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Powering growth: data centers impact muni issuers' risk and reward



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The rise of artificial intelligence has driven growth in U.S. data centers, creating economic opportunities for municipalities issuing bonds. However, these developments also present challenges, including creating tax incentives and meeting rising energy demands. More data centers could broadly impact the municipal market, expanding local tax bases and prompting electric utilities to issue bonds for energy infrastructure upgrades.

BY THE NUMBERS

- 5,400: number of data centers in the U.S., more than in any other country.¹
- 80%: U.S. data center capacity concentrated in 15 states (including VA, IL, TX and CA).²
- 4.4%: amount of U.S. electricity consumed by data centers, projected to reach nearly 8% by 2030.³
- 59%: U.S. utilities that are public power, representing 15% of electricity consumed.⁴
- \$26.8 billion: public power bond issuance in 2024, up from a 10-year annual average of \$14 billion.⁵

DATA CENTER EXPANSION REQUIRES BALANCING GROWTH AND ENERGY DEMANDS

The U.S. leads the world in data processing, and an increased number of data centers is necessary to meet growing demand. One estimate suggests there are nearly 5,400 data centers across the country, with another 1,400 currently under construction or proposed.

OPINION PIECE. PLEASE SEE IMPORTANT DISCLOSURES IN THE ENDNOTES.

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States and municipalities have competed to attract these operations, offering generous subsidies and long-term tax incentives. Some municipalities have seen tax revenues related to data centers surge, while others have seen limited local economic impact.

Data centers challenge the nation's electric infrastructure, as they require elevated amounts of electricity to operate. Many communities question whether households and regular businesses should shoulder capital expansion costs for the industry through higher rates on their electric bills, or whether a more holistic approach should be taken to pay for the required infrastructure growth.

Nuveen believes data center expansion may have broad implications for municipal bond issuers. Let's highlight two examples: local governments and electric utilities.

Local governments seek economic development and growing tax revenues

While data centers are potentially attractive for economic development, the actual impact on a local economy can be difficult to measure.

The initial impact on local employment during construction can be meaningful, with the average data center employing nearly 1,700 construction workers. But after construction, data centers require few staffers onsite, typically only security and IT staff, and support only about 160 local jobs.⁶ Favorably, those permanent jobs are typically highly skilled, technical roles and well-compensated, with an average annual salary of \$90,000.

Indirectly, data centers may assist in attracting other employers and their tax dollars to an area. Certain businesses rely on fast data processing, and establishing a location near a data center can reduce latency and improve network speed.

Additionally, many of the large-scale data center operators — such as Amazon Web Services, Microsoft, Google and Meta — operate workforce development programs in coordination with their data centers to improve the pool of available skilled workers. These programs have spillover effects that may benefit the broader local economy

WHAT IS A DATA CENTER?

A data center is a building that houses computer servers and routers. Data centers often co-locate in clusters to be closer to clients and cloud services users. Some are owned and operated by hyperscalers, companies like Amazon Web Services (AWS), Microsoft Azure, Meta, Google Cloud and Equinix. Others house servers that are rented to users. Servers run continuously and use 10 to 50 times more electricity per square foot than a typical office space.⁷ New chip technology has significantly increased the demand for data centers and the amount of energy required to operate them.

and in turn the credit quality of these local governments. A skilled workforce will attract businesses with similar technical workforce needs.

Tax policy management impacts tax revenue potential

Data centers generate state and local tax revenue primarily through sales and property taxes. Local governments typically levy property taxes based on the assessed value of the land and buildings as well as on certain assets housed on the property. For data centers, these assets can include high-value computers, servers and other technology.

Furthermore, large purchases of equipment may generate significant sales tax revenues for state and local governments both at the initial purchase and when the equipment needs to be upgraded or replaced.

In practice, however, governments dole out generous tax incentives to attract data centers. More than half of states have some form of tax incentive for data centers to locate in their states, and local municipalities also negotiate additional tax incentives. Property and sales tax abatements are common and may abate up to 100% of taxes owed, extending for up to 30 years or more.

CASE STUDY:

Data centers may benefit municipalities

Loudoun County, Virginia, has \$2 billion of municipal bonds outstanding as of 30 June 2024 and the densest concentration of data centers in the U.S., with nearly 250 centers in 2025.⁸ Data centers have been locating in the area since the 1990s.

