



Making Tech Sustainable

The Rise of Data Centers

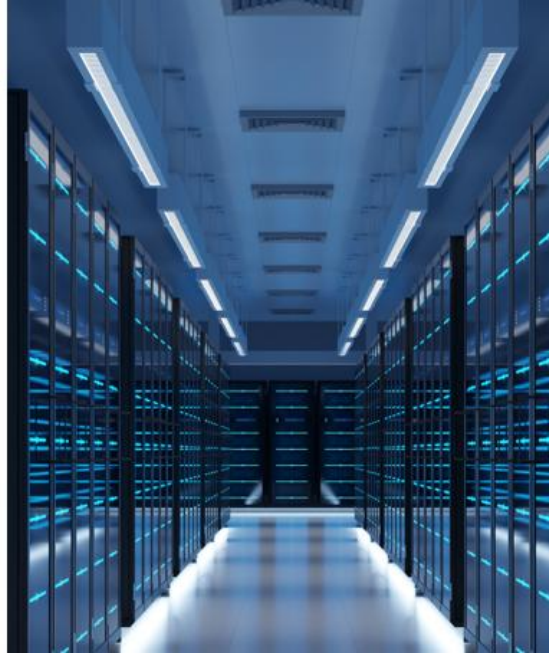
4Q2025

Sean Farney
Vice President, Data Center Strategy
JLL

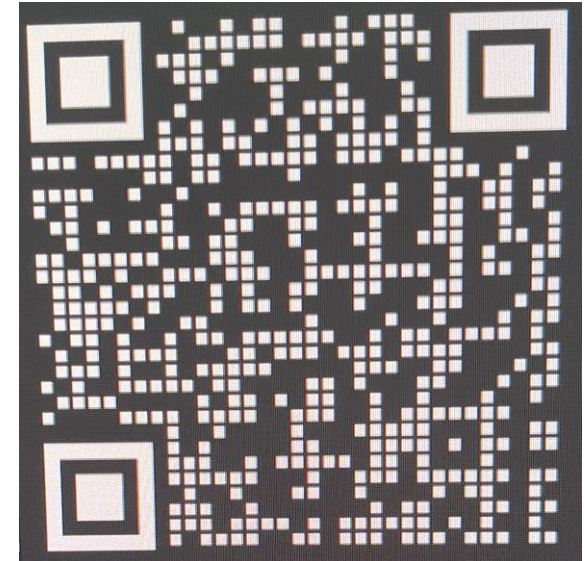


North America Data Center Report

Another record performance despite some uncertainty



Link to market data:



<https://www.jll.com/en-us/insights/market-outlook/data-center-outlook>

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Executive Summary



Supply and demand trendlines remain intact, despite market turbulence in H1

DeepSeek, tariff implications and hyperscalers walking away from leases created significant uncertainty in H1. Despite this, the sector maintained momentum and delivered a fresh set of records.



Vacancy declines to a new record low of 2.3%, strong preleasing will suppress vacancy through 2027

Colocation vacancy is constraining economic growth and undermining national security. The construction pipeline of 8 GW is 73% preleased, signaling that vacancy will remain restrictive for the next few years.



Demand remains concentrated in core markets, led by Northern Virginia and Dallas

With vacancy near 0%, virtually all absorption is the result of preleasing. A market's ability to capture demand relies on the size of the development pipeline and product available for lease.



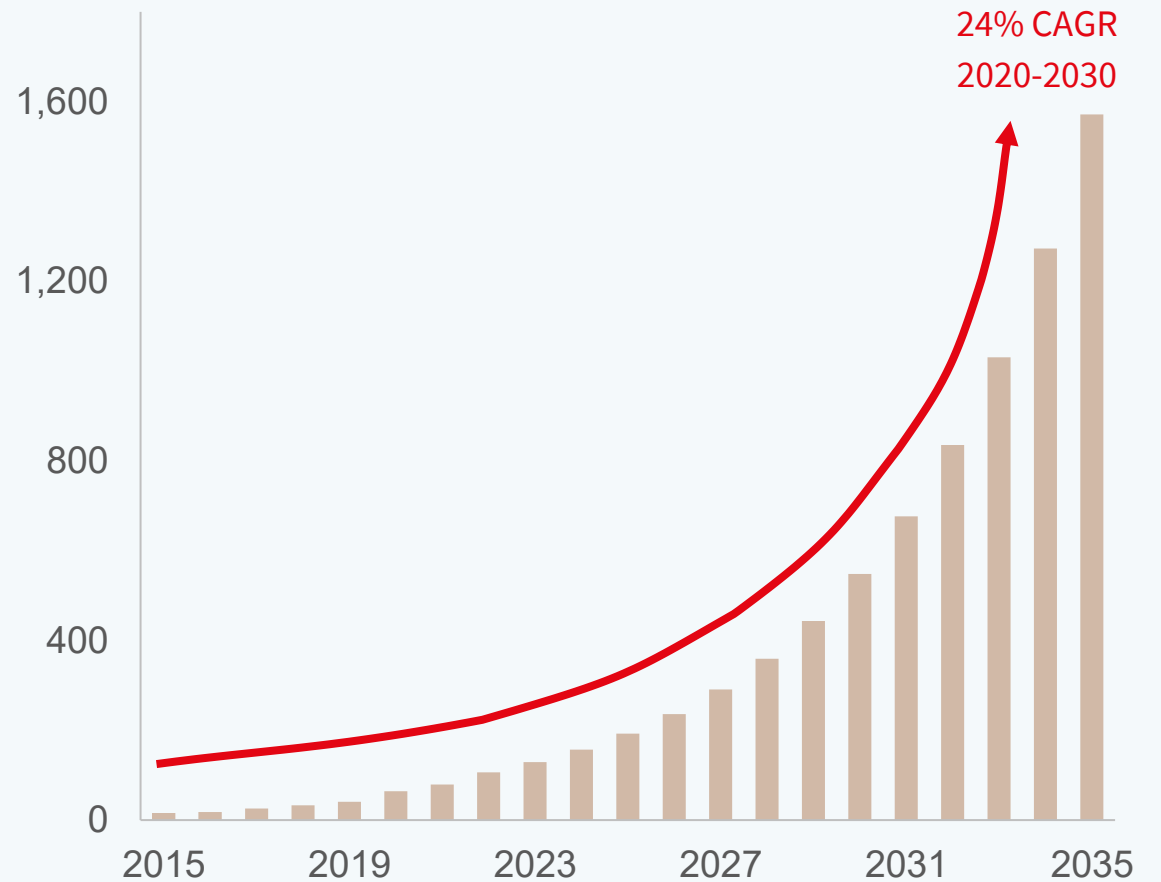
North America could see \$1 trillion of data center development between 2025 and 2030

More than 100 GW of capacity (colo + hyper) could break ground or deliver between 2025 and 2030. There is strong investor appetite to fund development. Projects under construction are 73% preleased.

Data is growing at a 24% CAGR, driving demand for data centers

- The most elemental form of data center demand – data creation and storage – has been growing at a 24% CAGR over the last decade.
- This is the foundation of data center demand. AI data center demand can be thought of as a supplement or additive to this base layer of demand.
- Roughly 50% of the world's data was generated in the last three years alone.
- Less than 6% of the data created this year will be stored. There is an enormous opportunity to capture more data which would fuel additional data center demand.
- The pace of data creation could accelerate as AI begins to generate greater volumes of content – particularly images and videos – which contain significantly more data than text files.

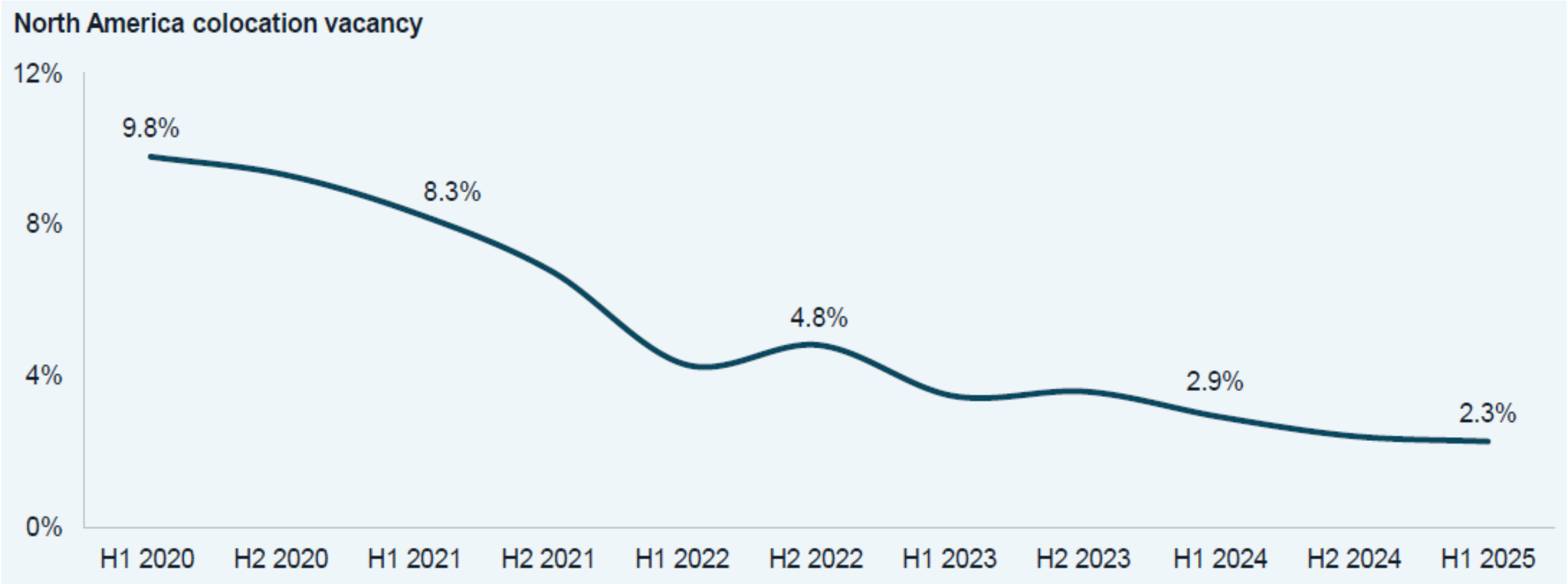
Global data created annually in zettabytes



