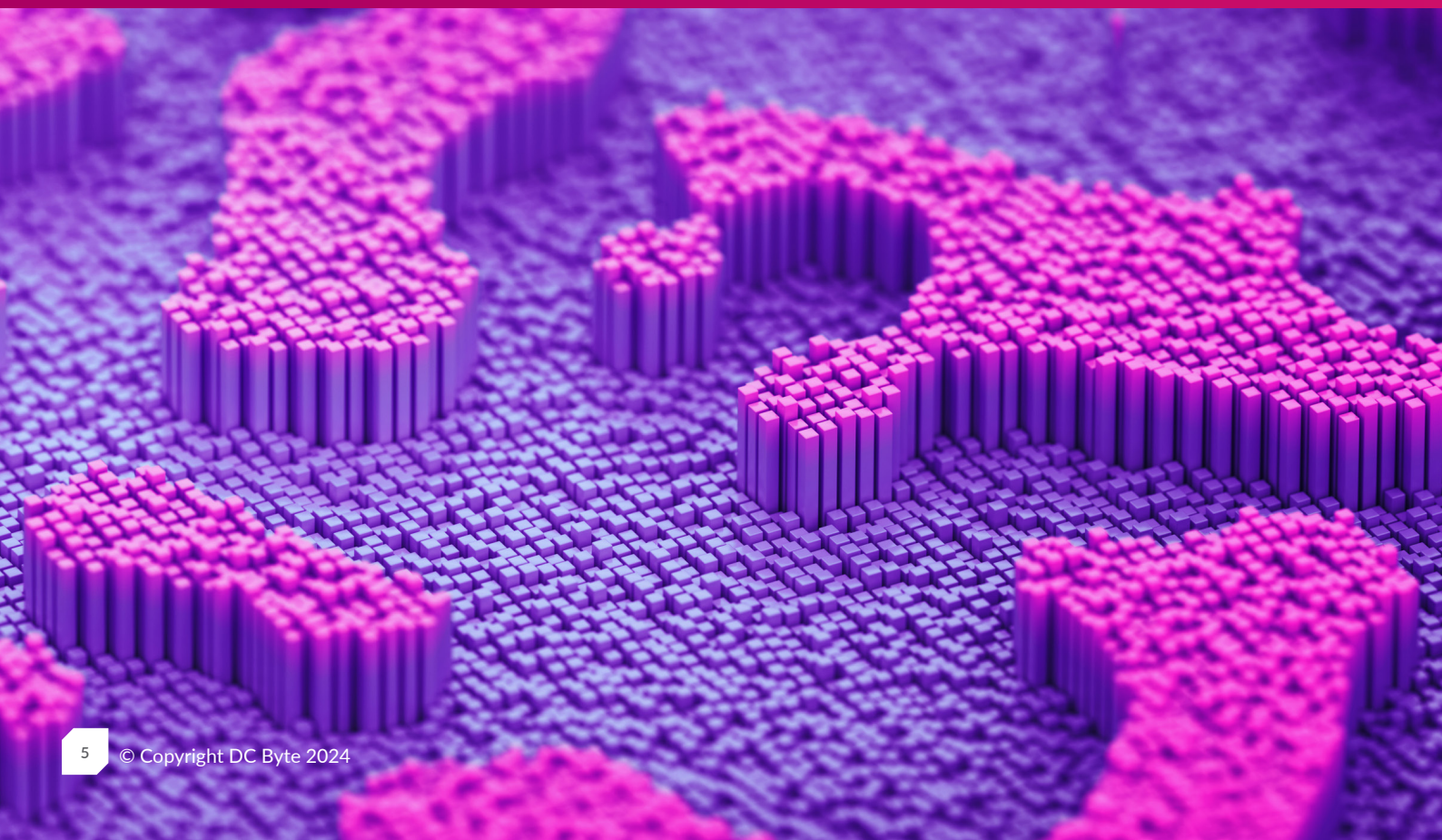
Qualified Supply is the sum of Live, Under Construction, and Committed Supply.

Early Stage (ES) Supply

Early Stage Supply is the IT Load that has been announced or speculated, but has yet to secure all of the required elements (government, land, power, etc.) for development. We do not hold full confidence in the development potential of this supply and it may require a major client precommitment for development to take place.

Total Supply

Total Supply is the sum of all four supply categories: Live, Under Construction, Committed, and Early Stage Supply.



Section I: Global Overview

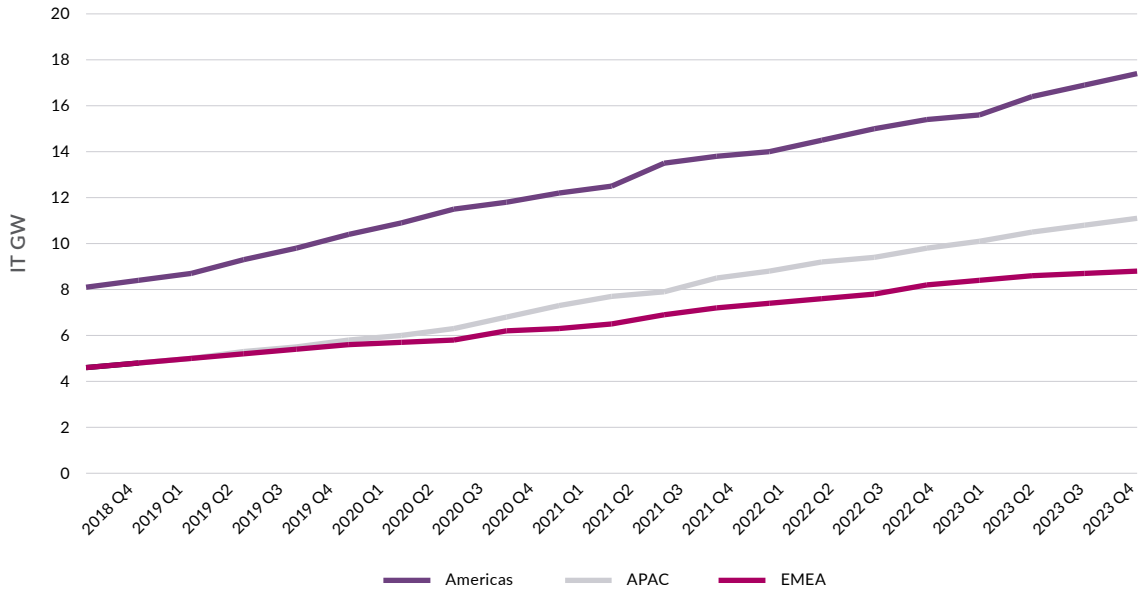
Colby Cox
Managing Director, Americas
colby.cox@dcbyte.com

Jingwen Ong
Research Manager, APAC
jingwen.ong@dcbyte.com

Chris Owen
Associate Director
chris.owen@dcbyte.com

Global Growth

Global Live Supply Growth



The Americas was and remains the market leader across all supply categories.

At the end of 2018, the region sat at 8.1GW of Live Supply, which more than doubled to 17.4GW in 2023. Growth remains robust as the democratization of Artificial Intelligence (AI) has fuelled the adoption of generative AI and Machine Learning (ML) applications. The United States in particular accounts for the majority of capacity and data centre supply growth in the region as the home base of innovation and development enabled by its status as a global superpower.

20GW growth

16.6% CAGR from 2018-2023 globally

APAC experienced the strongest growth at 19.1% CAGR from 2018 to 2023.

Developed markets such as Australia, China, Japan, and Singapore each contributed over 500MW to the 6.5GW of regional Live Supply growth over this period. Emerging markets within South and Southeast Asia also began to see growing interest in more recent years – the highly populous and young demographics of these countries present strong untapped potential for data centre demand. This is expected to fuel significant growth of the APAC data centre market as political and economic environments develop toward enabling digital infrastructure investments in these markets.

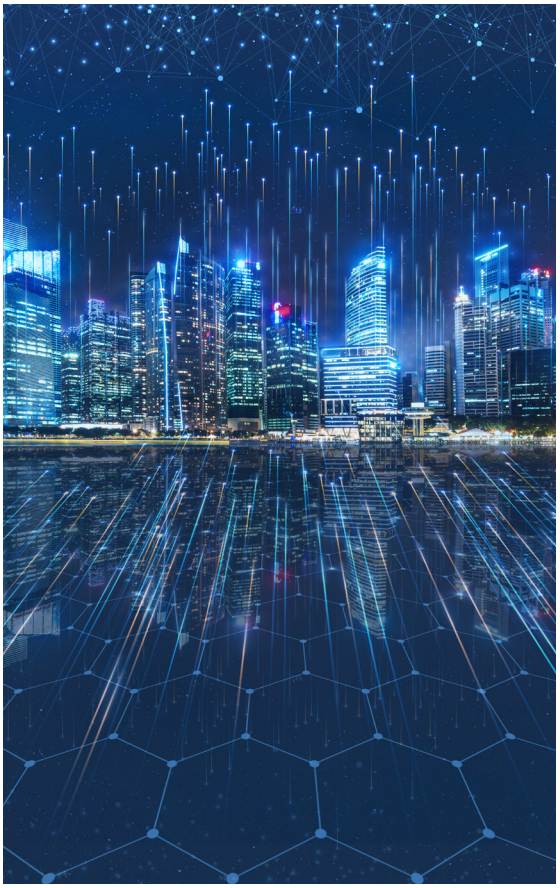
Americas
16.7% CAGR

APAC
19.1% CAGR

EMEA
13.6% CAGR

EMEA's Live Supply grew from 4.6GW in 2018 to 8.8GW in 2023.

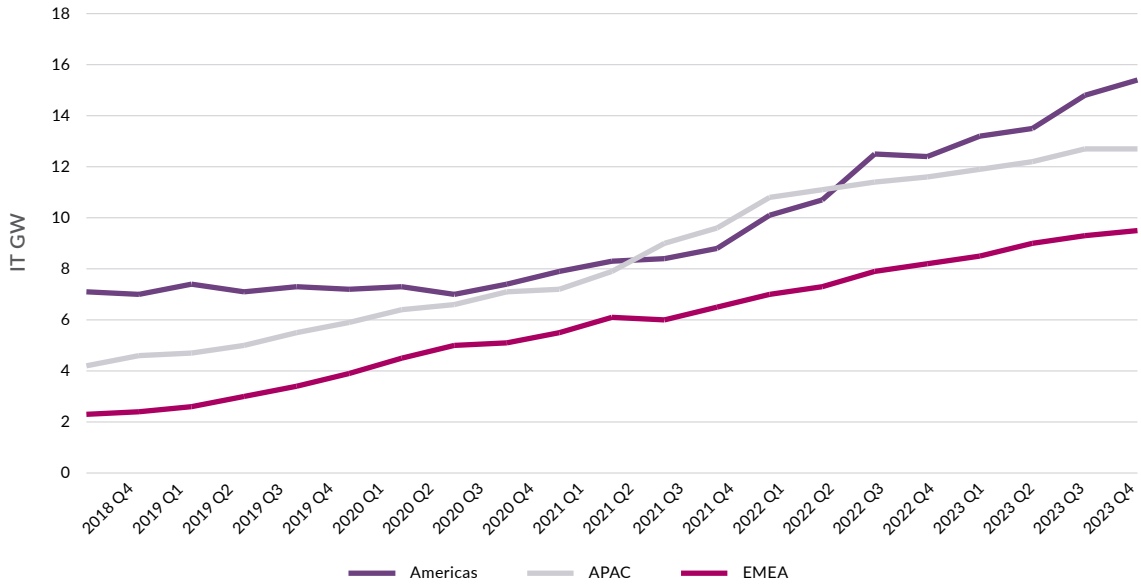
The established FLAP-D markets experienced the strongest growth, adding an average of 450MW of Live Supply each. However, secondary markets such as Belgium, Denmark, Poland, Spain, Sweden and the UAE have each recorded over 100MW of Live Supply growth during this time period. AI continues to drive data centre growth further and there is an emerging trend of operators and hyperscalers expanding outside of the established clusters where there is a greater offering of land and power to meet the specific needs of AI applications.



