



Global | H1 2021

Research

H1 2021 Data Center Outlook

Insight into the industry's top trends
in the first half of 2021

Welcome

The pandemic completely disrupted the way we work, live, and play and it continues to evolve across the globe. We hope everyone reading this report continues to stay safe. The pandemic had a significant impact on data center sector demand and investment. After a pandemic-induced record year for demand in 2020 as streaming services and virtual connectivity skyrocketed, the data center sector recorded a strong start to 2021 and is poised for significant growth throughout the year.

JLL's Data Center Solutions Team is hard at work to bring our market leading data center solutions across all service lines across the world. You can look forward to hearing from us about exciting new initiatives in 2021.

David Barnett,
Director,
Americas Research



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Executive summary

- A strong resurgence in enterprise-level demand was felt across the top major data center REITs in the first half of 2021. Financial, technology, and healthcare companies drove much of this demand. Spend on public cloud services is projected to grow by 8.4 percent in 2021 reaching \$4.1 trillion, according to Gartner.
- Data center providers and occupiers continue to make inroads with their sustainability goals. With health, wellness, and sustainability at the forefront of corporate agendas, the data center industry is feeling the heat to use more efficient systems, renewable energy, and carbon-cutting practices.
- Last year was a record-breaking year for mergers and acquisitions and data center investment. While activity is below last year's pace, the largest data center deal on record was announced in June of 2021. Investment firm, Blackstone, purchased QTS Realty for \$6.7 billion, \$10.0 billion assuming debt, which puts it ahead of Digital Realty's \$8.4 billion purchase of Interxion in 2020.
- The global construction pipeline remained robust in the first half of 2021. In the United States, construction ramped up from 611.8 MW in the end of 2020 to 680.8 MW in the first half of 2021. The pipeline virtually stayed the same in the first half of 2021 compared to year-end 2020 in Europe.
- Demand is on pace for another strong year for data centers in 2021. Cloud, technology, and social media companies continue to drive near-record levels of demand across the globe.



Top global trends

1.

Data center spending and enterprise demand resurgence in 2021

The pandemic forced organizations to tighten their budgets amid economic uncertainty, including IT spend. COVID-19 served as an accelerant for digitization and connectivity for many organizations to keep their businesses churning, but overall global IT spending still reached a historical low in 2020. Now, with vaccination rollouts and lockdowns being lifted across countries, spend on public cloud services is projected to grow by 8.4 percent in 2021 reaching \$4.1 trillion, according to Gartner. Much of this growth is fueled by technology initiatives and employee management platforms.

A strong resurgence in enterprise-level demand was felt across the top major data center REITs in the first half of 2021. Financial, technology, and healthcare companies drove much of this demand. In fact, in the first quarter of 2021 enterprise demand was up nearly 50 percent compared to the second and third quarter of 2020 for QTS Realty. According to its first quarter earnings, it signed 34 new enterprises in the first quarter alone. CyrusOne also started the year off strong with 28 MW signed in the first quarter compared to 20 MW in the final quarter of 2020. Furthermore, Equinix's year-over-year as-reported revenue in the first quarter of 2021 was up 16 percent in **Asia Pacific**, ahead of the **Americas** with 10 percent, and **Europe** with 8 percent.

Technology companies have been notably active in **Asia Pacific**. For example, U.S.-based tech giants were recently granted conditional approval to build and manage hyperscale data centers (HDCs) and cloud services in Malaysia. Due to the nature of the pandemic and its geographical variances, the **Asia Pacific** region, overall, is further ahead in work reentry. Reentry there has driven recent industry growth, primarily in China.

The resurgence of enterprise activity reflects the evolving landscape of the pandemic and the global progress on

vaccine administration and restriction lifts. Employees and C-suite leaders are eager to work face to face with colleagues, adopt robust virtual connectivity applications, and healthy assets and workplaces that use data to enhance health and wellbeing.

Looking forward to year-end 2021

Virtual connectivity and cloud adoption drove record demand in 2020 as companies continued their business operations with COVID-19 restrictions in place. But is this specific demand sustainable if we see a large-scale return to the office?

Amid reentry, companies are making more decisions related to their workplace strategies and hybrid work arrangements. JLL Research found that while hybrid work will remain durable in a post-COVID-19 environment, the office will remain the central component of the working ecosystem.¹ Flexibility will be essential for workplace programs. To maintain flexibility, manage facilities, and implement dynamic occupancy plans, companies will need to invest in smart technologies to drive real-time decision-making. As a result, these investments will increase demand for data center capacity.

2.

Sustainability ambitions materialize across the industry and geographies

In our year-end report from 2020, we discussed sustainability trends and increased interest across operators and consumers. Data center providers and occupiers continue to make inroads with their sustainability goals. With health, wellness, and sustainability at the forefront of corporate agendas, the data center industry is feeling the heat to use more efficient systems, renewable energy, and carbon-cutting practices. These green ambitions are starting to be met with materialized plans and execution.

Sustainability is mainstream and green spending will continue to grow. In JLL's latest Sustainable Real Estate survey of over 550 corporate real estate leaders, **7 in 10 occupiers are willing to pay a rental premium to lease green buildings in the future, and 83 percent of occupiers and 78 percent of investors understand that climate change imposes a financial risk to their business.**² While occupiers are particularly focused on their office spaces, they demand the same green goals from data centers, which historically use significant power and water consumption. In a recent survey of 825 Multi-Tenant Data Centre (MTDC) operators by S&P, about 43 percent said they have a strategic sustainability initiative in place to improve their data center builds and operations in a comprehensive fashion.

What does sustainability look like for data centers?

After a year of significant expansion in 2020 and doubling the amount of markets it operates in, Vantage Data Centers is now expanding its sustainability program. The operator now offers renewable energy options to help meet carbon-cutting goals for its customers. Four of the operator's 14 campuses around the world run at on 99 percent renewable energy, while other campuses offer green power and other renewable credits for customers. These design certifications are helpful for customers looking to identify the right partners to achieve their sustainable initiatives.

¹ JLL Workforce Preference Barometer Survey, June 2021

² JLL Sustainable Real Estate Report, June 2021

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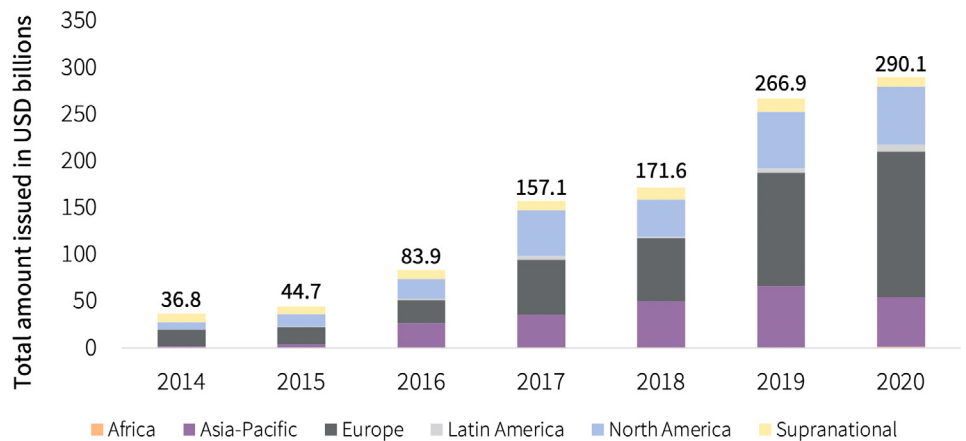
ways to create a greener industry and more sustainable world:

01. Green finance

Green bonds have grown in use in the data center industry since Digital Realty first issued these in 2015. These funds are directly tied to sustainable data center projects. Equinix launched its third green bond offering in May of 2021, issuing \$1.0 billion to support sustainable projects.

Outside the data center industry, the green bond market's overall growth over the past six years is impressive. The total amount of green bonds issued grew by 688 percent from 2014 to 2020, according to data from Climate Bonds Initiative.

Total Amount of Green Bonds Issued by Region, 2014-2020



02. Creative designs and operational solutions

Data center developers and operators have made strides to use fewer building construction materials and optimize power usage effectiveness (PUE) and water usage effectiveness (WUE). PUE and WUE are two of the most important indicators in tracking progress toward a more sustainable sector. In addition to issuing green bonds, **Equinix has over 16 million square feet of LEED-certified and other sustainable certified data center space. It increased its renewable energy use from 34 percent in 2015 to over 90 percent in 2020.**

Water usage to cool power systems in data centers has gained steam as of late. While there are environmental considerations, such as water availability and droughts specific to different geographies, this method offers another tool for operators to achieve green ambitions. In addition to CyrusOne's first net-positive water data center in Chandler, Arizona, the REIT opened its second net-positive water data center in Carrollton, Texas.

03. Industry and government partnerships

Industry leaders joined together to create The Climate Neutral Data Centre Pact. It sets out clear direction on some of the key areas in which they provide support to the European Green deal, in setting time-based deliverables. They set a number of targets and agreed to develop additional specific metrics in the coming months. Government policies may act as an accelerant as more credits and subsidies are put into place to hit carbon cutting goals across jurisdictions.

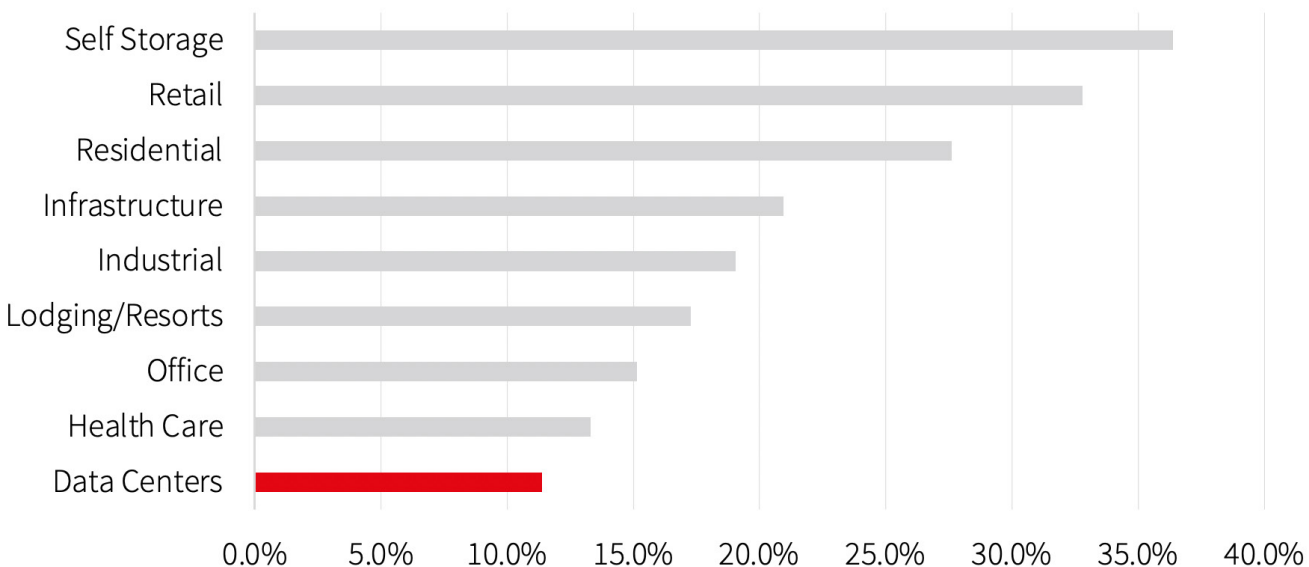


Top global trends

3.

M&A activity and investment focused on Europe and Asia Pacific

Total Returns by Sector, FTSE Nareit U.S. Real Estate Index Series, as of June 30th 2021



REIT performance as of June 30th, 2021 reflects the reentry and reopening of economies across the globe. While the data center sector still produced 11.4 percent in returns, there were notable gains for the office sector, residential, and retail.