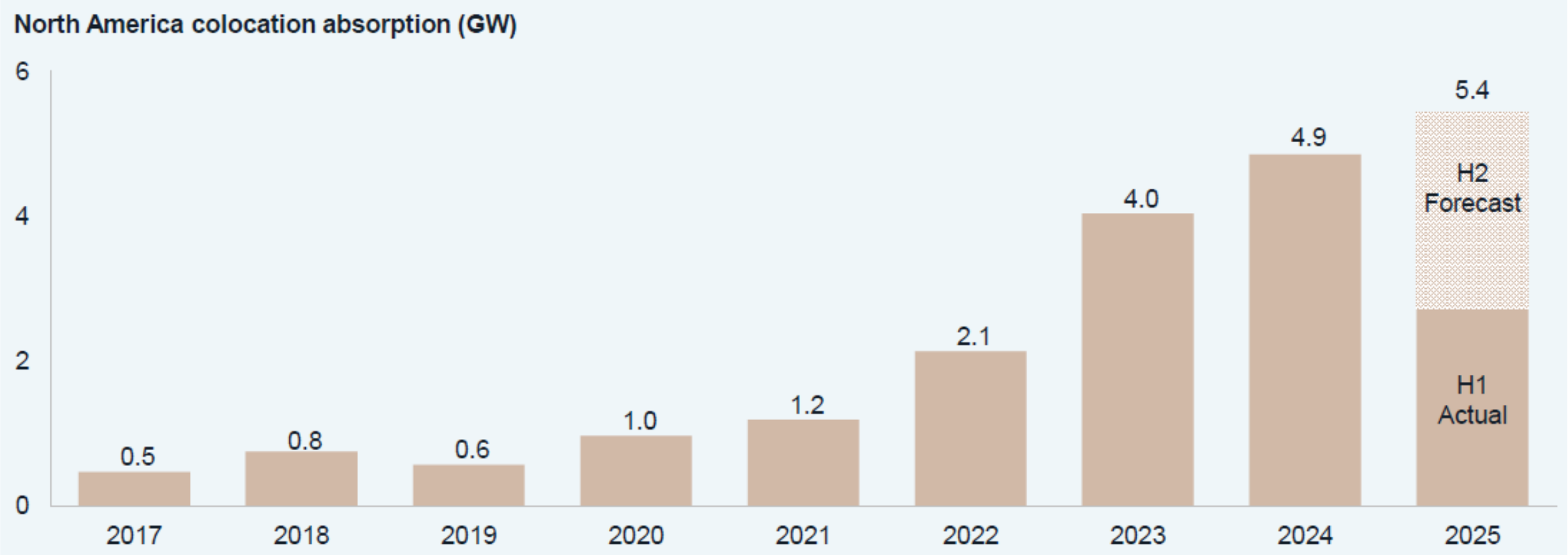
Market context

01

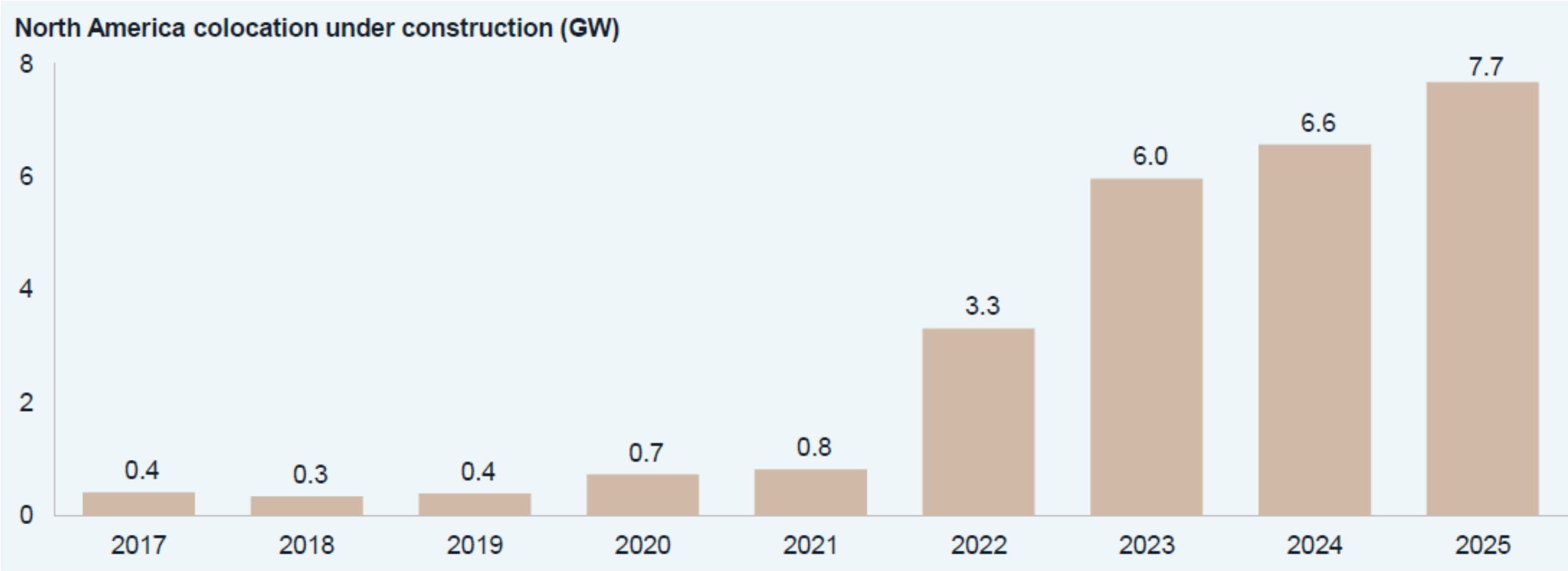
Colocation supply problem could slow business growth, impact national security



NoVa and Dallas account for 63% of H1 absorption

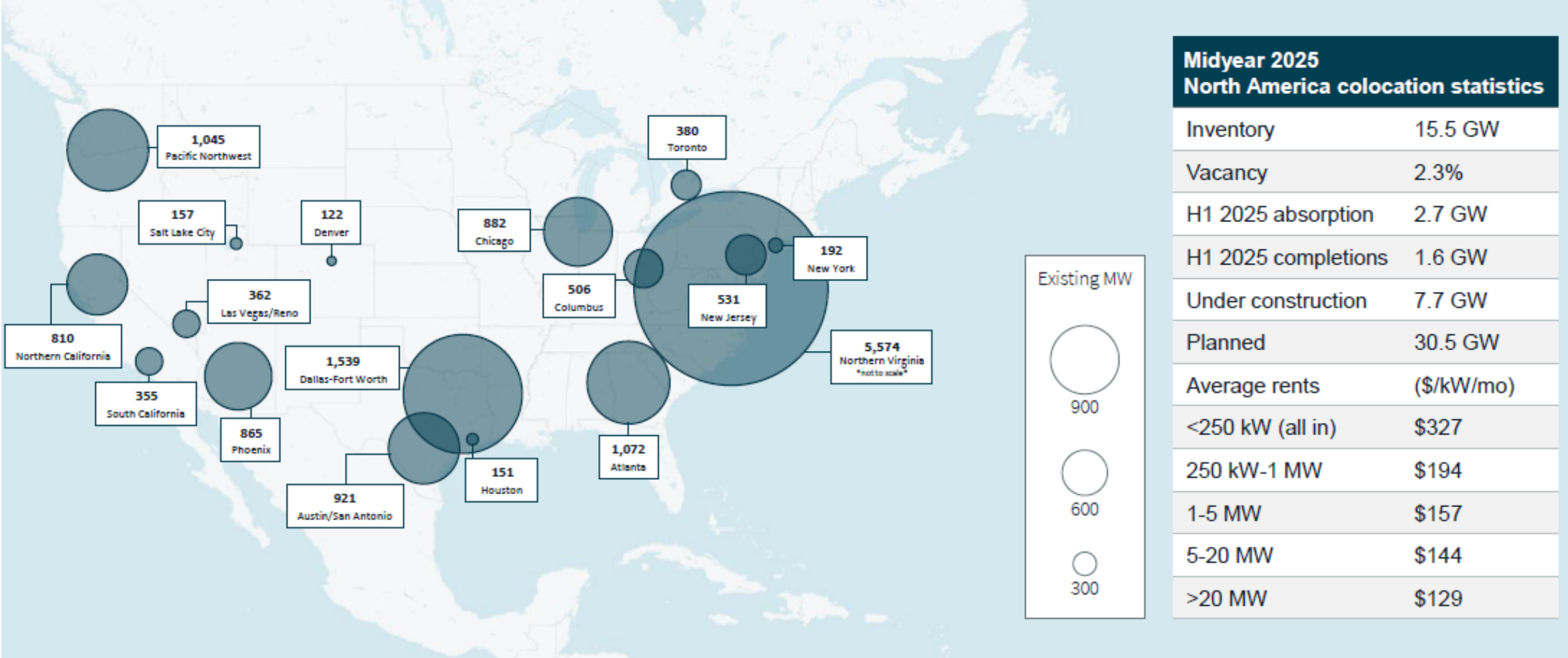


~8GW build pipeline is 73% pre-leased

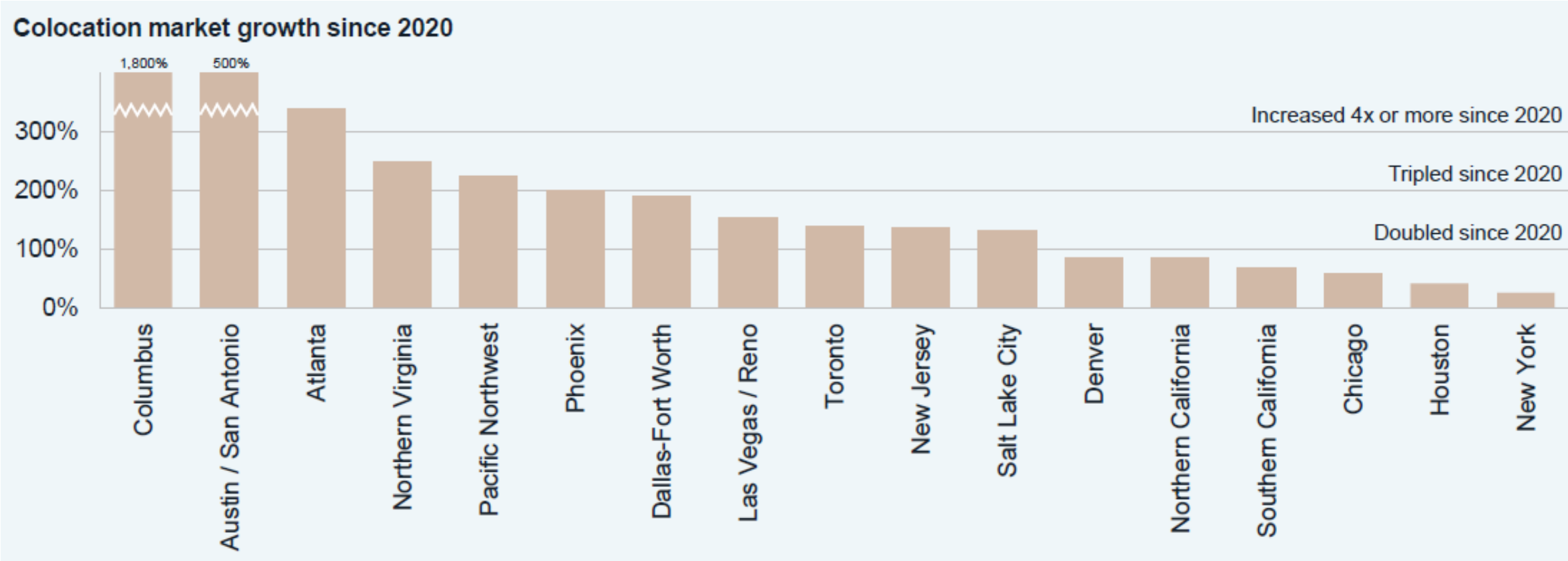


SOURCE JLL Research, *North American Data Center Report Midyear 2025* .