EMEA's growth rate has fallen behind APAC and the Americas due to a number of reasons. This includes increasing challenges around power availability and the high cost or availability of land. The region is also generally more restrictive in terms of data centre development, whereby planning permission is difficult to obtain and there are more regulations and policies in place. Overall, demand exceeds supply across EMEA, which has been a common theme for the past few years. In turn, this has had a knock-on effect on increasing colocation rental rates, which has been further exacerbated by rising build costs.

Global Pipeline Supply Growth

Global Pipeline (UC+Committed) Supply



Pipeline (Under Construction + Committed) Supply can be viewed as a proxy for tangible interest or investment in a market on both supply and demand fronts, as this capacity is driven by actual or speculated demand. A major proportion of this supply is expected to become Live Supply in the next three to five years.

Pipeline Supply observes an increasing trend globally, with each region having slightly different trajectories.

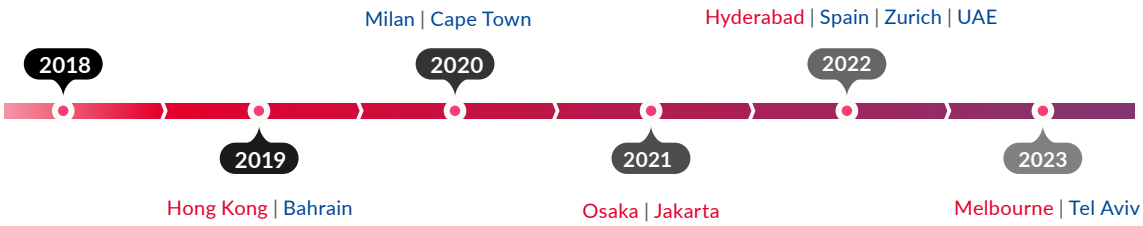
Characteristic of many developed markets, supply growth is increasingly constrained by power availability in markets such as Virginia. Growing campus sizes see demand for power going up to and over 500MVA per project. This exerts an increasing burden on existing power infrastructure which is failing to keep up with demand. The culmination of requirements for upgraded or dedicated transmission and distribution infrastructure, pressure for larger and cleaner power generation, and global supply chain issues have resulted in longer timelines for development and delivery. However Pipeline Supply continues to grow to serve the boom in demand for computing power.

Despite beginning at the same starting point for Live Supply in the previous section, APAC maintains a larger pipeline than EMEA, possibly attributable to the region being home to some of the biggest economies and most populous countries in the world.

23.9 GW growth

22.4% CAGR from 2018-2023 globally

AWS Cloud Region Timeline: APAC & EMEA



Activity and demand from the global Cloud Service Providers (CSPs) as the largest consumers of data centre space allows for a measure of comparison between regions. Among the markets where AWS opened a cloud region in APAC, Osaka and Melbourne stand out as secondary markets accompanying established primary markets with gigawatts of Total Supply, speaking to strong demand and conducive environments for data centre industry development in Japan and Australia.

Additionally, comparing population numbers across the number of countries included in this list highlights another key difference between APAC and EMEA: the combined population of the five APAC metros depicted is approximately 12 million greater than these seven EMEA metros and across the entire region, the former has fewer national markets in spite of housing approximately 60% of the world's population (cr. UNFPA). This implies a higher population density in APAC markets in general which, when combined with governance, policies, and regulations at the national level, make for great investment decisions where opportunities may come in a more "wholesale" fashion than in EMEA.

EMEA witnessed the strongest Global Pipeline Supply Growth out of the three regions reflecting a CAGR of 32.4% despite having the slowest historical growth in Live Supply. Much of this is driven by the appetite of hyperscalers and other enterprises needing capacity in some of the world's most established data centre markets so that certain requirements are met, particularly from AI applications. With this, demand has grown for capacity across EMEA in the face of a lack of available power and appropriate land across the region. Whilst the number of deals is decreasing, the sizes of these deals have increased and larger campuses are being built to meet these requirements.

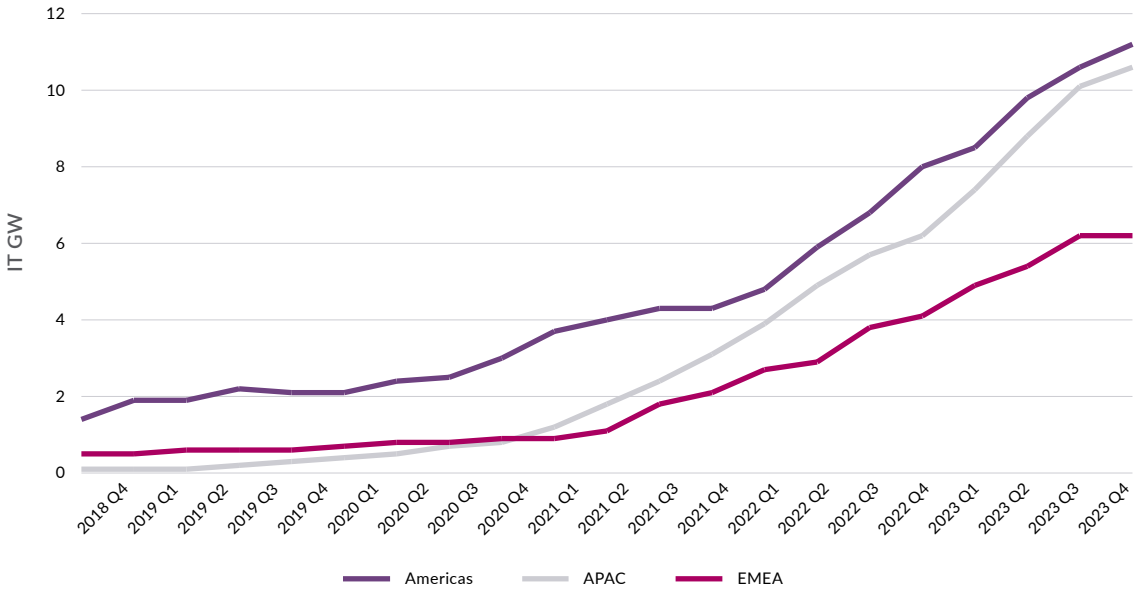
Americas
16.7% CAGR

APAC
24.5% CAGR

EMEA
32.4% CAGR

Global Early Stage Supply Growth

Early Stage Supply



Early Stage Supply refers to supply without all necessary elements secured for development. Having a sizable Early Stage Supply category is characteristic of either strong interest or the existence of prevailing market challenges.

All regions observed an exponential growth of Early Stage Supply from 2021 onwards, with APAC ranking first in both gross numbers and growth rates. India, Malaysia, Australia, and South Korea each contribute over a 1GW of Early Stage Supply to growth numbers over this period, with India and Malaysia accounting for half of the total 10.5GW increase across all APAC markets.

These two countries have boomed for slightly different reasons. Putting aside greater affordability and availability of land and power relative to established markets, India draws parallels with China as a highly populous market with a vast insular economy that has seen accelerated growth. Although 1.3GW of this Early Stage Supply sits in Mumbai, multiple secondary Indian markets such as New Delhi, Hyderabad, and Chennai have also proven to be on the radar for several international operators, with these markets housing over 300MW of Early Stage Supply each as well.

25.9 GW growth

68.5% CAGR from 2018-2023 globally

Announcements of huge campuses have been observed in the past two years across several Southeast Asian markets, among which Malaysia has seen the most of. Malaysia is similar to India as a national market with both primary and secondary markets being the targets of strong interest and investment; 1.8GW of Early Stage Supply sits between Kuala Lumpur and Johor Bahru in a 55:45 split. Kuala Lumpur's growth may be attributed to the market's advantage in infrastructure readiness as one of the more developed markets in the subregion due to several factors including government receptivity to data centre investments, transparency around regulations and potential challenges informed by the pre-existing enterprise market, and availability of talent. On the other hand, Johor stands out as a unique market in APAC as many see it as the major beneficiary of the moratorium in Singapore due to the proximity between these markets.

EMEA demonstrated strong growth of Early Stage Supply from Q2 2021 onwards. Whilst the region observed slower growth than the less developed APAC region, growth rates exceed that of the Americas, reflecting a CAGR of 62.4%. Supply growth is primed to continue over the next few years with significant industry players announcing data centre developments across the core EMEA data centre markets as well as in the tier two markets of Milan, Madrid, and Berlin etc. Further to this, the MENA region is emerging as a key destination due to experiencing fewer market challenges (land and power constraints) in these locations, combined with the fact that countries such as the UAE and Saudi Arabia occupy strategic geographic positions, have good connectivity, and have observed growing demand in recent years.

Americas
51.7% CAGR

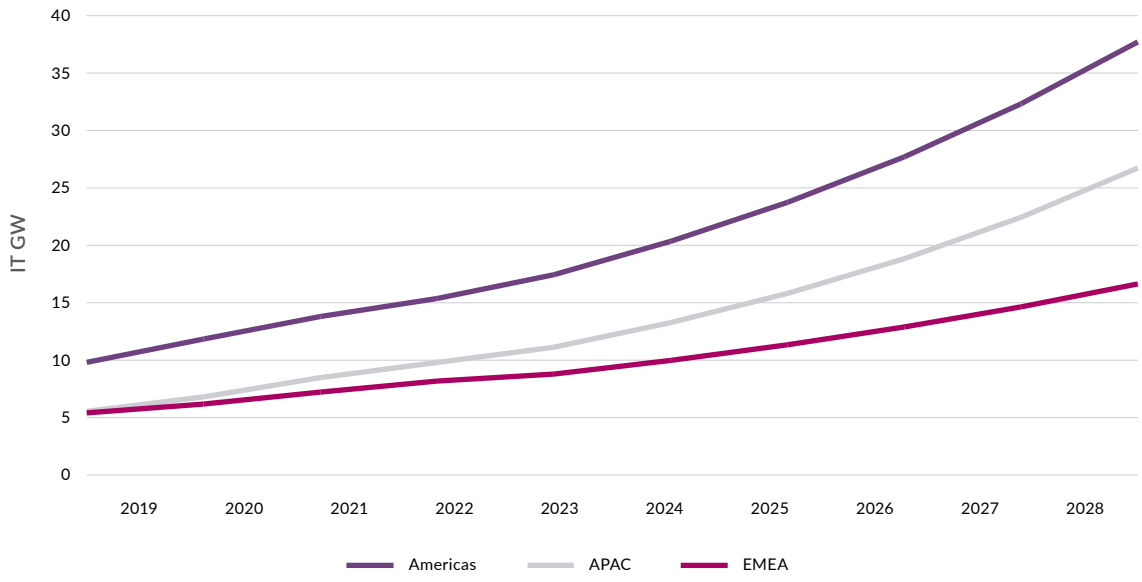
APAC
145.7% CAGR

EMEA
62.4% CAGR

While the US has historically been focused on core primary markets, there has been a boom in the growth of secondary and tertiary markets. This movement is a direct byproduct of the rapid evolution of AI as well as the scarcity of power caused by increasing demand, which pushes primary markets to evaluate sub-markets and new markets as targets of development to meet requirements for more computing power. AI as well as the access to inexpensive land and power have increased demand in states such as Indiana, North & South Carolina, Wisconsin, etc. Due to the explosion in demand, the US has and will continue to see data centre sprawl with new Early Stage schemes in these emerging markets.

Global Live Supply Growth Projections

Live Supply Projections



Historical 5-year CAGRs have been used to project the growth of Live Supply for each region.

Several factors exerted opposing pressures on growth over the 5-year period from 2018 to 2023. The beginning of this period coincides with the COVID-19 pandemic, which brought with it strong tailwinds boosting the growth of the global data centre industry. The pandemic necessitated virtual connectivity against the backdrop of mandatory physical isolation, accelerating growth of digitalisation and technology adoption which greatly boosted demand for data centre space.

However, the global data centre market was not prepared for such unprecedented demand growth - regulations, resources, and infrastructure have proven insufficient in sustaining growth trajectories. This came alongside issues accompanying the growing visibility of the industry and ensuring sustainable growth as ESG considerations began to dominate conversations about the future of industrial and economic development.

