S&P Global
Market Intelligence

451 Research 2026 Preview

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2026 Trends in Data Center Services & Infrastructure

AI continues to impact the data center industry and energy utilities, as data center providers and customers seek to lock in access to large amounts of power to support AI adoption. However, even though adoption of generative AI and other types of AI is strong, it is difficult to know how much infrastructure will be required and where. To meet the power requirements of AI infrastructure, utilities are planning to build additional gas-fired power plants or keep coal-fired power plants online, raising sustainability concerns as well. AI requirements will continue to affect the industry, and data center demand will remain strong. However, there could be some major shifts in data center design and location, as well as some proposed facilities that either do not get built or are built later than planned.

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Table of contents

Executive summary

Introduction

For decades, data centers have been essential infrastructure for IT expansion worldwide. However, the launch of ChatGPT in November 2022 sparked a generative AI boom and a race to build infrastructure for GenAI model training and use. This AI training infrastructure requires more energy and more efficient cooling than typical IT infrastructure, which impacts data center design, requires new construction and makes access to electricity a key potential bottleneck for the growth of AI. As utilities struggle to determine how much energy data centers will require over the longer term, fears are mounting that infrastructure could be over-built and demand may not materialize.

The size and quantity of data centers have attracted scrutiny from governments, local citizens and environmental groups. Governments (and utilities) have restricted data center development in various markets even as the industry becomes more efficient and seeks to use renewable energy. AI training facilities can theoretically be placed in locations where electricity is available, away from population centers; however, it is not yet clear how much AI inference can be performed from those locations. Data gravity, as well as regulations, will impact IT workload placement, along with the need for interconnection between data, software, AI models and end users. We believe that the need for data centers will continue; however, some of the current build plans may not materialize or may be delayed.

About this report

Reports such as this showcase insights derived from a variety of market-level research inputs, including financial data, M&A information and other market data sources both proprietary to S&P Global and publicly available. This input is combined with ongoing observation of markets and regular interaction with vendors and other key market players.

This report specifically includes data from the following sources:

- Data Center Services & Infrastructure Market Monitor & Forecast
- Voice of the Enterprise: Data Centers, Colocation 2025
- Voice of the Enterprise: Data Centers, Liquid Cooling Technology 2025

The Take

We continue to see large-scale plans for data center construction around the world to serve GenAI needs, even as concerns grow that not all the planned infrastructure will be required (or that it will be commercially viable to build). Although the adoption of generative AI and other types of AI is strong, it is difficult to know how much energy and data center infrastructure will be required and when. We believe that the data center industry itself is relatively agile and can quickly adjust or suspend build plans to match the demand for IT infrastructure. However, power infrastructure is not typically as agile or quick to build, which can create a potential mismatch between electrical system plans and data center demand that may not materialize.

Sustainability remains a key concern, and a top question is whether AI infrastructure will lead to extended lives for coal-fired power plants or the construction of additional gas-fired power plants, which could impact carbon targets. We will continue to model how AI adoption is likely to affect data center demand as well as work with our S&P Global Energy colleagues to model the energy industry's response. We will also continue to examine new technological advances, supply chain challenges and the regulatory environment for data centers.