Last year was a record-breaking year for mergers and acquisitions and data center investment. While activity is below last year's pace, the largest data center deal on record was announced in June of 2021. Investment firm,

Blackstone, purchased QTS Realty for \$6.7 billion, \$10.0 billion assuming debt, which puts it ahead of Digital Realty's \$8.4 billion purchase of Interxion in 2020. While Blackstone has been active in the sector with COPT and Ascenty, this deal presents strong sentiment for the future of the industry. The deal significantly expands Blackstone's portfolio as QTS operates in over 14 markets across the globe. The deal also presents an opportunity for QTS to expand into **Europe** and **Asia Pacific** in markets where

Blackstone has already been active. Notably, Blackstone invested \$150 million into the Chinese provider, 21Vianet. The deal represents strong sentiment on the future of hyperscale data centers, which drives about 40 percent of QTS Realty's revenue.

Other providers continue to expand across geographies. Equinix announced a \$6.9 billion investment that will build 23 new hyperscale data centers via its xScale program across Europe, Asia Pacific, and Latin America to grow its "data infrastructure" business with single customers. This effort will increase Equinix's portfolio to 32 data centers totaling 600 MW of capacity.

Demand in the primary European markets remains strong. CyrusOne purchased 12 acres in Frankfurt to provide over 60 MW of power capacity to support its expansion in the market. Operators continue to be active in secondary markets in **Europe**, as well. Digital Realty acquired a property and land parcel in Brussels, Belgium. It also acquired interest in land in Denmark. Overall, the REIT closed on 11 data centers throughout in the first quarter alone.

Elsewhere in the **United States**, Switch acquired Data Foundry for \$420 million to expand its presence into Texas. This will total Switch's data centers to 16 across the United

States in markets including Reno, Las Vegas, Atlanta, and Grand Rapids. The new Texas portfolio will provide Switch with increased connectivity to the robust and growing population centers of Houston and Austin.

Looking forward: Expect increased competition with industrial players over land.

Data center developers are competing with industrial developers for limited land in key markets. In the **United States**, land viable for data center development in Phoenix, Las Vegas, and Utah has been largely scooped up by industrial developers. There continues to be a shortage of warehouse space, pushing pricing for industrial land which is compressing the premium a data center user and developer would typically pay for the right piece of land. Limited land availability and increased competition with industrial players may hinder expansion plans for users and operators throughout the year.



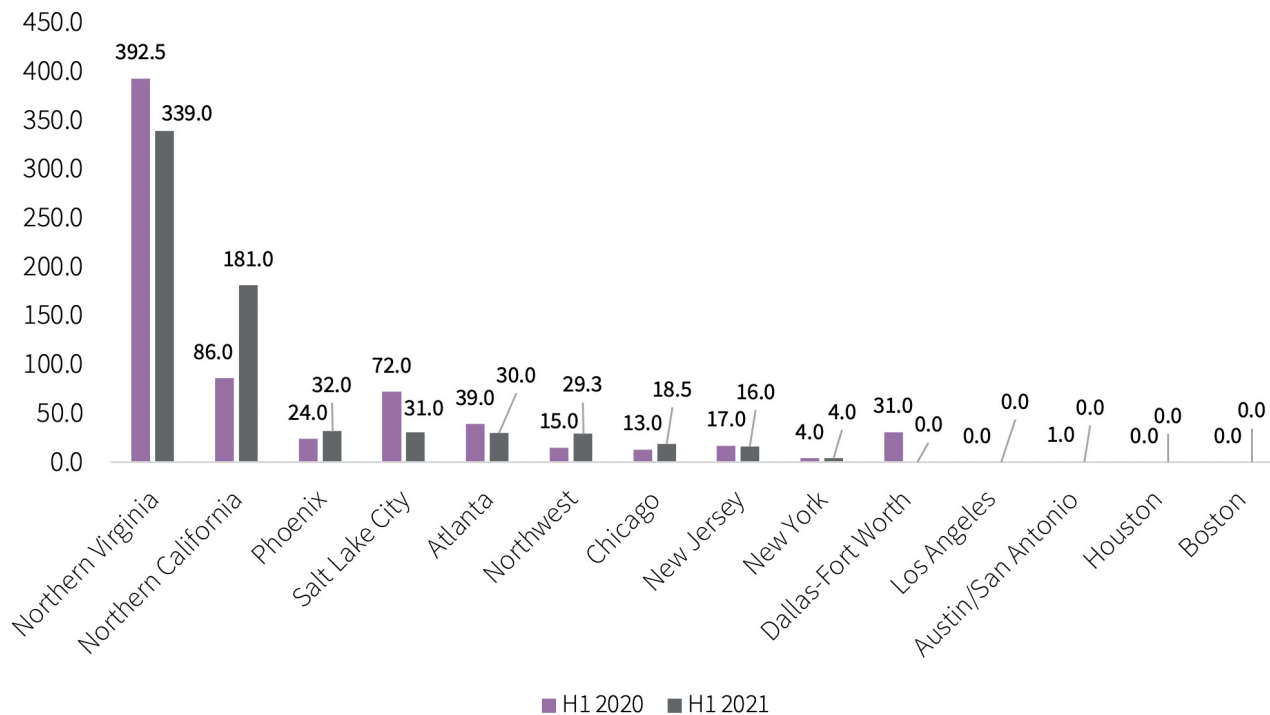
State of the industry

Construction | The global construction pipeline remained robust in the first half of 2021.

In the **United States**, construction ramped up from 611.8 MW in the end of 2020 to 680.8 MW in the first half of 2021. This figure is shy of the record set in first half of 2020 when the pipeline reached 694.5 MW under construction across 14 U.S. markets. Northern Virginia continues to lead in construction activity, while significant gains were made in the notably tight markets of Northern California and Northwest which both have submarkets

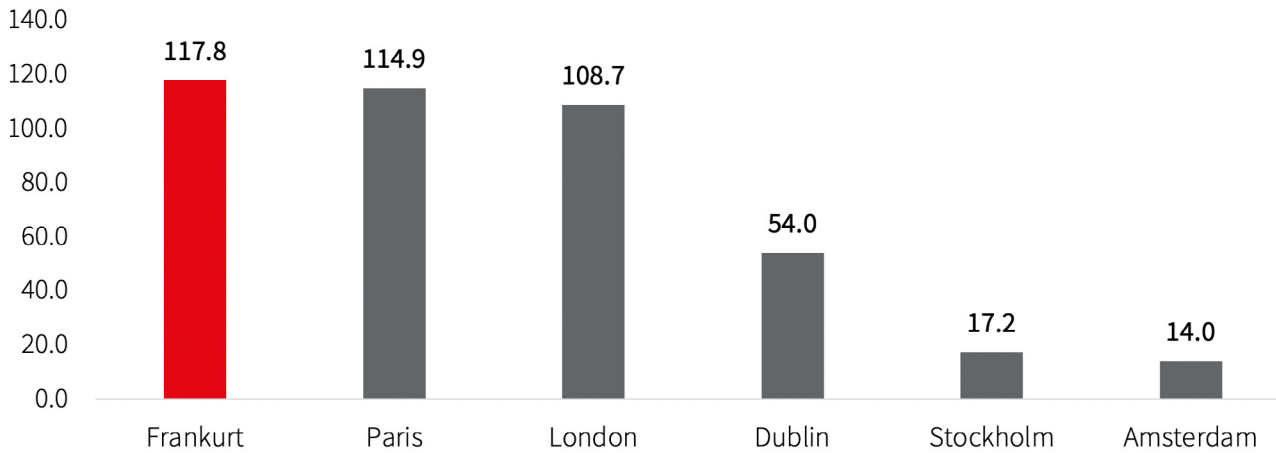
with vacancy in the single digits. Development significantly increased in Toronto in the first half of the year with 52.0 MW under construction. However, scarce land availability may hinder expansions throughout 2021. The overall construction pipeline in North America is forecast to grow throughout the year to meet growing demand from cloud and technology companies.

Under construction (MW) by U.S. market



The pipeline virtually stayed the same in the first half of 2021 compared to year-end 2020 in **Europe**. Over 8.8 MW were delivered in London, reducing the pipeline from 117.5 MW in year-end 2020 to 108.7 in the first half of 2021. We forecast the market to deliver an additional 117 MW by year-end. Stockholm has seen an uptick in construction activity, due to available land, low power costs, and access to renewable energy.

Under construction (MW) by EMEA market, H1 2021



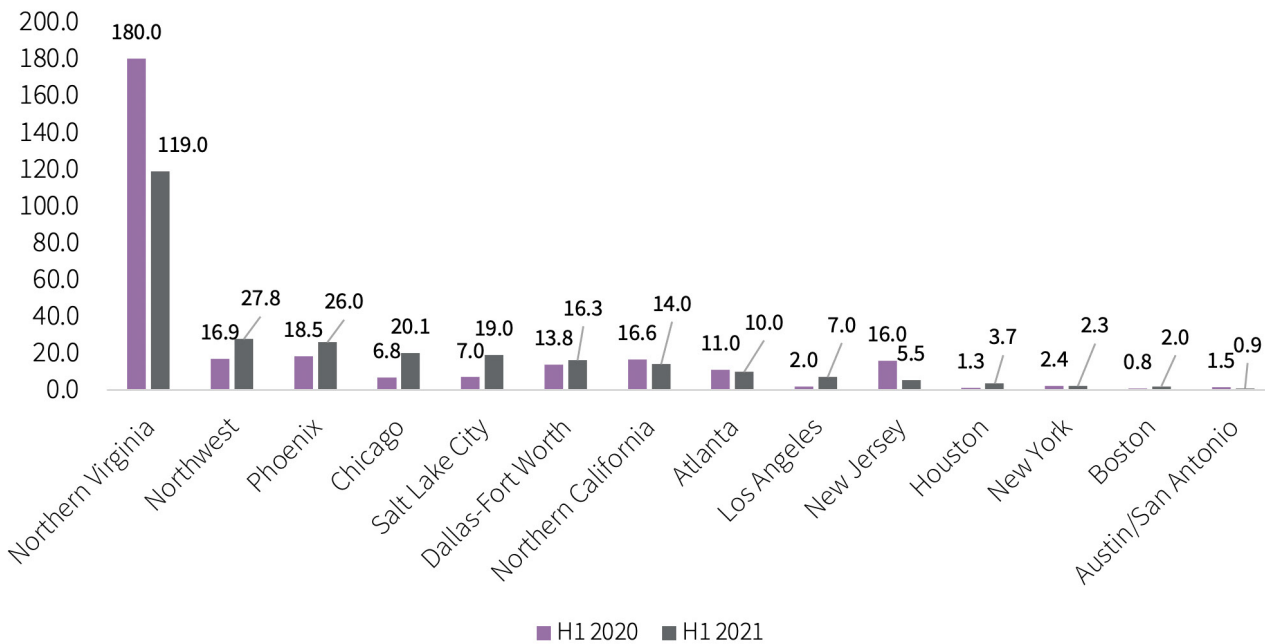
State of the industry

Demand | Demand is on pace for another strong year for data centers in 2021.