20 GW growth

16.6% CAGR from 2018-2023 globally

Additionally, COVID-19 restrictions significantly affected consumers, businesses, and economies across the world. Supply chain disruptions and rising costs of construction and raw materials continue to influence investment decisions, pricing, and delivery timelines as well. The pandemic has however also had lasting positive effects on industry growth through the fostering of a global community of digital citizens whose digital consumption habits and attitudes have been transformed due to COVID-19, contributing to the further proliferation of data and thus directly or indirectly, data centre demand. In the post-pandemic recovery period, the global data centre market has begun seeing increasing activity as economic conditions stabilise and challenges aggravated by the pandemic begin to ameliorate.

The boom of Artificial Intelligence (AI) also began toward the end of this period, with the release of ChatGPT in 2023 building widespread consumer awareness of AI technology.

At the forefront of exponential AI demand with high rack density requirements, the US market leads the industry-wide challenge of balancing ESG goals through optimising effectiveness and efficiencies in power and water consumption with the cooling technologies required to support such requirements. While government efforts toward increasing the generation and use of renewable energy ramp up across the region, the limiting factor of Live Supply growth will however be due to delays in power generation and delivery. Live Supply is expected to grow at a dampened rate in the short term, before accelerating after the issues around lacking power infrastructure are resolved.

Based on the historical CAGR, APAC is positioned to grow from 11.1GW in 2023 to 26.7GW in 2028. Actual growth is likely to outperform forecasted figures, especially toward the end of the forecast period. The sizable Early Stage Supply categories in developing APAC markets are expected to exceed the effects of supply constraints increasingly observed in the established markets.

Americas
16.7% CAGR

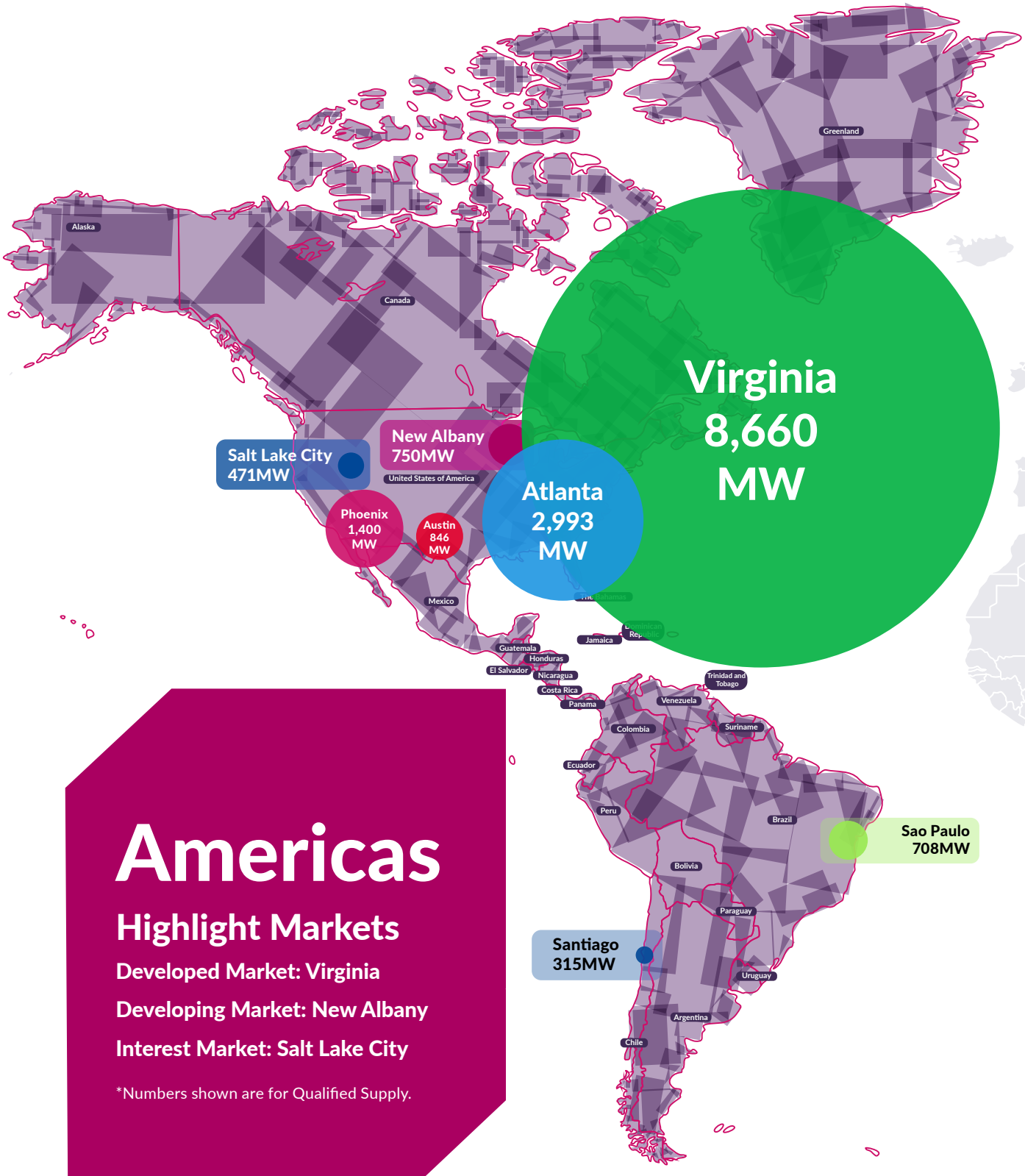
APAC
19.1% CAGR

EMEA
13.6% CAGR

Much of the Early Stage Supply in developing APAC markets are dependent on securing an anchor tenant. This expansion of this pool of potential anchor tenants will require time as international interest and the evolution of demand industries are only starting to direct their attention to or kick start investment into these emerging markets.

Live Supply Projections highlight growth of 13.6% CAGR in EMEA, however actual growth is anticipated to exceed the forecasted numbers and start to accelerate going forward. This is on the basis that EMEA demonstrated the strongest growth of Pipeline Supply out of all the regions which should start to translate into Live Supply. Live Supply will play a pivotal role in supporting the growing demand for AI and continued adoption of cloud services across EMEA. We expect that supply growth is primed to continue over the next few years with the likes of major real estate funds and hyperscalers announcing billions worth of investment into digital infrastructure.

The following section features three highlight markets of each region, selected to provide a representative view of the Americas, APAC, and EMEA through market activity coverage of a developed, developing, and interest market each.



Americas

Highlight Markets

Developed Market: Virginia

Developing Market: New Albany

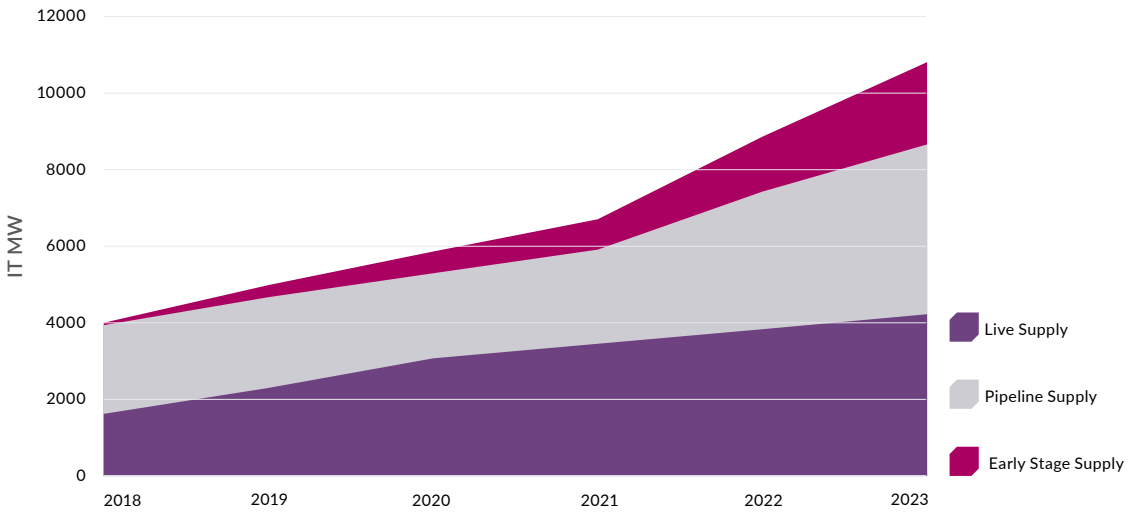
Interest Market: Salt Lake City

*Numbers shown are for Qualified Supply.

Lillian Flynn
lilli.flynn@dcbyte.com

Developed Market Highlight: Virginia

Virginia



Virginia is the largest data centre market in the world with over four gigawatts of Live Supply and plans to more than double that power in the future.

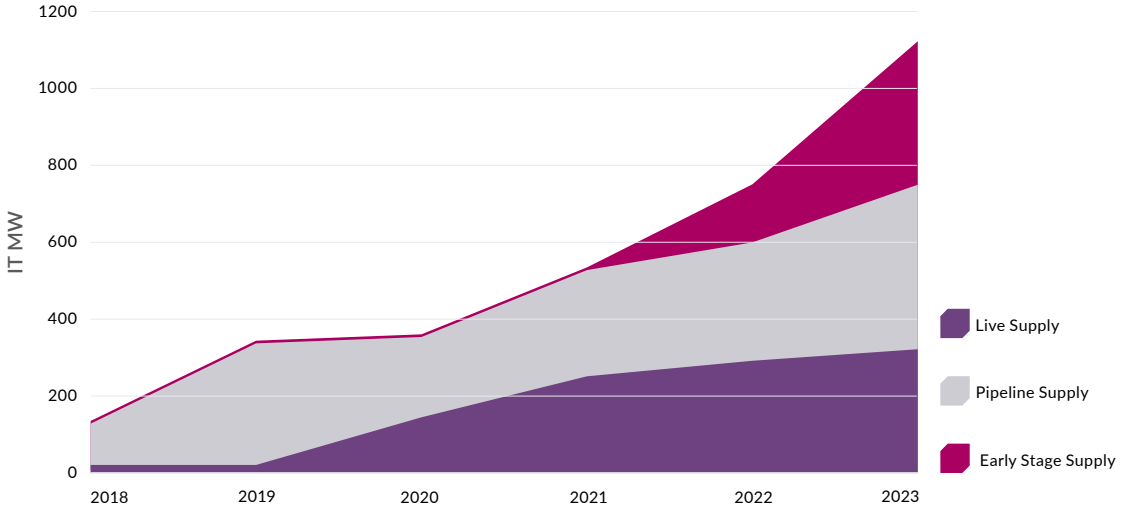
Ashburn in Loudoun Country, also known as Data Center Alley, houses 75% of current Live Supply but is presently experiencing delays in power delivery from Dominion Energy. This has not slowed demand for space in Virginia however, and the surrounding counties like Prince William are seeing an increase in planned data centre campuses.

- Virginia currently has over 6GW in the development pipeline including projects under active construction as well as Committed and Early Stage campuses.
- In recent years, Virginia has experienced an uptick in Pipeline and Early Stage Supply, which can be attributed to supply chain constraints as well as an increase in planned campus sizes to meet hyperscale demand, with a need for AI-ready densities being a major factor.
- In 2022, Loudoun County's primary power supplier Dominion Energy announced that it would not be able to meet power demand in the market. Delays in power delivery are expected until 2025 or 2026 while new power infrastructure is built. In the meantime, Dominion Energy would be providing power incrementally.
- Counties outside of Loudoun are expected to grow while Data Center Alley waits for power. Nearly half of Virginia's 6GW pipeline is located outside of Loudoun County, of note being Prince William County which recently saw the approval of two major campuses: Prince William Gateway and Devlin Technology Park.
- Cloud is the greatest driver of growth in Virginia. AWS operates over 40 facilities in the state and Microsoft operates a massive campus in Boydton as well as a smaller facility in Loudoun County. Both companies have more self-build campuses in the pipeline and are also major colocation tenants across the market.
- Due to high demand amidst recent power and infrastructure constraints, Virginia is seeing vacancy rates as low as under 1% as existing and planned power is quickly leased. Vacancy rates across Virginia will likely remain low for the next several years; power constraints in Loudoun County, demand for large MW deals, and political backlash in Virginia's other counties will likely keep supply from catching up to demand.

