U.S. data center update

Leasing and
Capital Markets trends

Q4 2024
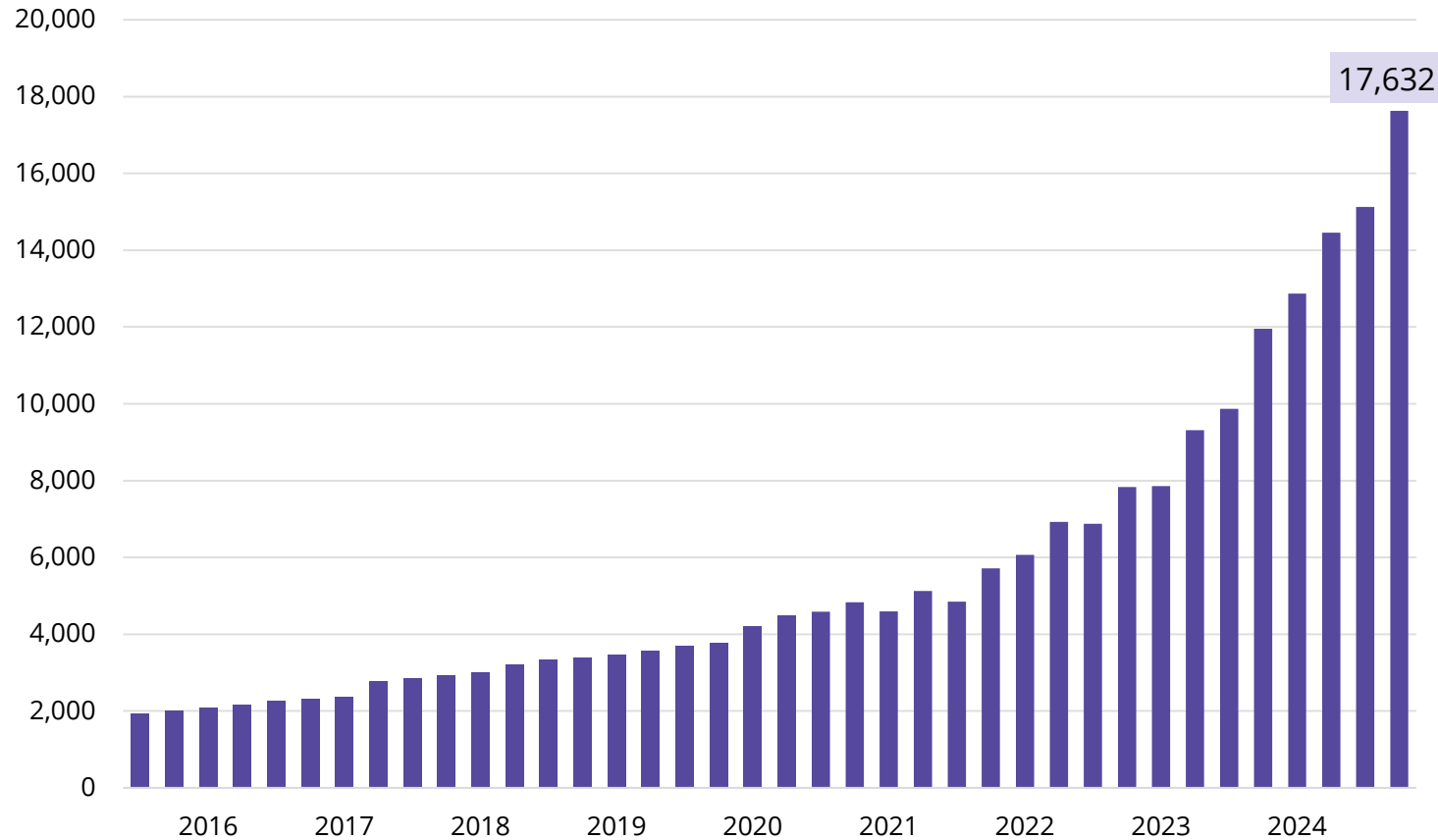
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Inventory

Colocation inventory by quarter (MW)

17,632

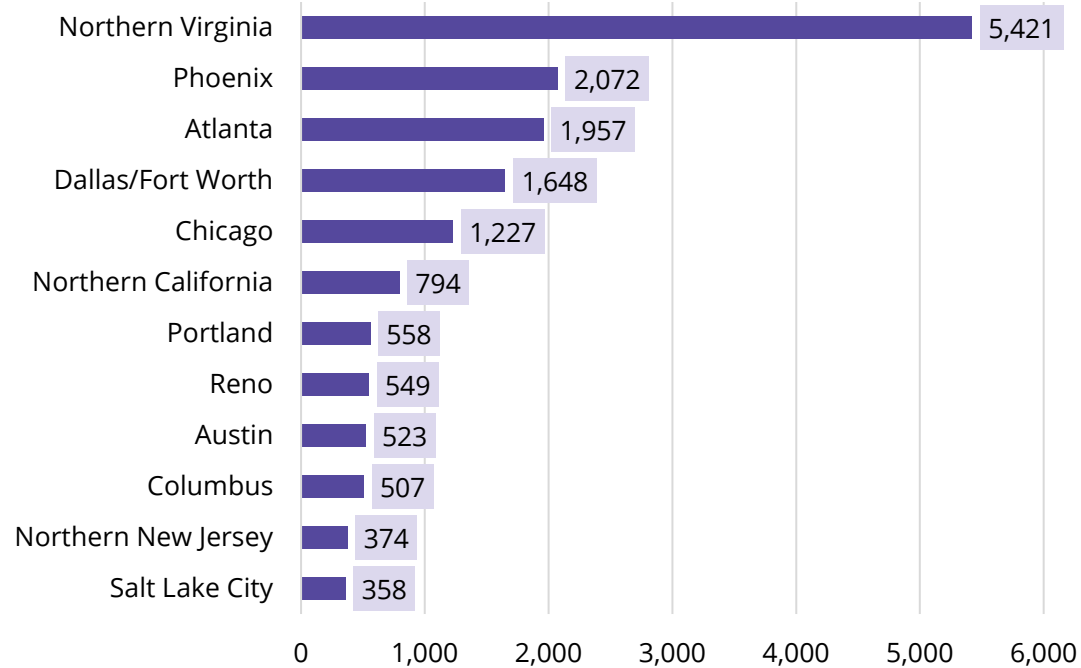*Colocation inventory of U.S. primary and secondary markets.
Source: DatacenterHawk

