Principal Asset Management℠

# Understanding the nuances of the data center sector in an AI era

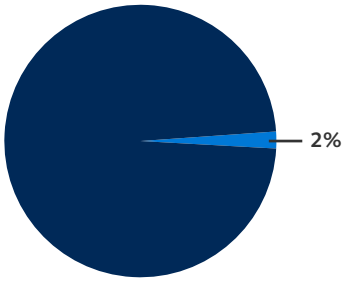
Has excitement about AI caused data centers to become overvalued? Are land and power constraints, new regulations, and/or community pushback making development more difficult? What does an exit look like in this environment? Our global data center team answers these questions.

## The investment case for data centers is compelling.

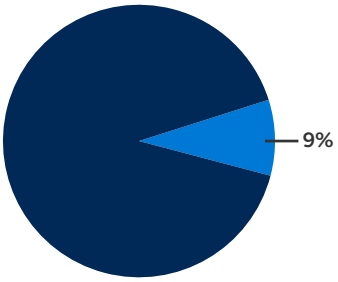
The case for data centers is compelling, but investment in the property type is still in the nascent phase of deployment. The asset class remains underrepresented in many institutional real estate portfolios despite strong historical performance in both the private and public markets.

**EXHIBIT 1: The data center sector is outperforming, but under-allocated**

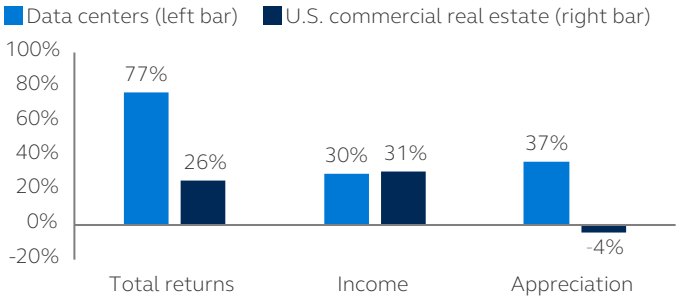
**Data centers' share of private U.S. commercial real estate market**



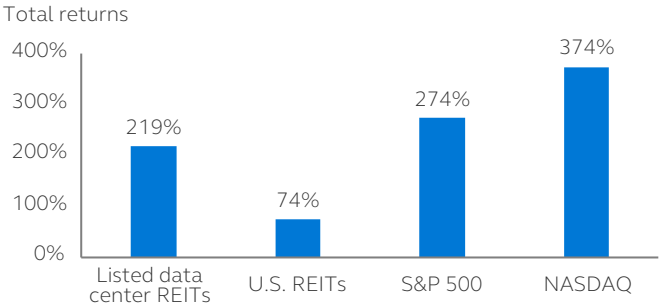

**Data centers' share of U.S. listed REIT market capitalization**




**Private market performance 2Q19-2Q25**




**Public market performance 2016-2025**




Sources: FactSet, NCREIF, Bloomberg, S&P 500, NASDAQ, as of 2Q 2025.

The growing spotlight on data centers presents an important opportunity to examine the nuances of this evolving asset class. The following are three questions regularly fielded by Principal's Global Data Center team.

## Has excitement about AI caused data centers to be overvalued?

It's essential to decouple the concepts of AI demand versus data center demand. Demand for compute capacity to run AI workloads (including model training and inference) is just one component of overall data center demand, and while it is currently the fastest growing, it is not the largest. Furthermore, not all AI workloads have the same demand profiles or data center requirements, and there is much more driving data center demand than AI model training.