With colo vacancy approaching 0%, the industry has a supply problem

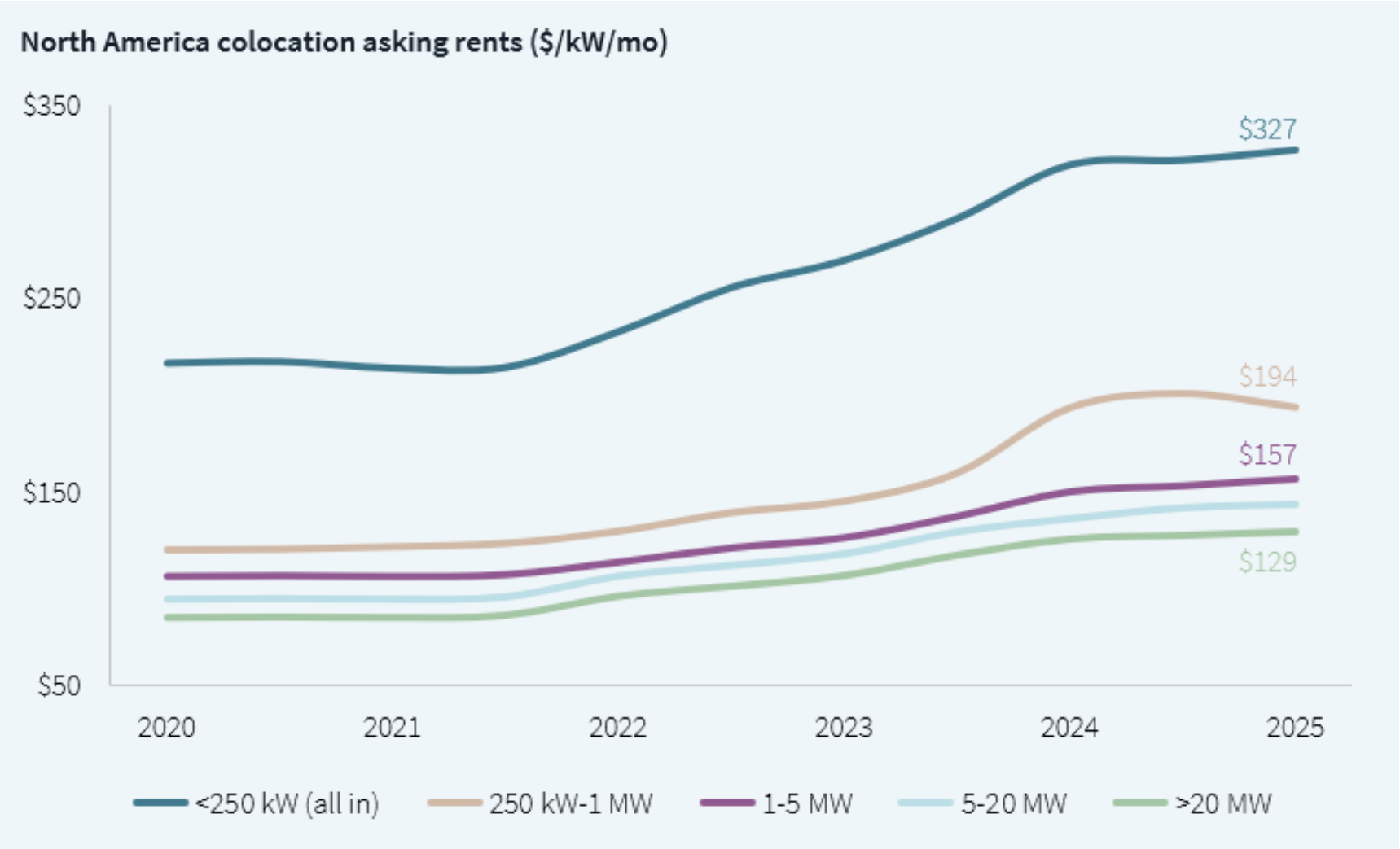


~11 NFL markets have doubled+ since 2020



SOURCE JLL Research, *North American Data Center Report Midyear 2025* .

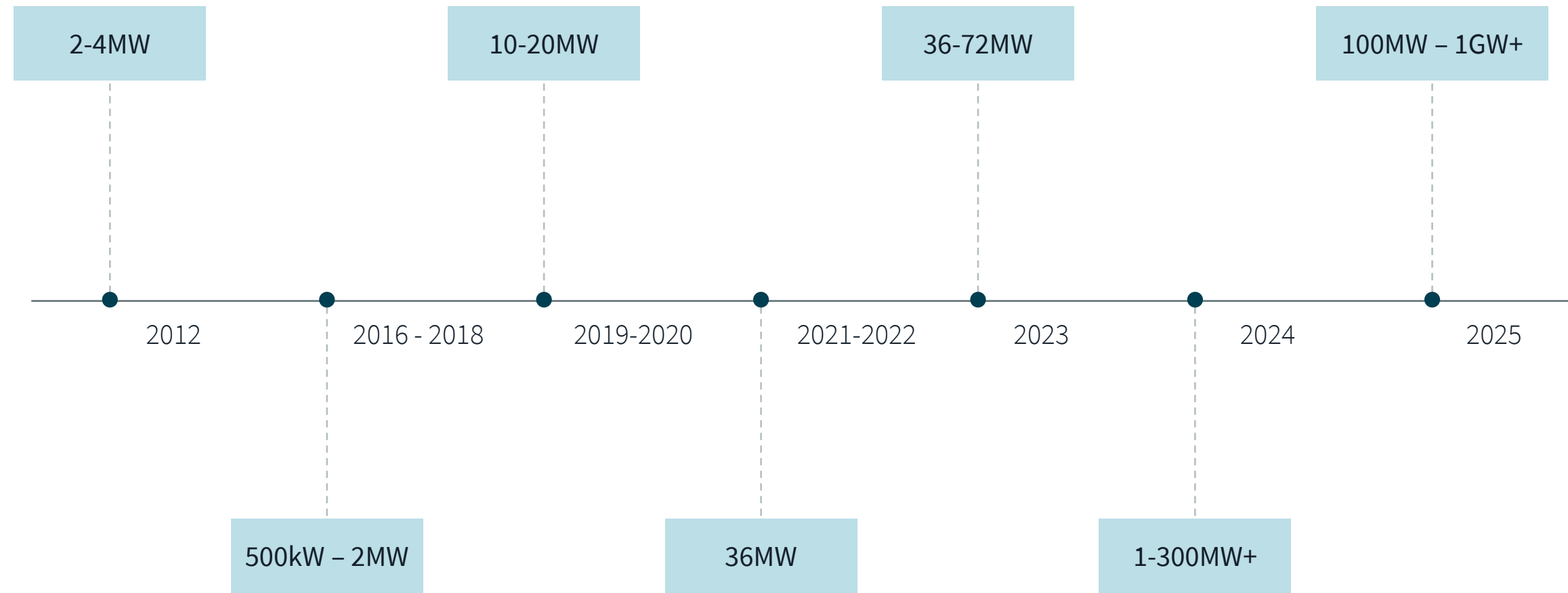
Colocation rents are up >50% since 2020 due to continued demand



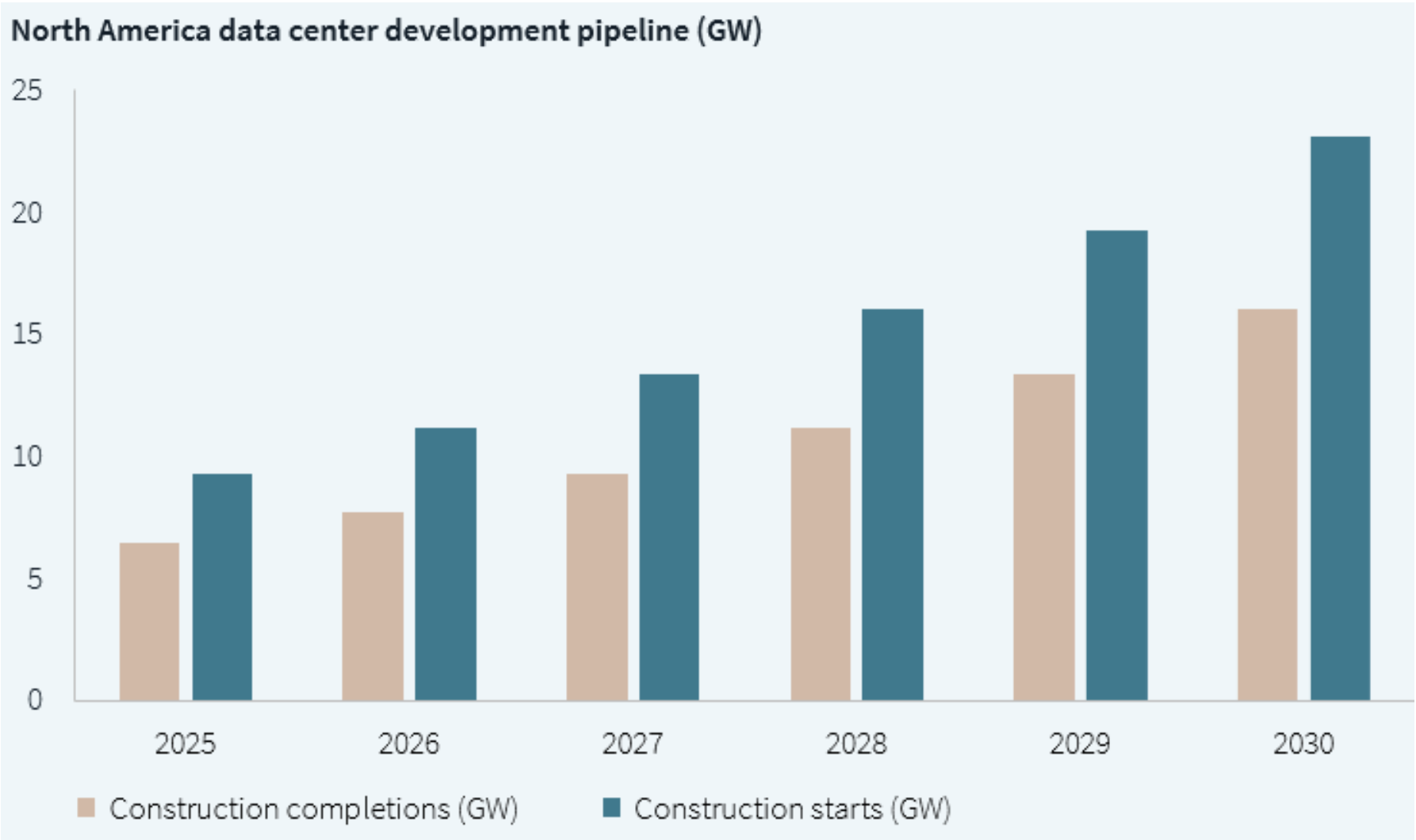
Source: JLL Research, North American Data Center Report Midyear 2025 .