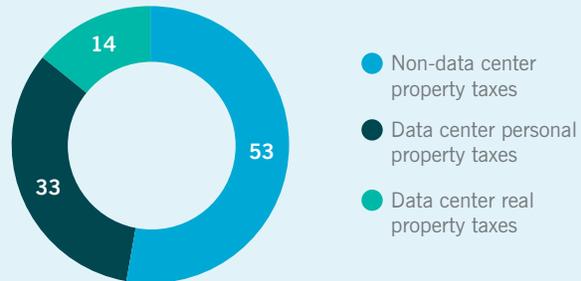
Today, Loudoun County's high-speed network connectivity continues to draw data centers. Data centers in the county have extremely high assessed values relative to other commercial or industrial properties at \$858 per square foot on average, compared with \$258 for general commercial properties.⁹

Computer equipment housed within data centers is expensive and contributes significantly to their overall assessed value. Because of the high value and increasing number of facilities, data centers added \$16 billion to the county's \$174 billion property tax base in 2024 alone.¹⁰

The county derives tax revenue from data centers through real estate, computer equipment and building fixtures taxes. According to the Loudoun County Administrator, data centers are expected to generate nearly half of the county's property tax revenues in fiscal year 2026 (Figure 1).¹¹

Due to the growth in the tax base driven by data centers, the county expects total governmental

Figure 1: Loudoun County proposed property tax revenue (%), FY26



Data source: Loudoun County, VA: Press Release Loudoun County Administrator Presents Proposed Budget for Fiscal Year 2026.

revenue to increase 11% in FY26 while lowering the county's real estate tax rate by 7%.¹² Loudoun County officials estimate that without the data centers the property's real property tax rate would be 25% higher.¹³

Loudoun County certainly is an exceptional case, given the volume and density of data centers. However, it demonstrates the potential revenue benefits and positive credit implications for municipalities that can attract data centers if the tax incentives given to entice the data centers are limited.

ELECTRIC UTILITIES SEE INCREASED DEMAND FOR POWER

Data centers currently consume between 3% and 4% of power produced in the U.S., and the demand is projected to steadily increase to almost 8% by 2030.³ Demand growth from data centers is driven by increased use of generative AI, machine learning activity, data storage and processing cryptocurrency. Electricity demand is also expected to increase from electric vehicles and other electric transportation, homes and industry.

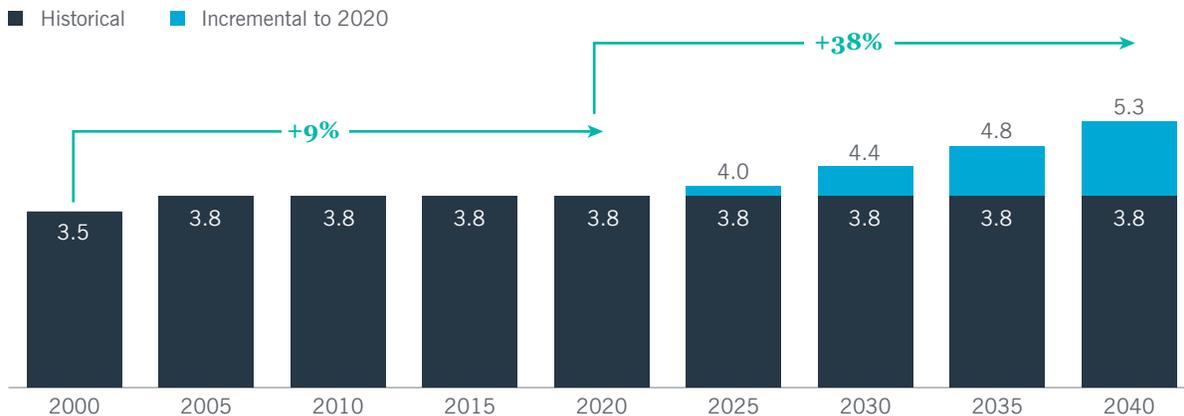
After two decades of small increases in power sales, many analysts predict that electricity demand could

rise dramatically over the next 5 to 10 years (Figure 2). In fact, President Trump used the expected need for power as a rationale to declare a national energy emergency with the goal of bringing shuttered fossil fuel plants back online.

Electric utilities are expected to continue ramping up capital spending and infrastructure investment at a time when capital expenditures are already historically high. Capex grew by more than 15% in 2023 and 13% in 2024 and is projected to grow by 8% in 2025.¹⁴ Meeting the demand for power will require investing in the nation's power transmission infrastructure, which means more municipal bond issuance from these entities.

Figure 2: Energy demand charges ahead of capacity, creating opportunity

U.S. power demand (thousand TWh)



Data source: McKinsey Energy Solutions Global Energy Perspective 2024; EIA AEO 2023.

There is currently a total of \$138 billion in debt outstanding in the municipal market for public electric utilities. In 2024, public power issuance totaled \$26.8 billion, up from an average of \$14 billion over the last 10 years, and we expect issuance to remain elevated.⁵

WILL INCREASED POWER DEMAND LEAD TO HIGHER RATES FOR AMERICAN CONSUMERS?