In the **United States**, absorption reached 273.6 MW across 14 domestic markets, excluding Denver. While this figure is below the record amount of 294.6 MW recorded in the first half of 2020 for the same markets, it is still the second highest amount on record going back to 2018. While Northern Virginia continues to lead in demand, other markets recorded significant increases year-

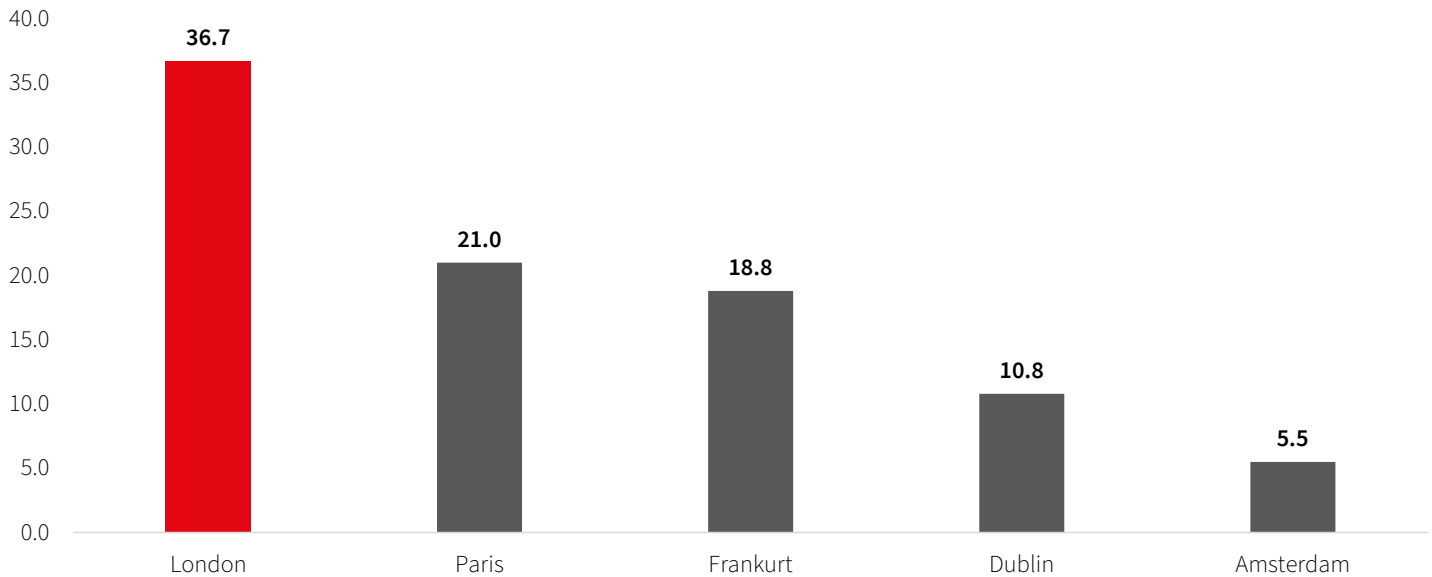
over-year. These include Northwest, Phoenix, Chicago, and Salt Lake City. While enterprise demand was more limited in Chicago, expansions and edge requirements added up to a robust first half. The average deal size increased significantly in the Northwest, which now boasts the second highest demand in the country.

Absorption (MW) by U.S. market



In **Europe**, demand is on track for a second consecutive record year. So far, 2021 has eclipsed all previous take up figures. Take up for the second quarter reached 55.5 MW, considerably higher than the 37.2 MW seen in the first quarter of the year. From a half yearly perspective 2021 is at 93 MW, surpassing last year's record high of 91 MW.

Absorption (MW) by EMEA market, H1 2021



Definitions:

Inventory of multitenant data center square footage and power that's either leased (absorption), shell space planned for future development (planned), turnkey/conditioned available today (vacant) or currently being developed into turnkey/conditioned (under construction) all under one roof.

Planned represents development that has been announced, in process of entitlements and design.

Total vacant space represents turnkey/fully conditioned data center space available for lease.

Under construction represents data center space that has broken ground and has entitlements.

Absorption (Net) represents the amount of new multitenant data center square footage and power leased less the total amount of square footage and power no longer occupied between the current and last measurement periods.

Hyperscale data centers represent data centers with the ability to scale out from hundreds to thousands of servers owned and operated by one entity.

Multitenant data centers comprise facilities where an owner sells space and power to multiple tenants.



North America market insights

Atlanta

Hyperscale activity continues to circle the market

Market overview

Supply

Atlanta gets another boost in supply as Flexential delivers new demand-driven colocation space and power. Serverfarm is poised to expand its offering in Atlanta, and many other operators continue to plan for near-term expansions.

Demand

Absorption has trended down compared to an unprecedented 2020 year for Atlanta, though it remains on par with previous years. Hyperscale users will fuel absorption for 2021.

Market trends

The Atlanta data center market continues to be a focus for hyperscalers searching for land or ready colocation space. Facebook announced another billion-dollar investment and expansion of its data center campus.

Outlook

for Users

- Near-term supply offers many choices
- Pricing remains stable
- Concessions being offered

for Providers

- Hyperscalers continue to look for a presence in Atlanta
- Users continue to embrace colocation
- Users value flexibility with power growth or reduction

Supply

	s.f.	MW
Total inventory:	2,299,692	288.0
Total vacant:	284,000	40.0
Under Construction:	160,000	30.0
Planned:	970,000	127.0

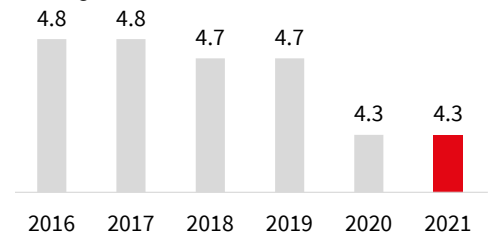
Demand

	MW
Net absorption:	10.0

Rental rates

	Low	High
(All-in) sub-250 kW	\$165	\$250
250 kW-1 MW	\$95	\$125
1-5 MW	\$95	\$110
5 MW plus	-	-

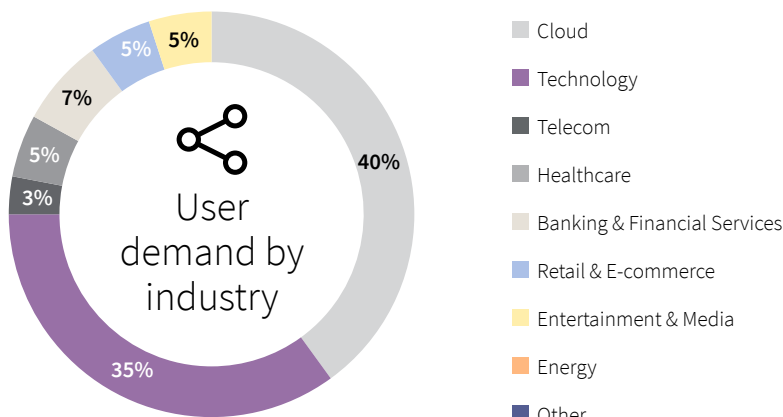
Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021

User-favorable market
Neutral market
Provider-favorable market



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See page 41 of this document for contact information.

Austin & San Antonio

A new entrant in the Texas market raises intrigue

Market overview

Supply

Construction of new supply is light. SWITCH made waves by acquiring Data Foundry for \$420 million in May, entering the Texas market with plans for major expansion. Hyperscalers continue to drive growth in San Antonio, with many of them focusing on expanding existing activities, as well as acquiring government cloud contracts.

Demand

Demand remains light, but steady in both markets with hyperscalers dominating activity. Colocation demand remains light. San Antonio is becoming a hot bed for cloud services and servicing federal data contracts.

Market trends

Providers have not stepped up construction to increase supply, so the market has limited options on the supply side. Pricing remains steady, but activity is picking up with regards to enterprise hyperscale interest in the San Antonio market.

Outlook

for Users

- Lack of turnkey space requires longer term capacity planning
- Rental rates remain largely unchanged from 2020
- Limited options for users in Austin and San Antonio will affect demand

for Providers

- Lack of turnkey space suggest an opportunity for a provider to build on spec
- Upfront utility planning is key to timely delivery of new supply
- Scalable space is critical to meeting current and future hyperscale demand

Supply

	s.f.	MW
Total inventory:	1,372,934	121.0
Total vacant:	31,500	3.0
Under Construction:	-	0.0
Planned:	14,500	6.0

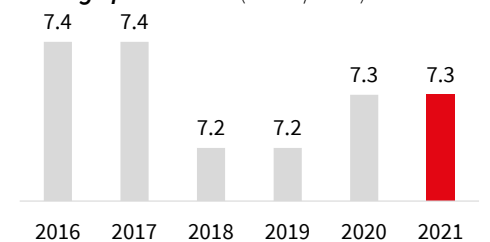
Demand

	MW
Net absorption:	0.85

Rental rates

	Low	High
(All-in) sub-250 kW	\$220	\$290
250 kW-1 MW	\$85	\$120
1-5 MW	\$85	\$105
5 MW plus	-	-

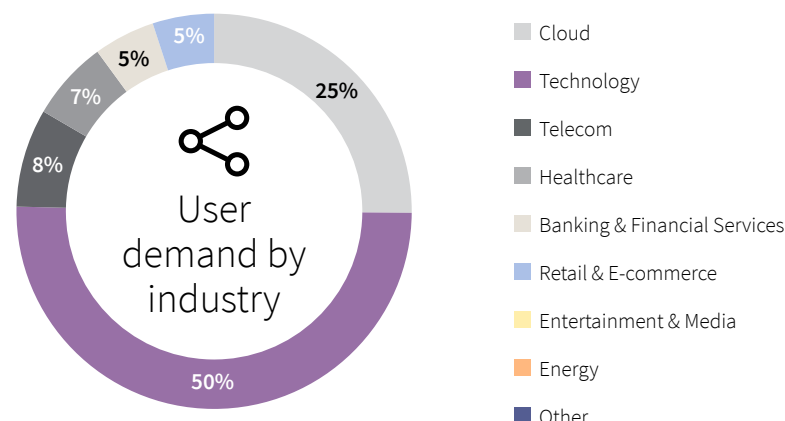
Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021

User-favorable market
Neutral market
Provider-favorable market



Authored by: Curt Holcomb

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Boston

Best growth in over two years driven primarily by migration from owned data centers and computer rooms to colocation

Market overview

Supply

Market supply continues to be available across submarkets in Boston, including downtown, 128, and 495.

Demand

Demand has improved with several migrations from corporate data centers and computer rooms to colocation with One Summer, 70 Innerbelt, and Tierpoint Marlborough capturing the most.

Market trends

Demand is strong across technology, healthcare and biopharmaceuticals, and education in that order.

Outlook

for Users

- Pricing remains competitive for space and power
- Energy efficiency projects are reducing overall costs
- High competition for full-service offerings, including DR

for Providers

- Pricing has been stable for last year
- Energy efficient and green offerings will be attractive to customers
- Market seems to be stabilizing and returning to meaningful growth

Supply

	s.f.	MW
Total inventory:	1,200,000	160.0
Total vacant:	255,000	29.0
Under Construction:	0.0	0.0
Planned:	60,000	10.0

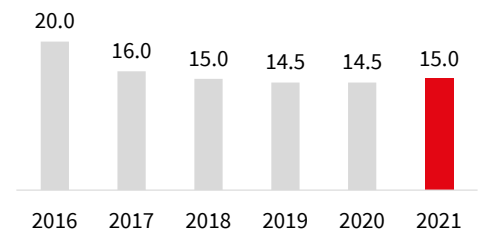
Demand

	MW
Net absorption:	2.0

Rental rates

	Low	High
(\$/kW+E) sub 250 kW	\$115	\$280
250 kW-1 MW	\$110	\$145
1-5 MW	\$95	\$130
5 MW plus	\$85	\$115

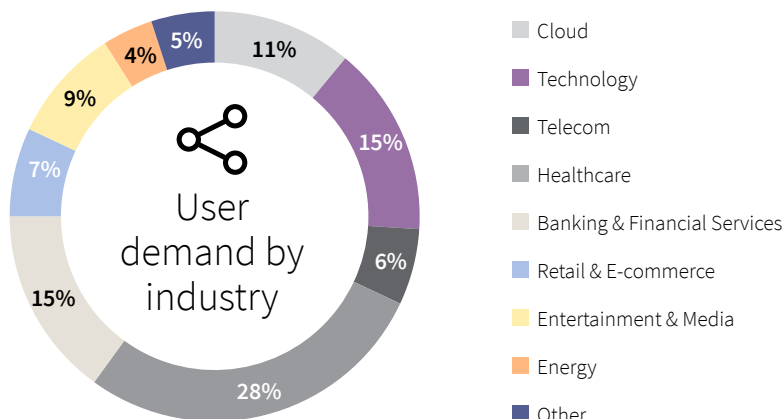
Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021

User-favorable market
Neutral market
Provider-favorable market



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Chicago

Chicago building for long-term growth

Market overview

Supply

Available supply increased in the first half of 2021 with newly commissioned capacity delivering from T5, NTT/RagingWire, Digital Crossroads, and Element Critical. Additional projects were announced by Aligned, EdgeConnex, Stream, and Skybox.