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Transaction size 50x+ in last ten years



\$1 trillion of data center development will seek funding 2025-2030

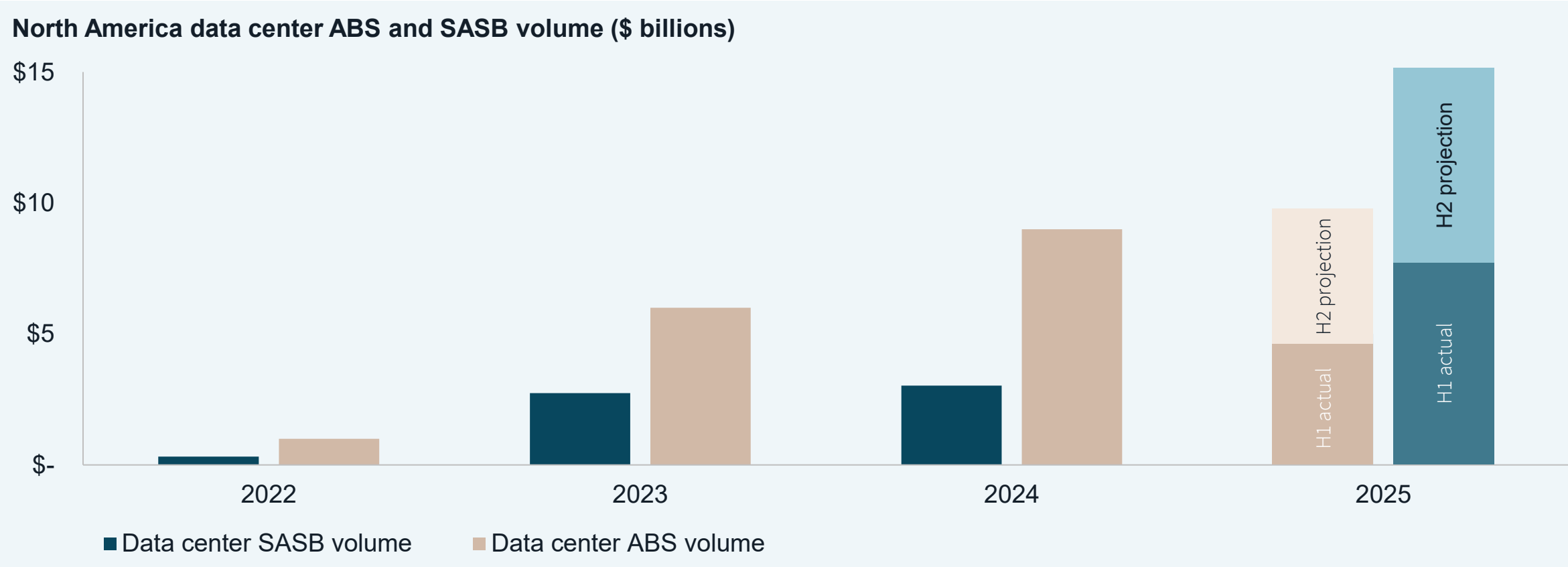


Source: JLL Research, *North American Data Center Report Midyear 2025*.

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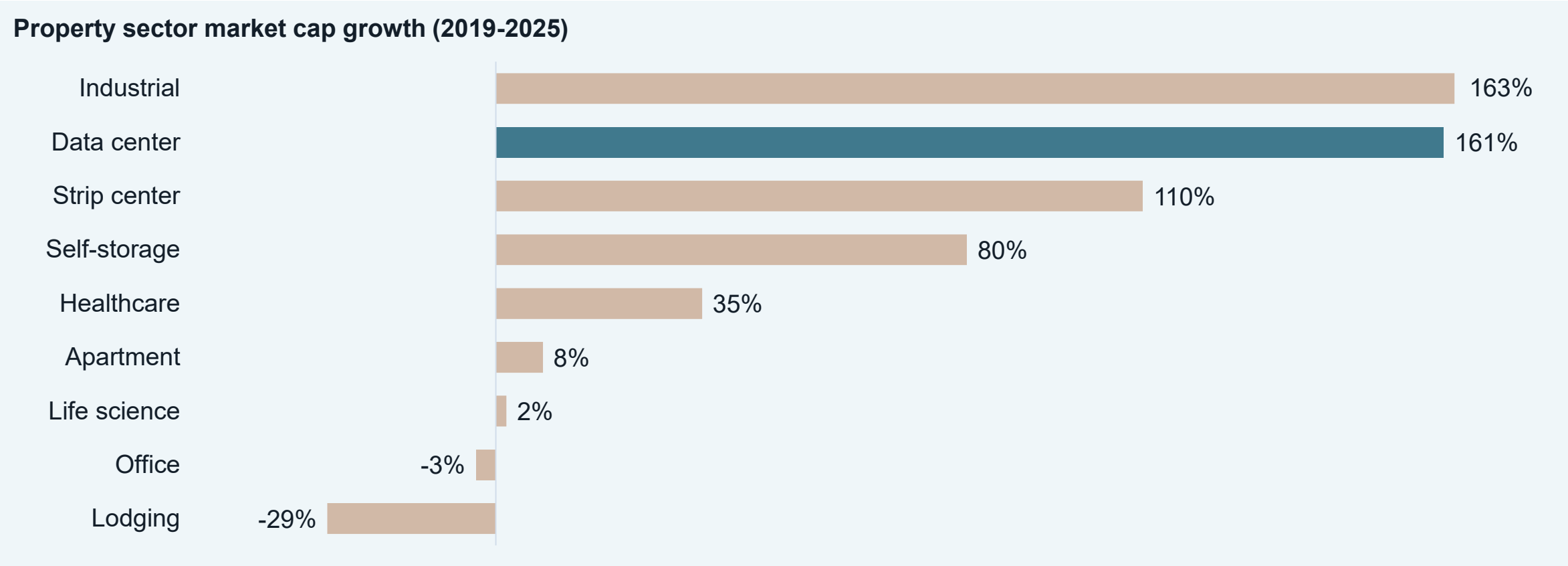
Data center secured debt issuance could increase 10x in 3 years

Asset-backed security (ABS) and single-asset single-borrower (SASB) loan activity is increasing for the third consecutive year. These funding mechanisms offer an alternative approach to refinancing projects versus selling assets at stabilization.



The data center investment thesis continues to attract new capital

The sector has seen an extraordinary increase in asset value driven by rapid supply expansion and intense investor interest. The lender pool depth continues to expand, inclusive of CRE banks, project finance lenders, life companies and debt funds.



Sources: JLL Research, Green Street
Note: REIT market caps taken as of 1/2/2019 and 8/8/2025
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FOR CLIENTS ONLY



Constraint context

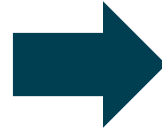
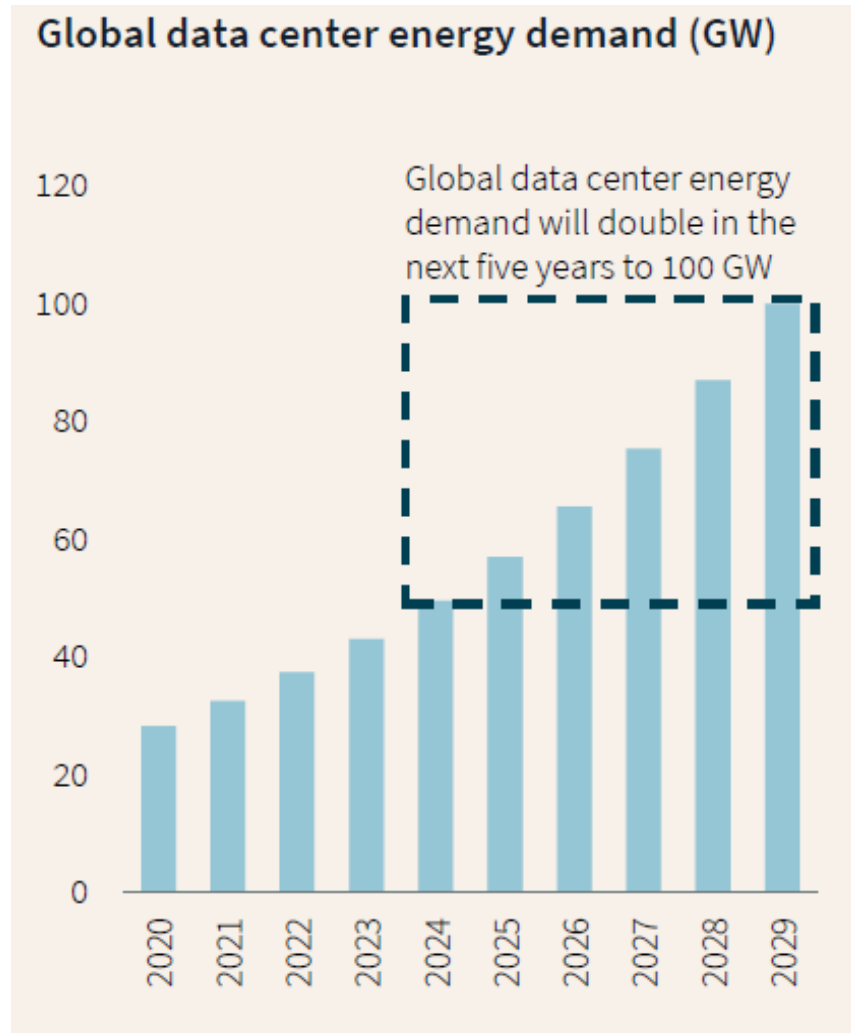
02

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**Your revenues are
power limited**

Jensen Huang
Chief Executive Officer, NVIDIA
GTC 2025

Doubling of demand coupled with more stringent connection requirements has made power the #1 site selection criteria & concern