Trends we anticipate in 2026

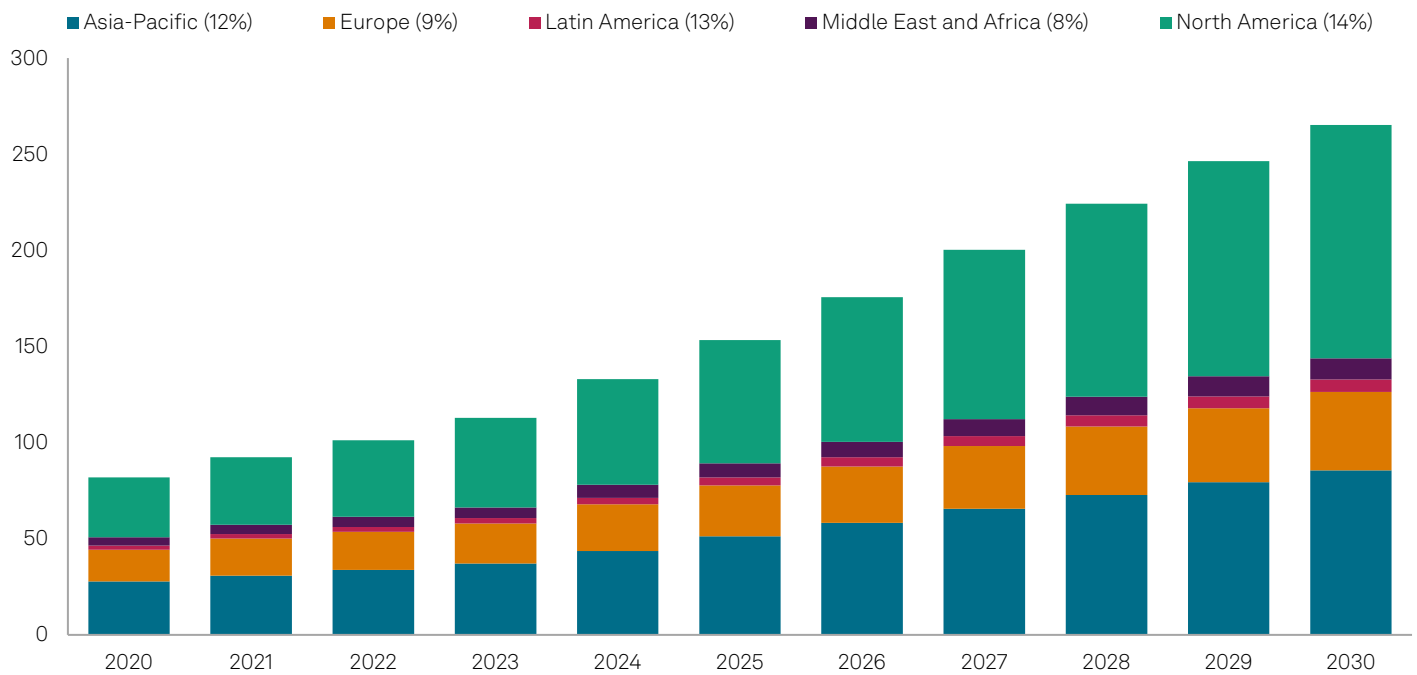
Trend 1: Race to build AI data centers will continue

Since the launch of ChatGPT in November 2022, cloud hyperscalers and leading generative AI firms have engaged in what can only be described as an AI arms race. OpenAI, Google, xAI, Microsoft, Amazon, Oracle, Meta, Alibaba and others have committed hundreds of billions of dollars to train large language models in the hopes of gaining first-mover advantage and being recognized as having the "best model."

This approach is exceedingly resource-intensive: Training a top LLM can use tens of thousands of graphics processing unit chips, each requiring 5-8 times (or more) the energy of other chips. These must be housed in data centers, along with data storage gear, other computational hardware and networking equipment. This AI demand has been particularly strong in North America so far, as most generative AI models have been developed in this region. However, firms have been laying the groundwork to develop large-scale AI data centers outside the US.

Although some "prospector" data center builders are included in this forecast, as well as some duplicate plans for expansion that may not materialize or be delayed, we expect strong data center growth to continue globally in the immediate future.

Figure 1: Data center growth by region (all types of data centers, GW of IT power), CAGR 2024–2030



Source: 451 Research's Data Center Market Monitor, September 2025.

Trend 2: Data center constraints will impact location and speed of builds

Multiple factors determine data center location, and several of these are facing growing constraints. The first is related to AI use cases. There are relatively few location requirements related to AI workloads — AI model training can generally be carried out quite a distance away from where end users are located, for example. However, we are tracking AI use cases to monitor the need for AI inference or training that requires rapid connectivity or specific data constraints (e.g., due to data sovereignty requirements) and would need to be in a specific location, such as near urban centers.

Another location factor is available power. Firms expecting to benefit from AI infrastructure demand, such as hyperscale cloud providers, are seeking to lock in as much power for future data centers as possible to avoid having their growth restrained by energy availability and potentially losing out to competitors that have access to more power. However, it is unclear exactly how much power will be required. This creates challenges for energy utilities, particularly if they need to build additional generation capacity and transmission lines (which can take years) to meet this expected demand.