Max Shapiro
max.shapiro@dcbyte.com

Developing Market Highlight: New Albany

New Albany



New Albany has quickly become the data centre capital of the Midwest in recent years.

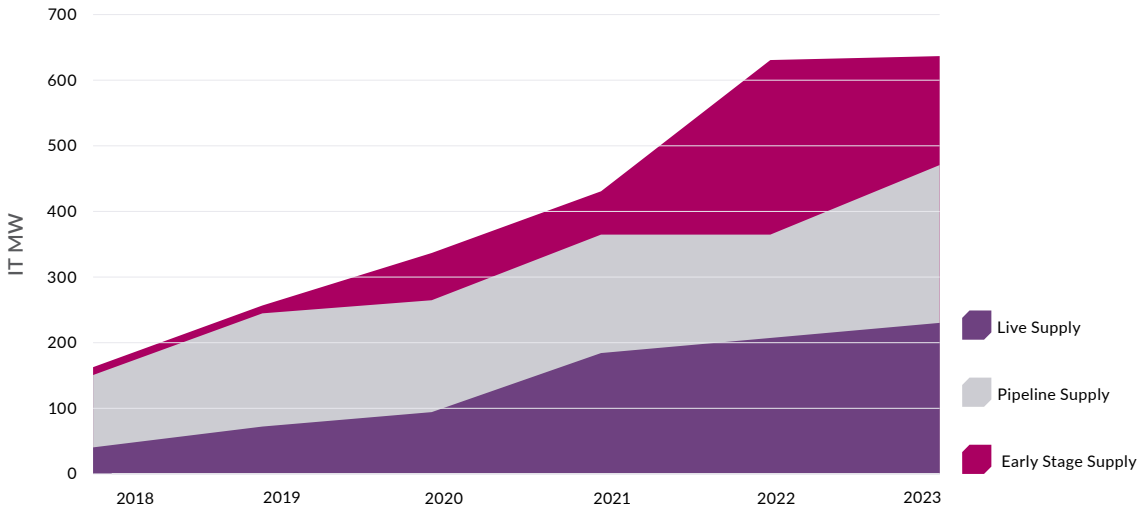
A strategically placed hub with relative proximity to other primary data centre markets, it offered an abundance of affordable land and accessible power for developments. AWS marked the first major hyperscale entrance into the market in 2015, with others following shortly after. Demand has not slowed, however with the quantity and scale of developments that have been announced in the past 12-18 months, utility power in the New Albany market has gone from having healthy amounts of available supply to being primarily spoken for. Local utility provider American Electric Power Co. (AEP) has communicated to developers that the delivery of power for future contracts will require several years of lead time.

- New Albany has continued to maintain a welcoming environment for data centre development, with significant incentives including equipment sales tax exemptions and real estate tax abatements, as well as low natural disaster risks, and reasonable electricity prices.
- The amount of, and variety of growth the New Albany market has seen in recent years is a testament to the above. Between new builds and expansions at existing campuses, AWS, Microsoft, and Google each have billions worth of new investments in various stages of active development.
- While this market has been traditionally dominated by hyperscale self-build campuses, multiple colocation providers have announced significant developments over the past 18 months.
- All in, this market boasts over 1GW of capacity that is currently under development (U/C, Committed, Early Stage), which would triple the amount of current Live Supply.
- In the face of significant industry labour shortages, Central Ohio boasts a strong talent pipeline with 52 colleges that produce 22,000 graduates each year.
- Current vacancy rates in this market are as low as 2.7%.

Ben Hood
ben.hood@dcbyte.com

Interest Market Highlight: Salt Lake City

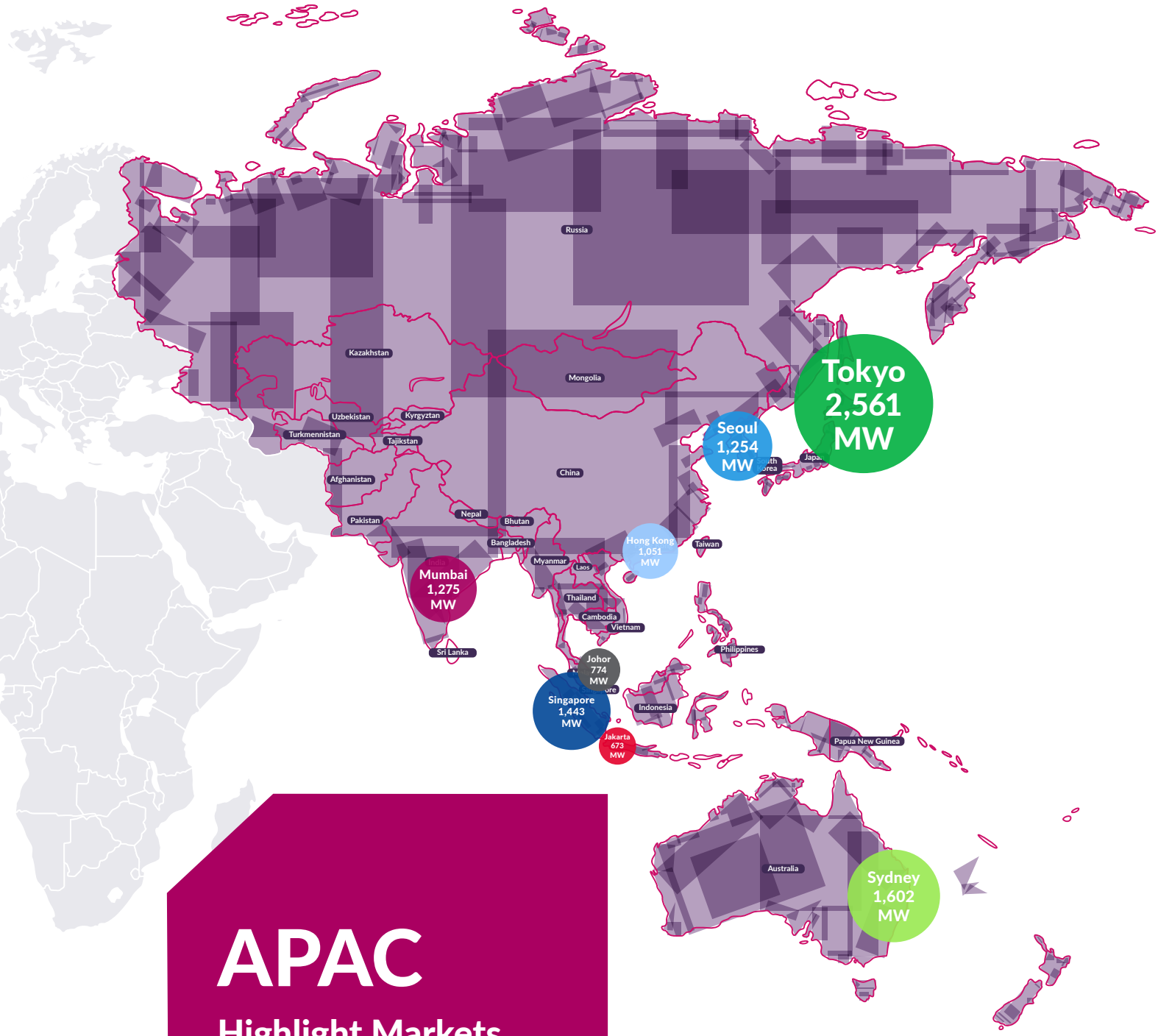
Salt Lake City



Salt Lake City's (SLC) growing status as an emerging market can be attributed to multiple factors that reduce costs, constraints, and risks for data centre development.

All of these contribute to SLC's strong potential as an emerging market. Strong growth has been observed in recent years, with approximately two-thirds of the market's Total Supply sitting in the future development pipeline.

- Supply growth is less incremental and more sporadic and sharp, with a few large-scale developments announced instead of many smaller-scale sites, which highlights growing deal sizes (typically 2 to 6MW), and the emergence of promising players in the market.
- Interest and activity are growing; Live+Pipeline Supply has slightly more than tripled in size from 2018 to 2023.
- Almost all activity in Utah remains centred in the Metropolitan SLC area due to the relatively cheaper electricity prices, attractive taxation policies around sales, personal income, and corporate taxes, as well as strong fibre connectivity. The data centre market also benefits from its climate and location, allowing developers to reap cost savings from free cooling and low natural disaster risk.
- SLC has been concentrating efforts toward developing renewable energy infrastructure such as solar and wind power sources, which is feeding the strong availability and affordability of power in the area. This move has been bolstered on the state level, with the government of Utah implementing several environmental goals for Utah to reach in coming years which closely align with this green shift.



APAC

Highlight Markets

Developed Market: Tokyo

Developing Market: Mumbai

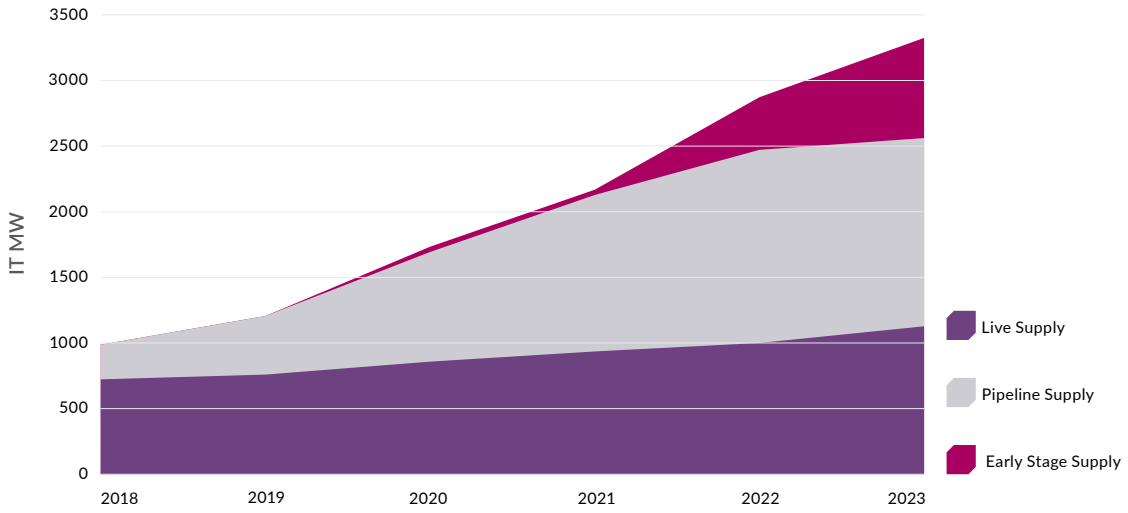
Interest Market: Johor

*Numbers shown are for Qualified Supply.

Jingwen Ong
jingwen.ong@dcbyte.com

Developed Market Highlight: Tokyo

Tokyo



Tokyo is one of the most established APAC markets and is the largest by Live Supply after the main metros in Mainland China.