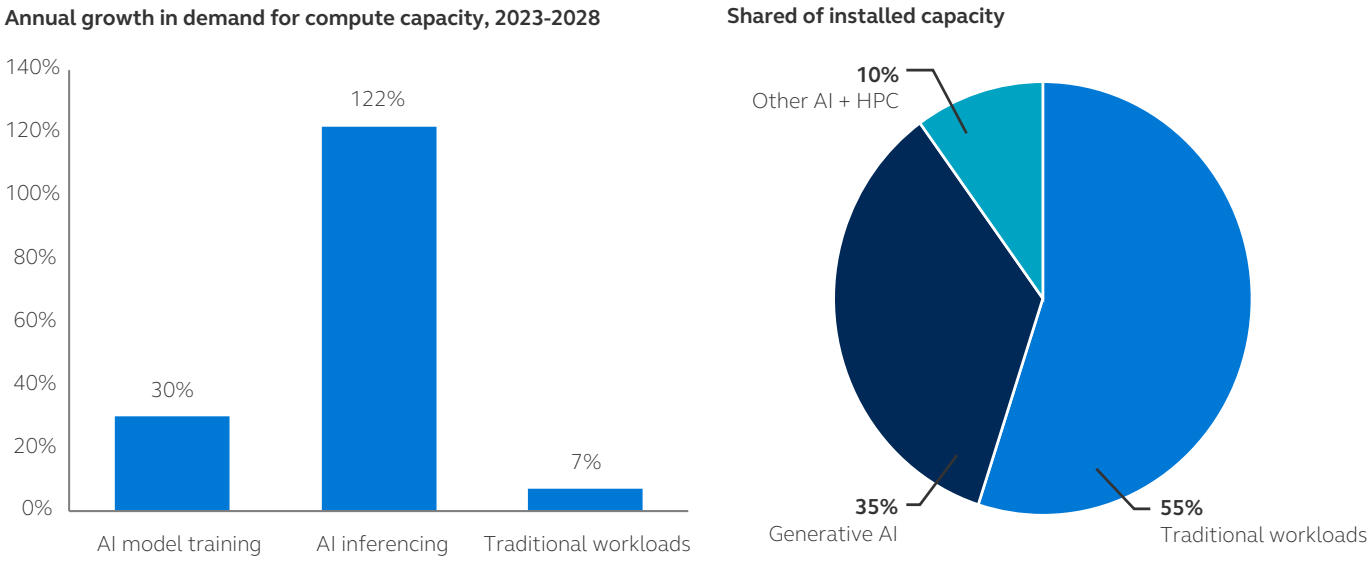
## Data center demand growth today is largely in three categories:

- **Cloud:** Data center capacity designed to support traditional enterprise and cloud applications – e.g., email, file storage and sharing, content streaming, etc. – has the most stable demand profile. Cloud data centers look largely like they did a decade ago. Rack densities are typically 5-10 kW in facilities that are typically air cooled. Cloud data centers are usually located relatively near to population centers within an availability zone (that is a cluster of data centers within a single region, interconnected via high-speed, low-latency fiber).
- **AI inference:** AI inference is the 'doing' phase of AI, where a trained model takes in new data and uses its learned knowledge to generate an output. Data centers built to support AI inference are optimized for high throughput and low latency. They are typically not as high density as model training facilities and are often located closer to end users. In some cases, as with autonomous vehicles, ultra-low latency is essential. As more AI models are trained, demand for data center capacity to support inference workloads rises.
- **AI model training:** Teaching an AI model to recognize patterns using large datasets is the first step in the development of AI applications. The power of a model is determined in part by the number of parameters it is trained on, and that is done on ever-larger clusters of connected graphics processing units (GPUs). Rack density is typically very high (120 kW per rack, heading quickly toward 600), which requires liquid cooling. Easily requiring a gigawatt of power or more and spanning millions of square feet, model training data centers are more likely to be located outside of traditional markets (where land and power are constrained).

> *"On the overall AI journey, the focus is still on the model-training phase, which is driving tenants to locations where they can access the quantum of power that's needed at an affordable cost."*
>
> **Paul Lewis**
> Managing Director, European Data Centres

Demand for data centers to support AI is additive to demand for data centers that support traditional (primarily cloud) workloads. Demand from traditional workloads continues to grow as enterprises continue to migrate workloads to the cloud and as new cloud-based applications—including AI applications—are developed. Between 2023 and 2028, demand for compute capacity to support AI workloads will grow faster, but traditional (cloud) workloads will continue to make up the majority of installed capacity.