Inventory growth in North American data center markets has accelerated in response to the surge in demand, with total U.S. colocation data center inventory expanding by 47.5% year over year in the fourth quarter of 2024.
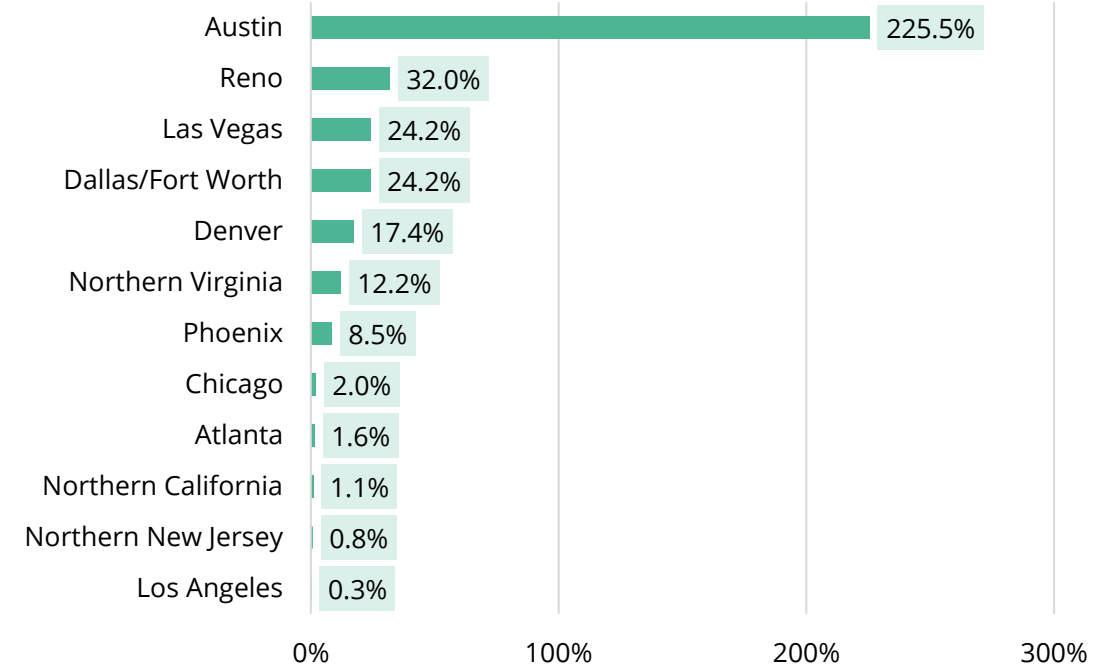
Inventory

Northern Virginia remains the largest data center market in the U.S. and globally, while Phoenix reclaimed its position as the second largest market, surpassing Atlanta, which now ranks third. Austin emerged as the fastest growing market in the fourth quarter of 2024, with significant construction and a strong development pipeline driven by both colocation and hyperscale operators.
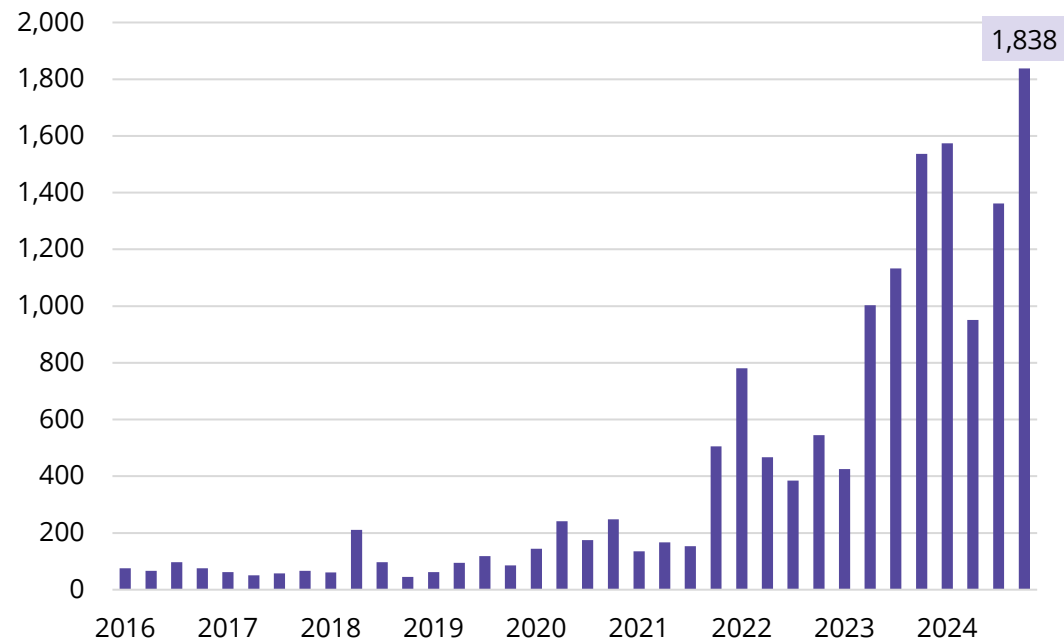
Inventory of largest U.S. markets (MW)

Market	MW
Northern Virginia	5,421
Phoenix	2,072
Atlanta	1,957
Dallas/Fort Worth	1,648
Chicago	1,227
Northern California	794
Portland	558
Reno	549
Austin	523
Columbus	507
Northern New Jersey	374
Salt Lake City	358

Largest quarterly inventory growth

Market	Growth
Austin	225.5%
Reno	32.0%
Las Vegas	24.2%
Dallas/Fort Worth	24.2%
Denver	17.4%
Northern Virginia	12.2%
Phoenix	8.5%
Chicago	2.0%
Atlanta	1.6%
Northern California	1.1%
Northern New Jersey	0.8%
Los Angeles	0.3%