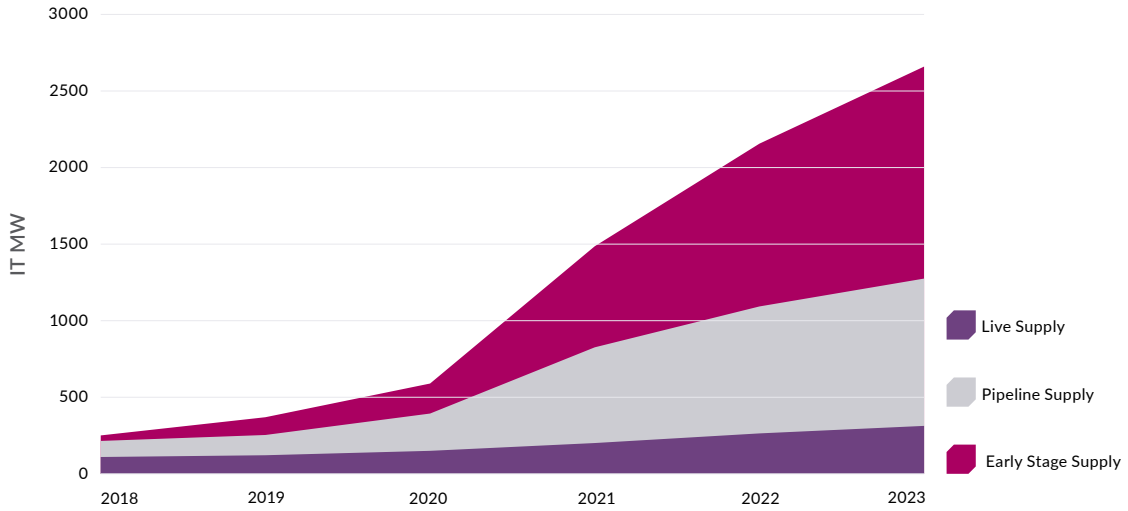
Enabled by political stability and a robust economy, Tokyo is among the earliest markets where global CSPs have opened a cloud region, with AWS being the first to do so in 2011. Growth of the market continues to be strong despite expectations that the market would have reached maturity. However, power and construction-side constraints have directed growth into subclusters and introduced unique difficulties to market players.

- The market has seen steady growth with approximately 350-500MW of actual Pipeline Supply added every year from 2020-2022, which is an accelerated rate compared to the previous years. This comes from the growing presence of international operators in the market, with activity concentrated in Inzai as the primary growing cluster after Central Tokyo due to power availability and growing deal sizes.
- Interest and development are heading outside of known clusters in Central and East (Inzai) due to power constraints – new projects have landed in areas across West Tokyo and further north of Inzai.
- Various resource constraints have been exacerbated by large-scale construction projects such as those for semiconductors and Expo 2025, which will be held in Osaka next year. This has made it difficult for developers to secure general and subcontractors for data centre projects, particularly for newcomers to the market.
- Demand remains strong and is driven by the global CSPs who have grown their presence through various deployment strategies. Wholesale colocation and build-to-suits remain prevalent, as it becomes increasingly difficult to build in Greater Tokyo.

Jenna Patel
jenna.patel@dcbyte.com

Developing Market Highlight: Mumbai

Mumbai



Mumbai is a rapidly emerging market in APAC with a Total Supply of 2.6GW. Supply is split across two key clusters: Central Mumbai (Chandivali) and Navi Mumbai.

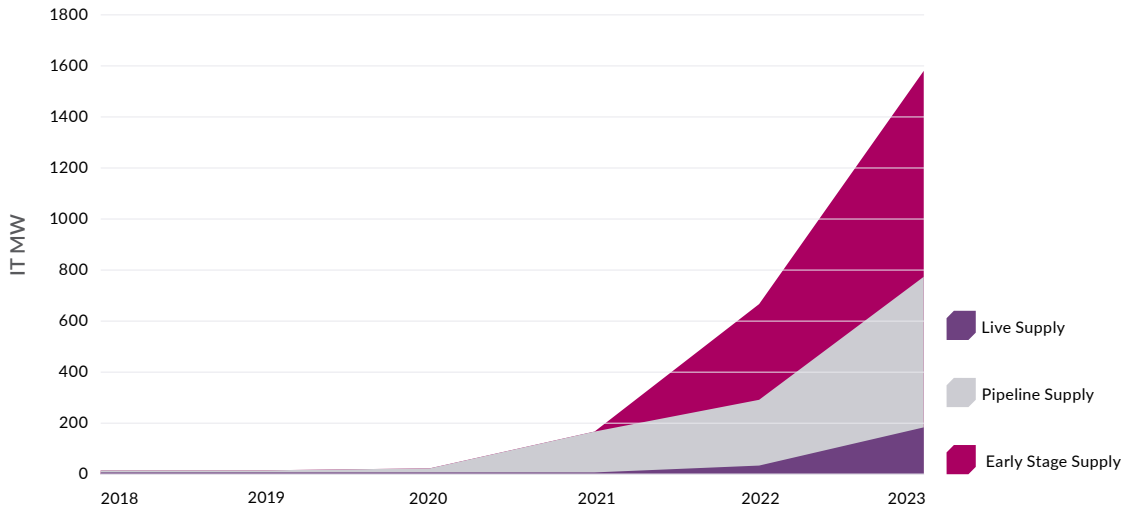
Chandivali was the first cluster to see data centre developments in Mumbai before Navi Mumbai began emerging in early 2020, with local and international players buying large plots of land for planned data centre parks. To ease the process and encourage the development of the industry, the Government of Maharashtra released an update to their IT policy with additional incentives to attract data centre development through the New Information Technology and Information Technology Enabled Services Policy of Maharashtra State - 2023.

- Mumbai is an active market that has been on the radar of many international players who have and continue to enter the market, many through acquisitions or joint ventures with local partners. These players have purchased sizable plots of land, with activity concentrated in Navi Mumbai.
- Majority of upcoming supply in the market is situated in Navi Mumbai due to advantages regarding connectivity, demand, and the low cost of land.
- The city is expected to add eight new substations, adding up to 1,500MVA of transmitted power to Mumbai to meet the increasing demand for reliable power in the metro. This will further enable data centre development in the market.
- Self-builds by the global CSPs have historically been in Hyderabad. However, in 2023, AWS acquired three plots across Mumbai. Although Microsoft has not disclosed plans for this market, the CSP owns three parcels in the same state in Pune, which might signal more activity from these players in this area in the future.
- Deal sizes are growing, with Mumbai being one of the very few markets in APAC where there have been AI-specific deals signed.
- In the near future, we expect Powai/ Chandivali and Thane District to further develop due to having availability of land, strong connectivity, and developed infrastructure.

Vivian Wong
vivian.wong@dcbyte.com

Interest Market Highlight: Johor

Johor



Johor is the fastest growing market within Southeast Asia with over 1.6GW of Total Supply.

The market has been the largest beneficiary of Singapore's moratorium on data centres since 2019 and experienced exponential growth as it absorbed the spillover demand from regional tech companies and OTTs. To date, the market has evolved uniquely as a build-to-suit market and there have been no signs of slowing down. Interest is diverting out of existing data centre clusters as international operators and CSP players start to land bank in anticipation of future demand.

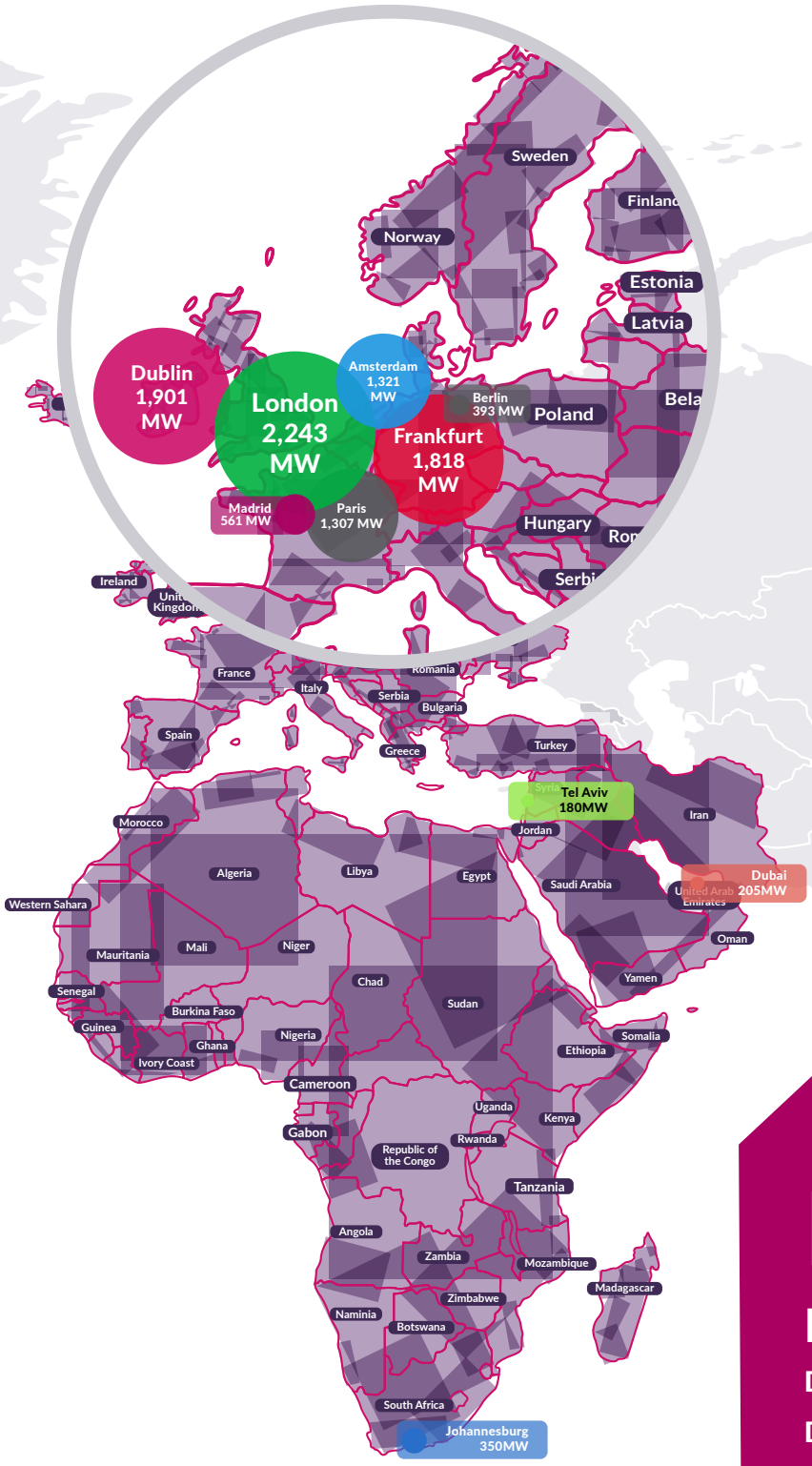
- Johor grew from a baseline of less than 10MW of Live Supply and the majority of growth in Total Supply occurred in the last three years after the announcement of the moratorium in Singapore.
- The current clusters are located in Sedenak Tech Park, Nusajaya Tech Park, and YTL Green Data Centre Park. Surrounding areas or regions offering land with power are beginning to see heightened interest as activities continue to intensify.
- The Malaysian authorities have been very supportive of the data centre developments and have actively positioned itself as the upcoming regional hub. To support market entry of international operators, the Malaysian Investment Development Authority (MIDA) and Malaysia Digital Economy Corporation (MDEC) have collaboratively established a Digital Investment Office to act as a one-stop centre between the government and investors to coordinate and facilitate digital investments.
- To streamline power approvals, the authorities have also launched the Green Lane Pathway initiative in 2023 to reduce the duration required to power a data centre to as short as 12 months.

