



CBRE

2018 GLOBAL DATA CENTER TRENDS REPORT

GLOBAL PERSPECTIVES ON THE TOP FIVE TRENDS
FROM CBRE DATA CENTER SOLUTIONS' ADVISORY,
VALUATION, AND OPERATIONS EXPERTS



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FOREWORD: A WORLD OF OPPORTUNITY



The global data center industry continues to change at a rapid pace. The constant evolution of modern technologies and services presents obstacles as well as opportunities for the industry. More capital is pouring into the sector, as institutional and private equity investors seek to leverage the strong returns over the past few years. Additionally, a rise in the need for enterprise end-users seeking hybrid IT solutions presents growth opportunities for users and providers to optimize their own data center portfolios.

Regardless of the role in the industry, a thorough understanding of all operational, valuation and transactional components is essential in the near and long-term. CBRE Data Center Solutions is unified to support clients in all the challenges they face to strategically align their IT requirements with business goals.

A handwritten signature in black ink, appearing to read 'Patrick Lynch'.

Patrick Lynch
Senior Managing Director
CBRE Data Center Solutions



EXECUTIVE SUMMARY

CBRE Data Center Solutions' Global Trends Report provides a macro-level analysis of today's key happenings in the data center industry and their potential impacts on clients. By identifying the top trends in the market, and providing global viewpoints from advisory, valuation, and operational perspectives, CBRE uniquely aims to respond to our client's global inquiries as listed under each trend category.



HYPERSCALE PROVIDERS

- With global demand for hyperscale space at record levels, are the approaches to scaling deployments appropriate?
- Is there any potential resistance to network demand continuing to drive hyperscale demand worldwide?
- How is more commonplace speculative data center development ensuring that demand is met?



PRICING FACTORS AND DIRECTION

- Is there potential to pay too much for data?
- As the growth of the global hyperscale sector drives down pricing, what are the impacts on new versus renewal business?
- Is pricing of legacy facilities out of step with market?
- Will new changes in IT strategies increase price, with the U.S. seeing the first indications?



CORPORATE OUTSOURCING AND PROCUREMENT STRATEGIES

- Will the rapid increase in enterprise cloud adoption help or hurt the colocation market?
- As data requirements continue to grow, what is involved in optimizing footprints?
- What are the next services that will create a ripple in the data center space?



REGULATORY IMPLICATIONS

- How are legislative measures addressing growing concerns over data privacy in the near and long term?
- With increased tax and incentive legislation worldwide, what does this mean for the bottom line?



EMERGING MARKETS

- As the world becomes seemingly more connected by the day, what makes a market more susceptible to growth?
- Are emerging markets really the land of opportunity?



Hyperscale Providers

WHY? The evolution of technology, along with the rapid growth in demand for data across the globe, is largely driven by the leading hyperscale cloud providers. To meet the demands across the industry, these firms are rapidly absorbing, expanding and delivering new space and infrastructure options.

NORTH AMERICA

The influx of modern technologies such as edge computing, the Internet of Things (IoT), cloud computing, driverless cars and artificial intelligence (AI) are top-of-mind business considerations for the hyperscale data center market. These technologies are impacting the hyperscale space as providers that previously focused on infrastructure redundancy have started to roll out more services to capture tenant demand.

The overall market maturation has led to increased price sensitivity and competition. Regardless of the shift, hyperscale providers are still mainly driven by client and tenant capacity demands. According to CBRE Research, within the seven primary markets in North America, a record of more than 267 megawatts (MW) was absorbed in 2017, much of which came from large hyperscale users. The demand also manifests itself in the uptick of sale-leaseback activity designed to create win-win business outcomes for both hyperscale providers and end-users.

Overall, the focus on scalability has shaped the uniqueness of size and scope of hyperscale requirements, given previous investment in technology, network infrastructure and data center redundancy. Hyperscale providers are leading the market in operational and infrastructure strategies, and CBRE foresees enterprise and colocation data center owners attempting to follow in their footsteps.