Demand

There was tepid leasing activity in the first half of the year among enterprise users. However, it was backed up by existing customer expansion, inbound edge requirements, and smaller hyperscale transactions across the market.

Market trends

Several expansions hit the market and newly announced developments will add to existing inventory and likely compress rates. A number of legacy leases are coming up on term and it has yet to be seen if legacy capacity will be returned to the market.

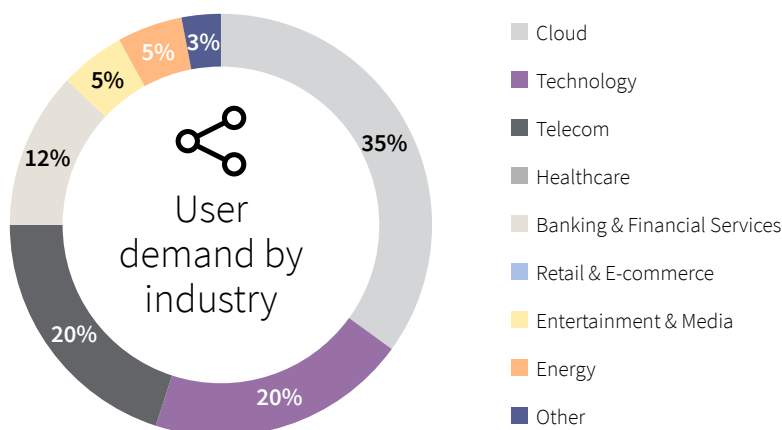
Outlook

for Users

- Oversupply and pressure on returns will compress rental rates
- Expanded options within the market place
- Tax incentives make Chicago one of the cheapest markets nationally

for Providers

- Increased competition by spec developers and land banking
- Rate compression
- Submarket specific requirements



Supply

	s.f.	MW
Total inventory:	5,062,500	631.6
Total vacant:	426,500	62.0
Under Construction:	190,000	18.5
Planned:	40,000	6.0

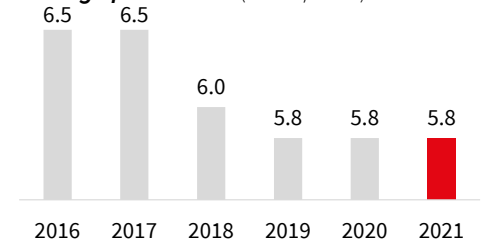
Demand

	MW
Net absorption:	20.1

Rental rates

	Low	High
(\$/kW+E) sub 250 kW	\$105	\$150
250 kW-1 MW	\$95	\$105
1-5 MW	\$85	\$98
5 MW plus	\$72	\$85

Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021
<i>User-favorable market</i> <i>Neutral market</i> Provider-favorable market				

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See page 41 of this document for contact information.

Dallas/Fort Worth

Demand increases following a soft 2020 market

Market overview

Supply

Supply in Dallas/Ft. Worth ("DFW") is plentiful after a sluggish market during the height of Covid-19 restrictions in 2020. The market is beginning to absorb some of the excess supply that has been present over the last few years. Providers are managing supply by tightly controlling "just-in-time" construction of new supply.

Demand

Demand in DFW is much greater in the first half of 2021 compared to 2020. Absorption is over 20 MW and stronger than any six month period since 2017. Demand is from net new requirements, as well as expansions by existing colocation tenants.

Market trends

Pricing in DFW continues to be very soft as competition among the providers has led to aggressive pricing and incentives. Most of the major providers have a presence in the DFW market. Diverse options coupled with aggressive pricing means DFW will continue to see enterprise users evaluating the market.

Outlook

for Users

- Renegotiations and renewals will provide increased value to users
- Users locking in lower rates and more flexible terms
- Flexible terms and low rates for credit-worthy logos

for Providers

- Organic growth from existing customers fueling expansion
- Users are valuing higher density infrastructure
- Cloud access and services are key differentiators

Supply

	s.f.	MW
Total inventory:	3,784,863	539.0
Total vacant:	219,650	52.0
Under Construction:	0.0	0.0
Planned:	793,000	137.5

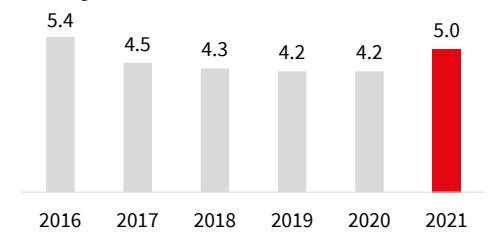
Demand

	MW
Net absorption:	16.30

Rental rates

	Low	High
(All-in) sub-250 kW	\$110	\$175
250 kW-1 MW	\$85	\$185
1-5 MW	\$75	-
5 MW plus	\$75	-

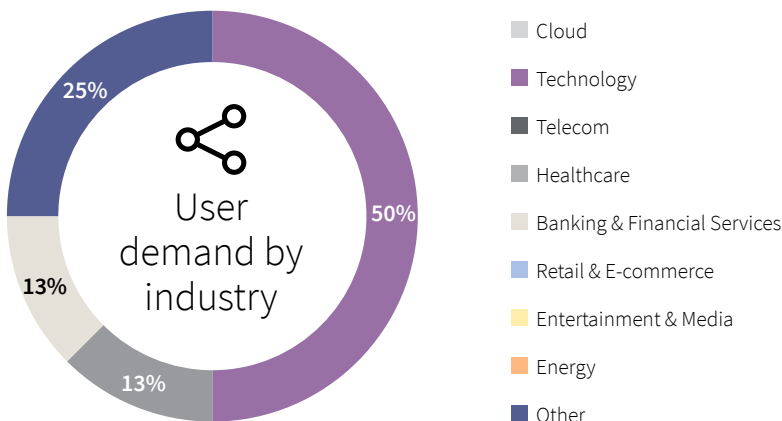
Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021

User-favorable market
Neutral market
Provider-favorable market



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See page 41 of this document for contact information.

Houston

Demand remains sluggish as the oil and gas industry begins to recover

Market overview

Supply

With oil and gas dominating the market, addition of new supply is at a standstill until demand further increases. There are no new speculative builds in the pipeline and overall supply is static.

Demand

Although the oil and gas market is slowly rebounding from recent historical lows during Covid-19 in 2020, data center demand lags behind with the majority of absorption occurring from tenants expanding existing capacity.

Market trends

Lack of demand continues to drive market pricing lower throughout the first half of 2021. Historically, the Houston colocation market follows the lead of the oil and gas industry and this will continue for the foreseeable future.

Outlook

for Users

- Lack of new supply will soften price compression
- Quality space available at competitive pricing
- Users leveraging market to renegotiate terms

for Providers

- Providers connecting Houston facilities with their other markets
- Access to cloud providers and services key
- Providers focusing on retaining tenants

Supply

	s.f.	MW
Total inventory:	1,468,207	138
Total vacant:	64,000	26
Under Construction:	0.0	0.0
Planned:	230,000	42

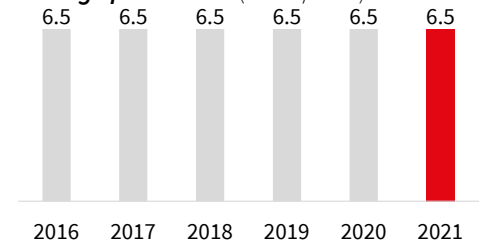
Demand

	MW
Net absorption:	3.7

Rental rates

	Low	High
(All-in) sub-250 kW	\$170	\$250
250 kW-1 MW	\$80	\$110
1-5 MW	\$75	\$95
5 MW plus	-	-

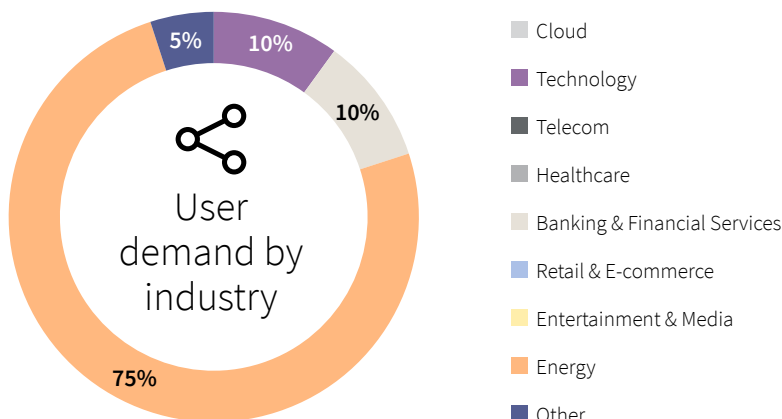
Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021

User-favorable market
Neutral market
Provider-favorable market



Authored by: Curt Holcomb

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Los Angeles

Los Angeles market gains momentum induced by increased user demand

Market overview

Supply

Low single digit vacancy in the industrial market has limited options by large operators and cloud providers in the market

Demand

The demand for faster, safer, and more reliable content delivery will continue to propel the market.

Market trends

No longer are smaller cabinet deals the focus of the market, as large cloud providers continue their Southern California expansion.

Outlook

for Users

- Lack of powered shells for new expansion opportunities
- Continued rate compression and consolidation among providers
- Several large users looking for similar requirements

for Providers

- Expect more efficient environments to combat high energy rates
- Built out pods in high demand
- Clients require state of the art environments

Supply

	s.f.	MW
Total inventory:	2,500,000	250.0
Total vacant:	500,000	30.0
Under Construction:	0.0	0.0
Planned:	0.0	0.0

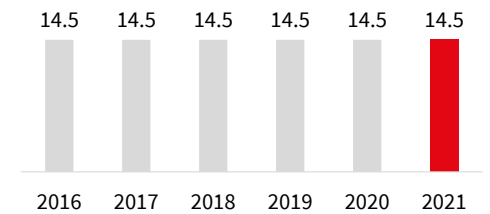
Demand

	MW
Net absorption:	7.0

Rental rates

	Low	High
(\$/kW+E) sub 250 kW	\$125	\$135
250 kW-1 MW	\$115	\$120
1-5 MW	\$105	\$115
5 MW plus	\$90	\$115

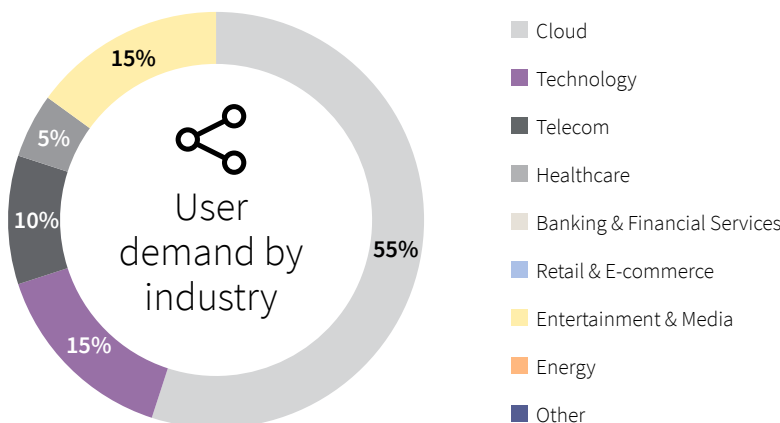
Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021

User-favorable market
Neutral market
Provider-favorable market



Authored by: Darren Eades

See page 41 of this document for contact information.

New Jersey

New Jersey continues to see steady expansion from financial services, healthcare, and technology to start 2021.