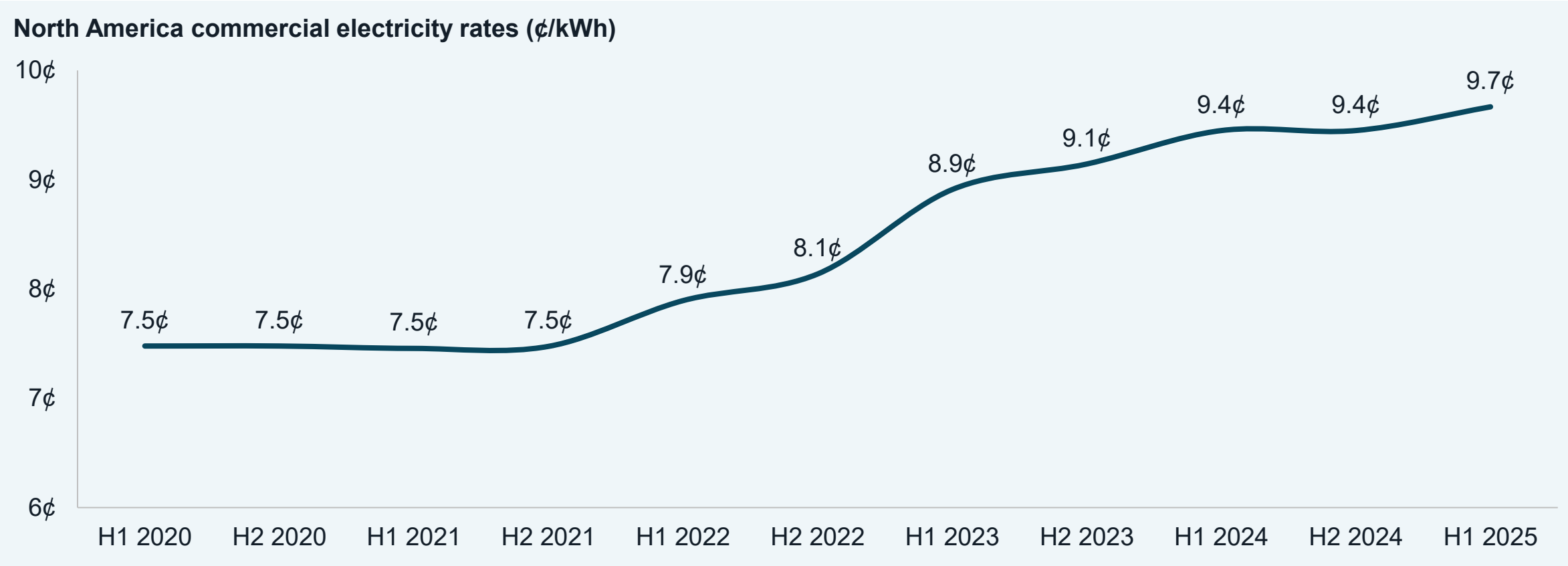


Utility policy updates for large loads:

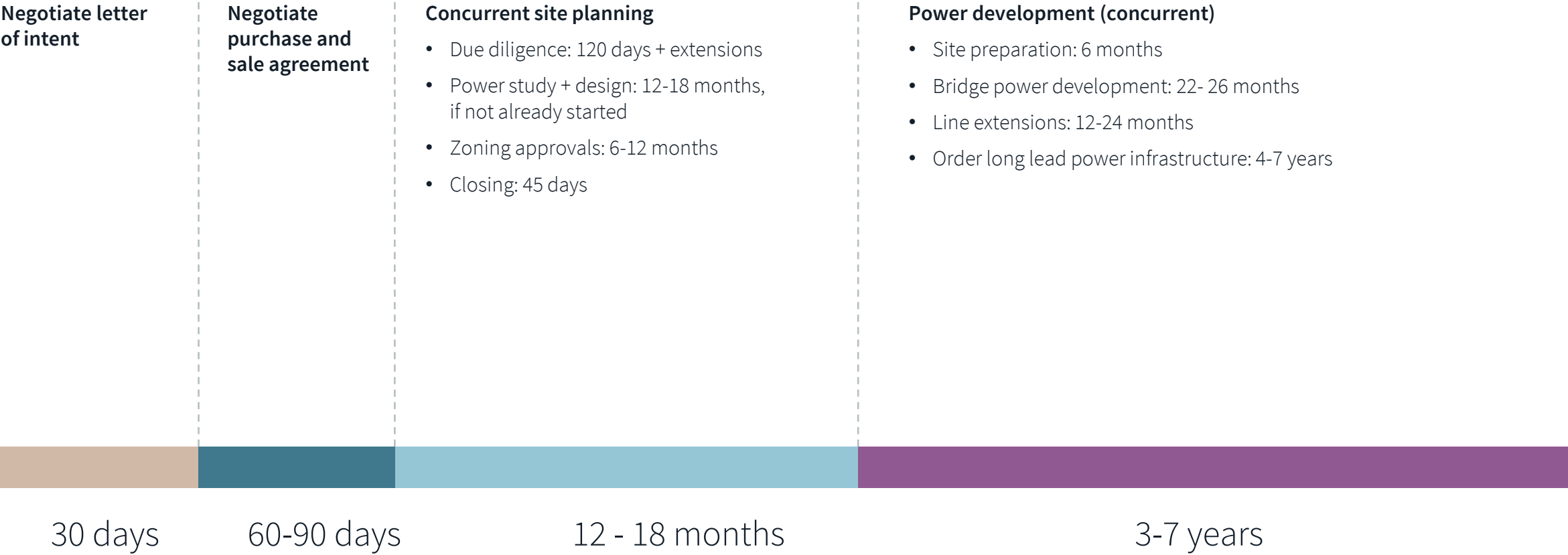
- Intake forms to assess power requests
- Application fees of \$200,000+
- Request queues and take-or-leave policies when your project is approved
- Upfront payments for infrastructure or costs are amortized over the contract period
- Take-or-pay clauses requiring customers to pay up to 85% of contracted power regardless if the power is used or not

Commercial electricity rates are up nearly 30% since 2020

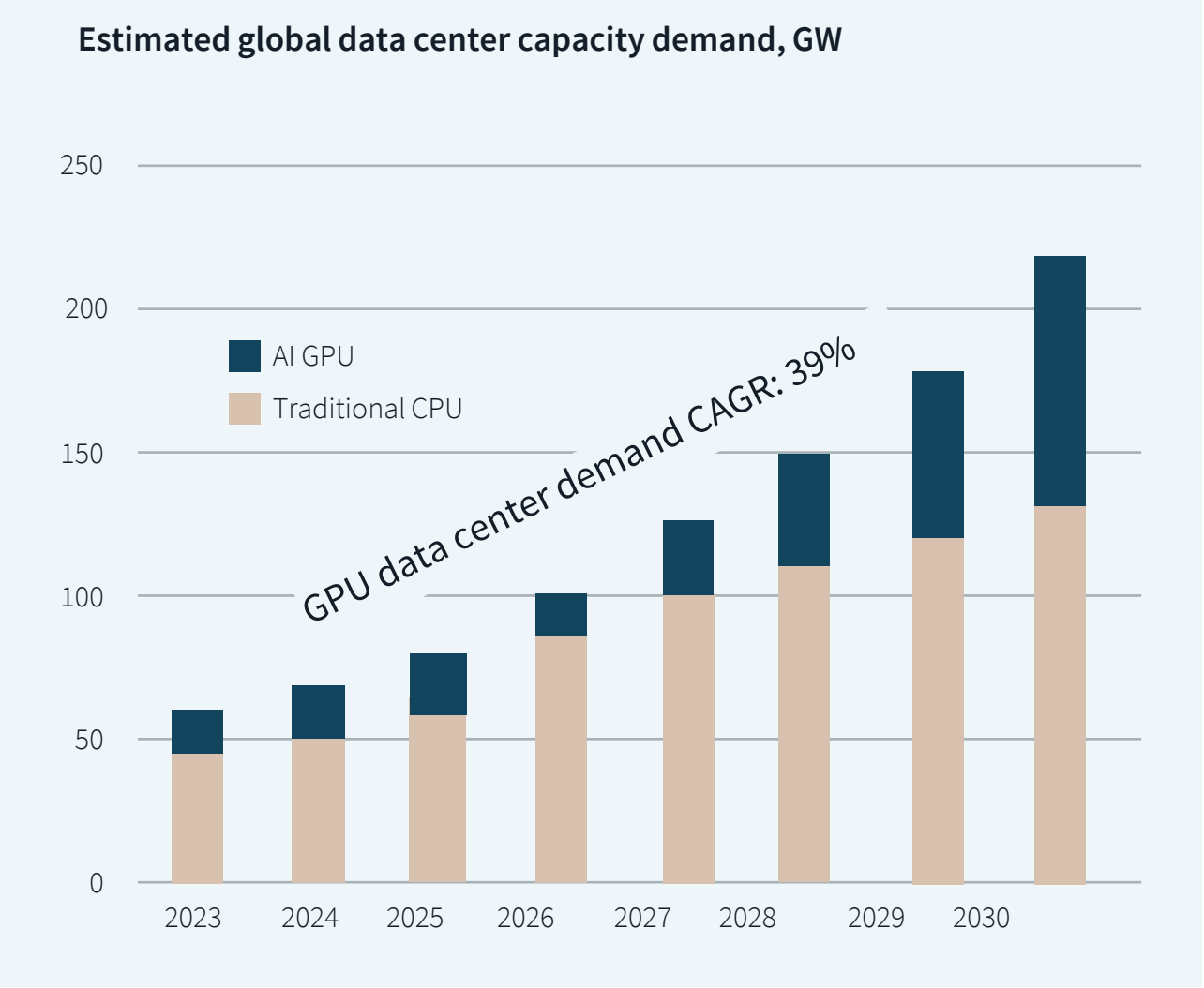
U.S. commercial electricity rates were stable from 2010 through 2020, but over the last five years rates have increased nearly 30% as utilities ramp up spending to address aging infrastructure and record electricity demand.



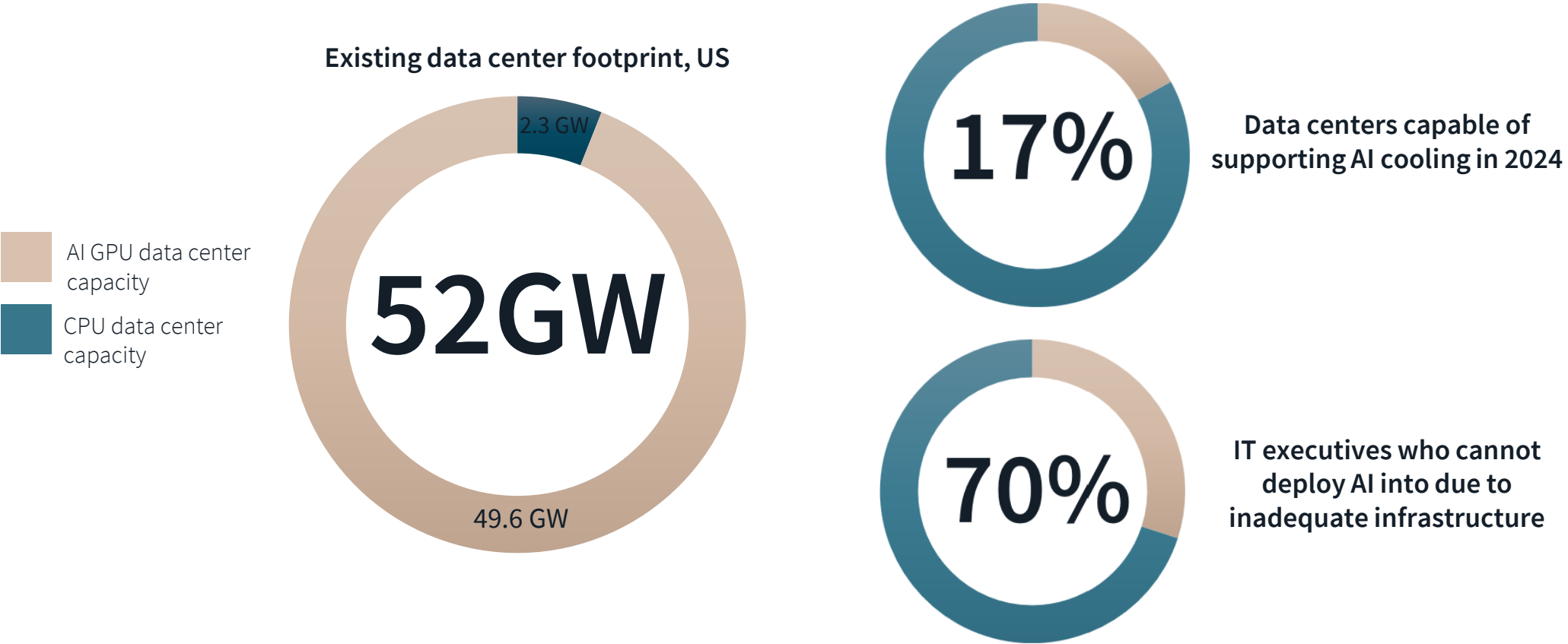
Site delivery timelines stretching out due to power development constraints