APAC

Hyperscale requirements remain increasingly prevalent in the Tier-1 APAC markets, defined by CBRE as Singapore, Hong Kong, Sydney and Tokyo. The APAC region is known for its large population, expanding economy and underserved demand, which culminates in a strong potential for further growth in the near-to-long term. For these reasons, it is clear why the APAC region is being targeted for hyperscale deployments.

Generally, hyperscale providers seek wholesale colocation providers to enter new and emerging markets, thus driving their market pricing and go-to-market strategy. Hyperscale providers tend to drive strict service-level agreements (SLA) and key performance indicators (KPI), but will sign on for longer-than-average rent terms, which makes them attractive tenants for colocation providers, REITs and investors. Hyperscale providers increasingly operate on lean staffing models due to their reliance and investment in industry-leading infrastructure and technology systems.

EMEA

Hyperscale cloud service providers are the key driver behind activity in the European markets today. CBRE Research statistics show that 70% of take-up was across the four largest FLAP markets (Frankfurt, London, Amsterdam and Paris) in 2016 and 2017. Hyperscale companies are aggressively increasing the scale of their European demand requirements, drawing similar characteristics between EMEA and North America as colocation providers pursue these specific users on a proactive basis. Historically, hyperscale supply has been sourced from U.S.-based companies, however, in 2018 CBRE anticipates the first large Chinese cloud and tech companies will procure hyperscale level activity across EMEA.

There are no indications of hyperscale supply and demand slowing. CBRE expects hyperscale providers will continue to seek out a blend of build-to-suit and speculative space options across the globe. Additionally, there is a strong indication for expansion into secondary and tertiary markets, such as Columbus, Ohio; Reno, Nevada; the Nordics region; and India.



Corporate Outsourcing and Procurement Strategies

WHY? The convergence of IT and real estate in the data center industry has caused firms to procure outsourced specialized services to guide them in their IT strategy. CBRE continues to see high demand for outsourced services from data center occupiers, owners and investors, most recently including a shift toward network/connectivity offerings and private/public cloud options.

NORTH AMERICA

Amid growing market maturation, enterprise users have migrated their data center demand by implementing hybrid IT solutions. Enterprise facilities built five to 10 years ago are, in many cases, underutilized and therefore have presented strong business cases for sale-leaseback opportunities. In turn, this creates a demand for contract flexibility and visibility into the potential impacts of hybrid IT services to achieve business goals. CBRE remains actively engaged with enterprise users to help facilitate acquisition and disposition of assets, connecting our clients' data center portfolios with their desired outcomes.

At an operational level, CBRE receives inquiries and invitations to engage on integrated data center operations outsourcing opportunities from clients representing a wide range of business maturity levels, and has observed several trends across this spectrum. For example, clients with more mature business models tend to protect their data center portfolio through effective and efficient technology, systems and infrastructure. These firms typically allow CBRE to drive SLAs and KPIs. Conversely, clients with less-mature business models rely heavily on operational staff to manage risk.

Regarding stakeholders, CBRE finds the most successful projects include client stakeholders from IT, real estate and procurement that are high-ranking enough to drive strategic transformation throughout their business.

APAC

APAC is in a vastly different phase of outsourcing than the rest of the world, due to regional, cultural, political and geographic diversity. Currently at the transaction level, some enterprises (e.g., financial services, health care, retail industry verticals, etc.) are starting to adopt cloud-based solutions and multi-megawatt build-to-suits, especially in Singapore, South Korea and Japan. Most of these environments are designed to have the capacity hosted on-premise within existing office locations.

APAC is beginning to see new additions to the supply pipeline in dedicated data center facilities in more established markets such as Hong Kong and Singapore. CBRE also acknowledges the significant demand in the colocation sector from across the region.