Market overview

Supply

Continued expansion among existing client base and wholesale pipeline has opened 3-6 MW of supply among DC REITs in the first half of 2021. These include: Digital Realty with 3 MW, CyrusOne with 6 MW, QTS with 4.5 MW, Coresite with 4+ MW, and Equinix with 750 kW.

Demand

Demand continues to increase in New Jersey among financial services, life sciences, and technology sectors. Increased demand for managed services, including IaaS, bare metal, disaster recovery and cybersecurity, accelerates as result of hybrid cloud deployments.

Market trends

The potential of a financial transaction tax has financial markets, buy and sell side players, and trading firms on alert. Several operators are looking for anchor tenant opportunities to add this market to their portfolios. Operators and tenants are poised for a healthy recovery in the remainder of the year after an initial slight pause.

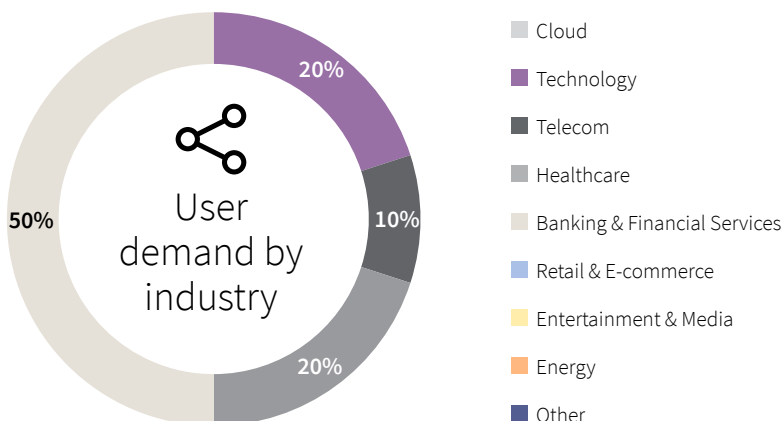
Outlook

for Users

- Latency performance driving new product innovation
- Investments are being made in IoT sensors for operational efficiency
- Security standards are a top priority for outsourced solutions

for Providers

- Sites with available power in high demand
- Industrial developers contending for prime locations in Northern New Jersey
- Sale lease-backs and subleases emerging in older facilities



Supply

	s.f.	MW
Total inventory:	3,850,000	410.0
Total vacant:	182,000	18.0
Under Construction:	145,000	16.0
Planned:	275,000	16.0

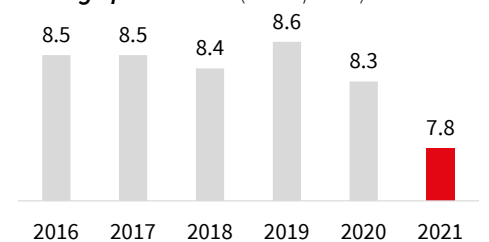
Demand

	MW
Net absorption:	5.5

Rental rates

	Low	High
(\$/kW+E) sub 250 kW	\$120	\$180
250 kW-1 MW	\$105	\$115
1-5 MW	\$95	\$105
5 MW plus	\$85	\$95

Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021
<i>User-favorable market</i> <i>Neutral market</i> <i>Provider-favorable market</i>				

Authored by: Thomas Reilly | Jason Bell

See page 41 of this document for contact information.

New York

Continued edge growth and expansion in carrier hotels among carrier, content, and technology tenant Base

Market overview

Supply

Sabey recently added supply to support existing tenant expansion needs. Digital Realty and Coresite compete for cloud service business at 32 Avenue of the Americas. 1547 and Datagryd position shell conversion space. 325 Hudson continues to attract near carrier hotel traffic and Teirpoint, Webair, and NYI compete for managed services.

Demand

NYC is a small edge market ranging from 25-100 kW supporting carrier hotel capacity, content providers, wireless radio networks, and local NY government applications. Coresite and Digital Realty have retail success positioning multi-cloud access deployments of hybrid clouds at 32 Avenue of the Americas. Teirpoint is leading with IT Services.

Market trends

Limited engineering resources has positioned the market as one of the fastest growing managed cloud, security, and DR Services hubs. Equinix, Teirpoint, and WebAir enhance the market's product set.

Outlook

for Users

- Multi-cloud access options are a top requirement in NYC edge deployments
- Managed security solutions are now more readily available as breaches rise
- Managed service bundles of cloud, network, and security expected through one provider

for Providers

- Sustainability, IoT, and BMS services surfacing to provide more efficiencies
- Investment opportunities in major interconnect locations will emerge
- Managed services are growing as enterprises are capital and resource constrained

Supply

	s.f.	MW
Total inventory:	1,020,000	152.0
Total vacant:	65,000	11.5
Under Construction:	25,000	4.0
Planned:	140,000	20.0

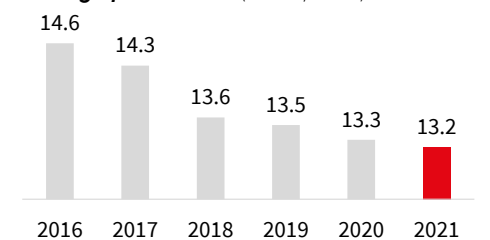
Demand

	MW
Net absorption:	2.3

Rental rates

	Low	High
(All-in) sub-250 kW	\$300	\$350
250 kW-1 MW	\$250	\$300
1-5 MW	\$150	\$250
5 MW plus	\$130	\$150

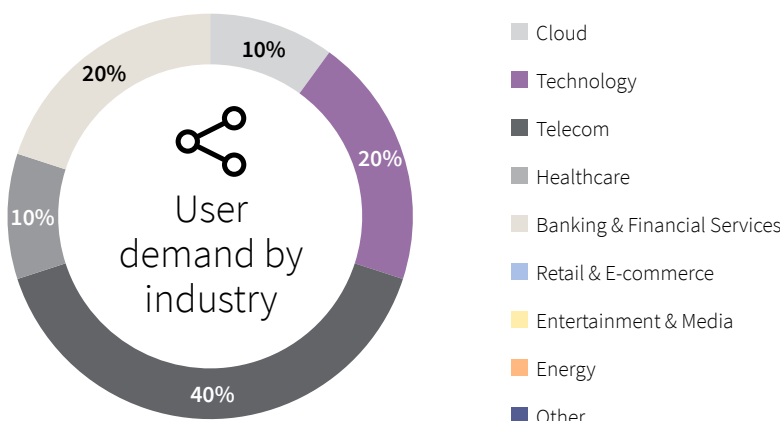
Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021

User-favorable market
Neutral market
Provider-favorable market



Authored by: Jason Bell | James Quinn | Gary Youm

See page 41 of this document for contact information.

Northern California

Fundamentals remain the strongest in the U.S. as landlords experience difficulties in bringing new supply online to meet demand.

Market overview

Supply

Vacancy continues to trend downward, falling to ~5% in H1 2021. Each NorCal submarket has vacancy rates at or below 10%, with Santa Clara leading the way at ~3%. Sacramento experienced a banner first half, resulting in vacancy falling by nearly 8%. Santa Clara continues to see heavy interest from investors and operators seeking to either enter or expand in the market.

Demand

H1 2021 net absorption was 14.9 MW, decreasing from H1 2020 (19.4 MW). Operators, such as NTT, which delivered the initial phase of 1150 Walsh 80+% preleased, continue to see strong demand for new product.

Market trends

Market pricing remains stable despite decreasing vacancy rates and difficulty delivering new supply to alleviate supply/demand imbalance. Construction costs, lack of quality development sites, and challenges procuring power, have contributed to delays and increased expenses when delivering new facilities.

Outlook

for Users

- Scarcity of new product is driving competition between users
- Near-term supply will remain incredibly tight
- Given rising construction costs and low vacancy, operators may push pricing

for Providers

- Need to be mindful of competitive supply coming online
- Need to be realistic about difficulty in the procurement of power
- Need to be mindful of development costs and construction delays

Supply

	s.f.	MW
Total inventory:	6,375,415	508.0
Total vacant:	327,385	48.0
Under Construction:	2,398,492	181.0
Planned:	2,584,491	419.0

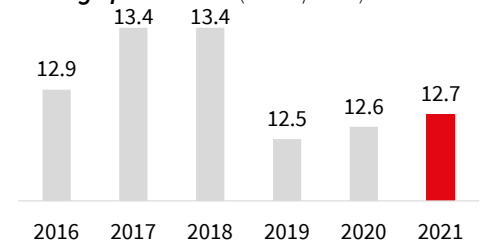
Demand

	MW
Net absorption:	14.0

Rental rates

	Low	High
sub 250 (all-in)	\$200	\$300
250 - 1 MW (+E)	\$140	\$160
1-5 MW (+E)	\$120	\$150
5+ MW (+E)	\$120	\$150

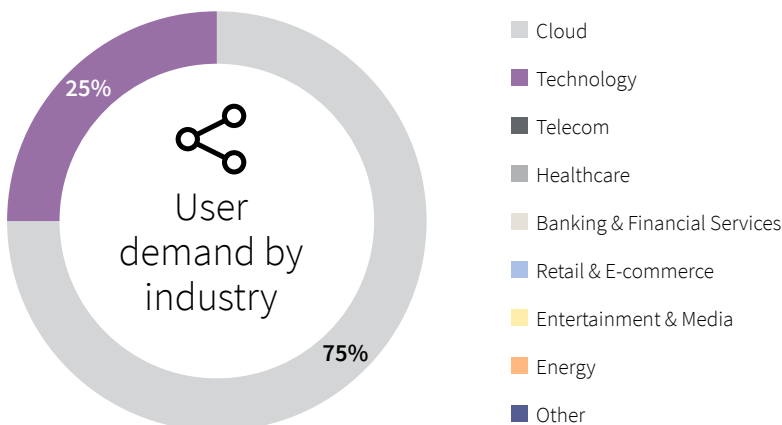
Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021

User-favorable market
Neutral market
Provider-favorable market



Authored by: Raul Saavedra | Patrick Murdock

See page 41 of this document for contact information. | *Northern California includes Silicon Valley/Santa Clara, San Jose, San Francisco, and Sacramento

Northern Virginia

Northern Virginia absorption remains strong despite digesting a record 2020

Market overview

Supply

90 MW of MTDC inventory were added to supply in the first half of 2021. 339 MW are currently under construction. 16 buildings can currently satisfy between 1 and 5 MW.

Demand

Cloud accounted for 50 percent of the 119 MW in absorption in the first half of 2021. Following a historic year, social media demand is down slightly, but still continues at high levels.

Market trends

Land pricing has swelled. Price per acre in both Loudoun and Prince William counties has reached record levels. Institutional investors have flocked to the region to execute on data center investments.

Outlook

for Users

- Historically low rates and additional concessions
- Many high quality options to consider
- Competition will stay strong for the foreseeable future

for Providers

- Margins decreasing for providers due to aggressive new competitors
- Large hyperscale deployments are at historic highs
- Must prepare for longer power lead times for future development

Supply

	s.f.	MW
Total inventory:	31,118,534	2,801.0
Total vacant:	2,817,500	161.0
Under Construction:	5,932,500	339.0
Planned:	51,502,500	2,943.0

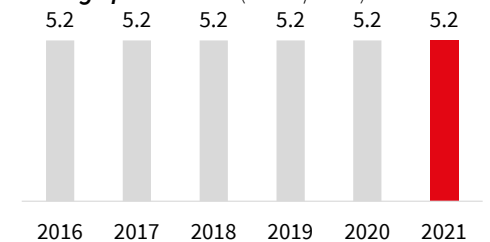
Demand

	MW
Net absorption:	119

Rental rates

	Low	High
(\$/kW+E) sub 250 kW	\$125	\$180
250 kW-1 MW	\$80	\$120
1-5 MW	\$75	\$100
5 MW plus	\$65	\$85

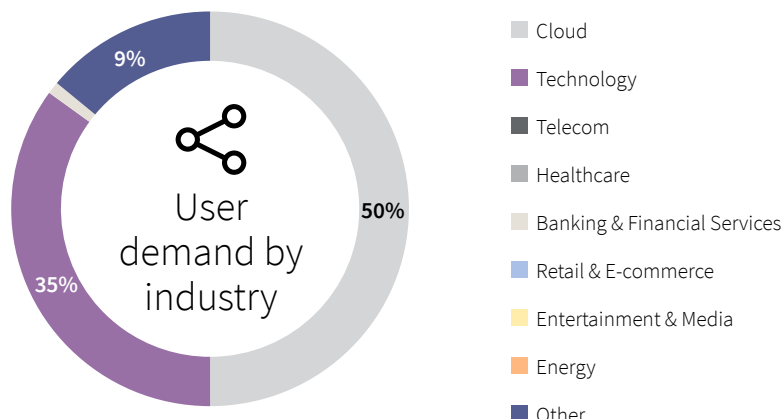
Average power rate (cents/kWh)



Data Center leverage

H1 2019	H2 2019	H1 2020	H2 2020	H1 2021

User-favorable market
Neutral market
Provider-favorable market



Authored by: Jeff Groh | Kelly Katz

See page 41 of this document for contact information.