Top 12 North American markets; includes all facilities that have delivered or have a committed tenant.
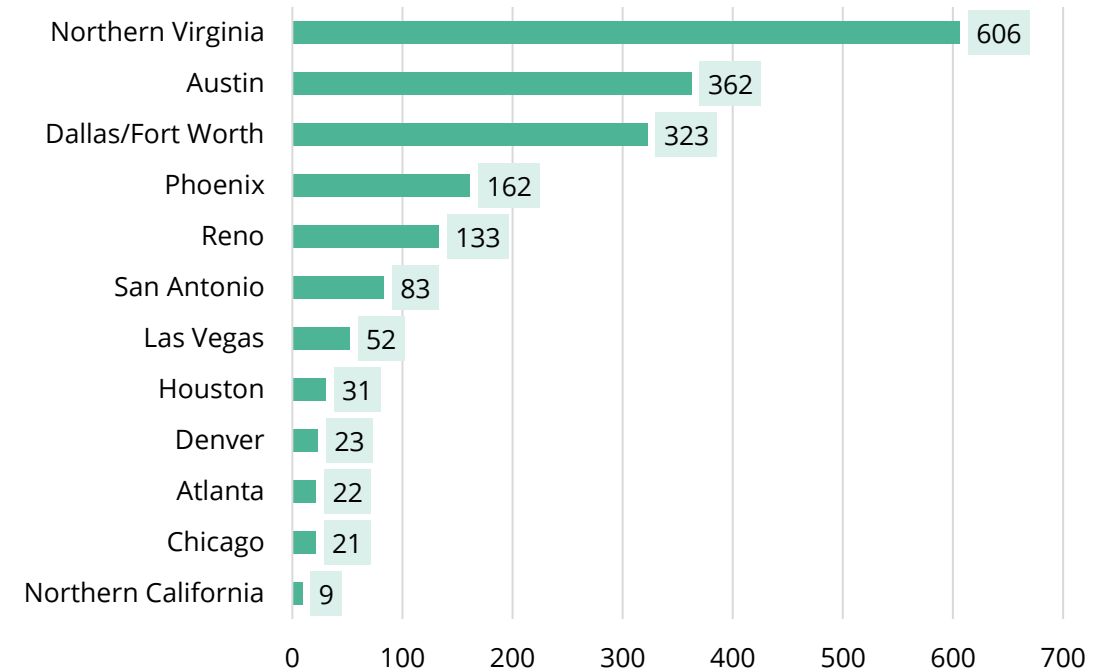Source: DatacenterHawk

Absorption

Net absorption reached a record high in the fourth quarter of 2024, exceeding 1.8 GW nationwide. Northern Virginia led the market, as expected, while Texas showed remarkable growth. The emerging market of Austin ranked second highest, and the more developed Dallas/Fort Worth market came in third.
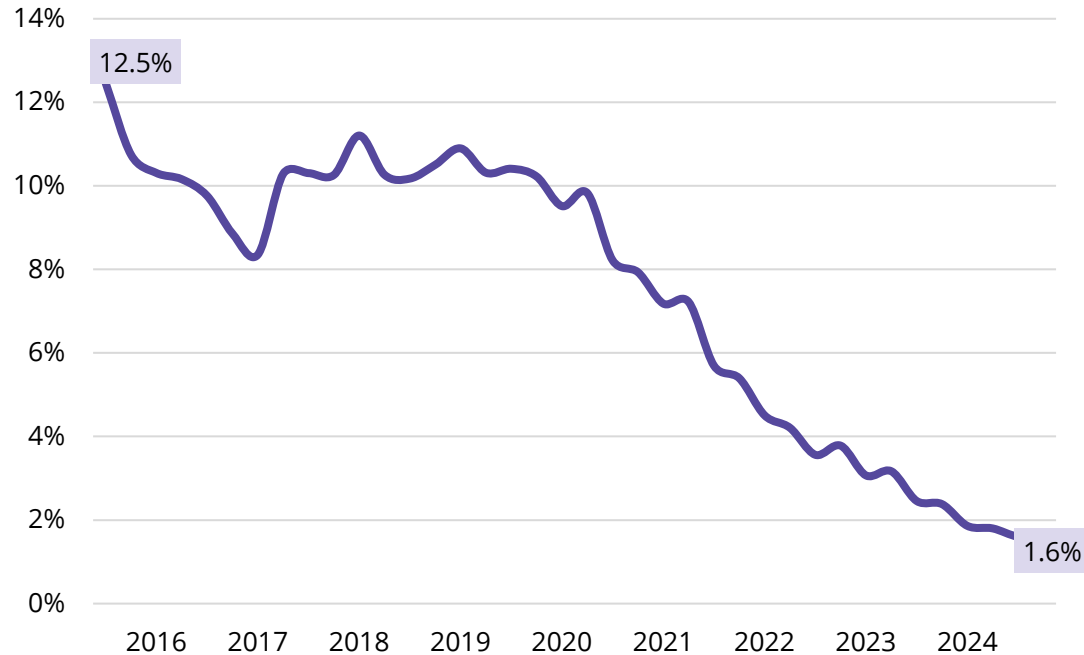
Net absorption (MW)

Highest net absorption markets in Q4 2024

Market	Value
Northern Virginia	606
Austin	362
Dallas/Fort Worth	323
Phoenix	162
Reno	133
San Antonio	83
Las Vegas	52
Houston	31
Denver	23
Atlanta	22
Chicago	21
Northern California	9

Top 12 North American markets; includes all facilities that have delivered or have a committed tenant.
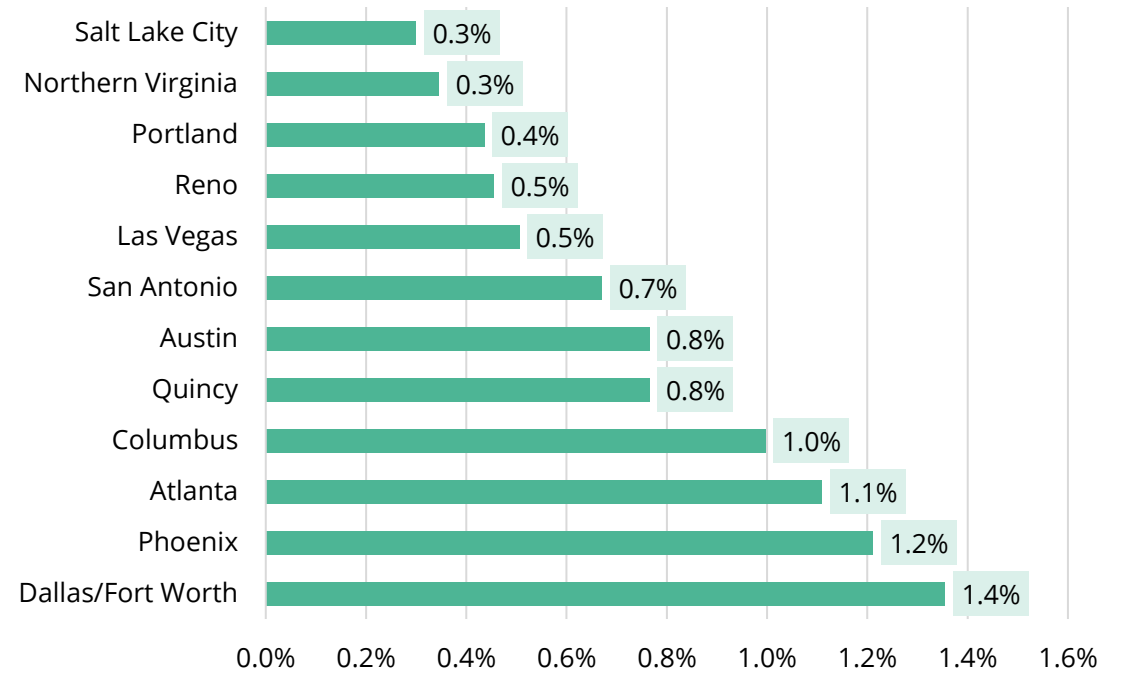Source: DatacenterHawk