Many of the most desirable data center markets already face constraints related to power, including potential shortages of generation capacity or challenges in building transmission lines. These include PJM (which covers top data center markets such as Virginia, Ohio and Pennsylvania) as well as ERCOT (Texas). Data center developers increasingly face a choice between waiting years for a grid connection in a desirable location, seeking a less desirable site with faster access to grid power, or using behind-the-meter power (e.g., constructing a natural gas-fired power plant).

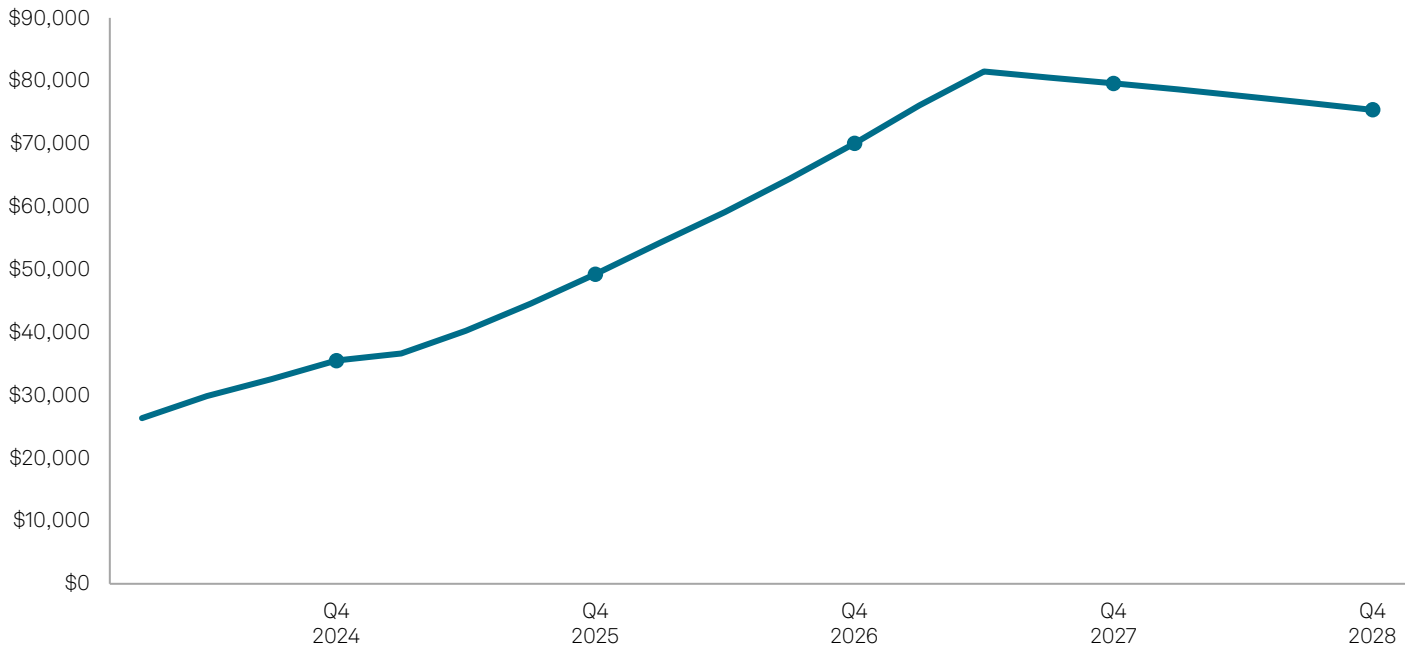
Additional location factors include electricity costs, taxes, regulations, local resistance to data centers, availability of fiber, type of power available (e.g., from renewable sources), water access, suitable land and the ability to plug into district heating systems or other off-takers for heat. We are developing a model to weigh the trade-offs among data center locations to build scenarios for growth by area and the resulting market for behind-the-meter power options.

Trend 3: The ability to raise capital will be a key differentiator for data center providers and customers

Organizations have invested massive amounts of capital in AI infrastructure so far, with continued eye-watering amounts expected, even without factoring in the costs of AI chips, servers and electrical infrastructure, such as transmission and generation. In the US alone, we project average spending on data center construction of more than $70 billion per quarter from 2025 to 2028.