GPU-specific data center demand's 39% CAGR almost double that of CPU



<5% of built US data center capacity able to support GPU density, enterprises require retrofits



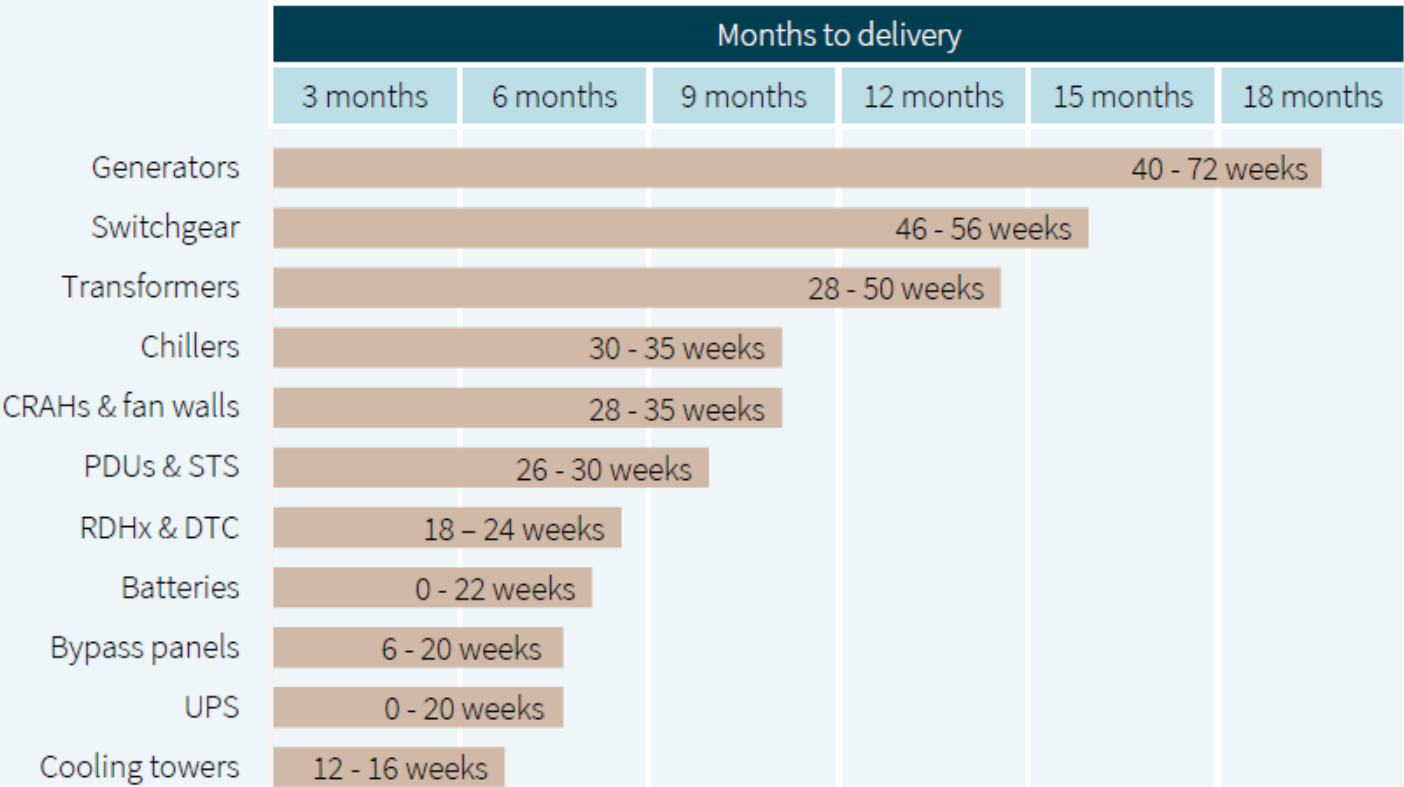
Despite efficiencies forced by pandemic challenges, voracious demand for data keeps CapeEx gear in long queues

Supply chains are improving, but challenges remain

Supply chains for data center equipment continue to be challenged. The COVID-19 pandemic was a stark reminder of the fragility inherent in global supply chains. And while the issues specific to the pandemic have subsided, today we are met with a new set of challenges.

One of the key challenges with equipment lead times is the increasing complexity of global networks. Mitigating geopolitical and trade uncertainties is an increasing risk. Client orders are also continually evolving due to the pace of technological change. And the exponential growth of data center development is pushing manufacturers to the limits of their production capacities.

Data center equipment lead times



Solution context

03

The formal inclusion of AI dominance in US industrial policy and national defense per *America’s AI Action Plan* should decrease time-to-revenue for the industry

AMERICA'S AI ACTION PLAN

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Creative Destruction's Invisible Hand is reshaping data center fuel at revolutionary rate

Grid power is the most affordable, reliable, and widely accessible source of electricity in North America. More than 90% of existing data centers receive their primary power from the grid, but concerns about supply is forcing rapid development of new sources

Natural Gas: The odds-on favorite fuel for both backup & primary power replacement via turbines, linear generators, etc. Large-scale development has already started based on access to natural gas transmission lines & new facility clusters

Batteries: Scalable in 5 MW increments for up to 4 hours. Generators still needed for longer durations. Good option for demand response. Cost competitive when paired with wind/solar.

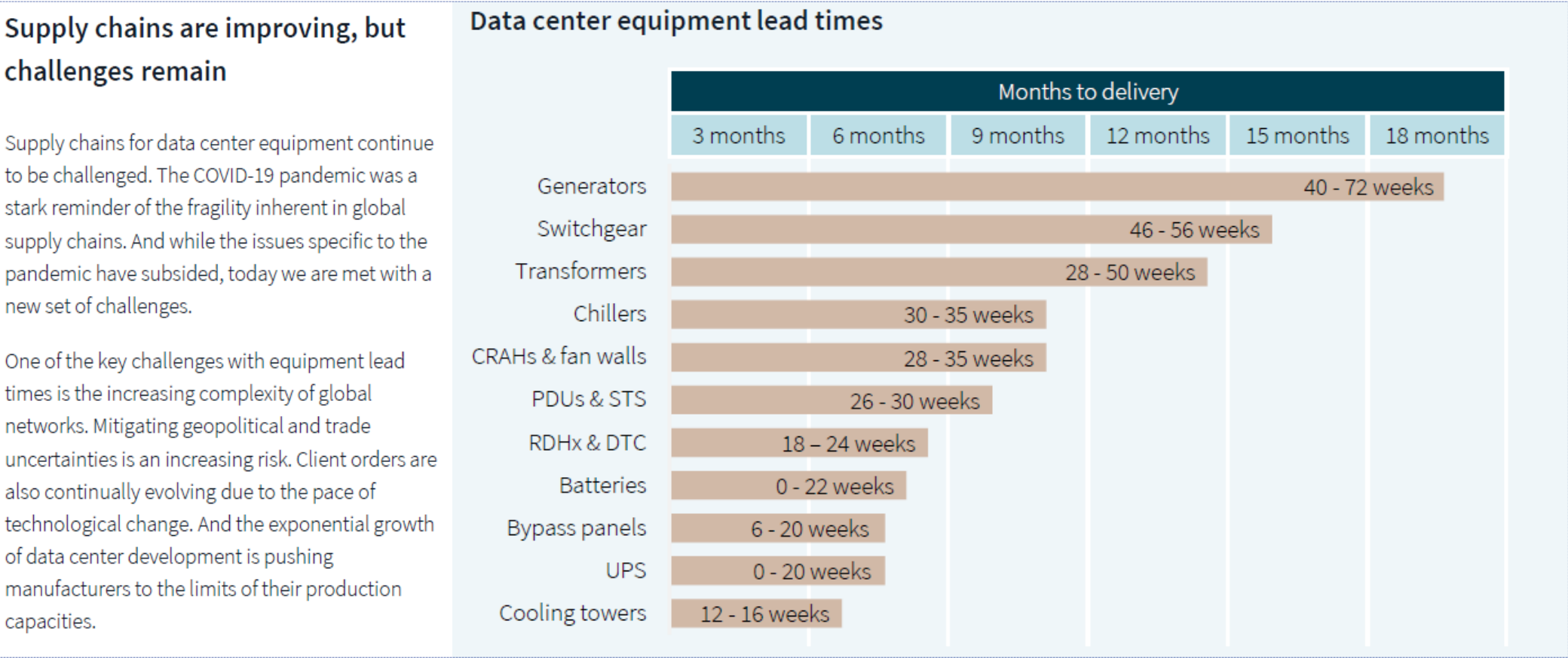
Nuclear: Very high interest, particularly for small modular reactors. JLL's 2025 Global Data Center Outlook includes a detailed examination of the future of nuclear power and data centers.

Hydrogen: A few data centers are currently running on hydrogen fuel cells. 100% hydrogen turbines are in development. Growth will be limited by infrastructure, supply and cost.

Fuel cells: Proven technology with more than 1 GW in use. Cost competitive and quick delivery. Can run on natural gas, biogas or hydrogen. Scalable to 80+ MW. Produces some emissions.

Solar/wind: Represents an increasing percentage of grid power, but the intermittent nature of wind and solar limits the applicability to supplemental data center power or offsets.