**EXHIBIT 2: AI workload demands are growing faster but traditional (cloud) workloads will continue to make up the majority of installed capacity**




Source: BCG, as of January 2025.

Cloud and AI inference data centers, both in the U.S. and Europe, offer the potential for the most attractive risk-adjusted returns. These facilities cater to established, robust demand for data storage, processing, and distribution from existing tenants, providing more predictable cash flows. In contrast, we are cautious on the model training facilities that we view as more speculative given uncertainty around the long-term scale of training demand.

## We optimize our data center investments by investing in locations where fundamentals are strong—either in existing data centers being redeveloped or in new facilities designed for flexibility.

### Investing in locations where fundamentals are strong

Site selection is a very important tool to build portfolios that are resilient to a potential AI bubble. A lot of locations that are being used for AI model training deployments are not best suited for latency specific cloud and other traditional workloads.

We focus our investments in the locations where fundamentals for cloud demand are strong—where there has been and will continue to be strong demand for cloud and other traditional workloads, because we believe doing so provides value protection for the assets we invest in. These are likely to be the locations where fundamentals for AI inference demand are strong as well. While AI capability can provide additional upside potential, we base our investment decisions on the fundamentals of traditional workload demand.

The fundamentals that determine a market's attractiveness for cloud and AI inference data centers include:

- Location within an established cloud availability zone
- Fiber connectivity
- Proximity to population centers
- Availability of power and land
- Low risk of natural disasters
- Cost of reliable power
- Tax incentives
- Proximity to primary markets

Learn more in Data center development opportunities in secondary markets

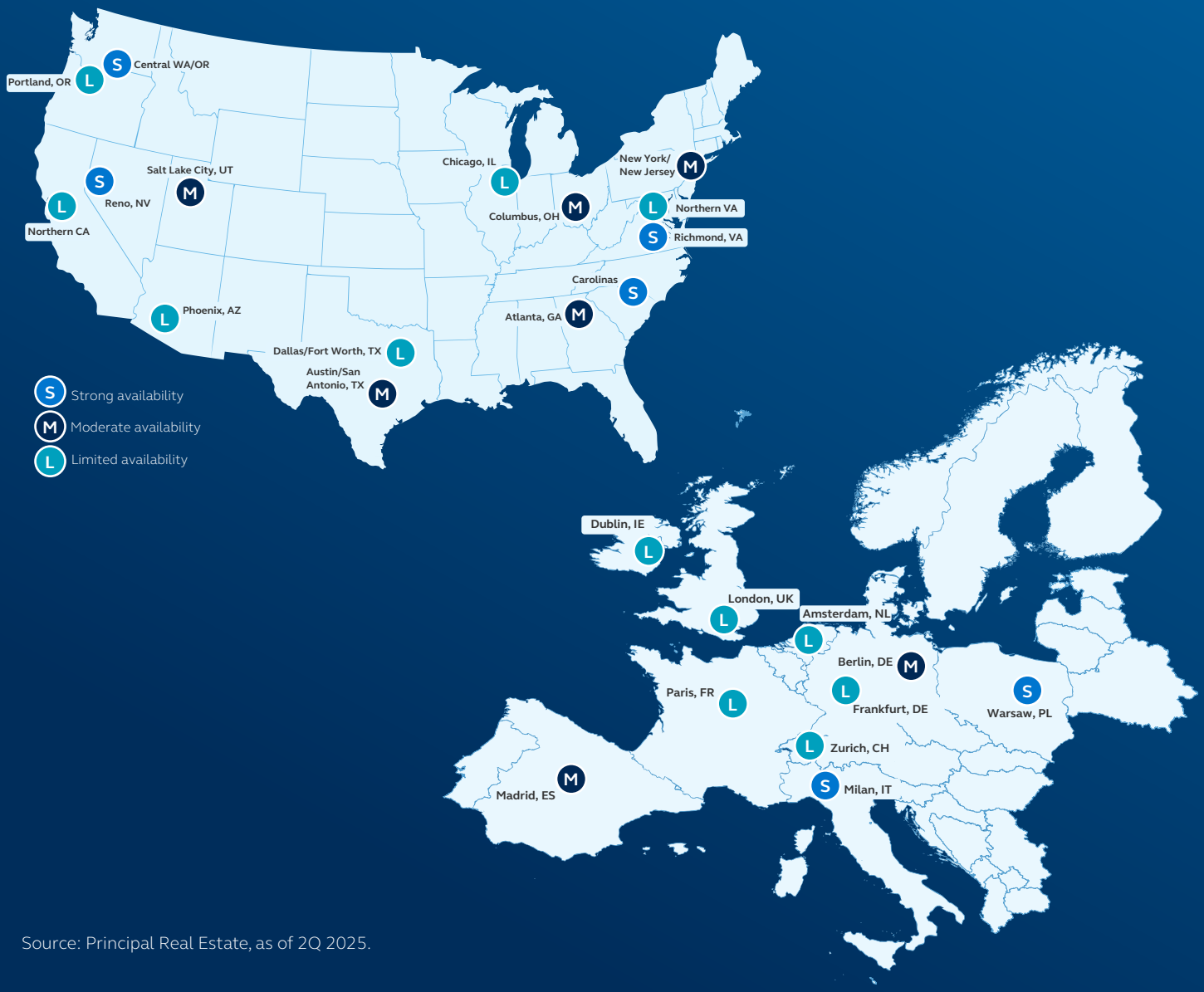
For building portfolios that are resilient to a potential AI bubble, two location factors are particularly essential: location within an established cloud availability zone, and owning power and land where it is starting to become scarce.