Live+Pipeline Supply Growth

To the exclusion of Early Stage as low confidence in development potential

222.07%
3-year CAGR

119%
5-year CAGR



EMEA

Highlight Markets

Developed Market: London

Developing Market: Madrid

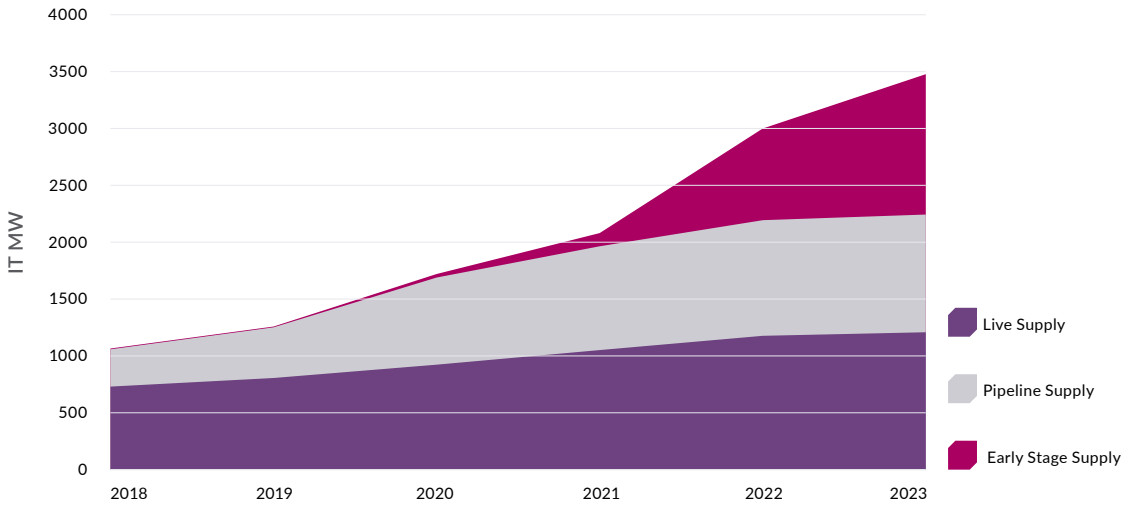
Interest Market: Berlin

*Numbers shown are for Qualified Supply.

Cyprien Dumont
cyprien.dumont@dcbyte.com

Developed Market Highlight: London

London



London is the most established data centre market in Europe and a historical hub when it comes to the industry's development.

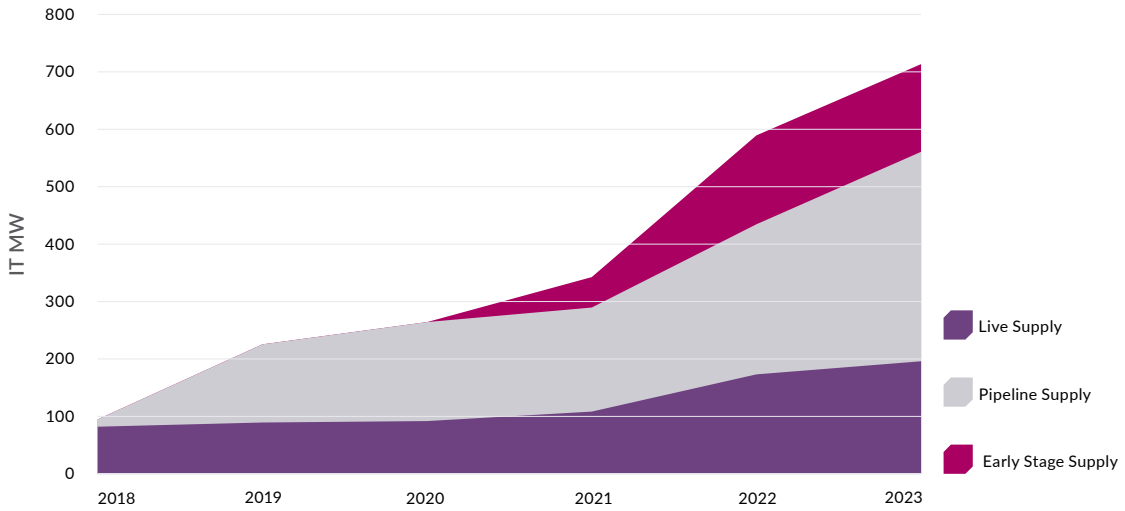
Geographically, the market spreads further out of London into the neighbouring counties and along the M4 corridor. London's data centre market began with retail colocation facilities in the Docklands. Benefiting from a high level of connectivity, data centres multiplied in that area and have had to look further afield to develop - Slough was thus picked as a key location due to its abundant well-connected land on the Slough Trading Estate, marking a migration to West London and industrial estates. As demand for hyperscale capacity as well as constraints on land and power continued to grow, the London market has had to spread outside of the traditional AZs. Operators and hyperscalers are now considering locations further north, east, and west of the city.

- London currently stands at 1.2GW of Live Supply and has a little over 2.3GW in Pipeline and Early Stages Supply. While Slough & West London still witness developments, areas such as the Docklands, East London and London's neighbouring counties account for a large portion of the pipeline. Hyperscalers have continued to drive demand across the market in consolidating their AZs, but constraints in land and power have led them to shift their focus to these relatively untapped locations.
- Supply is still constrained in Slough & West London due to the delays in the delivery of Uxbridge Moor's substation upgrades in Iver. A large part of the power that will be delivered in the late 2020s to early 2030s has already been allocated to data centre schemes in the cluster with some power left for new developments.
- East London is seeing more activity with large schemes in the pipeline. Originally dominated by retail colocation and smaller facilities, these new developments will bring close to 360MW of supply to the market; the appeal of scalability of these projects will put East London on the radar for wholesale colocation development and deployment of capacity.
- Areas outside of the city such as Chesham, High Wycombe, Watford, Didcot, and Harlow have all attracted the interest of operators as cloud providers push the boundaries of their AZs.
- CSPs have started to look, in the past 3 to 5 years, at building their own facilities. Self-builds are relatively new to the London market, however ongoing projects and land acquisitions across the region highlight the hyperscalers' shift in deployment strategy in this market.

Ben Hood
ben.hood@dcbyte.com

Developing Market Highlight: Madrid

Madrid



Madrid is a flourishing market in EMEA, with increasing interest from regional and international players alike.

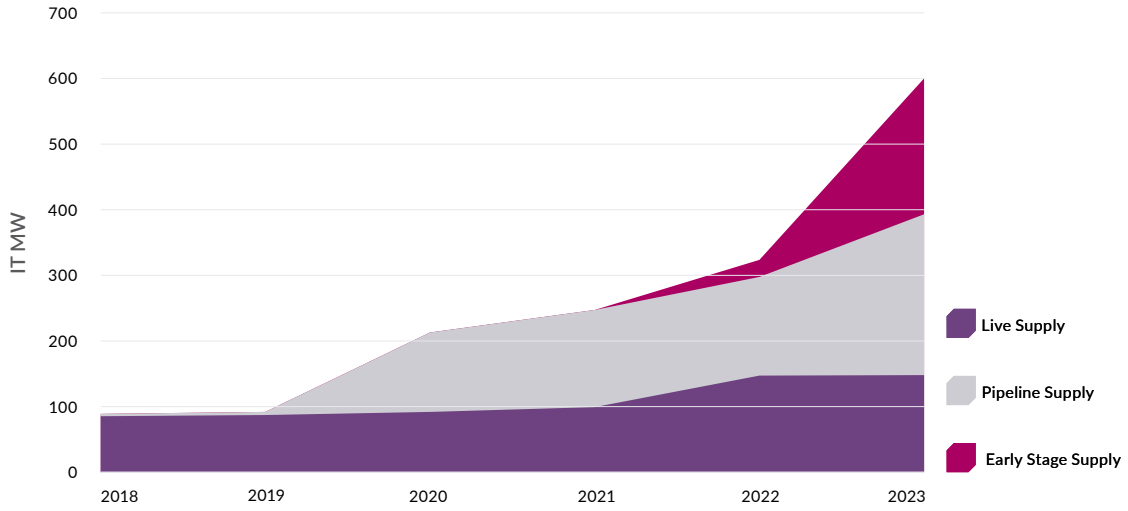
The city benefits from connection with a major fibre axis running through the area from Portugal to Barcelona, comparatively affordable land prices by EMEA standards, and an increasing supply of green power through investment in renewable energy production in Spain, with the country aiming to be run on 74% renewable energy by 2030 and 100% by 2050.

- Madrid's strong potential and high desirability are reflected in the growing size of Pipeline and Early Stage Supply, which has seen a sharp uptick in planned projects in recent years. These buckets of supply grew from approximately 13MW in 2018 to over 500MW in 2023, while Live Supply also more than doubled in the same time period.
- While the market currently sits at roughly 75% colocation - 25% self-build, there is a growing preference for self-build facilities amongst hyperscalers who are increasingly developing their own sites at larger scales.
- While Madrid has seen the most consistent interest for expansion and development, the Spanish market as a whole has seen a gradual distancing from the urban hub to areas slightly further afield, with hyperscalers developing away from the city in Aragon, in the North-East of the country. This is due to growing constraints on the power grid in the city which has not undergone sufficient development to appropriately distribute larger loads, meaning the search for available power is moving further away from the metro. However, as power and connectivity infrastructure in various parts of the country is set to expand and improve and with many sites now including their own sources of energy production, it is expected that this distancing trend will grow in commonality.

Christian Tshishiku
christian.tshishiku@dcbyte.com

Interest Market Highlight: Berlin

Berlin



Berlin is fast becoming Germany's second cloud region after Frankfurt, partially due to growing land and power constraints in the Frankfurt data centre market.

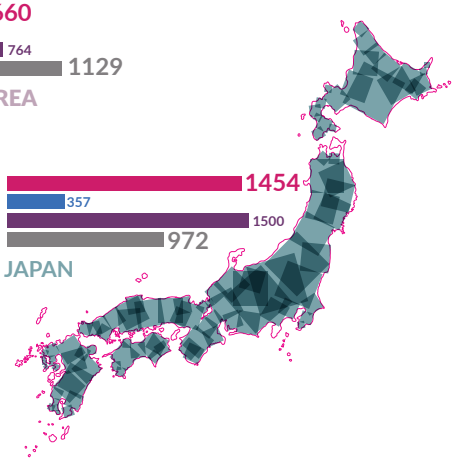
Berlin benefits from its geographical location to the east of Europe, and land prices are cheaper compared to Munich and Frankfurt, which increases the value of the region for data centre operators. The market has surpassed Munich by far by Total Supply despite only overtaking the latter in 2020 and is now the second largest market in Germany. Berlin is also known as an international hub of start-ups, which contributes to demand for data centre space in the market.

- New international players have entered the Berlin data centre market and account for a significant amount of Pipeline and Early Stage Supply. At the rate of growth of the market, Berlin may reach 1GW of Total Supply in the next two to three years.
- There are insufficient funds for the required upgrades of Berlin's power grid, as Stromnetz Berlin explained in the Economics Committee of the House of Representatives. The current financing model is insufficient and the grid operator faces several challenges as existing transmission and distribution infrastructure are not yet designed for future loads.
- The dispute over water in East Brandenburg continues. The regional water supplier is putting a halt to new construction projects due to the alleged lack of resources. The Märkisch-Oderland district is currently approving a well itself.
- Berlin's demand remains heavily dependent on supply availability, or lack thereof, in Frankfurt.

