CenterSquare
REAL ASSET INVESTMENT LEADERSHIP

Insights Brief

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Data Centers: Commercial Real Estate's Digital Frontier

Real estate represents the built environment where we live, work, and play, and the data center sector has the unique distinction of impacting our universal activities. Over the last decade, the proliferation of technology has not only fundamentally changed the way we utilize data centers but has also elevated the criticality of these properties to new heights. In this brief, we examine the backdrop of the rise of the data center sector and share our predictions for a promising future.

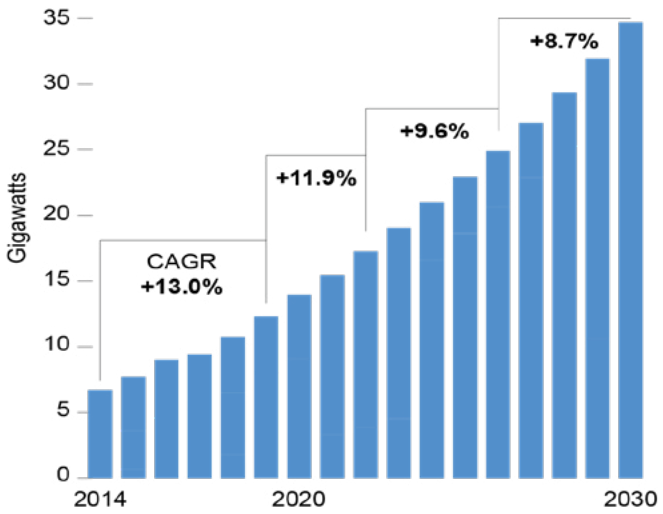
The Rise of the Machine

The first data center was built in the 1940s; however, the evolution of the modern data center we know today began in earnest through the 1980s and 1990s as users started utilizing servers located in data centers globally via the internet. Data center demand, as measured by power consumption, grew to 17 gigawatts (GW) by 2022 in the U.S. alone, and is expected to grow by nearly 10% annually through 2030 to reach 35 GW (Figure 1). The pace at which we consume and create new data continues to grow exponentially and is a secular trend that has been driving data center demand for several years. The newest technology advancement – the broad-based adoption and deployment of artificial intelligence (AI) – is poised to augment aggregate demand for computing power, creating a compelling opportunity for real estate investors.

The Data Center Landscape

Data centers, like most real estate property types, can be categorized into unique sub-sectors. The two most prevalent are 1) enterprise data centers that serve the

Figure 1: Data Center Power Consumption



Source: McKinsey & Company, January 2023. Demand is measured by power consumption to reflect the number of servers a data center can house. Demand includes megawatts for storage, servers, and networks.

Data Demand by the Numbers

- Stored data grows 5x faster than the world economy[1]
- 1.7MB of data is created per person per second[2]
- 2.5 quintillion bytes of data were created per day in 2020[3]
- 306.4B emails per day were created in 2020, up from 293.6B in 2019[4]
- There will be 24B connected devices by year-end 2023[5]
- Internet users will be 66% of global population in 2023[6]
- Cloud traffic grew at a 27% CAGR from 2015-2020[7]

Source: 1. Dihuni, 2020 2. Northeastern University, 2016 3. SG Analytics, 2020 4. Radicati Group, 2019 and TechJury, 2020 5. RCR Wireless News, 2020 6. Cisco Annual Internet Report, 2020 7. Digital Realty, 2021. Global Consumption Chart Statistica, January 2023, Big Tech Revenue from Cloud chart, Green Street Advisors, November 2022, Company Disclosures. These are estimates, actual results may be materially different.

needs of most companies, and 2) network-dense data centers that provide an ecosystem of connectivity among many different users.

Enterprise data centers can be further parsed into colocation data centers, which house multiple, smaller tenants in the same data center, or hyperscale data centers, which typically house a single large tenant – such as a cloud provider (i.e., Microsoft Azure, Amazon AWS). Whether an enterprise data center houses one tenant or many, these properties store and manage most of the data we create. Given the tenancy and usage of these spaces, these enterprise data centers tend to have longer term leases that can range from 5-20 years with large credit tenants (i.e., Alphabet, Apple, Meta).