Vacancy

Despite record-setting deliveries in the fourth quarter of 2024, U.S. colocation data center vacancy rates maintained all-time lows, driven by strong demand and constrained supply.
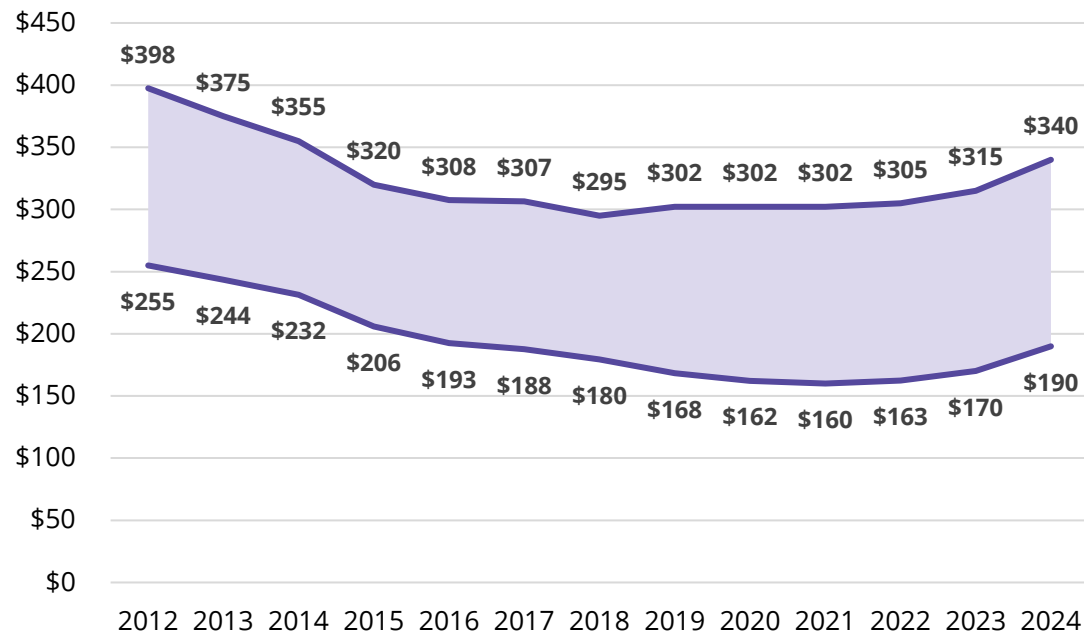
Vacancy rate by quarter

Lowest vacancy markets Q4 2024

Top 12 North American markets; includes all facilities that have delivered or have a committed tenant.
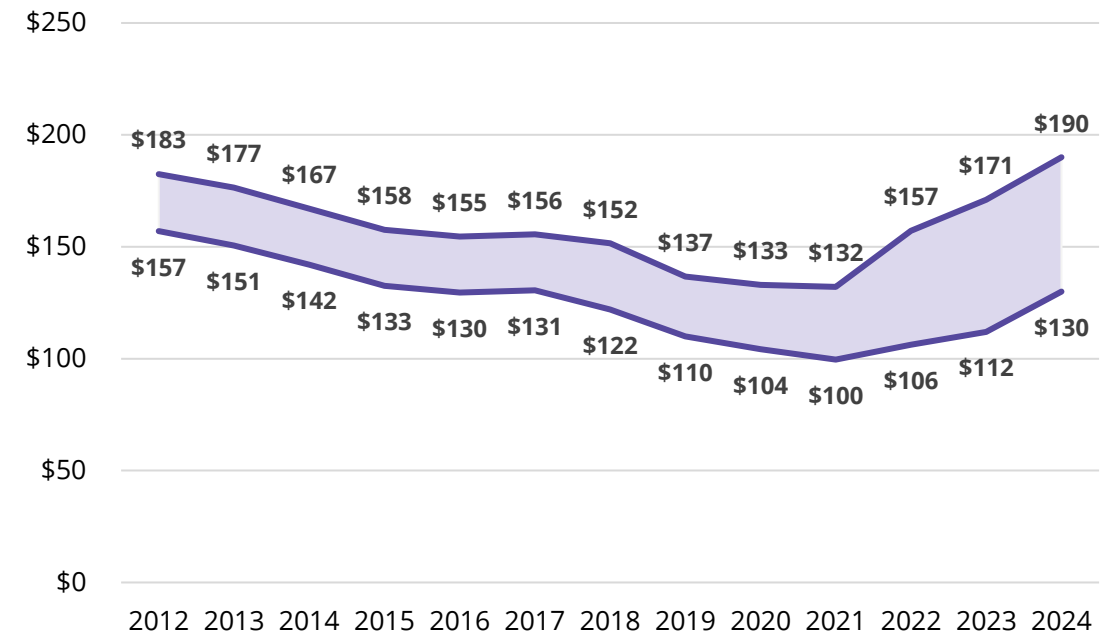Source: DatacenterHawk

Historical pricing

Turnkey rents are beginning to move upward in response to tightening market conditions. Pricing for large requirements saw a greater increase, as large existing availabilities are few and far between in most mature markets.

Average retail range ($/kW)

Upper line: $398 (2012), $375 (2013), $355 (2014), $320 (2015), $308 (2016), $307 (2017), $295 (2018), $302 (2019), $302 (2020), $302 (2021), $305 (2022), $315 (2023), $340 (2024)

Lower line: $255 (2012), $244 (2013), $232 (2014), $206 (2015), $193 (2016), $188 (2017), $180 (2018), $168 (2019), $162 (2020), $160 (2021), $163 (2022), $170 (2023), $190 (2024)

Average wholesale range ($/kW)

Upper line: $183 (2012), $177 (2013), $167 (2014), $158 (2015), $155 (2016), $156 (2017), $152 (2018), $137 (2019), $133 (2020), $132 (2021), $157 (2022), $171 (2023), $190 (2024)

Lower line: $157 (2012), $151 (2013), $142 (2014), $133 (2015), $130 (2016), $131 (2017), $122 (2018), $110 (2019), $104 (2020), $100 (2021), $106 (2022), $112 (2023), $130 (2024)

Capital market trends

Capital markets trends

M&As are ramping up

After a slow 2023, mergers and acquisitions in the data center industry accelerated in 2024, driven by a surge in investor interest.

Cap rates fall

Cap rates for data centers fell in 2024 as the asset class became increasingly more desirable. With lower interest rates that may come later in 2025, along with unrelenting demand, rates will likely see further downward pressure.