Cloud data centers are usually located relatively near to population centers within an availability zone (AZ). By deploying workloads across multiple AZs, organizations can maintain continuity even if a single data center, or an entire AZ, experiences a failure. For example, Amazon Web Services (AWS), which popularized the term, operates five distinct AZs in its Northern Virginia region.

While the term AZ is mostly used in the cloud world, they are not limited to cloud and, in fact, we believe they are ideal locations for corporate AI inference data centers. Hyperscalers are increasingly designing data centers to support both cloud and AI inference, which is pushing demand and rents in these locations. We therefore believe that investment in a cloud data center location in an AZ may help mitigate exposure to fluctuations in cloud demand, while offering potential benefits from continued AI advancement.

Each cloud provider has its own designated availability zones, but they overlap and largely include Tier 1 and Tier 2 markets.

**EXHIBIT 3: Markets where fundamentals are strong for cloud and AI inference**




Source: Principal Real Estate, as of 2Q 2025.

In addition to a data center's location within an established cloud availability zone, the availability of land and power are critical location factors for new development. In major markets, both are increasingly scarce. As a result, older facilities can hold significant value because of their utility connections and land position. Strategic land location with access to utility power is critical for the long-term viability of a data center, even if the facility's initial configurations have to be modified to support modern workloads.

> *"We do think data centers will eventually revert to the tier 1 markets, because once AI is in the inference stage, it will need to be closer to the population density."*
>
> **Casey Miller**
> Managing Director, Portfolio Management

### Investing in existing data centers being redeveloped

Given the power and land constraints on new data center development in locations where fundamentals are strong, redeveloping existing facilities in these markets can be an effective investment strategy. In many cases, older data centers that were designed for traditional workloads can be retrofitted to meet new regulatory standards or support emerging workloads. For example, a data center occupied by a financial services company commissioned nearly 15 years ago was upgraded and fully leased to a specialty cloud provider. With strategic retrofits, it now supports one of the world's largest AI/ML supercomputing deployments.

### Investing in new data centers designed for flexibility

Ensuring that newly developed data centers are "future-proof"—that is, adaptable to support workloads with different requirements—is another way to optimize risk-adjusted returns, as long as the facility is in a location where fundamentals are strong.

A facility might be developed today to support high-density AI model training, with built-in flexibility to minimize the cost of reconfiguration for lower-density AI inference or non-AI cloud workloads in the future. For example, one of our development partners invented a pre-engineered integrated solution for both air and liquid cooling. The solution enables both AI and traditional workloads in the same facility, allowing transition from forced air to direct liquid cooling without significant added expense, operational disruption, or delays.

