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Transformative Impact of Generative AI on Investment Growth in the Data Center Market: How the Market Is Poised to Change in 2025 and Beyond

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Since ChatGPT's launch in late 2022, businesses have adopted generative artificial intelligence (Gen AI) at a faster clip than both PCs and the internet.[1] As Gen AI has transformed from a promising technology to an investible asset in 2024, the demand for data centers – the critical hubs supporting Gen AI operations – continues to surge. To meet the projected demand in 2025 and beyond, the data center market must navigate significant challenges, such as escalating power and capacity constraints and evolving political and regulatory landscapes, which will require strategic collaboration among the market's key stakeholders.

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DATA CENTER CAPACITY AND POWER AVAILABILITY REMAIN THE BIGGEST HURDLES TO MARKET GROWTH, AS STRONG VALUE ENHANCEMENT FROM EARLY GEN AI ADOPTION DRIVES FURTHER DEMAND

The explosion in demand for data center capacity is well-documented.[2] Long-term, experts agree that the demand for capacity and the power required to support it will exceed projected supply, highlighting the need for enormous investment in both data center infrastructure and the grid that feeds it. Events in 2024 have already clarified the impact such issues are having on market expansion, as developers consider power availability as the most critical factor driving new data center builds.[3]

Less understood, however, is whether and how Gen AI will evolve to sustain this surging demand, especially given that no "killer application" has

yet emerged.[4] And the extent to which constraints on capacity and power availability will limit market growth depends largely on how quickly organizations can realize tangible value from Gen AI. As companies at the forefront of Gen AI adoption ramp up their allocation of capital – bolstered by promising reports of returns on early investments – we transition from a "proof-of-concept" phase to a clearer understanding of Gen AI's practical applications in 2025.

If positive use-case reports continue to bolster Gen AI's value proposition, the challenges related to power and capacity are likely to intensify in both the short and long term, driven by increasing demand from corporate boardrooms and investors.

SHIFTING POLITICAL AND REGULATORY ENVIRONMENTS POSE UNCERTAINTY AND POTENTIAL CHALLENGES FOR THE DATA CENTER MARKET IN 2025

Lawmakers played a key role in the U.S.'s climb to the top of the global data center market, as states across the country implemented legislation and incentives encouraging the development of large-scale data centers within their borders. This past year, however, a number of these politicians have started to re-think – and even scale back – many of these tax breaks following concerns around grid stability and clean energy generation. For example, while emerging markets in Ohio and Illinois continue to grow, developers are seeing a trend away from historically popular markets[5] – such as "Data Center Alley" in Virginia, where legislative studies are being conducted (with publication expected in Q4 2024) to assess how data centers are affecting electricity reliability and affordability.

On the federal level, there are many uncertainties regarding how President-elect Trump's economic policies will affect the data center market once he takes office in January 2025. While markets and investors in Gen AI may favor his proposals to reduce corporate taxes and regulatory burdens in the short-term, his proposed tariffs on foreign goods have spurred fears of increased costs for data center manufacturers that source many of their components internationally. Although Trump's ultimate stance on these issues and their long-term effects remain to be seen, the market has less-speculative issues to prioritize – such as the ways in which their key stakeholders can collaborate to meet growing demand.

DATA CENTER COMPANIES MUST COLLABORATE WITH UTILITIES AND POWER PRODUCERS IN DEVELOPING INNOVATIVE SOLUTIONS TO MEET SPENDING PROJECTIONS

For the data center market to achieve sustainable, long-term power generation, utility companies and data center operators must collaborate to develop innovative solutions that can meet the unprecedented demand driven by Gen AI. In 2024, the data center market's biggest players invested heavily in behind-the-meter solutions, including nuclear, solar, and wind on-site renewable projects designed to reduce grid reliance. While continued investment in these projects will be crucial for enhancing supply and alleviating supply-strain on utilities, often-lengthy regulatory and construction timelines will require industry players to identify and implement shorter-fuse solutions.

Utilities are expected to need to invest a projected $50 billion in new power generation capacity to support data center load growth by 2030, with liquidity being one of the primary constraints in this equation. Although utilities may consider raising capital through increased debt capacity or issuing more equity, they have been reluctant to raise rates amid concerns that the costs of data center growth will be passed on to residential consumers. To protect these customers, some utility companies have proposed new rate structures that require data centers to bear the full incremental costs of their increasing energy usage. As issues regarding these arrangements play out in 2025,[6] data center operators (and their cash-rich private equity backers and other partners) should be more willing to collaborate with utility companies in developing creative solutions. Beyond rate structures, we may increasingly see data centers and utilities come together by signing longer-term contracts, forming joint ventures, or implementing incentive programs and rebates that encourage the use of off-grid power or energy-efficient equipment.[7]

CONCLUSION

The rise of generative AI is reshaping the data center market, driving an unprecedented demand for digital infrastructure. As we approach 2025, the industry faces a number of critical challenges. Chief among them are power and capacity constraints, which could outpace supply and hinder growth. Addressing these issues will require substantial investment and strategic planning across the sector. Collaboration will be essential to overcoming these obstacles. Data center operators and utility companies must work together to develop innovative,

sustainable solutions to meet the rising energy demands of Gen AI. Additionally, shifting political and regulatory dynamics will add complexity to the landscape, requiring flexibility and coordination among stakeholders to navigate potential risks and uncertainties.

The future of the data center market therefore hinges on its ability to adapt to these evolving conditions. By fostering collaboration between operators, utilities, and regulators, the sector can ensure that the infrastructure needed to support Gen AI is resilient, sustainable, and scalable. This cooperative approach will be critical not only for the successful integration of Gen AI technologies into the global economy in 2025 and beyond but also for positioning the data center market to meet the long-term demands of an increasingly digital world.

Notes

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