Northwest

With Hillsboro leading the charge, the Pacific Northwest is on track for a potential record year as absorption exceeds all previously forecasted mid-year absorption numbers.

Market overview

Supply

Hillsboro has experienced a major uptick in the total amount of megawatts of users currently in the market. The average size per transaction has increased significantly.

Demand

Central Washington has low recorded absorption primarily due to the lack of available product to support large-scale requirements. Construction is underway and planned given demand for product is high.

Market trends

Hillsboro has accounted for nearly 80 percent of Northwest absorption in 2021 year-to-date.

Outlook

for Users

- Users can leverage new construction opportunities
- Increasing importance to be close to key Northwest on-ramps
- Vacancy can quickly change in Hillsboro leading to potential price increases

for Providers

- The majority of users are looking for 5+ MW deployments with growth requirements
- High barriers to entry for operators due to lack of land/developable opportunities
- Planned construction forecasts for the Northwest are at an all-time high

Supply

	s.f.	MW
Total inventory:	2,579,631	382.7
Total vacant:	127,667	50.7
Under Construction:	304,958	29.3
Planned:	1,403,715	217.0

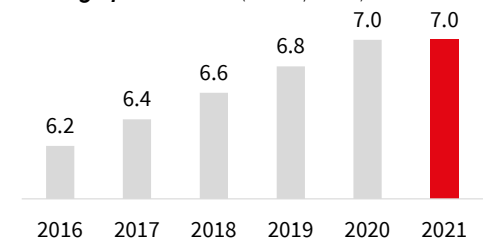
Demand

	MW
Net absorption:	27.8

Rental rates

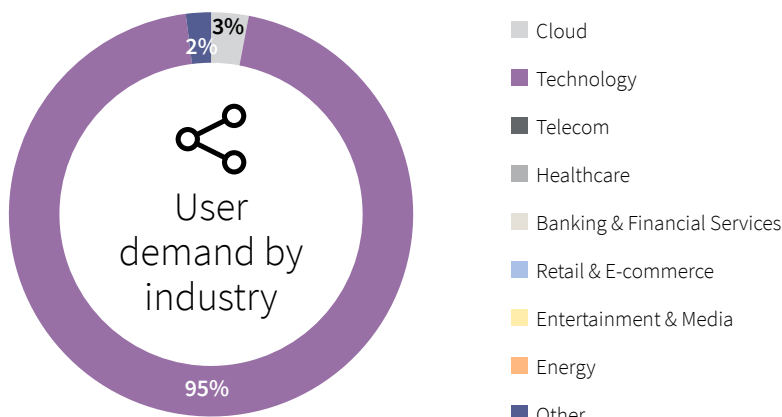
	Low	High
(\$/kW+E) sub 250 kW	\$160	\$200
250 kW-1 MW	\$90	\$110
1-5 MW	\$85	\$100
5 MW plus	\$80	\$95

Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021
<i>User-favorable market</i> <i>Neutral market</i> Provider-favorable market				



Authored by: Conan Lee

See page 41 of this document for contact information.

Phoenix

Cloud and technology drive colocation absorption for the Phoenix market

Market overview

Supply

Existing inventory is tight and new construction is underway. 50 MW of available data center space exists or is under construction to satisfy insatiable demand. NTT in East Mesa and Vantage Data Centers in Goodyear have both broke ground and will be delivering new capacity in the first half of 2022.

Demand

Institutional investors target Phoenix data centers and development sites. Recent land sales are reducing available options and increasing price per acre. Recent demand for acquisitions of data center properties have compressed cap rates. Data center and industrial land prices have increased as much as 20-40% in the last 6-12 months.

Market trends

The price competitiveness is expected to intensify in the Phoenix market. Additional second-generation product will bifurcate the current aggressive pricing environment.

Outlook

for Users

- More supply is being delivered to the market by Q1 2022
- Flexibility will be crucial to test the residual effect of growth
- Continued cloud strategy pressures from the C-Suite

for Providers

- Be able to deliver contiguous space to end users
- Pressure from end users to support operational staffing experience
- Compliance still of high importance for end users

Supply

	s.f.	MW
Total inventory:	2,184,076	326.7
Total vacant:	371,536	31.1
Under Construction:	-	32.0
Planned:	959,897	250.0

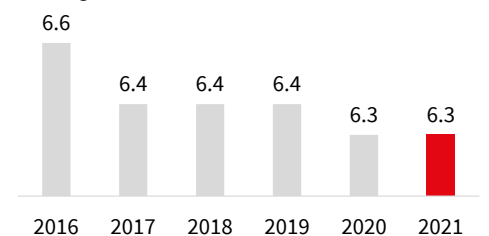
Demand

	MW
Net absorption:	26.0

Rental rates

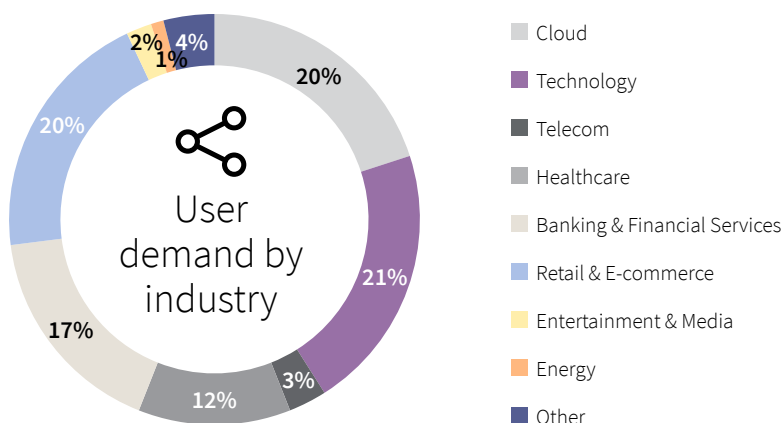
	Low	High
(All-in) sub-250 kW	\$200	\$300
250 kW-1 MW	\$95	\$110
1-5 MW	\$85	\$95
5 MW plus	\$75	\$85

Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021
<i>User-favorable market</i> <i>Neutral market</i> <i>Provider-favorable market</i>				



Authored by: Mark Bauer

See page 41 of this document for contact information.

Salt Lake City

Salt Lake City draws demand from enterprise and hyperscale users in the West

Market overview

Supply

Supply continues to be added in Salt Lake City. Aligned completed the build-out of its campus with a new second building, consisting of 48 MW of designed critical power. Novva Data Centers will complete construction on its first of five buildings in Q3 2021, which will support 24 MW. DataBank completed construction on SLC5, which added 13 MW to its campus and has been leased.

Demand

The market's diverse fiber routes across the Pacific Northwest, the Southwest, and Midwest, as well as its new data center tax exemption program, has made it a very attractive market for many technology and financial institutions. With low power rates, numerous renewable energy options, and a supportive tech sector, Salt Lake City has become an attractive market.

Market trends

Utah recently passed legislation that allows sales tax-free equipment purchases for data center clients, which became effective July 1st, 2020. Utah has made leaps and bounds in becoming one of the most competitively priced data center markets in the country, which has been proven with the constant expansion of new space coming to the market.

Outlook

for Users

- Stay competitive as more providers look to the market
- Compliance still of high importance for end users
- Pressure from end users to support operation staffing experience

for Providers

- Stay competitive as more providers look to the market
- Compliance still of high importance for end users
- Pressure from end users to support operation staffing experience

Supply

	s.f.	MW
Total inventory:	556,000	80.0
Total vacant:	63,000	10.0
Under Construction:	250,000	31.0
Planned:	1,490,000	160.0

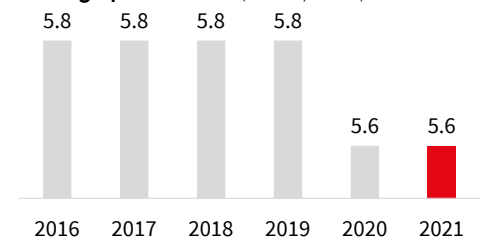
Demand

	MW
Net absorption:	19.0

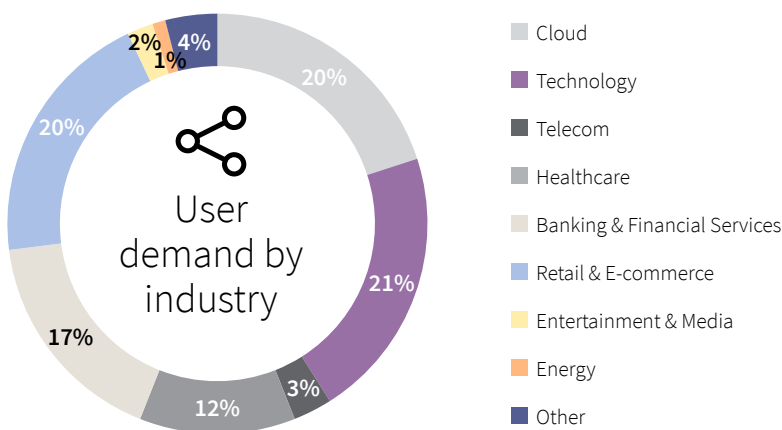
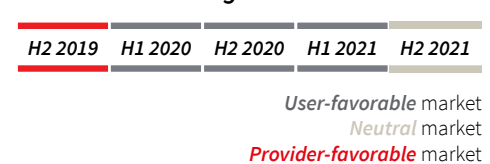
Rental rates

	Low	High
(All-in) sub-250 kW	\$225	\$275
250 kW-1 MW	\$95	\$110
1-5 MW	\$85	\$95
5 MW plus	\$78	\$85

Average power rate (cents/kWh)



Data Center leverage



Authored by: Mark Bauer

See page 41 of this document for contact information.

Greater Toronto

Significant market expansion on the horizon, but limitations on land availability will impact large developments

Market overview

Supply

New projects increased in the first half of 2021 with significant capacity from Stack Infrastructure (10MW) and a major tech company (two sites: 28 acres and 13 acres). Land availability for deployments requiring more than 10 acres has become scarce as competition for land from industrial and e-commerce developments has increased land prices significantly in the GTA.

Demand

Increased interest from international providers will improve market opportunities for users. However, the significant amount of planned developments may impact future pricing as new developments go live.

Market trends

Cloud users continue to drive the majority of market demand. Extended construction timelines coupled with limited, centrally-located development sites within the GTA may impact pricing. We anticipate increased demand towards Q4 of 2021 leading into 2022.