Numerous firms are hoping to enter the sector, and those with access to capital and experience in securing land, power and permits will be better positioned for success. New entrants can add competition in some locations, but they can also offer data center providers the opportunity to sell facilities that are already leased — with predictable revenue and appeal to investors — freeing up capital to build new facilities elsewhere. Vertically integrated models are also emerging, with energy companies, for example, entering the data center industry. Business models are evolving to become more specialized in managing capital, obtaining permits or power and serving particular customer segments. We will continue to explore how these data centers will be funded, how the industry is evolving and the business models that are emerging as a result.

Figure 2: Quarterly US data center construction revenue ($M)



Sources: 451 Research's Data Centers Market Monitor, September 2025; S&P US Construction Forecast, November 2025.

Trend 4: The AI value chain will continue to support renewable energy

Top AI and cloud firms have maintained their renewable energy targets, as have many of the firms that build or lease data centers to these clients, even as their annual electricity consumption rises. Although many technology firms claim to offset 100% of their energy use by procuring renewable energy, they also have data centers that rely on carbon-emitting power generation. This is expected to increase in many locations, as added electricity demand requires utilities to delay the retirement of coal generation or add gas-fired power plants.

Additionally, data center firms themselves sometimes build their own gas-fired power plants if the grid cannot accommodate their needs. As a result, there has been a clear trend toward greater renewable procurement among surveyed companies, according to the "Global Datacenters Clean Energy Sourcing Strategy – 2025 update," with the share of power sourced from renewables estimated at 58%, versus about 50% in the 2024 report.

Power purchase agreements remain the primary method for renewable procurement, supplemented by unbundled certificates and green tariffs. While solar is a major source of supply, there is a growing emphasis on hybrid and nuclear solutions.

However, in many areas, even if sufficient renewable or low-carbon generation is planned, a mismatch may occur between when the power-hungry data centers need that energy and the time it takes to add that capacity (e.g., from nuclear power). We will continue to work with teams across S&P Global to track data center growth and its impact on both utilities and renewable energy.

As data center power demand continues to rise, the tech industry may provide financial support for expanding generation across the board, including both renewable and non-renewable resources. But the need to offset increased emissions could drive investment into higher-cost technologies such as nuclear, carbon capture and storage, and battery energy storage systems.

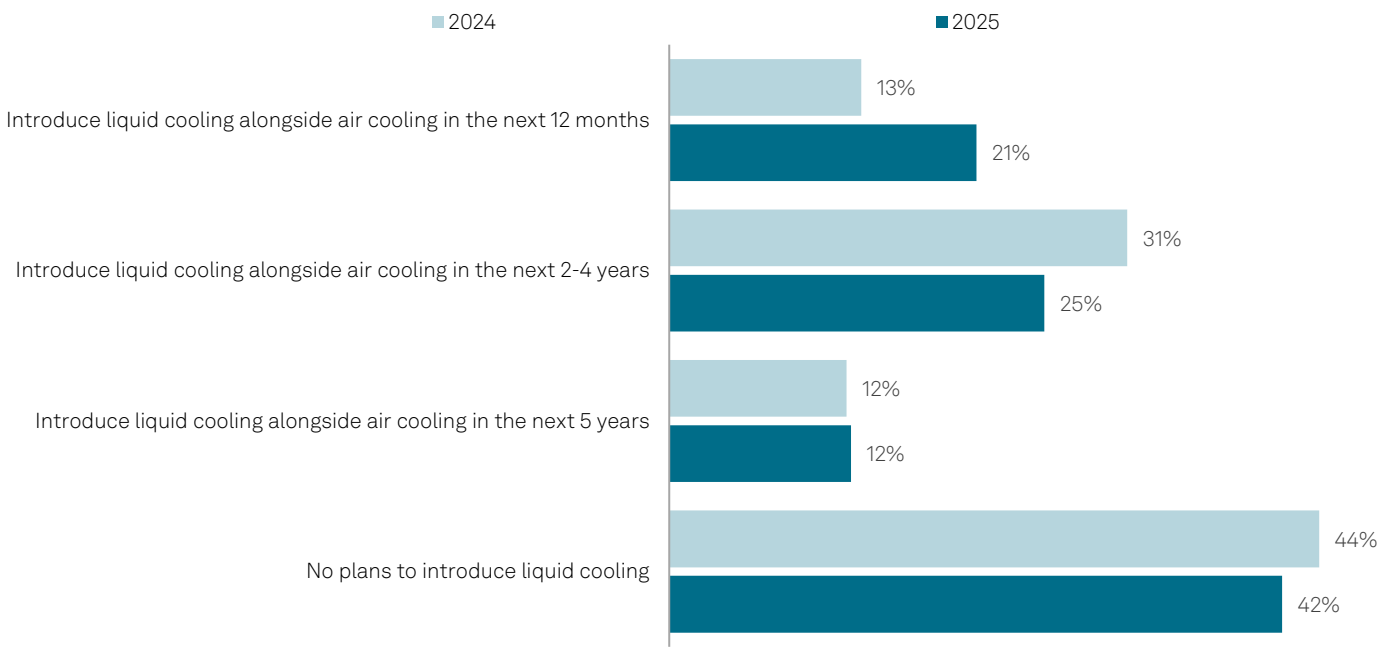
Trend 5: AI requirements encourage innovation in data center technology