New players

As the sector matures, private and public equity is seeking to enter the space. PE and institutional capital both continued to account for a larger share of data centers. The trend is expected to continue in 2025.

Speculative developers

Investor interest in data centers surged as demand continued to climb. Increasingly more opportunistic developers that are new to this space are eyeing the development of data center projects.
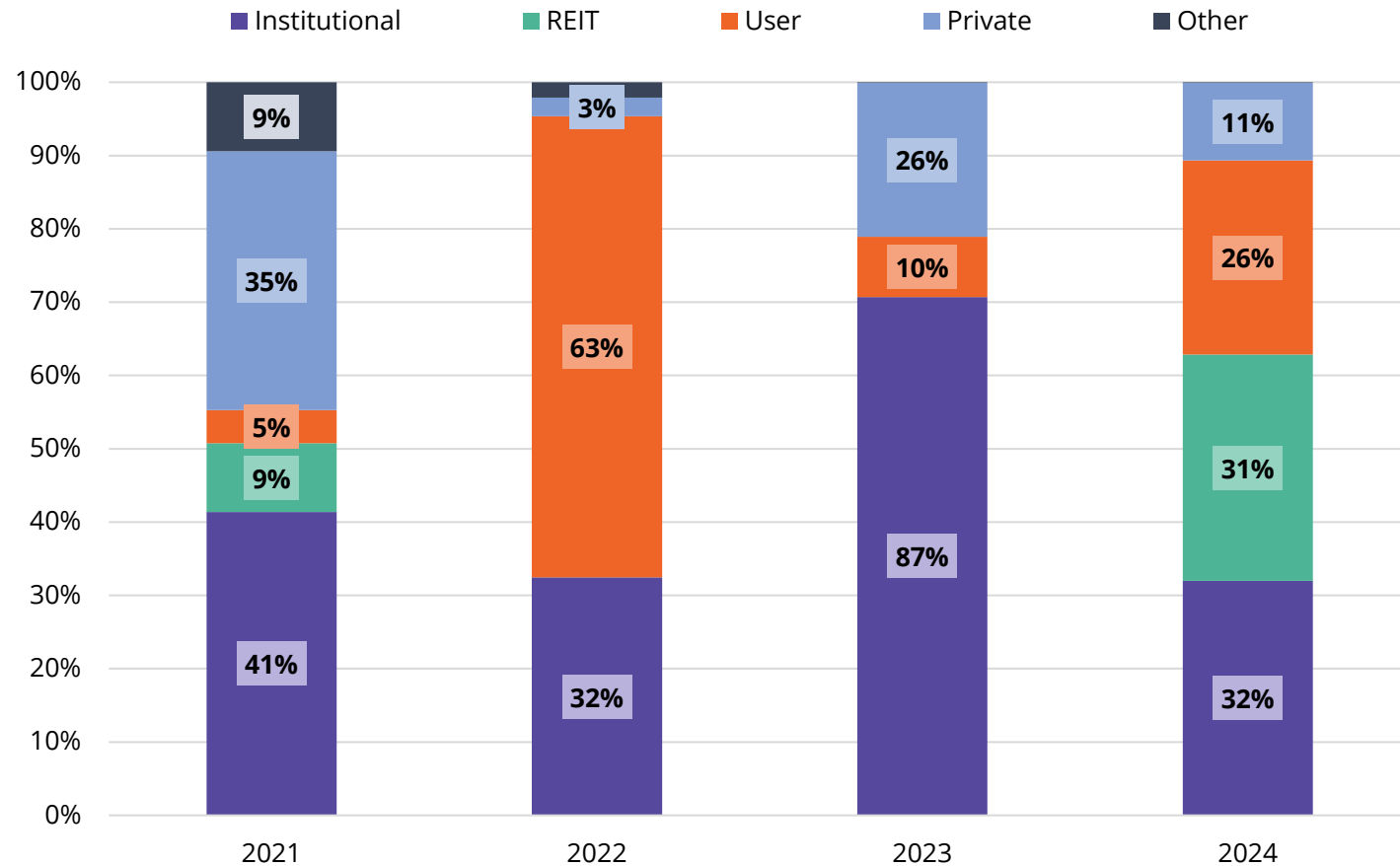
Major M&A deals

- **October:** Blue Owl Capital acquired IPI Partners

- **September:** Sixth Street acquired a minority stake in EdgeConnex from EQT

- **May**: King Street acquired majority stake in Colovore

- **April:** Brookfield acquired recently combined Cyxtera and Evoque as Centersquare
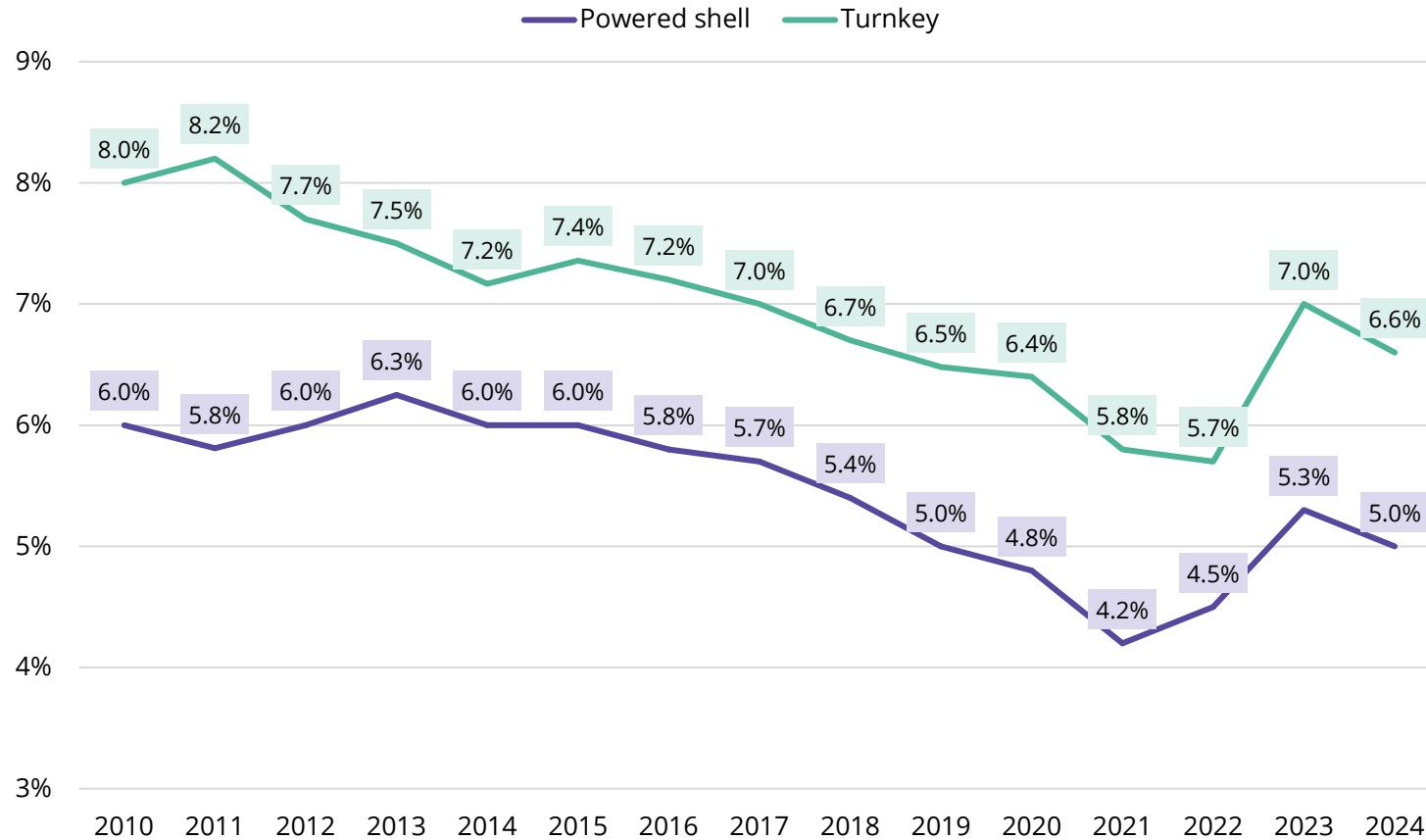
Buyer composition