The operational perspective in APAC bifurcates global and local companies. From CBRE's viewpoint, global companies are making decisions based on convenience, and are typically full-service operators looking for providers to drive value over the course of a 5+ year contract. On the other hand, local firms tend to secure operations services separately and on a site-to-site basis, while considering the total cost of ownership along with shorter contract terms. For these reasons, historical efforts to outsource have been primarily with local partners.

EMEA

Enterprise demand for colocation data center capacity has declined in EMEA over the past few years. This trend, linked to the increase in cloud activity and companies choosing to host data in an off-premise cloud environment rather than colocation, has been a defining characteristic in Europe. For example, financial service companies were historically the predominant driver of colocation capacity in Europe, but for the past two years colocation demand from this sector has nearly disappeared. However, the combination of financial clients having over-procured data center capacity and becoming more comfortable with outsourcing could lead to an increase in demand for colocation services from these companies as part of a wider on-premise, off-premise and cloud-hybrid method of hosting data.

On the operational side, procurement strategies for colocation and enterprise data center providers continue to include bundled services to maximize economies of scale. For example, colocation and enterprise data center providers often combine their outsourcing requests for mechanical, electrical, ICT and project services across multiple campuses or countries, as their procurement strategies focus on operational consistency and cost efficiency. Moving forward, a need for enterprise facilities will continue, especially for investment banking clients, stemming from an increased desire to manage and maintain their data within a closer proximity.

The maturity in the data center market's demand-and-supply fundamentals pivoted enterprise users from ownership and build-to-suit deployment models to scalable and flexible deployments where IT capacity is migrated to the cloud and third-party solutions. Among the reasons for this pivot are reduction in capital and operational expenditure and under-utilization of on-premise space. CBRE expects an increase in new construction where the developers/landlords seek to provide hybrid options to meet varied tenant requirements.



CBRE Data Center Solutions is designed to provide our clients with the tools and technology to maximize their infrastructure while simultaneously reducing their costs. The diversity in spaces and services available for clients presents an opportunity to leverage their needs and find advantageous rates. Unlocking savings in a notoriously “sticky” sector requires a precise implementation of the correct strategy. Conversely, looking forward, the continued adoption of hybrid IT solutions into the data center space is expected to strengthen rental rates across primary, secondary and emerging markets. Developing the correct strategy with the correct advisor is becoming more critical to fully understand the cost of data and where it sits in relation to the market.



Pricing Factors and Direction

WHY? While rental rates have stabilized over the past few years, the world’s growing population places upward pressure on data demands for mobile use, cloud computing and data storage. This demand raises the question: Does the data center industry fully understand the costs of its data?

NORTH AMERICA

CBRE Research suggests that North American data center pricing ranges from \$125 to \$145 per kilowatt (kW) per month (typical 250 kW/Tier III requirements at modified gross) across all markets. When combining traditional real estate pricing (e.g., location, balance sheet strength and capacity requirements) with the need for services (e.g., interconnection, cloud access and migration) tailwinds for future pricing growth occur. Users are beginning to evaluate renewal options on their spaces for deals inked five to seven years ago.

On the operations side, during the contract renewal process, many clients go to market looking for the same service they previously received from in-house staff, but seek new and additional services that may not be achievable in their current pricing model. For example, many clients reevaluating their data center needs are implementing strategic supply chain programs, market-leading technologies or new operational procedures.

These changes in IT infrastructure have a significant impact on operating costs, risks and client demand. While rental rates remain flat to slightly decreased, the shift toward hybrid IT solutions should bring back rental rate growth. These factors tie into the future impact on renewal rates from the provider and occupier perspective, as the balance between the costs of relocating/migrating, completing IT refresh projects and upgrading infrastructure become increasingly more dependent on individual user requirements.

APAC

Variances in pricing across the region are largely due to differing levels of maturity of certain markets. Across the Tier-1 markets, pricing remains relatively stable, reflective of global Tier-1 market pricing, notwithstanding some variation to reflect specific supply-and-demand dynamics.