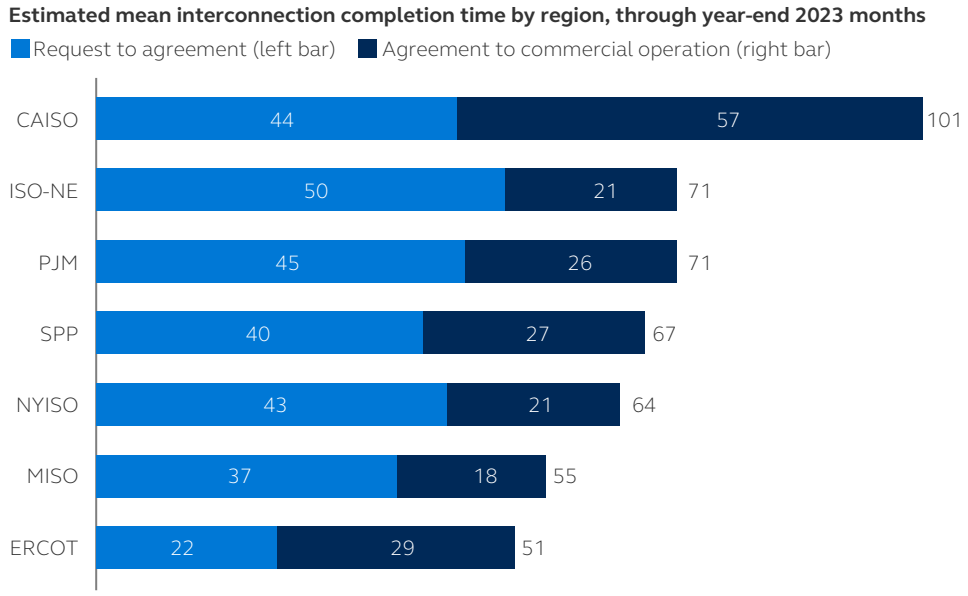
## Are land and power constraints, new regulations, and/or community pushback making development more difficult?

The nuanced answer is, yes, in many markets. But barriers to development increase the value of existing assets and the value of partners with a proven track record of overcoming development challenges. Furthermore, demand being constrained by land and power is not a typical hallmark of a bubble.

## Barriers to entry are increasing in many markets.

Land and power constraints, regulatory changes, and community pushback are making development more difficult in many primary markets. Acquiring existing assets is also increasingly difficult in these markets due to high demand and limited supply.

**EXHIBIT 4: Utility power interconnection timelines stretch beyond a year in most markets**




Source: Lawrence Berkeley National Laboratory; EY-Parthenon analysis, as of 4Q 2023.