Adaptive Reuse accelerates time to revenue by obviating long lead supply chain issues



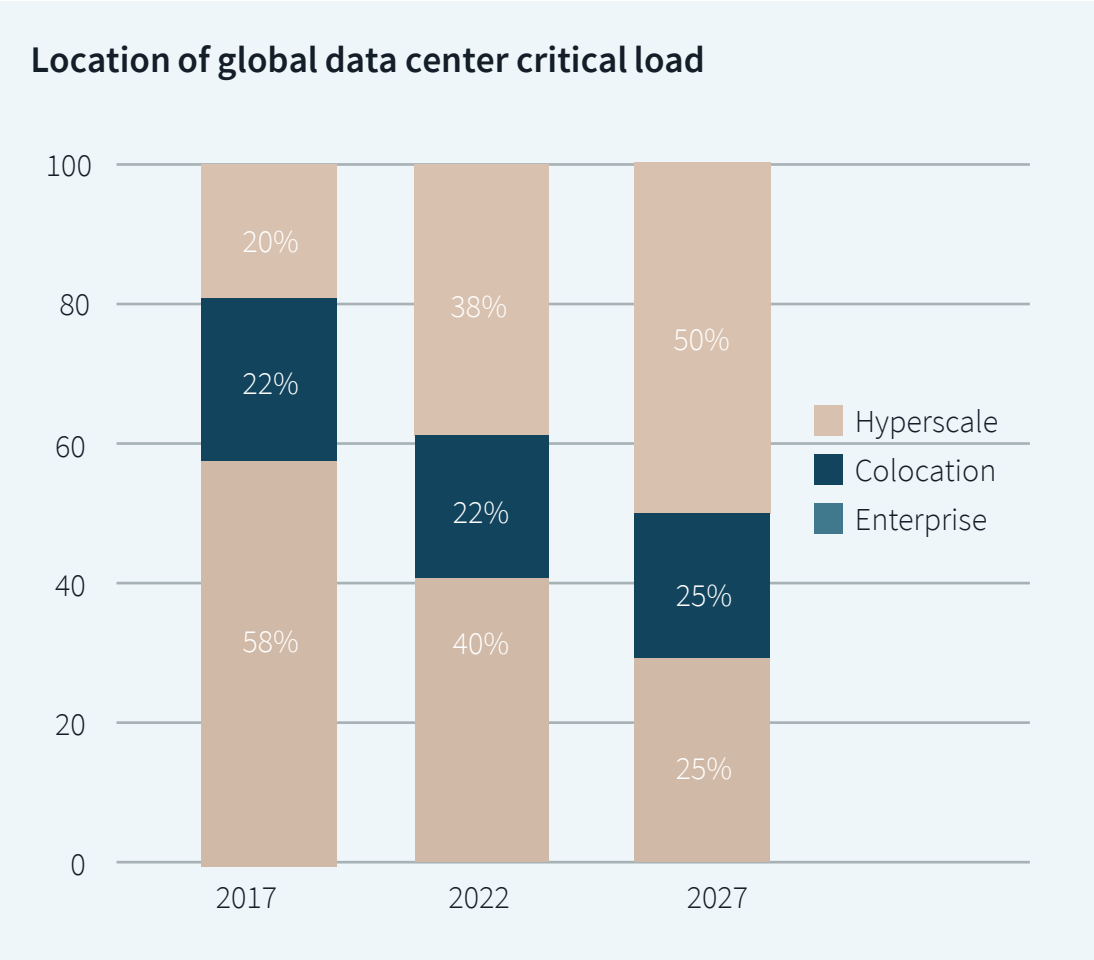
The data center industry was built on Adaptive Reuse

And in today’s power constrained world, it solves for energy and supercharges speed-to-revenue

<div>350 Cermak</div> <div></div> <div>RR Donnelley Printing Press</div>	<div>60 Hudson</div> <div></div> <div>Western Union’s “Telegraph capital of the world”</div>	<div>529 Bryant</div> <div></div> <div>Telephone switching station</div>	<div>1 Wilshire</div> <div></div> <div>Class-A office</div>	<div>400 S. Akard</div> <div></div> <div>Federal Reserve</div>
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“Future Fitting” on-premise facilities to free up gigawatts of stranded power

10+ years of data center consolidation, de-duplication and Cloud migration initiatives have left large swaths of power stranded in corporate headquarters. Although these sites cannot support the liquid cooling and power density required for GPU storage & compute, they have ample chiller tonnage, generators, staffing,



New NVIDIA architecture defines the sub-5MW data center

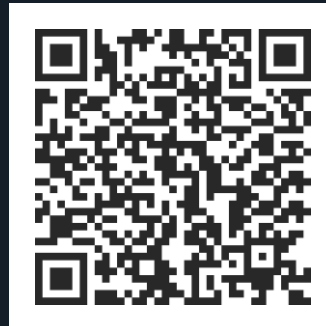
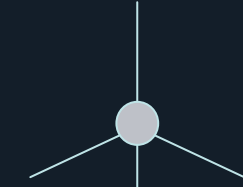
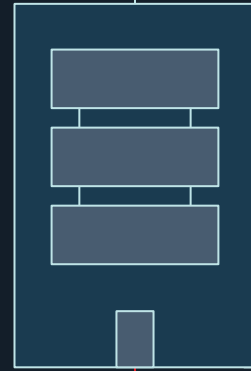
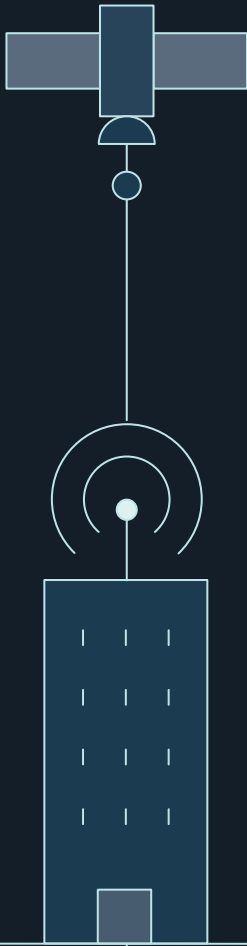
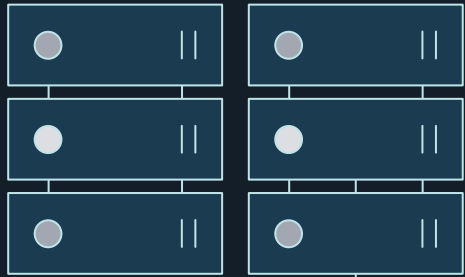
GB300 compute tray with 144 GPUs, 140kW/rack, 1.1MW+ in eight cabinets





Sean Farney

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Appendix

North America colocation statistics

Rank by existing capacity	Market	Inventory (MW)	Vacancy (MW)	Vacancy (%)	H1 2025 absorption (MW)	H1 2025 completions (MW)	Under construction (MW)	Planned (MW)	Avg rent <250 kW (all in) \$/kW/mo	Avg rent 250 kW-1 MW \$/kW/mo	Avg rent 1-5 MW \$/kW/mo	Avg rent 5-20 MW \$/kW/mo	Avg rent >20 MW \$/kW/mo	Average power rate (¢/kWh)
1	Northern Virginia	5,574	30	1%	647	620	1,067	5,900	\$300	\$220	\$168	\$155	\$155	7¢
2	Dallas-Fort Worth	1,539	43	3%	575	346	1,083	3,870	\$290	\$168	\$150	\$128	\$110	7¢
3	Atlanta	1,072	15	1%	150	123	1,112	1,203	\$255	\$153	\$148	\$140	\$130	7¢
4	Pacific Northwest	1,045	20	2%	34	57	267	227	\$318	\$170	\$148	\$140	\$135	10¢
5	Austin / San Antonio	921	25	3%	291	275	341	1,358	\$278	\$153	\$145	\$125	\$113	9¢
6	Phoenix	904	31	3%	10	100	1,307	4,154	\$325	\$200	\$180	\$180	\$125	8¢
7	Chicago	882	24	3%	368	16	1,184	2,950	\$313	\$165	\$160	\$150	\$140	8¢
8	Northern California	810	9	1%	29	-	686	3,000	\$375	\$305	\$200	\$190	\$170	15¢
9	New Jersey	531	23	4%	18	44	19	124	\$513	\$243	\$185	\$158	\$148	13¢
10	Columbus	506	5	1%	-	-	38	3,262	\$325	\$145	\$145	\$145	\$145	8¢
11	Toronto	380	9	2%	70	-	93	234	\$233	\$130	\$114	\$99	\$82	US 8¢
12	Las Vegas / Reno	362	4	1%	25	-	207	3,495	\$320	\$195	\$170	\$138	\$108	8¢
13	Southern California	355	48	14%	11	40	100	300	\$400	\$168	\$135	\$128	\$123	21¢
14	New York	192	4	2%	5	2	24	48	\$400	\$343	\$165	\$158	\$148	19¢
15	Salt Lake City	157	4	3%	-	-	228	885	\$325	\$200	\$180	\$180	\$125	6¢
16	Houston	151	32	21%	0	11	57	312	\$315	\$170	\$145	\$120	\$113	8¢
17	Denver	122	24	19%	7	10	36	304	\$275	\$170	\$135	\$118	N/A	6¢
U.S. overall		15,504	351	2%	2,241	1,644	7,849	31,624	\$327	\$194	\$157	\$144	\$129	8¢

NoVA is uncontested as the largest data center market



Chicago

Key themes

- Continued hyperscale and enterprise demand has tightened market conditions. With only a few large blocks available, competition is fierce for space delivering in 2025/2026. Providers are offering less flexibility on ramps, expansions and lease structures.
- The Biometric Information Privacy Act (BIPA) has stifled AI growth and pushed \$100 billion of investment into neighboring states.
- With constrained power and delayed delivery timelines, tenants are committing to space 18-24 months before delivery needs. Preleasing has become a critical strategy, especially for AI and cloud workloads requiring large contiguous footprints.

Market overview

- Vacancy remains at 3% as power constraints and long lead times delay new supply, pushing tenants to start leasing well ahead of deployment needs.
- Rental rates are up ~10% since 2024 due to limited supply and strong AI-related demand requiring dense power and cooling.
- Large contiguous blocks remain but are mostly reserved for hyperscalers, leaving smaller users with fewer quality options.
- Outer markets like Grayslake, Yorkville and Joliet are gaining traction as core submarkets run out of land and power.
- ComEd’s cluster studies, deposits and revenue guarantees are delaying timelines and forcing developers to reassess project viability, especially speculative ventures.

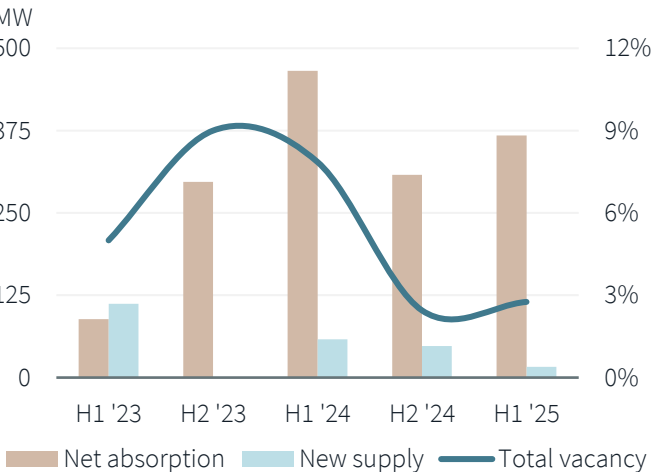
Outlook

- Chicago remains a top-tier market, but long power delays and regulatory issues will slow growth in 2027-2028.
- BIPA concerns may continue pushing AI-related demand toward neighboring states with less-strict privacy laws.
- Developers are turning to on-site solutions like gas turbines to offset four-to-five-year grid delays.
- AI demand is accelerating dense compute and advanced cooling, changing facility designs for future colocation and hyperscale builds.
- Operators offering ramp, expansion and lease flexibility, especially for <10 MW users, will be best positioned to win deals.