AI workloads typically require high-density infrastructure at the data center level; however, this high-density equipment can generate a large amount of heat, testing the limits of standard data center cooling systems. Until recently, most IT equipment has been cooled using fans to pull cold air past the hot elements to remove the heat. However, as these components become smaller and hotter, they can reach the limit of what fans and cool air can do. Liquid is a more efficient cooling medium than air and has been used for some high-performance computing and advanced modeling, but it has not been broadly adopted in the data center industry for a variety of reasons. That may be changing. Our survey of enterprise data center decision-makers reveals that 21% of respondents plan to shift to liquid cooling over the next year, up from 13% in 2024's survey, with another 25% planning to switch over the next two to four years.

It helps that technological innovations have made liquid cooling easier to use and retrofitting operational data centers less costly. Most importantly, the increase in high-density workloads, combined with requirements that data centers be as efficient and sustainable as possible, is set to make liquid cooling a more logical approach than air cooling. After years of adoption for specialized uses, the combination of higher-density servers, liquid cooling innovation and sustainability benefits may finally lead to broad adoption.

In addition, the industry is looking at other technological advancements in backup systems, such as using alternatives to lead-acid or lithium-based batteries, using diesel alternatives for generators or replacing generators altogether with hydrogen fuel cells or renewable power sources. Data center firms are also exploring the reuse of heat by plugging into local district heating systems, as well as investigating ways to reduce embodied carbon. We plan to examine and compare many of these proposed technologies in the year ahead.

Figure 3: Enterprise approach to cooling in-house data centers



Q. Which of the following best describes your organization's plans, if any, to introduce liquid cooling to its primary data center?
Base: Respondents whose organizations use only an air-cooling system in their primary data center (n=100).
Source: 451 Research's Voice of the Enterprise: Data Centers, Liquid Cooling Technology 2025.