Section II: Regional Focus APAC

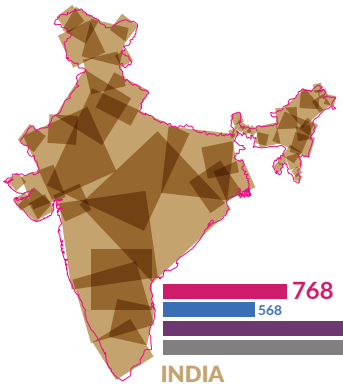
506
124
454
45
HONG KONG SAR

660
274
764
1129
SOUTH KOREA

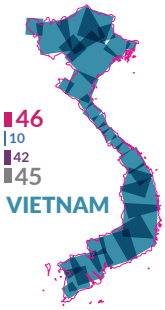


1454
357
1500
972
JAPAN

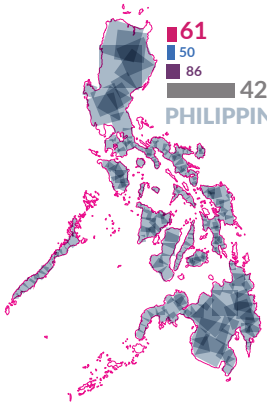
253
47
52
18
TAIWAN



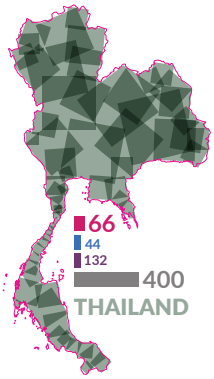
768
568
1723
3224
INDIA



46
10
42
45
VIETNAM

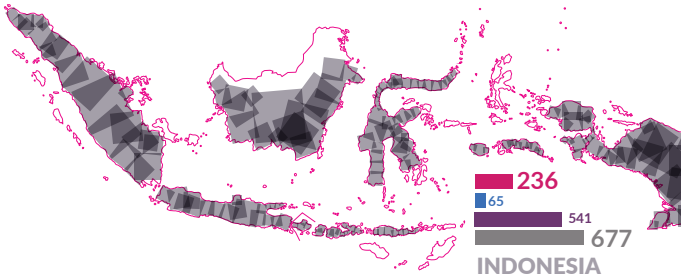


61
50
86
422
PHILIPPINES

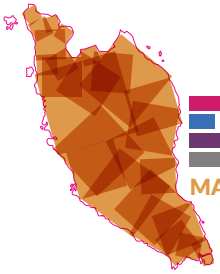


66
44
132
400
THAILAND

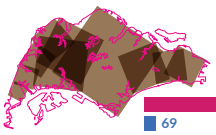
7
5
11
0
CAMBODIA



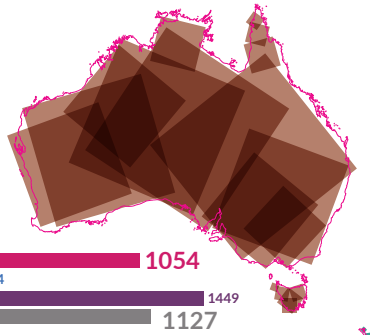
236
65
541
677
INDONESIA



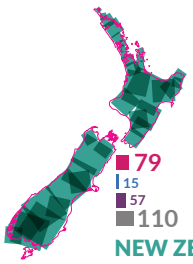
280
159
766
2016
MALAYSIA



988
69
387
1
SINGAPORE



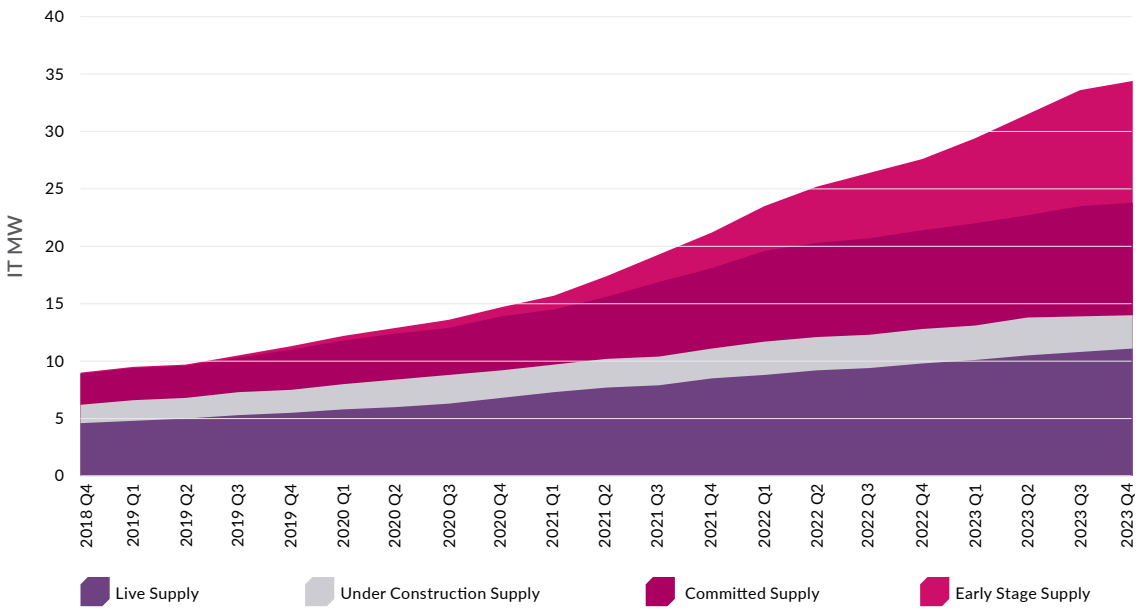
1054
294
1449
1127
AUSTRALIA



79
15
57
110
NEW ZEALAND

TOTAL LIVE IT MW
TOTAL U/C IT MW
TOTAL COMMITTED IT MW
TOTAL EARLY STAGE IT MW

APAC Regional Supply Growth



APAC has observed strong growth over the past five years and continues to see the entry of established operators new to the region.

Some constraints such as geopolitics and the lack of clear policies exert relatively stronger effects on data centre development in APAC, which impacts supply growth and demand profiles in each market. These challenges have however led to a balancing of supply growth across the developed and developing markets, driving growth across the region.


Image © DC Byte

Total Supply grew from 9GW to 34GW between 2018 to 2023, with the majority of this coming from Committed and Early Stage Supply.

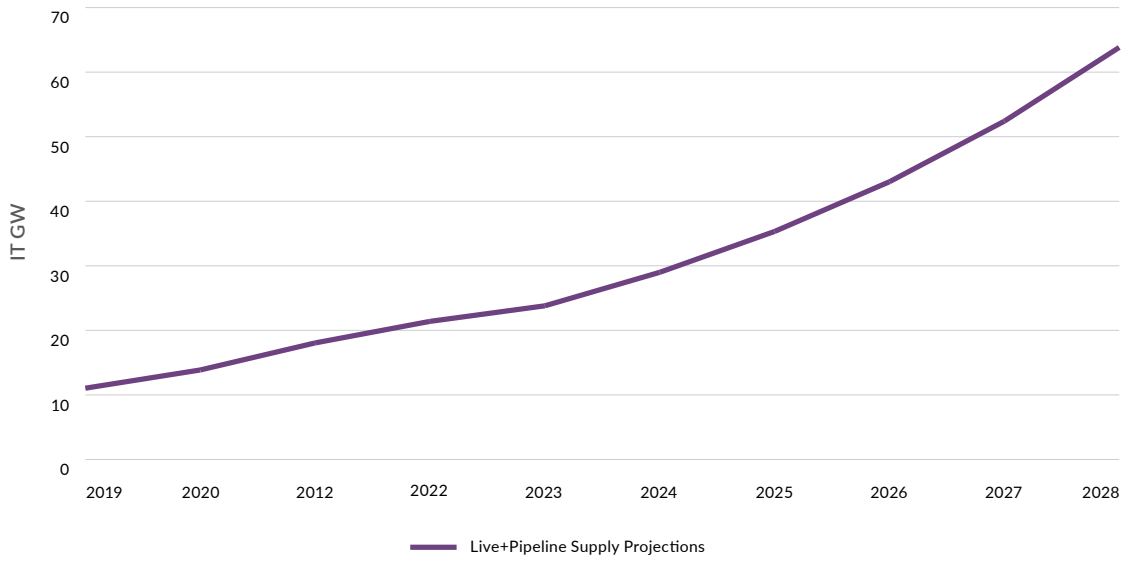
Committed Supply: Australia, India, Japan, Malaysia and South Korea saw the addition of >500MW added, of which the first three markets grew over 1GW each in this category.

Early Stage Supply: India, Malaysia, and South Korea also saw the largest additions to Early Stage Supply at 3.1GW, 2.1GW, and 1.0GW respectively.

- There has been strong cloud demand in both Australia and Japan, with a greater proportion of that in Australia being serviced by self-builds compared to a predominantly colocation deployment strategy in Japan.
- India added over 2GW of Committed and Early Stage supply. This occurred due to some states establishing their data centre policies, strong connectivity particularly in Chennai, new data centre parks or IT parks being developed for firms and the ease for international players to enter and operate in the market. The availability of land and power lends itself to large campus-style developments, with 36 of such projects being 50MW and above compared to 21 and 23 in Australia and Japan respectively. A combination of these factors would have contributed to the CSP self-build trend the market is beginning to observe, six of which fall into the above category and positions India as the market with the largest self-build pipeline (Under Construction + Committed + Early Stage Supply) in the region. Self-builds of such sizes have only been observed in Australia and Taiwan across APAC to date, with India and Malaysia starting to see the same.
- A significant portion of the 1GW of Early Stage Supply in South Korea is in a massive campus to the south of the country that is years away from development. This campus is due to government efforts toward the decentralisation of data centres from the Seoul Capital Area. Many projects also face civil complaints, which is the largest challenge in the market. These factors account for a significant amount of Early Stage Supply in South Korea.

At the start of the year (2024), the Asia-Pacific Data Centre Association (APDCA) was launched with the aim of taking an organised approach to working with governments on policies and regulations to foster the growth of the industry in the region. Policies have not been able to keep up with the rapidly developing data centre space in many markets and conversations between policy-makers and stakeholders in the industry are crucial to striking a balance that would meet the goals and needs of all parties involved. This will hopefully enable not only the industry, but also economies to develop in a fair and sustainable manner.

Live + Pipeline Supply Projections



*Early Stage Supply has been excluded as there is lack of reasonable confidence in the development potential of this supply category.

The historical 5-year CAGR has been used to project the growth of Live+Pipeline Supply for APAC.

The inclusion of supply across all markets in APAC would comprise markets on both extremes of low and high growth rates; the moratorium in Singapore has heavily suppressed supply growth in recent years, while on the other hand, Malaysia and Indonesia have experienced significant growth spurts as the Southeast-Asia subregion began to develop.

The Southeast and South Asian markets started from a low base market size which has resulted in exponentially high growth rates for these markets that skew the historical CAGR heavily for the whole region. This is expected to level off in the future as market size grows. The bulk of demand growth may come later however, as these underserved markets also lack sufficient power and telecoms infrastructure to support the required digital infrastructure. However once those are in place, there is significant potential for development and this might be expected in the medium to long term.

14.9 GW growth

21.8% CAGR from 2018-2023 globally

Regardless, APAC is expected to continue to exhibit robust growth. The region is experiencing an influx of international operators from other regions and the establishment of multiple new platforms as both global and local real estate developers and investment funds attempt to penetrate the industry. As these markets continue to grow, there will eventually be market consolidation as some players find more success than others, whether it is due to being in strategically significant locations, price competitiveness, or the ability to leverage existing customer relationships in other markets etc. Growth will stabilise as more of these markets mature, however the region remains behind the others in terms of overall business environment, regulations, and maturity of the industry. Additionally, all of this room for development is now coupled with the explosion of generative AI, which has taken the global industry by storm.

Effects of AI on the growth of the APAC region remains to be seen as the region is only just beginning to observe land acquisitions that are speculated to be for potential AI training workloads. Operators have been receiving enquiries for AI-specific colocation requirements that include higher rack densities than existing design specifications cater to, leading to ineffective use of space as adjacent racks are removed to concentrate power into just one or two racks per row. Few AI deals have been signed across the markets to date but as this demand category grows, site-selection strategies, design specifications, and technologies employed in high-density AI data centres will differ from current practices in this new market segment. This is likely to further boost supply and growth trajectories for the region.