Network-dense data centers are a variation of enterprise colocation data centers where different tenants are interconnected and can "talk" to each other. These data centers represent unique ecosystems and are extremely difficult to create and replicate, resulting in only one or two network-dense data centers in any given market. Here, a real estate operator can generate revenues not only from leasing the space (data center leases come in the form of megawatts of power rather than square feet of space) but also from creating highly-coveted interconnections between the tenants. These data centers also tend to have shorter lease terms – typically less than five years.

Starting from Foundational Strength

Data centers have long benefitted from the outsized growth of data consumption around the world. Sustained and significant growth in global digitalization seems inevitable as businesses continue to deploy technology solutions to become more efficient, and consumers rely heavily on emerging technologies to manage all aspects of their lives. As data creation, consumption, and usage continue to proliferate, third-party data infrastructure providers have emerged as the most efficient and effective way to access new and expanding technologies. According to the Gartner Group, approximately 35 percent of enterprises in the U.S. today have outsourced their data center infrastructure to a third-party provider. This figure is up from roughly 20 percent a decade ago. Moving servers off-premises to a private or public cloud environment will continue to occur and this transition will benefit data center providers. Yet, this demand is facing meaningful supply restrictions primarily driven by limited availability of power in core data center markets like Northern Virginia. As a function, data center space today is characterized by low availability and strong pricing power unlike the industry has experienced in the last few decades.

The Next Wave of Growth

Building from this position of strength, data centers are now seeing a new demand driver on the horizon in the form of artificial intelligence. Here, we anticipate the impact on data centers will unfold in two stages: training and inferencing.

AI's initial training phase, which is already unfolding today, is based around a large language model (LLM) and requires incredible amounts of power and computing. These needs are currently being met by large enterprise data centers in secondary or tertiary markets where power is available, cheap, and the general environment is business-friendly. The typical focus toward connectivity and low latency within data centers will be less critical in these facilities than in traditional data centers. For example, Amazon recently announced its plans to build a data center campus on 400 acres of land in central Ohio and spend approximately $10 billion on the project once it is fully developed. Not so coincidentally, this campus will be in the same county where Intel is building its new $20 billion semiconductor manufacturing facility. With cheap and abundant power, a business-friendly political environment, and access to the latest and greatest chips Intel will produce down the street, this scenario is a prime example of the types of locations large multinational cloud providers will pursue to train their new AI models.

Once the LLMs are trained, they can then be utilized in the inferencing phase, allowing enterprises across industries to make use of the AI technology for their specific business needs. As a result, it will be critical to co-locate and interconnect with multiple AI models in more centralized data centers to reduce the total all-in cost and increase efficiency. In more latency-sensitive applications, it will be important to place servers in closer proximity to the LLMs. In general, the inferencing phase is expected to enhance the value and tenant retention of the current network-dense data centers located in more traditional markets.

The Development Opportunity

The appetite for new development across the real estate industry has plummeted in recent months as a function of restricted capital markets and rising construction costs. However, data centers continue to screen as an attractive development opportunity today, especially given the significant and unmet demand for hyperscale data centers in the secondary and tertiary markets where the infrastructure is meaningfully under-developed. Despite rising construction costs, rising rents are bolstering development yields to the low-teens and profit margins exceeding 40%.

The opportunity for development within the data center sector is poised to grow even further as AI will require unique building specifications beyond what existing data centers offer. For example, the new computing chips powering AI often require more than 30 kilowatt hours per rack to operate. If a data center is running more than 35 kilowatt hours per rack, it cannot be sufficiently cooled by today's conventional air-cooling technology. Alternatives include developing new data centers with liquid cooling technology or upgrading existing air-cooling technology to address evolving needs. While each solution comes with pros and cons for tenants, both will require development expertise for owners and operators to deliver and meet tenant requirements.

Conclusion

At CenterSquare, we have long asserted that alternative property types are becoming the real estate of the future. These assets go beyond four walls and a lease and meet the evolving functional needs of the built environment today. Data Centers fall squarely in this mix, and we expect this sector to outgrow and outperform core real estate in the coming years. Real estate investors who can understand the more complex development and management of these properties will be poised to do the same.

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