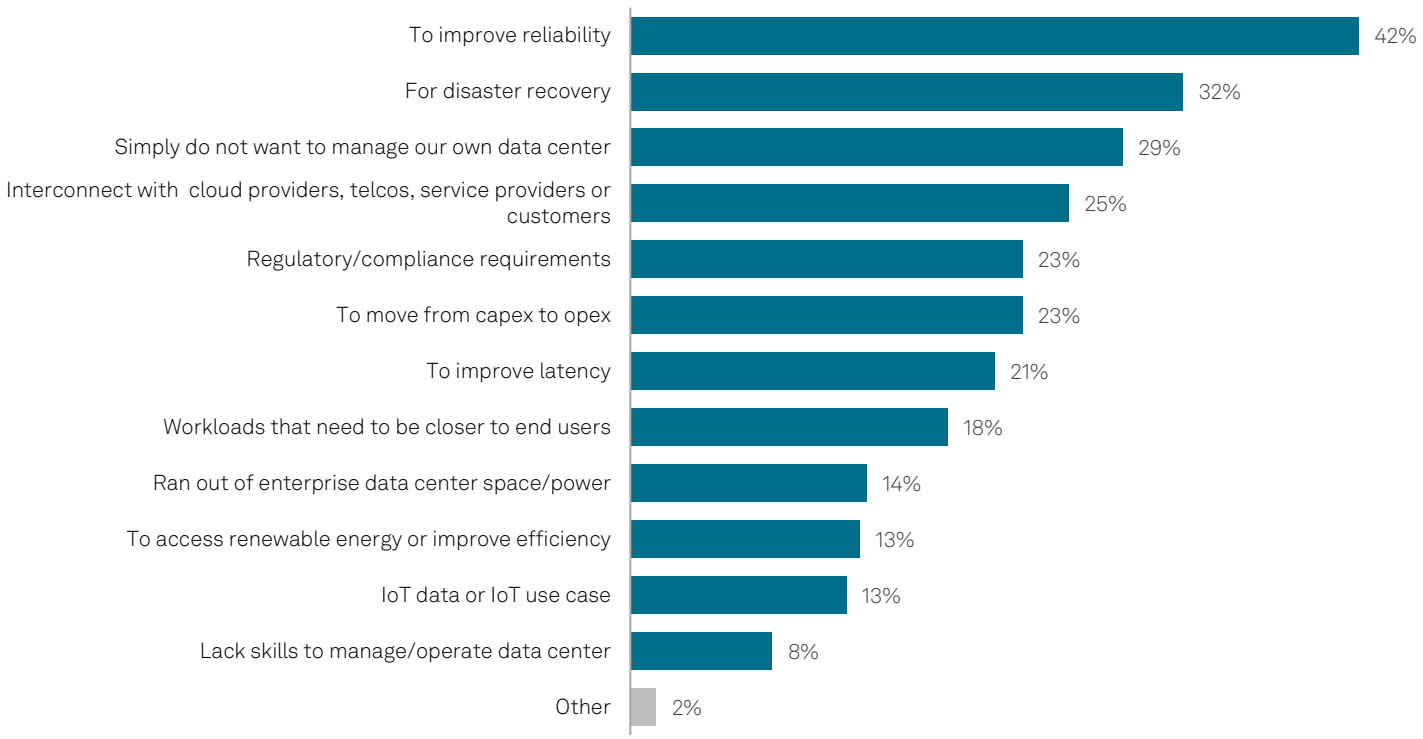
Trend 6: Interconnection will continue to drive data center demand

Companies that use colocation services increasingly point to interconnection — with public cloud, service providers, networks, partners and customers — as a key reason for leasing space in a data center (see Figure 4). As AI inferencing workloads grow, we expect these workloads to boost demand for interconnection. Inference workloads tend to be more dispersed — analogous to web front ends, as opposed to the training workloads, which are similar to back-end resources. This dispersed nature will impact network requirements, and these workloads are expected to require interconnection between AI modeling resources, data potentially stored outside of public cloud and diverse end users. Leased data center providers focused on interconnection typically have higher network density than other data centers and often have more large-capacity networks connected, which could help solve a key problem for enterprises regarding their AI workloads: network performance.

To improve interconnection services, data center operators should consider a cloud-native approach. This could include partnering with cloud-native wide area network providers to offer connectivity in a self-service form with quick turnaround. This would allow networking to become a fluid proposition that could respond to the needs of both AI and non-AI workloads flowing between public cloud (possibly from multiple cloud providers), as-a-service providers and private cloud.

In addition, data centers should think beyond interconnection to focus on helping enterprises wrestle with growing quantities of data. Leased data centers can offer a secure place to store data at a lower cost than public cloud storage, and with automated interconnection enabling that data to be used by applications residing in various clouds. This could be a differentiator for leased data centers, making them more appealing than public cloud for data storage and preferable to on-premises facilities for enterprises, thanks to their connectivity options. We expect to see continued growth and innovation around interconnection.

Figure 4: Reasons for leasing data center capacity



Q. Why does your organization rent space at a colocation provider? Please select up to 3.
Base: Organizations that rent space from a colocation provider (n=256).
Source: 451 Research's Voice of the Enterprise: Data Centers, Colocation 2025.

Trend 7: Data centers at the edge will become more important in an age of AI inferencing

AI inferencing, the process that a trained AI model uses to analyze new data, creates an unprecedented opportunity for edge computing. Inferencing must run somewhere, and every computing venue is a candidate, from processors on devices such as cell phones to large-scale public cloud venues. While some inference will certainly run on public cloud, some will also likely run closer to end users, at the edge. Much will depend on the use cases for AI: Applications that need to respond in real time will be more likely to run edge inferencing. However, the edge may also be attractive for enterprises that want more control over data. Enterprises have already noted in our surveys that top reasons for processing AI tasks at the edge include security and data sovereignty, not just performance requirements. Key questions for enterprises will be: Which venue will provide the necessary AI inferencing performance at the lowest cost and with the least complexity?