Fundamentals

Total inventory	882 MW
Total vacant	3% / 24 MW
H1 2025 net absorption	368 MW
Under construction	1,184 MW
Planned	2,950 MW
Rental rates 1-5 MW (\$/kW/mo)	\$155-\$165

Historical trends



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Matt Carolan | Vice Chairman | matt.carolan@jll.com

Austin/San Antonio

Key themes

- In Austin, growth is shifting outside of AES territory due to affordable land and better power access compared to the urban core.
- Absorption in Austin rises as new capacity comes online, with providers energizing large-scale developments in the market.
- San Antonio continues to serve larger federal and hyperscale requirements, creating limited availabilities for smaller requirements.

Utility power delays may push project completions to 2027 and 2028, prompting the exploration of microgrids and renewables.

Market overview

Outlook

- Limited access to new power in the San Antonio market poses challenges for operators.
 - Large hyperscale users have begun occupying allocated space north of Austin.
 - The rise of AI workloads continues to fuel demand in both markets, as end users look to absorb any availability of capacity.
 - Development continues in Pflugerville, Hutto and Round Rock. New offerings arise in San Marcos.
 - Tract's acquisition of 1,515 acres in Caldwell County signals strong confidence in the future growth of the Central Texas market.
- Keep tracking changes in utility schedules to stay informed about power delivery timelines; utilities in both markets face strain from data center demand.
 - Utility power delays may push project completions to 2027 and 2028, prompting the exploration of microgrids and renewable partnerships.
 - Groups will continue expanding outward from Austin and San Antonio into areas served by other electric utility providers, including cooperatives.
 - As Austin's tech sector expands, local companies will increasingly seek colocation capacity in Central Texas, fueling demand for further market development.

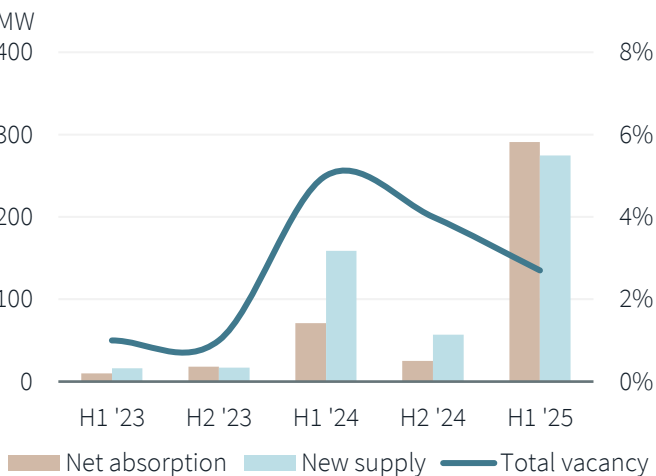
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Landry Shive | Associate | landry.shive@jll.com

Fundamentals

Total inventory	921 MW
Total vacant	3% / 25 MW
H1 2025 net absorption	291 MW
Under construction	341 MW
Planned	1,358 MW
Rental rates 1-5 MW (\$/kW/mo)	\$125-\$165

Historical trends



Atlanta

Key themes

- Atlanta's data center market size doubled since 2023 and is on pace to double again in 2026.
- Access to power drives the data center sector, but the utilities have introduced new guidelines and requirements.
- Speculative power-land plays struggle without hyperscaler credit to obtain the power commitment.
- Entitlement challenges increase with public pushback on data center rezonings.

Market overview

- Significant headwinds for future data center development including rezoning pushback, moratoriums and costly power commitments.
- Utilities have introduced new guidelines, and power-land plays are struggling to obtain power without hyperscaler credit.
- Despite challenges, data center projects under construction remain at an all-time high.
- The Atlanta data center market size doubled since 2023 and it's on pace to double again in 2026.
- The industry has a new perspective on natural gas, shifting from hazardous risk to a source of on-site power generation.

Outlook

- There will continue to be demand for data center sites in Atlanta/Georgia given the number of hyperscalers that have committed to the area.
- Speculative developer land contracts will likely get squeezed out with the zoning challenges and new power policies.
- Pushback on data center rezoning will remain a headwind.
- Well-funded, energy-minded problem solvers and businesses are breaking into the industry to meet insatiable power demands.
- Economic incentives remain attractive for data center development.

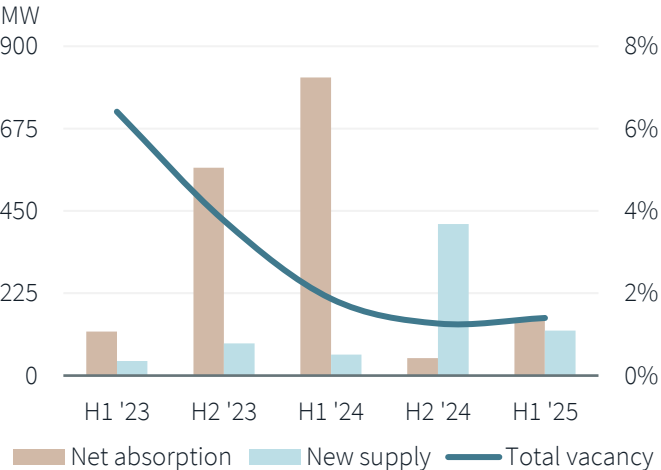
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Leigh Martin | Sr. Managing Director | leigh.martin@jll.com

Fundamentals

Total inventory	1,072 MW
Total vacant	1% / 15 MW
H1 2025 net absorption	150 MW
Under construction	1,112 MW
Planned	1,203 MW
Rental rates 1-5 MW (\$/kW/mo)	\$140-\$155

Historical trends



Dallas-Fort Worth

Key themes

- Exponential growth in cloud computing and AI/machine learning applications has driven absorption levels.
- Despite robust demand, utility constraints and power delivery timelines challenge development, with a renewed focus on self-generation and grid interconnection to support further expansion.
- With significant construction ongoing in the South Dallas submarket, data center providers and users are increasingly exploring westward expansion to grow their presence.

Market overview

- DFW’s robust fiber network and proximity to major cloud regions enhance its appeal as a connectivity hub for hyperscale and enterprise users.
- Despite strong growth, power constraints have delayed some projects. Utility providers are working to expand capacity, but lead times for equipment and grid connections have pushed back a handful of delivery dates beyond 2026.
- Hyperscale and AI/ML users have fueled unprecedented demand for capacity in the market.
- Nearly 80% of supply under construction is preleased
- New entrants to the market are stymied by uncertainty around power timelines.

Yuma Morris | Senior Associate | yuma.morris@jll.com

Outlook

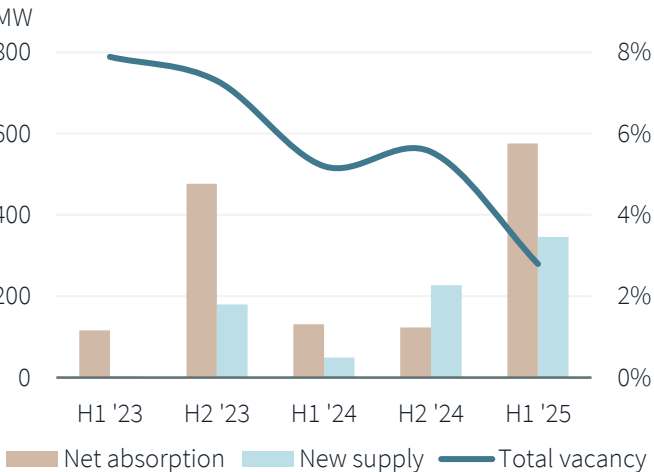
- Persistently low vacancy rates will continue due to supply chain and utility limitations slowing new deliveries, driving upward pressure on rents and sale prices.
- South Dallas and Fort Worth will see increased development as prime areas reach capacity, diversifying the market footprint.
- Anticipate a substantial influx of new capacity over the next 24 to 36 months, significantly increasing the market’s supply.
- Continue to track changes in utility schedules to stay informed about power delivery timelines.
- Hyperscalers and major developers will explore sites further west and south, outside the EPA’s severe nonattainment zone, to enable behind-the-meter power solutions.

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Fundamentals

Total inventory	1,539 MW
Total vacant	3% / 43 MW
H1 2025 net absorption	575 MW
Under construction	1,083 MW
Planned	3,870 MW
Rental rates 1-5 MW (\$/kW/mo)	\$130-\$170

Historical trends



Northern Virginia

Key themes

- Dominion Virginia Power has established a “batching system” in reaction to overwhelming customer demand. Lead time for engineering studies is expected to increase dramatically.
- Preleasing and build-to-suit commitments remain strong, accounting for 88% of total absorption.
- The lack of available inventory has driven colocation lease rates up by more than 34% over the last two years.
- The emergence of the I-95 submarket is being moderated by Dominion’s backlog, equipment deposits and credit requirements.

Market overview

- Market-ready inventory has been scarce, at less than 1%, for the past 14 quarters. Almost all (88%) of the new inventory expected through 2026 is already preleased.
- Absorption in H1 2025 was 647 MW (407 MW of MTDC and 240 MW of Shell). Cloud and technology requirements accounted for 77% of demand.
- Average colocation rates above 1 MW have risen 10% from year-end 2024 levels and 34% from year-end 2023 levels.
- AI workloads continue to pay a premium to secure space in the NoVA market due to persistent supply constraints.
- Loudoun County land prices continue to increase, with a high watermark of \$4.8 million per acre.

Jeff Groh | Vice Chairman | jeff.groh@jll.com

Outlook

- The market is critically short on immediate availability, and there is intense competition for all sizes of deployments.
- There is intense competition across all deployments with availability, placing upward pressure on rental rates. Tenants must act decisively to lock in needed facilities and energy.
- Given current market dynamics, providers with availability on the horizon are exceptionally well-positioned. Demand proves remarkably robust, even as prices climb.
- Based on Dominion challenges, we anticipate the supply/demand imbalance will persist for the foreseeable future.
- Behind-the-meter options continue to be more concept than reality in the NoVA market.

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Fundamentals

Total inventory	5,574 MW
Total vacant	1% / 30 MW
H1 2025 net absorption	647 MW
Under construction	1,067 MW
Planned	5,900 MW
Rental rates 1-5 MW (\$/kW/mo)	\$135-\$200

Historical trends