Data center buyer composition

Legend: Institutional, REIT, User, Private, Other

2021: Institutional 41%, REIT 9%, User 5%, Private 35%, Other 9%
2022: Institutional 32%, User 63%, Other 3%
2023: Institutional 87%, User 10%, Private 26%
2024: Institutional 32%, REIT 31%, User 26%, Private 11%

The data center market in 2024 saw a shift toward more institutional and REIT buyers, with institutional investors making up a significant portion of the market. User buyers, such as colocation operators, continue to play an important role but with slightly less market share compared to previous years. Private buyers decreased considerably, indicating a more mature market driven by large-scale, long-term investors.

Source: Avison Young

Cap rates

Typical data center cap rate

Powered shell —— Turnkey ——

Year	Turnkey	Powered shell
2010	8.0%	6.0%
2011	8.2%	5.8%
2012	7.7%	6.0%
2013	7.5%	6.3%
2014	7.2%	6.0%
2015	7.4%	6.0%
2016	7.2%	5.8%
2017	7.0%	5.7%
2018	6.7%	5.4%
2019	6.5%	5.0%
2020	6.4%	4.8%
2021	5.8%	4.2%
2022	5.7%	4.5%
2023	7.0%	5.3%
2024	6.6%	5.0%

Note: Typical cap rates are not necessarily averages of all market transactions. To handle small sample sizes, we have made adjustments to remove outliers and/or correct for deal nuances that may impact cap rate.
Source: Avison Young

Cap rates for data centers fell to the mid-6% range for turnkey facilities and around 5% for powered shell properties. While future Fed rate cuts remain uncertain, strong investor demand is likely to keep pushing cap rates lower.
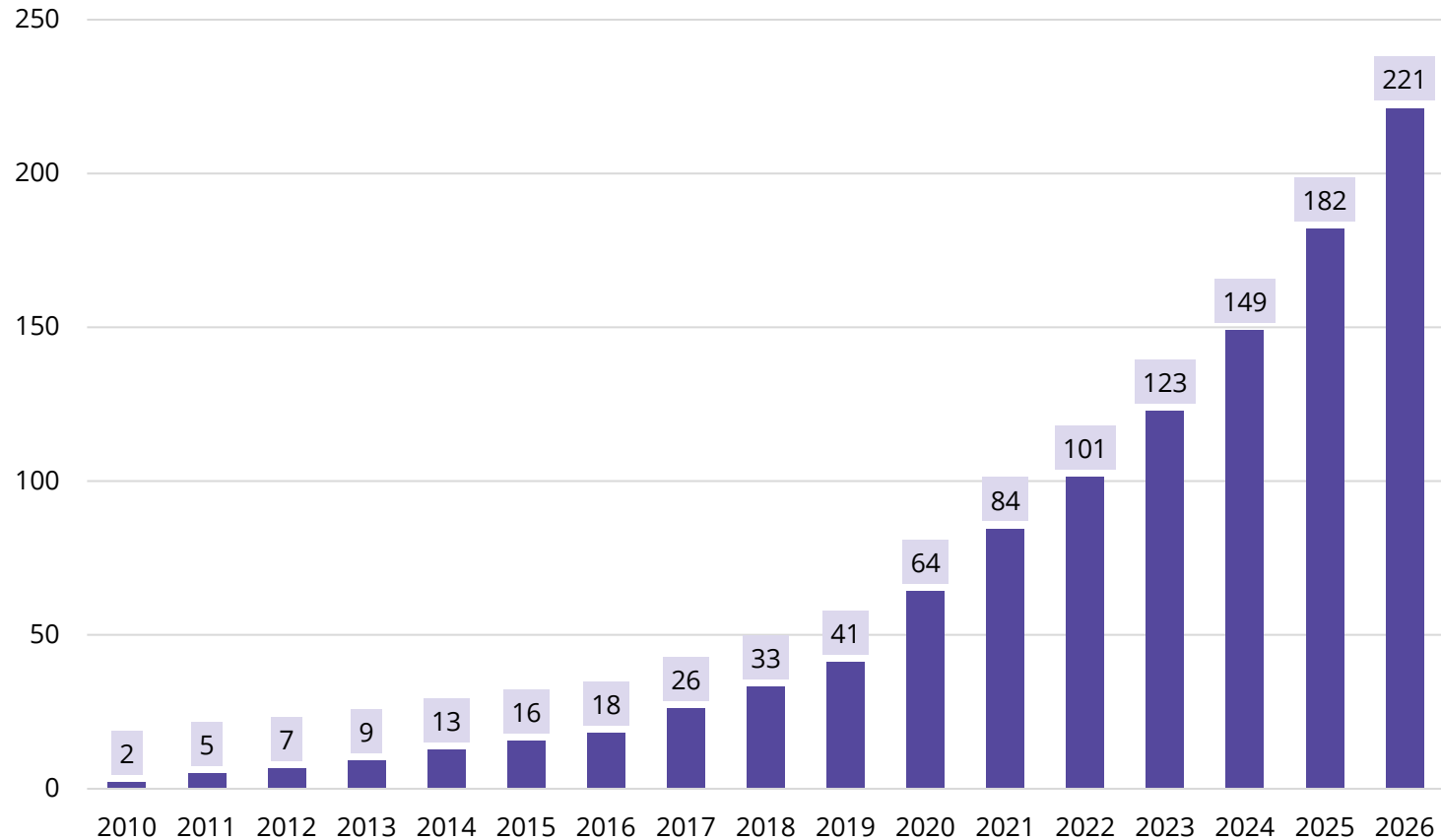
Looking ahead