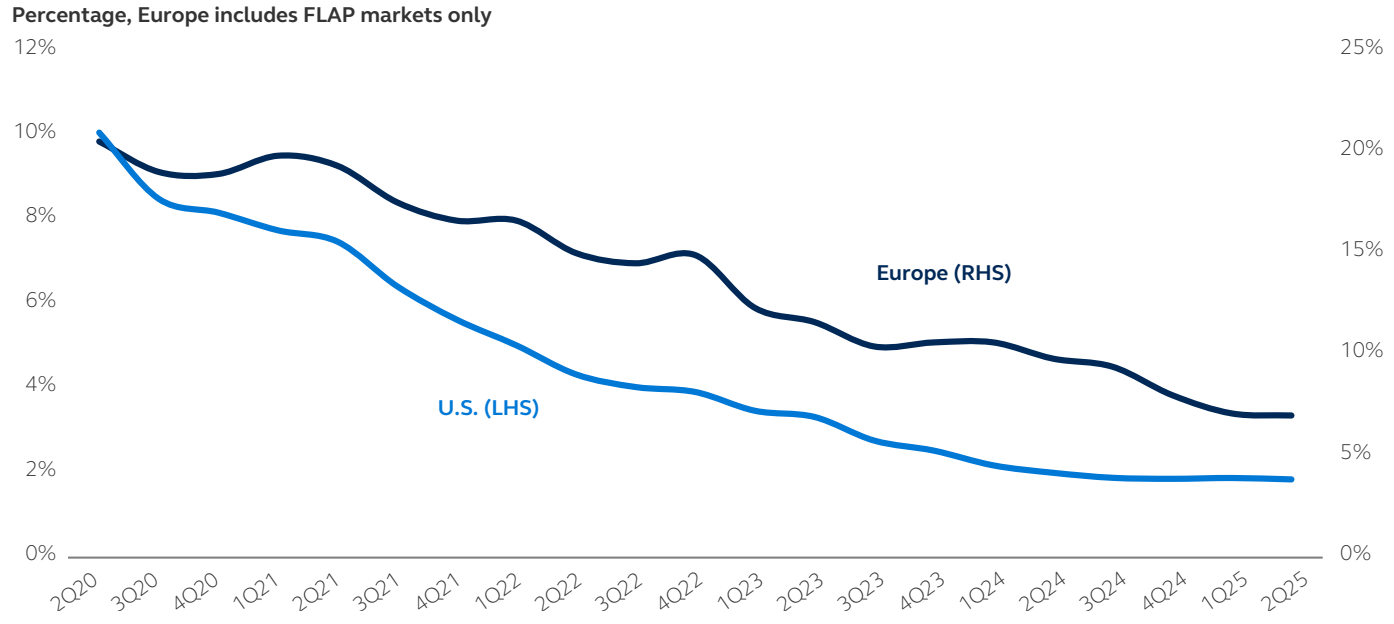
## Barriers to entry increase the value of existing assets.

Power constraints and permitting challenges that make it more difficult to develop data centers in primary markets are not per se negative for the asset class. The more difficult it is to develop new data center capacity, the better potential for long-term value protection existing assets have. Vacancy rates remain at record lows in most major markets in the U.S. and Europe, and the vast majority of capacity under construction is already pre-leased.

*"Data centers are complex developments that require significant experience and relationships for an effective execution. Market selection and timing of power availability are paramount. Without correct site selection, the investment opportunity may be destined for failure."*