Network growth and innovation will also affect what data will be processed and stored at the edge and what will be moved elsewhere, as will changes to the infrastructure required to support these deployments (e.g., compute, storage, content delivery, accelerators, power, footprint, noise level, ruggedization).

Edge vendors or operators will need to satisfy requirements for low maintenance, space constraints and power conservation. Still, the use cases will vary enormously, so it may be hard for vendors to gain scale in an atomized market. The ecosystem of vendors, operators, financiers and network providers at the edge is evolving rapidly, so we will continue to follow this market.

Trend 8: Blockchain, cryptocurrency will offer both pros and cons for the data center industry

The cryptocurrency mining industry continues to add data center capacity, in many cases taking advantage of renewable energy or stranded energy, thanks to the relative flexibility of its workloads. Most miners build and operate their own data centers, and some are considering offering these capabilities to other enterprises, particularly those with similar computing profiles and requirements, such as firms with high-performance computing (HPC) and AI workloads. However, when mining companies build facilities specifically for AI or HPC workloads, they are typically closer to more traditional data center builds (e.g., with backup power and some redundancy of equipment) than mining facilities, largely due to client requirements. Thus, cryptocurrency firms are in some cases becoming competitors to traditional leased data center providers. We continue to monitor the cryptocurrency industry and its requirements, as well as blockchain, and the impact both have on the data center industry.

Trend 9: Geopolitics, regulation will continue to shape data center industry dynamics

Data center developers and operators will need to navigate an increasingly complex web of geopolitical pressures and regulatory requirements for AI infrastructure. Export controls on high-performance AI chips, particularly between the US and China, are affecting hardware availability and influencing which countries require the highest-density data centers. Data sovereignty and privacy regulations continue to drive demand for local data centers or edge deployments. In addition, some governments are offering incentives — such as tax breaks — to attract sustainable, high-tech infrastructure. Other countries are imposing strict environmental or water-use restrictions that constrain data center growth. Political stability and energy policy are emerging as key factors that AI players need to consider.

Regulators could add requirements to planning and approvals, such as targets for power use and efficiency or penalties that apply when data centers create a potential power imbalance in the regional grid. AI infrastructure players may need to seek off-grid or hybrid power sources to mitigate regulatory risk and reduce the time to market for their sites. We anticipate that regulatory and geopolitical factors will continue to influence global growth patterns. Companies with experience navigating these challenges that can rapidly adapt their infrastructure and sourcing strategies and coordinate well with local authorities will have a competitive advantage, particularly for large-scale facilities.

Methodology

S&P Global Market Intelligence 451 Research provides essential insight into key trends driving digital transformation across the entire technology landscape. By offering a combination of expert analyst insight and differentiated data, 451 Research enables the industry with the information and perspectives they require to make more effective decisions.

Reports such as this offer a holistic perspective on key trends and themes driving the technology space over the coming year. These markets evolve quickly, so 451 Research offers a wide range of research services that provide critical marketplace updates on an ongoing basis. These reports, datasets and perspectives are published frequently, in numerous short- and long-form formats. Forward-looking M&A analysis and perspectives on strategic acquisitions and the liquidity environment for technology companies are also updated regularly, backed by industry-leading databases such as the 451 Research M&A KnowledgeBase.

Our research is organized into channels that align with the prevailing key issues driving digital transformation. These channels are: Applied Infrastructure & DevOps; Cloud & Managed Services Transformation; Customer Experience & Commerce; Data, AI & Analytics; Data Center Services & Infrastructure; Fintech; Information Security; IoT, Edge & Digital Industries; and Workforce Productivity & Collaboration.

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Further reading

'Bring your own power' is an option for those that cannot wait, November 2025

2026 US Data Centers and Energy Report, November 2025

What happened to the data center slowdowns? October 2025

The Nordics: Sweden Leased Data Center Market, October 2025

State-level data center policies, then and now: Part 1, the major markets, October 2025

India: Leased Data Center Market, October 2025

Asset-backed securities pave the way for a new data center financing model in Europe, September 2025

Air cooling remains prevalent, but liquid cooling is gaining momentum – Highlights from VotE: Datacenters, September 2025

Beijing-Tianjin-Hebei datacenter market remains one of the largest globally, July 2025

Truths about how the power sector can (and cannot) respond to datacenter needs, April 2025

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