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Demand drivers – digitalization

Data created and replicated worldwide (zettabytes)

The global datasphere (data created/replicated worldwide) is growing rapidly and projected to more than double by 2026 compared to the end of 2022 levels. Several new technologies are emerging that have the potential to consume orders of magnitude more data than typical applications today, including:

Internet of things: previously "dumb" devices are now connected and generating data

Advancing technology: existing technologies require more data as sophistication increases (e.g., photo file size)

**Autonomous vehicles (AVs):** require storage/processing of extraordinary amounts of sensor data

Artificial intelligence (AI): AI and machine learning (ML) necessitate the collection, storage and computation of massive data sets

Cloud storage and computing: increasingly more enterprises are shifting data storage and computation to cloud and hybrid solutions

5G connectivity: enhanced mobile connection speeds have enabled new use cases that rely on quick communication with edge data centers (necessitating many more such edge data centers)

Source: IDC Global DataSphere Forecast, 2022-2026

Demand drivers – AI workloads

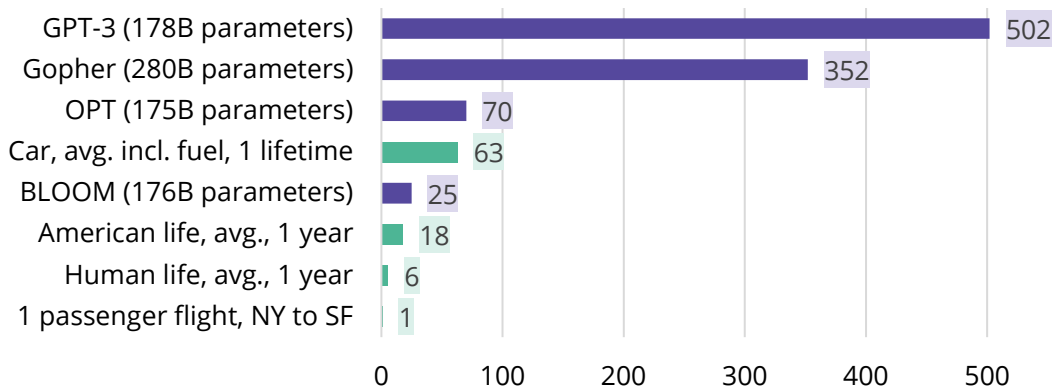**Plans to migrate AI-related workloads from cloud to colocation**
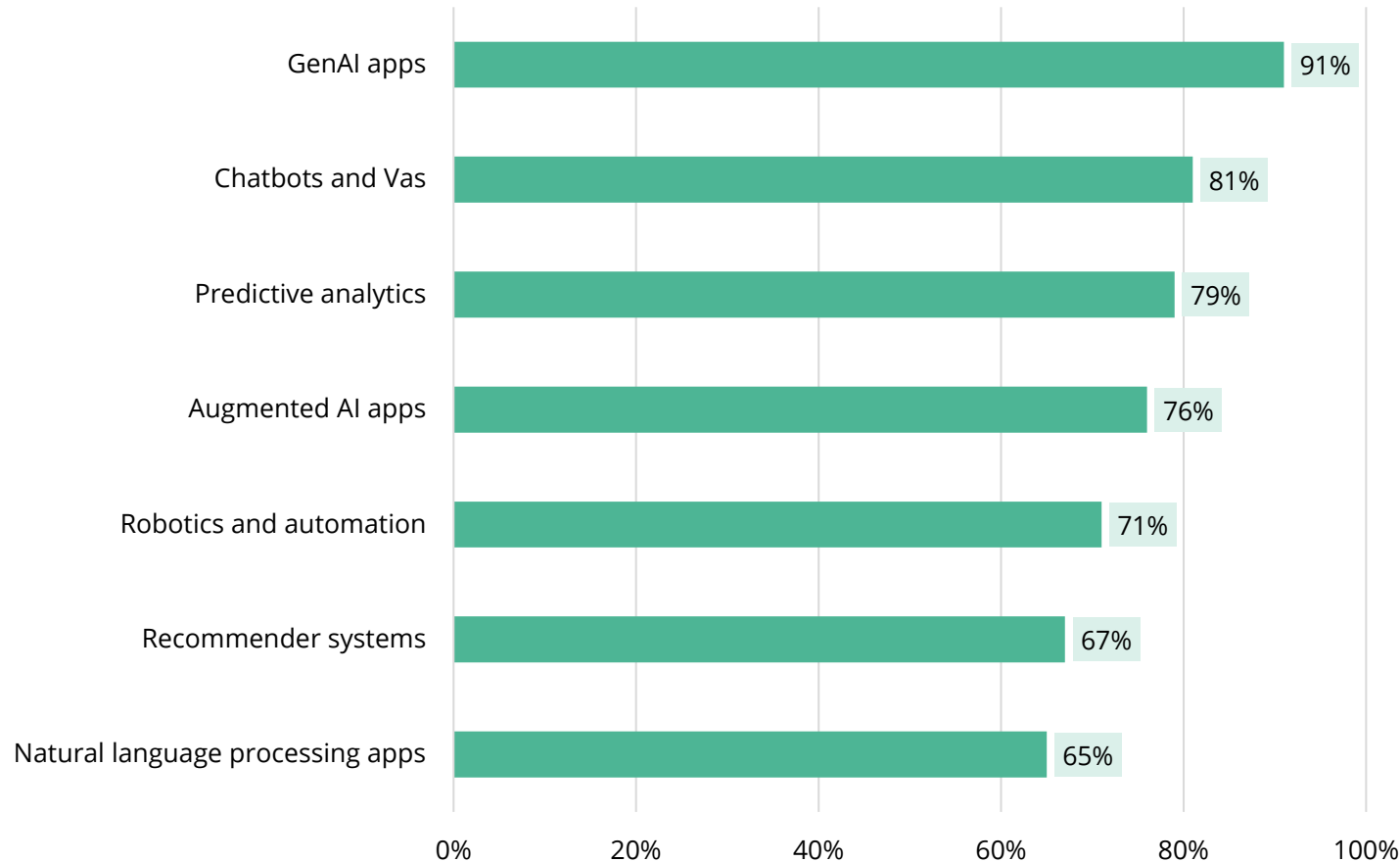
While many early adopters of AI/ML initially leveraged cloud services, a survey of IT leaders and business operators indicates a growing trend toward shifting these operations into colocation facilities. Colocation offers greater control over costs, scalability, and enhanced privacy, making it an increasingly attractive option for businesses looking to optimize their AI workloads.