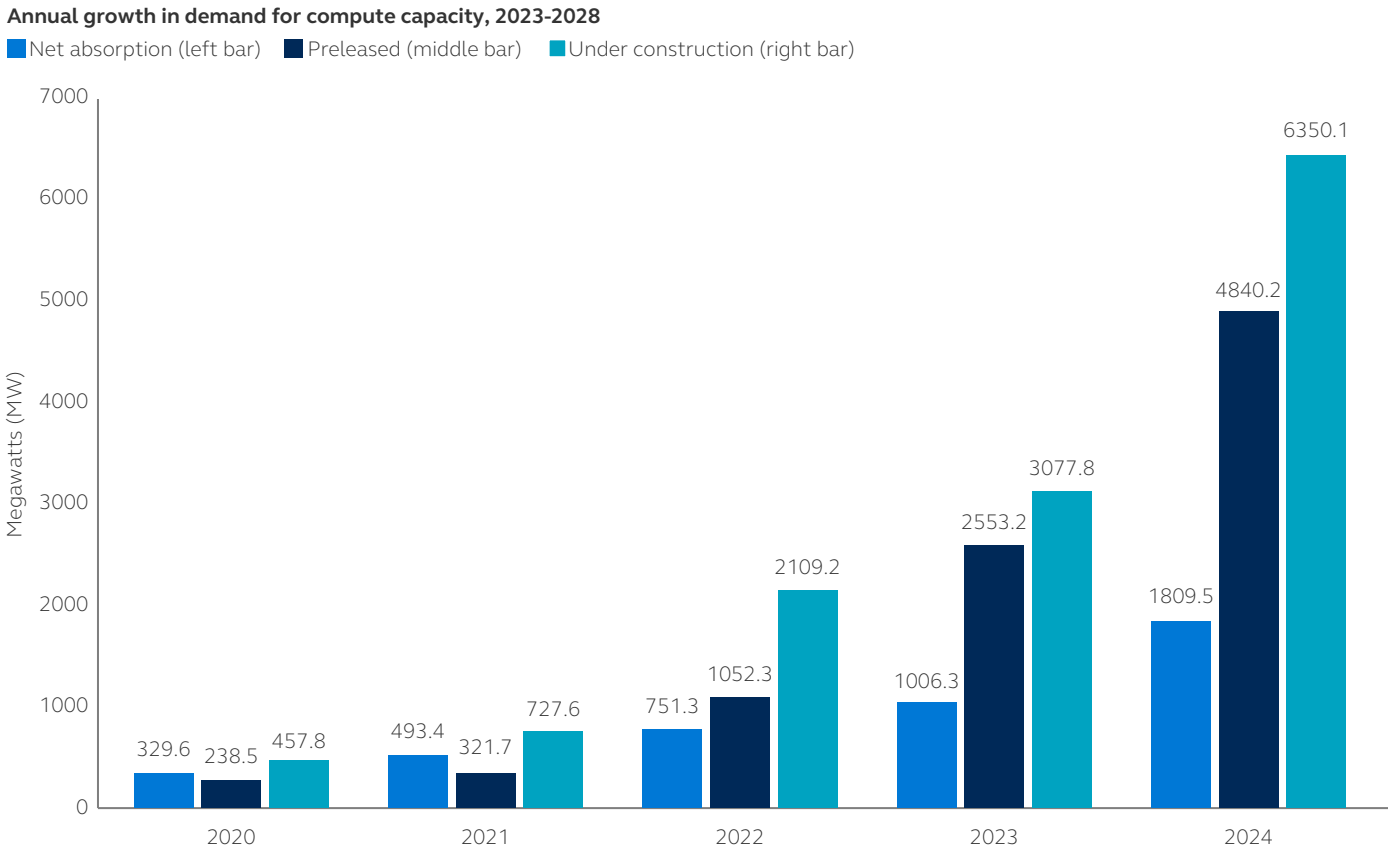
**Matt Hackman**
Portfolio Manager

**EXHIBIT 5: Data center vacancy rates are at record lows**




Source: datacenterHawk, CBRE, Principal Real Estate, as of 2Q25.

**EXHIBIT 6: Almost all new capacity is pre-leased**




Source: CBRE Research, CBRE Data Center Solutions, as of 2H 2024.

## Barriers to entry increase the value of partners with a proven track record of overcoming development challenges.

We partner with data center providers that have sophisticated site selection teams and have demonstrated an ability to secure power and land in the most competitive markets. These partners have a strong understanding of the local markets that they are looking to develop in. As execution becomes more difficult, whether from production of power or transmission, understanding the requirements and challenges of the local economy and population is key to being able to propose solutions that work with utility companies and local governments to find solutions while enabling data center development.

*"Higher interest rates and more stabilized assets have created demand for new sources of capital. Given the long-term, high-credit quality nature of the income that stabilized data centers have, we expect to see core capital start to move to the sector, which will change the nature of capital markets."*

**Sebastian Dooley**
Senior Fund Manager

## What does an exit look like when a single data center could cost $1 billion or more to build?

The nuanced answer is that, given the average size of a data center asset, the number of potential buyers is limited, so there are fewer trades in the market. (The U.S. sales landscape is not all that different from Europe, although there is a bit more active market in the U.S., if for no other reason than scale.) To date, Principal's approach has been to do deals asset-by-asset rather than at a platform level, because aggregating assets exacerbates the scale problem. When it comes to exits, we see there are two styles of transactions, depending on the lease in place:

- **Powered shell triple net lease direct to hyperscale –** Some developments are done as "triple net lease" or "NNN lease" powered shells; this is very popular style of transaction in the U.S. with certain hyperscalers and is a rising trend in Europe. Powered shells have considerably lower build costs, and hence much lower exit valuation. These are also much simpler income streams so more attractive to a wider group of investors. Large investors are interested in buying these assets, as they have lower cost than similar turnkey product and they tend to be more liquid. The buying pool for these assets tends to be real estate and infrastructure funds backed by insurance companies or pension funds that are looking for strong covenants and long leases.
- **Turnkey operational assets –** These are large, complex, operating assets. Very few are brought to market on a single asset basis; we often see large transactions covering 3-4 assets. Those that have come to market have taken place as YieldCo transactions, with operators looking to re-cap a portion of their stabilized portfolios (often around 60-80%). Core infrastructure funds are the demand drivers behind these types of assets, as they tend to like that income profile and are comfortable taking the operational risk. Single asset transactions should be considerably simpler and at a more reasonable lot size, so we anticipate strong demand from a wider buyer pool given better access to the same risk/return profile and cashflows.

## Principal sells 15.2 MW data center in Alpharetta, Georgia

A recent deal exemplifies how we can take a data center built over 15 years ago, retrofit it to support modern needs, and deliver a positive outcome for our investors. A U.S.-focused data center fund managed by Principal acquired the asset in August 2022 in a joint venture with Lincoln Rackhouse. The property is let to two tenants, including a Fortune 100 financial services business and a high-performance computing company.

The data center was originally built for a telecommunications technology company, in 2009, with an initial design enabling a power capacity of 4.05 megawatts. Following extensive densification, it currently provides a power capacity of 15.2 megawatts with the possibility of further expansion on the excess land adjacent to the building.

Strategically positioned in Alpharetta, one of the largest data center submarkets of Atlanta, the property benefits from strong connectivity and is clustered by several market-leading technology firms. The size of Atlanta's data center market increased by more than 475% throughout Principal's ownership of the asset.

*"Our data-driven approach to asset selection and value enhancement capabilities allow us to capitalize on markets with significant potential growth and the data center in Alpharetta is a prime example of this. We substantially increased the site's power capacity, further meeting the demand of today's tenants. Principal continues to see strong opportunities across the data center market and remains committed to investing in high-quality, strategically located assets."*

**Devin Chen**
Head of Private Equity Real Estate Portfolio Management

## Recap: While nuanced, the investment case for data centers is compelling. That makes the asset manager's investment approach more critical than ever.

Data centers remain a relatively new asset class for many institutional investors, with most portfolios still underweight. They have delivered strong performance in both public and private markets, driven by stable, long-term cash flows and robust growth from cloud adoption, AI, and broader digital trends. The long-term growth prospect remains strong given the emergence of a secular mega trend, but the sector also faces new considerations.

Achieving positive outcomes in this environment requires an asset manager with deep experience. At Principal, we have built an extensive track record in data centers:

**$11B** Data center assets under management

**147** Global real estate professionals with active data center exposure

**2007** Year began investing in data center sector

**19** Markets covered across 6 countries

**36** Data center transactions

It is this experience and our deep bench of expertise that enable us to answer the questions and help to navigate the challenges posed by rapid technological innovation like AI.

As of September 30, 2025.

## Risk Considerations

Investing involves risk, including possible loss of principal. Past Performance does not guarantee future return. All financial investments involve an element of risk. Therefore, the value of the investment and the income from it will vary and the initial investment amount cannot be guaranteed. Potential investors should be aware of the risks inherent to owning and investing in real estate, including value fluctuations, capital market pricing volatility, liquidity risks, leverage, credit risk, occupancy risk and legal risk. All these risks can lead to a decline in the value of the real estate, a decline in the income produced by the real estate and declines in the value or total loss in value of securities derived from investments in real estate. International investing involves greater risks such as currency fluctuations, political/social instability, and differing accounting standards.

Data center properties will only be attractive to a unique type of tenant. A limited tenant base increases the risk of vacancy. Additionally, a property designed to be a data center property, may be difficult to relet to another type of tenant or convert to another use and will be more likely to become functionally obsolete when compared to other properties. For example, if converted to industrial use, the expected rents would be lower than that projected for data centers. Thus, if operating a data center were to become unprofitable, the liquidation value of properties may be substantially less than would be the case if the properties were readily adaptable to other uses.

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