Live+Pipeline Supply is expected to grow nearly

2.7x

by 2028

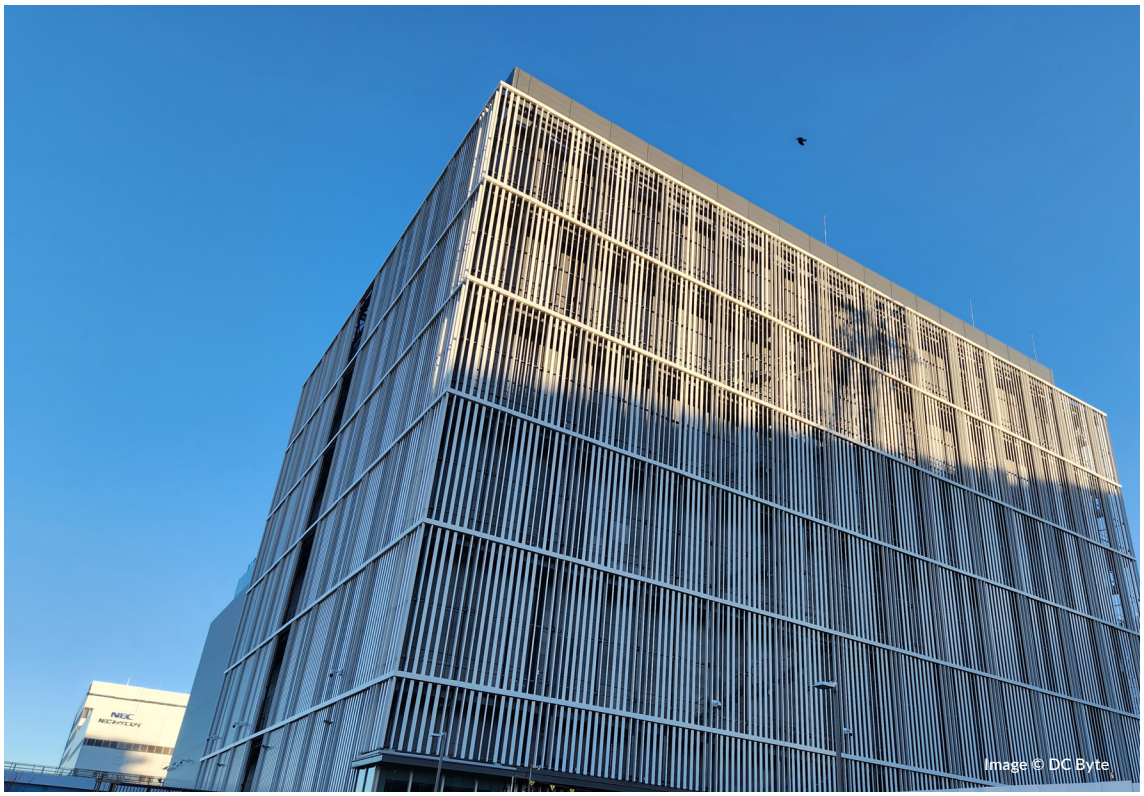
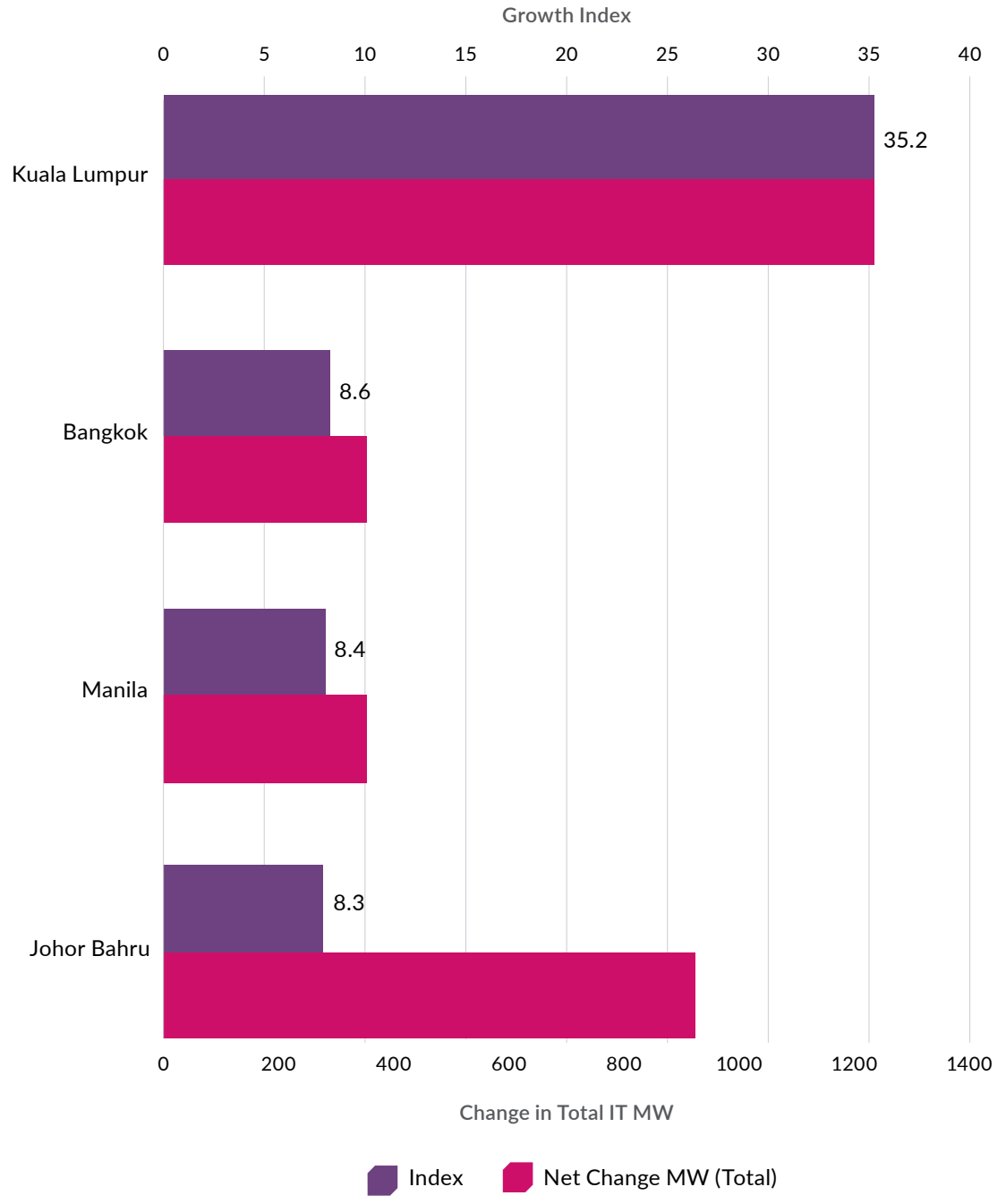


Image © DC Byte

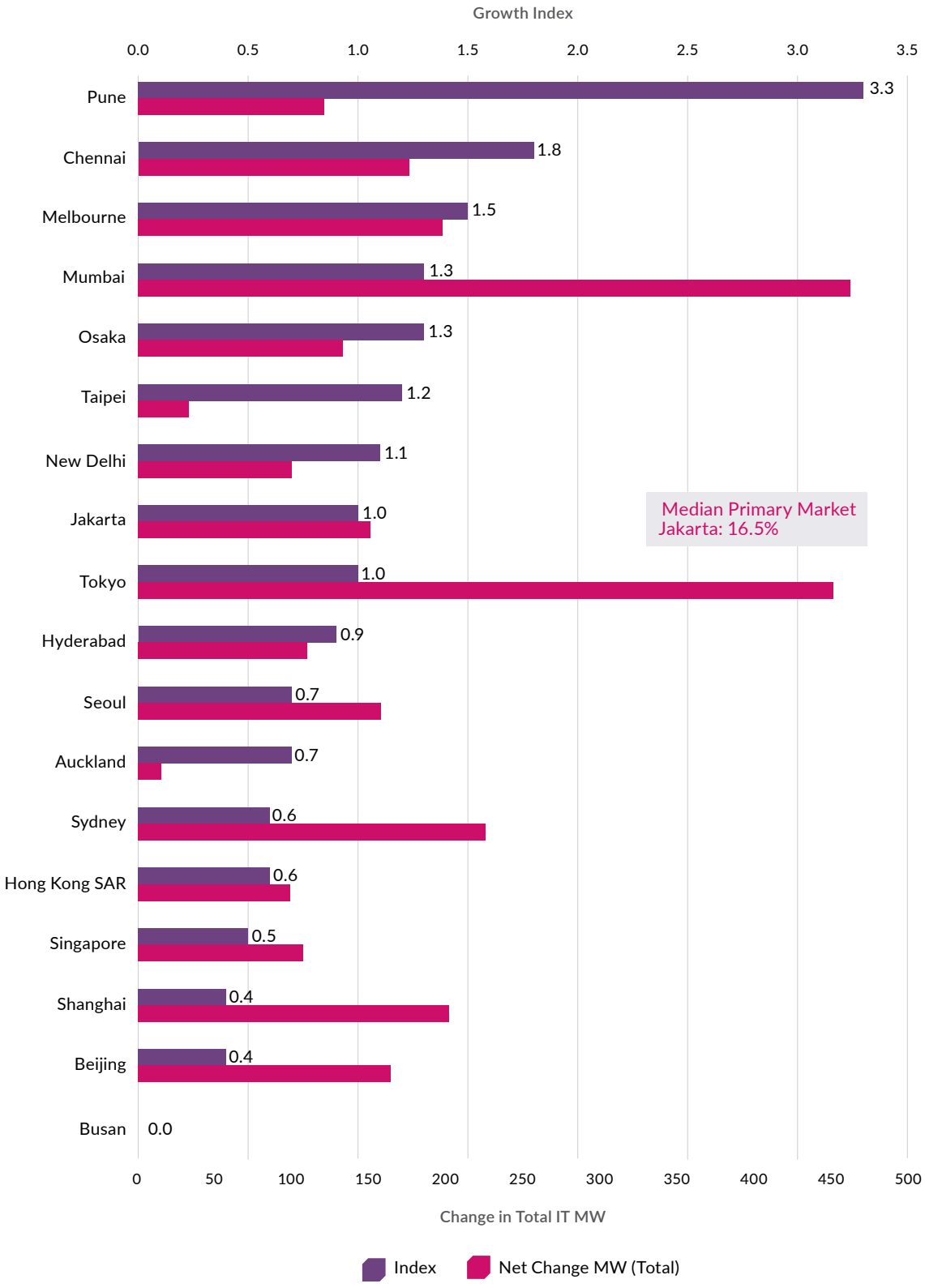
Growth Index

The growth index has been charted using Total Supply growth from 2022 to 2023, indexed against the primary market closest to the median (Jakarta, 16.5%).

Growth Index: Hypergrowth Markets



Growth Index



Glossary

Committed Capacity

Committed Capacity or Supply is the estimated IT Load that we are highly confident will be added to a market's overall supply. To the best of our knowledge, this supply has the required elements (government, land, power, etc.) secured, or will be developed by an operator with a strong and reliable track record. Committed Supply could take the form of a data centre scheme which has yet to start construction, or it may refer to shell space in an existing data centre. The difference being that shell space can be fitted out normally in a matter of 3-6 months, while a data centre scheme that has yet to start construction might take 1-2 years. Committed supply does not mean sold space.

Early Stage Capacity

Early Stage Capacity or Supply is the IT Load that has been announced or speculated, but has yet to secure all of the required elements (government, land, power, etc.) for development. We do not hold full confidence in the development potential of this supply and it may require a major client precommitment for development to take place

FLAP-D

FLAP-D refers to the historically established markets in EMEA: Frankfurt, London, Amsterdam, Paris, and Dublin.

IT Power

The net power capacity that can be provided to computer servers within a data hall. It represents not just the limit of the power coming through the power socket to the servers, but also the supporting mechanical and electrical equipment supporting those servers. For example, there may be enough power to add more servers than the stated IT power capacity within a data hall, but those servers would overheat because the air conditioning equipment is not sufficient to cool above the specified IT power.

Live Capacity

Determined IT power that is operational whether it is let or not.

Megawatts (MW)

Typically, we use MW to define IT Load capacity; as opposed to MVA which is used to indicate power coming in from an external utility feed.

Qualified Capacity

Qualified capacity is the total sum of live, committed, and under construction capacity.

Under Construction (U/C) Capacity

Under construction capacity is the estimated IT power that is currently having the mechanical and electrical plant installed to support it.

DCByte

Get In Touch

To learn more about our solutions, please reach out to:

Colby Cox
Managing Director, Americas
+1 240 818 6007
colby.cox@dcbyte.com

James Murphy
Managing Director, APAC
+65 9068 9803
james.murphy@dcbyte.com

Scott Roots
Sales Director, EMEA
+44 7710 236327
scott.roots@dcbyte.com

www.dcbyte.com