In developing data center markets like South Korea and Vietnam, variation exists due to differing factors, including government interaction and large conglomerates bundling IT and connectivity services. International operators without a large presence or fiber network may struggle to compete on pricing in some markets. For these reasons, a variation in pricing across the region exists. A common theme across these emerging and mature markets is the slight variations in pricing for large hyperscale deals, regardless of location.

EMEA

Pricing in the European markets has been consistently stable in the past three years, despite the volatility in overall market activity. The European markets have become attuned to balancing out short-term volatility, and this level of market maturity has brought inelasticity to overall rental rates in the FLAP markets.

However, the most meaningful change in pricing has come on a case-by-case basis by prospective providers. Operators have discounted rates and terms to acquire first-time clients or underpin significant schemes for hyperscale requirements, and therefore this group of “strategic” tenants has experienced favorable rental rates and terms.

Looking forward, CBRE expects a continuation of the consistent pricing levels in established markets, as market dynamics remain well-balanced and competition remains healthy. In secondary and tertiary markets, pricing is far less stable and can vary drastically between providers, as variances in supply/demand dynamics have a significant impact on market pricing.



Recognizing that data centers provide life-affecting services to society, such as managing the physical infrastructure that houses data for driverless cars, hospitals and military operations, CBRE is committed to the recent self-regulating efforts driven by the data center industry. Whether a client's focus is on data privacy or access to tax/law assessment, the impacts are widespread and immediately affect constituents in these regions. CBRE's depth of knowledge supports our client's understanding of the personalized impacts these policies have on their business.



Regulatory Implications

WHY? Regulatory legislation can rapidly alter dynamics within the data center space. Current prevalent issues sweeping the globe include data privacy, cybersecurity and financial implications such as tax laws.

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Unique to the region are proposed tax and incentive legislation. Notable focus is in Georgia, where the state senate is re-committing incentive investments for qualified data centers.

The Georgia House has also passed legislation that will expand the sales tax exemption for "high technology data centers" that meet a minimum investment level. The minimum investment level was changed from \$15 million per year to \$250 million per year in highly populated counties. The investment level could be reduced to \$100 million per year for less-populated, rural counties. In this example, IT equipment is the only eligible investment subject to sales tax. The new legislation will expand the exemption to cover mechanical and electrical equipment for power and cooling systems. The minimum threshold for job creation is 20 new positions and an investment over seven consecutive years.

At the transaction level, there would be no sales and use tax on infrastructure for the operator, and no sales and use tax on IT hardware for the tenant. The sales tax exemptions will cover investments made by enterprise users, colocation providers and colocation tenants.

Meanwhile in Prince William County, Virginia, there was an effort to increase the tax rate on "computers and peripherals." The attempt ultimately was voted down, as revenue from data centers was deemed too vital to the county and could be potentially threatened by the current incentives being altered. Such legislation could affect market equilibrium by altering the decision-making process of companies looking to enter new markets. CBRE anticipates that more states and counties will pass legislation to enhance the growth of the data center industry in their respective regions.

APAC

The APAC region is unique in that there is not a single regulatory change that could potentially impact the market. However, given the diversity across APAC's 25+ countries, CBRE believes the most impactful difference is the lack of commonality between the various countries. For example, there is no commonality of language, which often poses challenges in training, operations manuals, systems and documentation.

Both cybersecurity and data sovereignty are concerns across the region as well. In 2017, the Chinese government revised its existing cybersecurity law, which now requires that any organization defined as having "critical information infrastructure" must securely store and manage "all personal data collected from Chinese citizens" and "important data collected or generated in China" within the borders of China.

Although the law makes exceptions for companies that can prove the necessity to transfer customer data overseas, those companies must seek government approval in advance. Penalties for non-compliance range from financial fines to operational suspension and even criminal liability.

The regulation in place has meant that there are generally three options for a foreign data center operator or investor to go into the China data center market:

1. Partner with a local partner that has an IDC license.
2. Establish a Hong Kong / Macau business entity to go into joint-venture with a Chinese company, and apply for an IDC license.
3. Invest in a Chinese data center company.