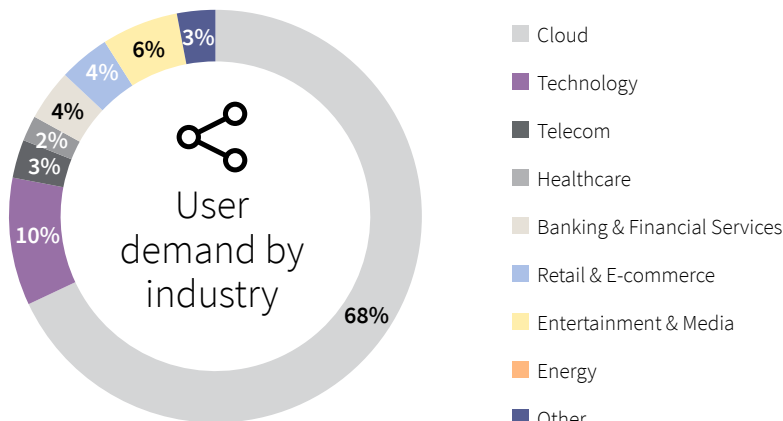
Outlook

for Users

- Stabilization in market rates and increased flexibility
- Limited options due to historic cloud leasing
- Improved selection of providers in the future with market expansion

for Providers

- Ongoing demand from cloud providers
- Increasing market availability in H2 2021
- Increased out-of-town interest in the market



Supply

	s.f.	MW
Total inventory:	2,000,000	426.0
Total vacant:	225,000	40.0
Under Construction:	425,000	52.0
Planned:	1,300,000	240.0

Demand

	MW
Net absorption:	14

Rental rates

	Low	High
sub 250 kW	\$115	\$150
250 kW-1 MW	\$105	\$120
1-5 MW	\$95	\$110
5 MW plus	\$80	\$95

2020 Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021

User-favorable market
Neutral market
Provider-favorable market

Authored by: Stuart Cox

See page 41 of this document for contact information.





Global insights

London

117 MW of new supply coming online in 2021

Market overview

Supply

The London colocation market supply stands at 800.0 MW IT load, the largest market in Europe with over 37 percent of the market share. We forecast that 2021 will see 117 MW of new supply added to the market, a 16 percent increase from the end of 2020.

Demand

Take up for the first quarter of 2021 was rather subdued compared to the record levels of demand seen in 2020. However, we have started to see demand pick up in the second quarter of 2021. Take up as of stands at 36.7 MW, with a substantial number of deals due to come online later in the year.

Market trends

Lack of power and land availability is driving high land values in the core markets such as Slough and West London. However, this has not abated the development pipeline in the market.

Outlook

for Users

- Access to major financial and business hub
- Most established data center market in EMEA
- Brexit uncertainty

for Providers

- Lack of available power in core submarkets
- Land prices at record highs
- Rise of self-build hyperscale campus

Supply

	s.f.	MW
Total inventory:	5,299,407	800.0
Total vacant:	-	167.0
Under Construction:	-	108.7
Planned:	-	166.0

Demand

	MW
Net absorption:	36.7

Rental rates

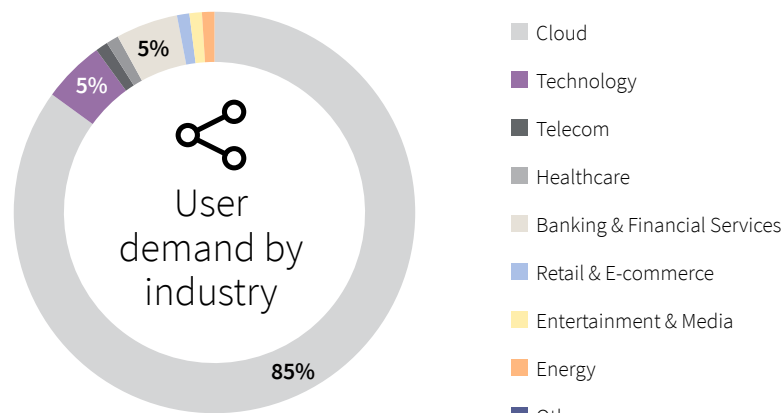
	Low	High
sub 250 kW	\$242	\$267
250 kW-1 MW	\$148	\$183
1-5 MW	\$118	\$142
5 MW plus	\$118	\$142

2021 Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021
<i>User-favorable market</i> <i>Neutral market</i> <i>Provider-favorable market</i>				



Authored by: Jonathan Kinsey | Daniel Thorpe

See page 41 of this document for contact information.

Frankfurt

Europe’s largest mainland colocation hub continues to grow rapidly

Market overview

Supply

Last year Frankfurt overtook Amsterdam to become the largest mainland colocation hub with 465 MW of supply. Growth in this market has been rapid over the last 5 years and looking at the development pipeline this is set to continue. We forecast 89 MW of new supply to be added in 2021, a 20 percent increase from the end of 2020.

Demand

In 2020, Frankfurt saw a record year in terms of take up with 69 MW of deals and 124 MW of headline signings. The first quarter of 2021 was rather subdued. However, we are expecting to see a large number of headline deals due to come online later in 2021.

Market trends

The imbalance in time taken to build a new facility and the time taken to source a new site is resulting in the growing popularity of alternative German cities such as Berlin, Munich, and Hamburg. Despite a very healthy development pipeline we are seeing these pre-leased up to 18 months before delivery.

Outlook

for Users

- Brand new developments offering quality space
- Significant number of new developments due in 2021
- Prevalence of build-to-suit market

for Providers

- Demand for new supply has led to data centers pre-leased before being developed
- Vacancy rates compressed by the speed of take up, forcing higher pricing
- Access to the German Internet Exchange, the world’s leading internet exchange

Supply

	s.f.	MW
Total inventory:	3,158,713	465.0
Total vacant:		55.0
Under Construction:	-	117.8
Planned:	-	68.0

Demand

	MW
Net absorption:	18.8

Rental rates

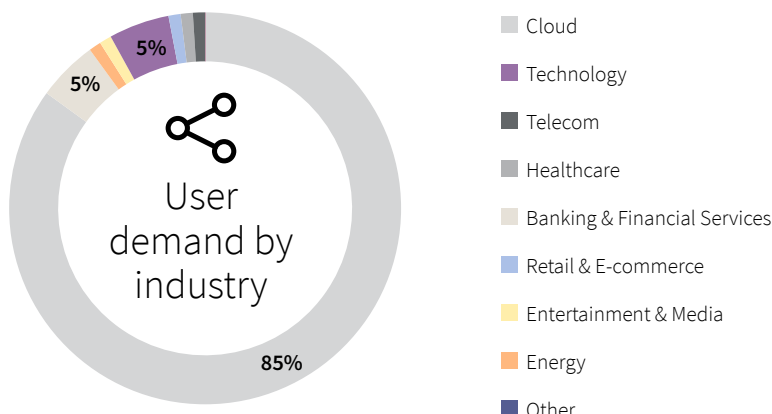
	Low	High
sub 250 kW	\$230	\$254
250 kW-1 MW	\$154	\$189
1-5 MW	\$118	\$142
5 MW plus	\$101	\$124

2021 Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021
<i>User-favorable market</i> <i>Neutral market</i> <i>Provider-favorable market</i>				



Authored by: Jonathan Kinsey | Daniel Thorpe

See page 41 of this document for contact information.

Amsterdam

Development constraints lifted but new supply is still limited

Market overview

Supply

Restrictions on data center developments were lifted in July 2020. Despite this, new supply in the market has been slow. Supply remains at 440 MW, the third largest colocation market in Europe. We are expecting a modest 28 MW to be added throughout the year.

Demand

Take up for the year has been very quiet at only 5.5 MW. Demand has been retail focused, although we expect some large headline deals to come through in H2 2021.

Market trends

Amsterdam has a couple of developments in the pipeline for 2021 and 2022, and we expect these to be pre-leased before completion. Limited supply and no new stock in 2020 has led to pricing in the market to slowly increase. After the development moratorium was lifted we have seen gradual growth and sustainable development in the sector.

Outlook

for Users

- Lack of new supply coming to the market
- Access to major business hub and dense fiber optic
- Major European tech and start-up hub

for Providers

- Development restrictions now lifted
- New developments must adhere to sustainability criteria
- Limited physical space for major additional developments

Supply

	s.f.	MW
Total inventory:	2,538,647	440.0
Total vacant:	-	113.0
Under Construction:	-	14.0
Planned:	-	64.0

Demand

	MW
Net absorption:	5.5

Rental rates

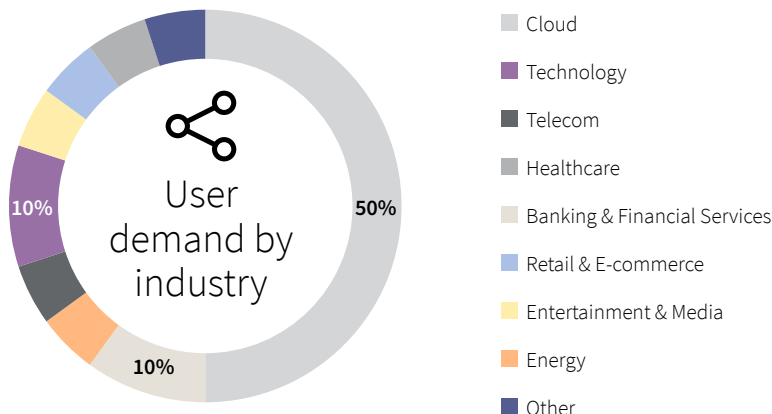
	Low	High
sub 250 kW	\$229	\$254
250 kW-1 MW	\$142	\$177
1-5 MW	\$124	\$148
5 MW plus	\$106	\$112

2021 Average power rate (cents/kWh)

11.3

Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021
<i>User-favorable market</i> <i>Neutral market</i> <i>Provider-favorable market</i>				



Authored by: Jonathan Kinsey | Daniel Thorpe

See page 41 of this document for contact information.

Paris

115 MW currently under construction in one of Europe’s biggest growth markets

Market overview

Supply

The Paris market has grown by 71 percent over the last 5 years, one of the fastest growing data center markets in Europe. However, we only saw a 1 percent increase in supply over the last year. 2021 looks set to pick up in terms of new supply with 45 MW due to be developed throughout the year and 115 MW currently under construction.

Demand

Take up for the year was at a modest 21.0 MW. However, we have seen a significant amount of headline deals due to come online throughout 2021.

Market trends

We forecast the city to have a significant increase in take up later on this year based on the number of contracts in process currently. We have seen pricing gradually increase over the last 12 months due to the availability of new stock, but we expect pricing to remain competitive and similar to the other core hub cities.

Outlook

for Users

- New supply coming into the market in 2021
- Demand for space has led to new supply being preleased before completion
- New sub-sea cabling in Marseille will reduce latency to Africa and Middle East

for Providers

- Lack of available land for data centers
- Very high land prices
- Tax incentive from French government on energy usage for data centers

Supply

	s.f.	MW
Total inventory:	1,912,973	275.0
Total vacant:		44.0
Under Construction:	-	114.9
Planned:	-	20.0

Demand

	MW
Net absorption:	21.0

Rental rates

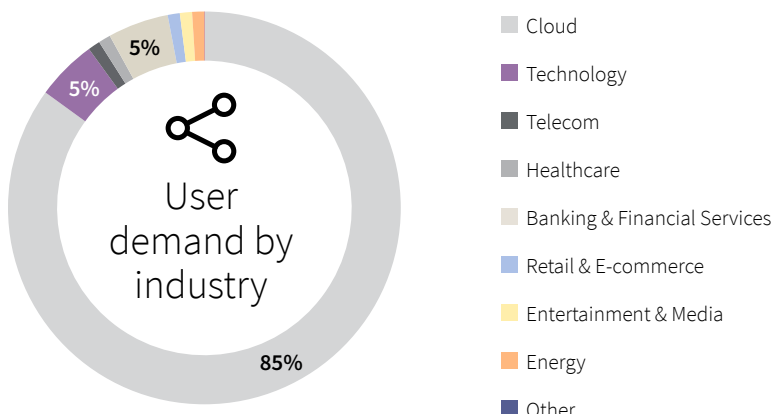
	Low	High
sub 250 kW	\$217	\$242
250 kW-1 MW	\$136	\$172
1-5 MW	\$118	\$142
5 MW plus	\$106	\$118

2021 Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021
<i>User-favorable market</i> <i>Neutral market</i> <i>Provider-favorable market</i>				



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Dublin

Smallest colocation market, but the largest self-build market in Europe

Market overview

Supply

Dublin is the smallest of the main European hub colocation markets at 141 MW. The city, however, has a huge self-build market with over 670 MW of hyperscale data centers. When combined with the colocation supply, this makes Dublin the largest data center market in Europe.