Source: CoreSite. (2024). 2024 CoreSite State of the Data Center Report.
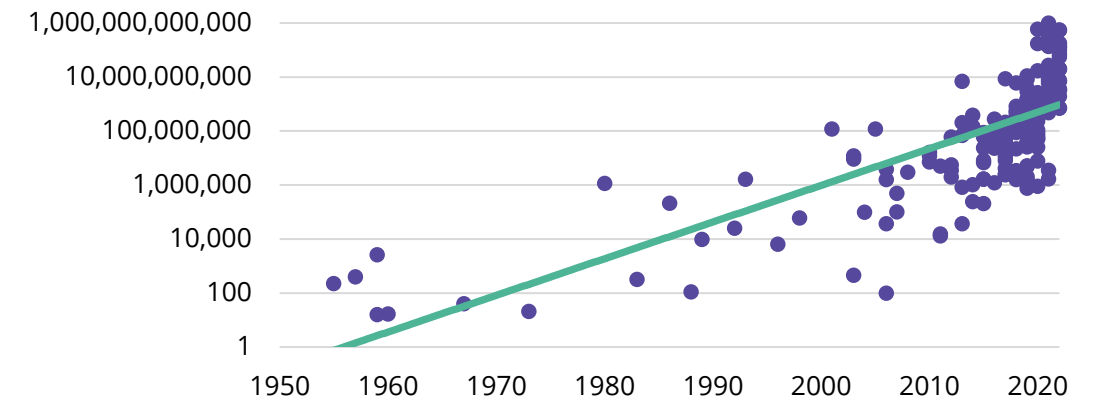
Demand drivers – Artificial Intelligence

A host of factors will lead to an explosion in the amount of data being created, stored and processed worldwide, ensuring that today's exceptional pace of data center demand continues.

CO_2 emissions equivalent of energy use (tonnes)*

Category	Value
GPT-3 (178B parameters)	502
Gopher (280B parameters)	352
OPT (175B parameters)	70
Car, avg. incl. fuel, 1 lifetime	63
BLOOM (176B parameters)	25
American life, avg., 1 year	18
Human life, avg., 1 year	6
1 passenger flight, NY to SF	1

Number of parameters of significant ML systems**

AI training draws immense power

Training GPT-3, the language model powering OpenAI's ChatGPT, is estimated to have resulted in 502 tonnes of CO_2 equivalent emissions from data center operations. This is roughly equivalent to the energy consumed by the average American over 28 years. GPT-4, the successor to GPT-3, is rumored to use over 1.7 trillion parameters. Additionally, LLM models are repeatedly trained on updated data to achieve improvements.

ML complexity is growing rapidly

The number of parameters in significant machine learning models has grown exponentially. As artificial intelligence technology grows in complexity, the requirement for computational power and data centers grows alongside it.

Innovative solutions – microgrids

As data center construction surges, power generation and transmission timelines from local utilities have become a critical bottleneck, slowing scalability and speed to delivery. As a result, behind-the-meter solutions like on-site microgrids are becoming increasingly attractive to developers despite high upfront costs. Microgrids allow data centers to scale power on the developer's own construction timeline rather than waiting years for utility upgrades. Additionally, they enhance reliability by insulating operations from grid disruptions. When integrated strategically with local utilities, microgrids can also contribute to grid stability by supplying excess power or acting as a buffer during peak demand or emergencies. For the many data center operators aligning with ESG goals, microgrids allow greater control over renewable energy integration. On-site solar, battery storage, and fuel cells (e.g., Bloom Energy) are becoming common components of data center microgrids.

Bloom Energy and AEP partner for 1GW fuel cell deployment to power AI data centers

In November 2024, Bloom Energy entered into a significant agreement with American Electric Power (AEP) to supply up to 1 gigawatt (GW) of solid oxide fuel cells (SOFCs). AEP placed an initial order for 100 megawatts (MW), with plans for expansion in 2025. These fuel cells will be colocated at AI data center sites to meet immediate power demands. Bloom's SOFCs, currently powered by natural gas, offer a scalable and efficient energy solution, with the potential to transition to hydrogen in the future.

This partnership exemplifies the growing commercial interest in microgrid technologies, providing data centers with reliable, on-site power generation that enhances grid resilience and supports the increasing energy needs of advanced computing applications.

Source: DataCenterDynamics (2024, January 29). Bloom Energy secures 1GW fuel cell supply deal with AEP to support AI-driven data centers.

Innovative solutions –
Small Modular Reactors

The growing power demands of data centers have brought small modular reactors (SMRs) into the spotlight as a promising energy solution. When integrated into a microgrid, SMRs provide a scalable and efficient alternative to traditional power sources, offering data centers a reliable, independent energy supply. Unlike large-scale nuclear plants, SMRs can be rapidly deployed using prefabricated, certified designs, with the flexibility to scale alongside the data center's needs. While commercial SMR deployments remain a few years away, they present a compelling future of clean, stable, and abundant energy, making them an increasingly attractive option for the data center industry.

Oklo signs a 12GW nonbinding agreement with Switch

Oklo, a company focused on SMR research and development, entered into a nonbinding master power agreement with data center developer Switch, aiming to deploy up to 12 gigawatts (GW) of new reactor capacity over the next 20 years.

Initial installations of Oklo's 50-megawatt electric (MWe) Aurora powerhouses could commence as early as 2029, with plans to explore designs exceeding 100 MWe for future scalability. This collaboration reflects a growing trend of data center operators partnering with nuclear energy firms to meet increasing power demands driven by artificial intelligence and cloud computing.

Looking ahead

Lease, then build

Given sharp vacancy declines across every major market, expect nearly all future leasing to take place in projects under construction or yet to break ground.

Transformer shortage

The ongoing shortage of transformers in the U.S. has considerably extended lead times for deliveries. This will impact data center development, potentially causing delays of two to three years.

Cloud repatriation

Public cloud users have become increasingly receptive to migrating critical workloads to colocation options. This shift is primarily driven by the need for improved security, performance, and scalability.

Outward push

Near-zero vacancy in urban primary markets are spilling to outlying suburban and rural markets due to availability of land and power. Logistics will become a significant bottleneck.

Alternative power

As power limitations drive innovation, data center operators are increasingly turning to alternative off-grid and hybrid power solutions, including microgrid solar, wind, natural gas and nuclear energy.

Pricing will keep rising

Low vacancy will persist as supply chain and utility constraints keep deliveries from meeting demand, which will create upward pressure on rents.

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