Expanded demand for power is driving more capital investment in the sector, which has increased electricity rates for consumers across the country. Many utilities are targeting 7% to 9% rate increases over the next five years. Some state regulators are expressing growing concern that retail rate payers — households and businesses across the country — are subsidizing capacity expansion for data centers, and they suggest a need to review rate design.

A proposal in California would require utility regulators to create a separate rate structure for data centers; a bill in the Virginia legislature would prohibit utilities from passing on construction costs to customers. The Ohio Public Utilities Commission is considering requiring data centers to pay

more upfront costs associated with long-term energy contracts.

It will be challenging for electric utilities to manage potential new demand from data centers. The long lead time for power construction can make it difficult for utilities to respond quickly to changes in demand.

On the one hand, increases in power demand can cause spikes in power costs and force electric utilities to procure power on the open market at high prices. This phenomenon could strain the liquidity of electric utilities. On the other hand, electric utilities risk overbuilding for demand that may not materialize — whether because the technology does not prove to be as useful as expected, technology changes in a way that reduces power usage, or individual data centers are closed.

It is important to note, however, that public electric utilities generally have the autonomous ability to increase rates to pay for higher power costs and to fund capital investment. In this context of uncertainty, it will be critical for electric utilities to maintain adequate liquidity; procure new power sources to meet demand and establish rate structures for data centers that reduce the burden of increased power costs on other customers.

WHAT DO DATA CENTERS NEED?

Data centers require affordable land, access to power and water, little threat of natural disaster and a robust fiber network. Connection to a reliable power infrastructure and access to low-cost energy are primary determinants for location. Data centers can also require large amounts of water for cooling systems to keep servers from overheating and often use water from nearby lakes or rivers. Staffing needs are limited; often they employ only 20 to 30 workers on site.

WHAT DOES NUVEEN CONSIDER WHEN EVALUATING DATA CENTER EXPOSURE?

Nuveen's robust credit research process considers many factors. For municipal bonds issued by local governments, we may examine the size of the tax base, trends in tax revenues, economic health and employment levels. When we consider investing in electric utilities, we focus on factors such as rate setting ability, service area and essentiality, capital expenditures and debt burden.

Local governments with data centers may experience positive impacts from the location of these data processing hubs within their borders, such as increasing tax revenues, a larger tax base, a growing economy and an increase in high paying jobs and industries. Conversely, local governments that dole out large tax incentives to entice the location of data centers may miss out on some, if not all, of these positive trends that could impact credit quality.

Electric utilities that can plan prudently to meet growing energy demands and not overbuild infrastructure with ever increasing amounts of debt may be better positioned to maintain or improve credit quality in the future.

Our analysts also examine the management practices and policies regarding data centers with an eye toward forecasting future trends. Our analysts may believe that local governments that manage data

center location to their advantage — such as Loudoun County, VA (see text box on page 3) — have credit upside in the future based on what we know about the potential to generate higher tax revenue. Or they may opine that electric utilities that incur significant additional debt to bolster energy infrastructure without first proving the need may face credit downside in the future.

Taking many factors into account, we maintain a disciplined, bottom-up analytical process to accurately identify those issuers that we believe are well positioned to manage the uncertainties — and take advantage of the opportunities — of exposure to data centers. Our goal is to effectively realize for investors the significant return potential of this fast-growing sector.

IN-DEPTH CREDIT ANALYSIS IS CRITICAL

Increased data processing demand from new technologies has led to a data center boom in the U.S., with plans to increase capacity by 25% in the near term. This trend has broad implications for municipal bond issuers, including potential for increased economic development and tax revenues and surging demand for power from public utilities. The municipal market is well-positioned to meet these demands, though careful credit selection is required to discern winners and losers. Not all impacts will be positive or uniform. However, meeting the needs for new and different technologies is an exciting prospect for municipal issuers, highlighting their role in financing public infrastructure that touches the lives of everyday Americans.

MUNI BONDS CONNECT WITH AMERICANS' LIVED EXPERIENCE

The Nuveen *Munis in your community* series explores the connection between effective muni bond investing and Americans' lived experience. Nuveen's muni credit analyst team — one of the industry's largest and longest tenured — constantly assesses the impact of the trends that influence muni credit quality across all market sectors.

Municipal bonds are a foundational element in Nuveen’s proud heritage of investing to support public purpose — and an asset class that touches the everyday lives of all Americans. Munis fund essential infrastructure for state and local government: K-12 schools, colleges and universities; roads and airports; hospitals; water and sewer utilities; housing and more.

Our research identifies what we believe are attractive investment opportunities. It also yields practical insights into what individuals can expect when it comes to the availability, operation and cost of services used daily — things like the price of an airline ticket or a hospital visit, the health of regional transportation options, the quality of local school systems or the dependability of critical utilities.

For more information, please visit [nuveen.com](https://www.nuveen.com).

Endnotes

Sources

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