Demand

Colocation demand is already significantly up on from last year at 10.8 MW. The market usually relies on hyperscale to contribute to the majority of take up for the year.

Market trends

A number of large hyperscale data centers are planned for 2022, with TikTok announcing plans to build a €420m facility and another company planning to build its third wind farm in Ireland to double its renewable energy capacity.

Outlook

for Users

- Smallest colocation supply out of the Tier 1 markets
- More expensive than the other Tier 1 markets
- Colocation market beginning to gain traction, number of large deals in the pipeline

for Providers

- Largest self-build hyperscale market in Europe
- Land competition from hyperscalers
- Tax incentives for self-build enterprises

Supply

	s.f.	MW
Total inventory:	666,168	141.0
Total vacant:		14.0
Under Construction:	-	54.0
Planned:	-	200.0

Demand

	MW
Net absorption:	10.8

Rental rates

	Low	High
sub 250 kW	\$229	\$254
250 kW-1 MW	\$172	\$207
1-5 MW	\$136	\$172
5 MW plus	\$95	\$118

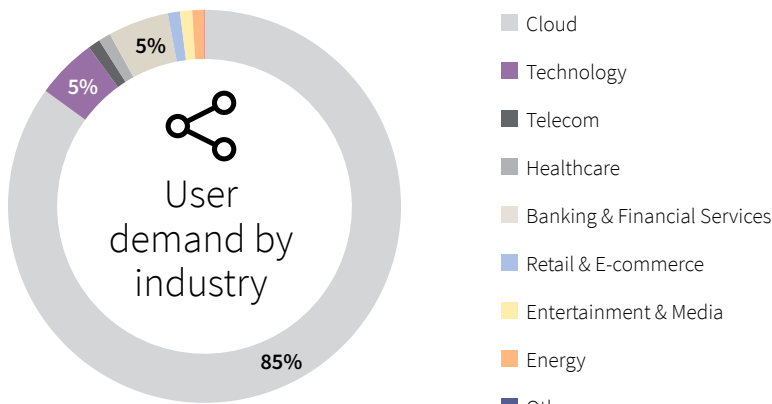
2021 Average power rate (cents/kWh)

16.6

Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021

User-favorable market
Neutral market
Provider-favorable market



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Stockholm

Affordable, green energy driving data center demand in Sweden

Market overview

Supply

Known supply in the Stockholm market is currently estimated at around 80 MW with several ongoing developments expected to add a significant volume of capacity in the near future. AtNorth is expecting to add a further 11.2 MW to the market with the completion of its data center in Kista, scheduled for December 2021.

Demand

Deployment of 5G and IoT are particular drivers in the growth of data traffic. With sustainability becoming an increasingly relevant factor, Sweden’s renewable energy procurement credentials are a strategic advantage in the growth of the data center market.

Market trends

Colocation providers are returning waste heat to the district heating network, with facilities having the potential to deliver 65-80 degree hot water back to the municipality and heat nearby buildings. We expect to see an increase in operators offering data centers running on 100% renewable energy such as Interxion.

Outlook

for Users

- New supply coming into the market
- Access to sustainable energy

for Providers

- Government support for data center development through allocation of land area
- Low energy prices and availability of renewable energy sources
- Since 2019 Sweden offers tax rebates on data center energy usage

Supply

	s.f.	MW
Total inventory:	42,908	78.7
Total vacant:	-	0.0
Under Construction:	-	17.2
Planned:	-	21.0

Demand

	MW
Net absorption:	-

Rental rates

	Low	High
sub 250 kW	\$0	\$0
250 kW-1 MW	\$220	\$280
1-5 MW	-	-
5 MW plus	-	-

2020 Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021
<i>User-favorable</i> market <i>Neutral</i> market <i>Provider-favorable</i> market				

India

India’s colocation data center sector provides boost to the digital economy during the lockdown

Market overview

Supply

Supply additions were steered by connectivity and a tactical approach by cloud players. New entrants established their footprint in the eminent markets of Mumbai and Chennai. Hyderabad and NCR-Delhi witnessed new expansion plans by players. Operators evaluating edge data center frameworks across non-metropolitan cities will meet the likely demand from 5G rollout.

Demand

India witnessed an increase in digital usage post-pandemic due to work-from-home, online education, and recreation. Banking and financial services are adopting hybrid options to meet digital growth, while homegrown video and gaming platforms see robust user growth. Telecom players formulating the roll-out of 5G are expected to drive higher data consumption.

Market trends

Expansion plans by new entrants and existing players indicate high growth potential. Players are adopting strategic alliances by investing in new submarine cables to meet the growing demand. The trend of sustainability has been gaining pace as tie-ups for green energy are being inked. The proposed personal data protection is likely to have a decisive impact on the sector

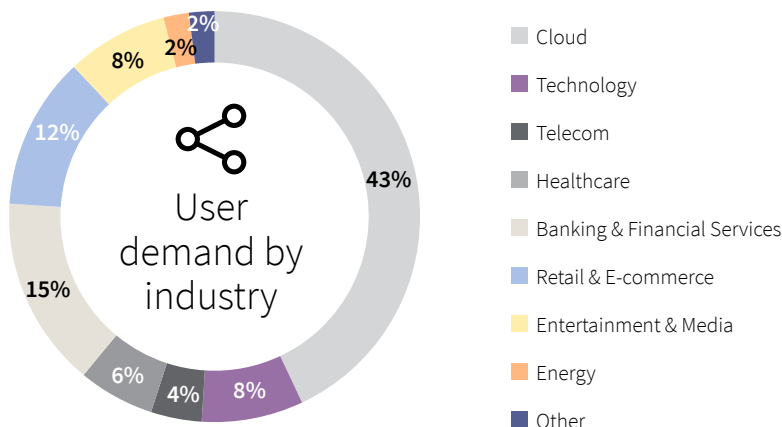
Outlook

for Users

- Cloud player strategies to drive demand in Mumbai, Chennai, and Pune
- State incentives to catalyse the growth of Hyderabad and NCR-Delhi regions
- Increased data usage due to 5G roll-out to influence IT decisions

for Providers

- Time to market and location to influence space absorption
- Integration across the value chain to provide a competitive advantage
- Hyperscale operations to drive efficiency and service options



Supply

	s.f.	MW
Total inventory:	11,264,806	499.1
Total vacant:	1,419,568	62.9
Under Construction:	2,640,532	117.0
Planned:	4,272,677	391.0

Demand

	MW
Net absorption:	46.5

Rental rates

	Low	High
sub 250 kW	\$120	\$150
250 kW-1 MW	\$90	\$125
1-5 MW	\$80	\$105
5 MW plus	\$75	\$100

Average power rate (cents/kWh)



Data Center leverage

H2 2019	H1 2020	H2 2020	H1 2021	H2 2021
User-favorable market			Neutral market	
Provider-favorable market				

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Asia Pacific

Jakarta

The Greater Jakarta market can be segmented into by four key areas: Central Jakarta, east of the city in Bekasi and Karawang, Bogor is to the south and Tangerang to the west. Currently, most of the data centres are in the central and east area. Bekasi and Karawang are popular locations due to good infrastructure and access to private power sources. This area may also be more expensive.

Melbourne

After Sydney, Melbourne is Australia's second biggest data centre colocation market; hyperscale developments have driven much of this. As of 2019, there were 32 unique colocation data centres in Melbourne, with many in Central Melbourne. Equinix, NEXTDC, AirTrunk and Digital Realty account for a large chunk of Melbourne's colocation market from a revenue perspective.

Sydney

Sydney is the largest data centre colocation market in Australia. As of 2019, 46 unique colocation data centres could be found in the city with many located in North Sydney. Equinix, NEXTDC, Global Switch and AirTrunk account for more than half of Sydney's colocation market in term of revenue.

Tokyo

As at 2020, Tokyo had 122 unique data centre colocation facilities with most located in Central Tokyo as well as in East and West Tokyo due to greater availability of power and land to allow for the requirements of hyperscale platforms.

Osaka

Osaka is another focus area for both domestic and international groups looking to expand their footprints in the Japan market. Osaka is well placed to service nearby urban areas including Kyoto, Nagoya and Kobe.

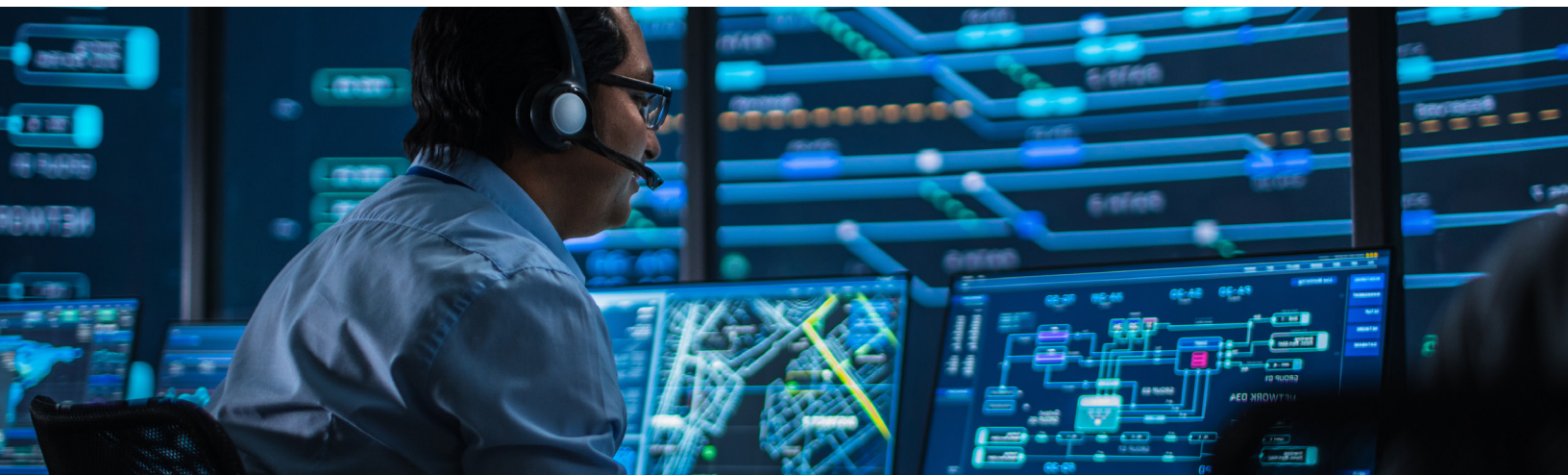
As of 2019, the Greater Osaka Metro area was home to 49 unique data centre colocation facilities. Central Osaka is a popular location for these groups but North Osaka also offers increased availability of land and power which accommodates the requirements of hyperscale facilities.

Osaka was historically a locally dominated market but international groups including Equinix, Digital Realty and Colt DCS have recently entered the picture.

Singapore

The Singapore government put a moratorium on new data centre development through 2021 and this may extend into next year. Pent up demand for additional data centre capacity in Singapore has ensued, with the market remaining extremely attractive from both an investor and operator standpoint. Overseas hyperscale cloud firms are already well established in Singapore and the appetite from these kinds of groups is likely to remain strong.

Data centre capacity is being driven by tech, cloud and large media companies. Small scale single market/site providers may find it challenging to compete with large global providers such as Equinix, Digital Realty and NTT or Asian groups including AirTrunk and Princeton Digital Group. As the data centre sector matures, larger global regional groups will likely be the main beneficiaries.



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