EMEA

The European Union (EU) will bring a major piece of legislation into law on May 25, 2018, as General Data Protection Regulation (GDPR) comes into effect. The regulation is designed to provide stronger data protection for individuals in the EU and govern the export of personal data outside of the EU.

This will have implications for both occupiers and operators of data centers. For example, operators will need to figure out if they act as a "data processor" or a "data controller" and take steps accordingly, as any failure to comply can incur hefty penalties. Conversely, data center occupiers may choose to host more data in-country, as individual member states look to take more control of their citizens' data. This could lead to increased demand for colocation capacity in secondary and tertiary EMEA markets, especially those perceived to hold a stricter stance on the matter.

In the U.K., there is a lot of conjecture around the Brexit negotiations and implications on the location in which EU or U.K. data is hosted, but CBRE has not witnessed any major effect on market dynamics to-date because of this.



Emerging Markets

WHY? The number of markets across the globe capturing expansion and new providers continues to grow. These markets have a growing appetite for data centers due to inexpensive power, connectivity and ease of the entitlement process, availability of land and incentives provided by local/regional municipalities. CBRE monitors these markets as the interest from data center end-users and providers grows.

NORTH AMERICA

North American markets poised for strong growth include Columbus, Las Vegas/Reno, Hillsboro and Montreal. The markets are home to large colocation providers and many of the global hyperscale cloud providers. Additional demand for these markets is due to proximity to multiple primary markets across the continent.

Factoring into market growth are lower power costs driven by hydroelectric power and renewable energies, tax incentives, robust fiber networks, direct connect access and edge connectivity, which will all play a role in the growth trajectory of these markets.

Moreover, many emerging markets have local variations that sometimes significantly differ them from more established global markets. Local knowledge is often a prerequisite to selecting the correct strategy.

APAC

Nearly all non-Tier 1 markets are considered emerging, including capital and secondary cities in India, China, the Philippines, Indonesia, Vietnam and Thailand. These markets have large populations that are mostly underserved in technology infrastructure, and will need to improve bandwidth, availability and latency due to the increase in online shopping, big data, IoT and smart cities.

India, for example, is a market that has proactive government policies, increasing popularity of cloud computing and a large and growing demand base that have boosted India's prospects as a data center hub. India is expected to match and subsequently surpass China's population by 2022 to become the world's most populous country, leading to a steep growth in internet usage that will further drive the demand for data centers.

CBRE recognizes that highly-populated countries like China and India present opportunity for data center owners, occupiers and users, but concludes these emerging markets can be challenging due to the trust that companies must first build and establish within the region.

EMEA

Historically, the growth in EMEA markets has been in pre-established major hubs rather than the creation of new markets. However, hyperscale and cloud providers' increased demand capacity across the region is driving growth in EMEA emerging markets. The hyperscale companies are single-handedly influencing entire markets within the region, and whichever market these companies turn their attention to next automatically becomes the next "hot" market in EMEA. The Nordics and Dublin remain a favorite among hyperscale providers for self-build projects. In the Nordics growth factors of a favorable climate, availability of land and cost of utilities all play a key role.

From an operations perspective, the Nordics region continues to maintain a high demand for qualified talent while experiencing a slight employment shortage. Career tenures for data center technicians in the Nordics seem to be longer than those within the FLAP markets. CBRE has observed that data center technicians in the Nordics tend to invest five to seven years with employers, versus the FLAP markets' 18 to 24 months. For example, CBRE believes the low attrition rate in the Nordics is due to the maturity of the market and employer options for data center technicians. As the market continues to mature and become more saturated, employment drivers will become more important for companies' site-selection processes and management decisions.

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Demand for space and hybrid IT solutions continues to feed the emergence of these markets across the globe. CBRE expects new markets to emerge, as technological advances and new trends continue to pivot the needs of hyperscale, enterprise and colocation users. Identifying opportunities within these markets will require local market expertise to ensure that the best strategy is selected at the ideal time.

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