North Dakota Legislative Council

Prepared for the Artificial Intelligence and Data Center Committee
LC# 27.9237.01000
August 2026

DATA CENTERS STUDY - BACKGROUND MEMORANDUM

Pursuant to a directive (appendix) by the Chairman of the Legislative Management, the Artificial Intelligence and Data Center Committee has been assigned a study of data centers, which must include consideration of:

- The growth and development of data centers;
- Drivers of data center investment and siting; and
- Economic and other relevant state and local interests in data center siting.

BACKGROUND

Types of Data Centers

The growth of artificial intelligence (AI) systems has created a surge in demand for new data centers to accommodate immense computational demands. Data centers are used whenever an individual interacts with the Internet and consist of the physical facility organizations use to store, manage, process, and transmit large volumes of data. A data center typically contains multiple computer servers, data storage devices, and network equipment. Data centers generally are classified into categories based on ownership or intended purposes. The three main categories of data centers are enterprise data centers, colocation data centers, and hyperscale data centers.

Enterprise data centers are privately owned and operated by a single company to allow the company complete control over the data center's infrastructure. Enterprise data centers commonly are used by a company that has unique network or security needs and may be located either on or off of the company's premises.

Colocation data centers are facilities owned and operated by independent service providers and designed for multiple organizations to host information technology (IT) infrastructure in the same facility. Colocation data centers allow smaller companies to lease space in the data center for a designated purpose. Specifically, colocation data centers allow organizations to lease space, power, cooling, and data center management and support services without the capital expense and operational complexity of building and running their own facilities. Some colocation data centers also serve as interconnection hubs, allowing enterprises to connect quickly to business partners and service providers and ensuring low latency.

Hyperscale data centers are large data centers, often driven by AI and cryptocurrency mining, which are designed to meet the needs of large cloud or IT service providers. Hyperscale data centers can be owned and operated by the user organization or by a service provider. Hyperscale data centers are larger than colocation data centers, typically exceeding 10,000 square feet, and used by customers to host large workloads and provide the networking capacity needed to support large deployments. For example, large technology companies like Meta and Google operate hyperscale data centers to power digital services such as cloud file storage and AI agents.

Data Center Growth and Development

The number of data centers in the United States is increasing rapidly, with an estimated 4,100 data centers operating in the country. In 2025, spending on data center construction exceeded $61 billion. [1] Data center construction in the United States increased from 611.8 megawatts (MW) at the end of 2020 to 680.8 MW in the first half of 2021.[2] By mid-2021, more than 527.6 MW of capacity were under construction in primary markets, representing a 42 percent increase compared to the same period in 2020. The data center construction market is anticipated to double in size from $64.2 billion in 2019 to $121.6 billion by 2027. Between 2014 and 2016, annual electricity use by data centers remained stable at approximately 60 terawatt-hours (TWh). By 2018, use increased to 76 TWh, accounting for 1.9 percent of total United States electricity consumption. In 2023, electricity use reached 176 TWh, representing 4.4 percent of national consumption. Projected electricity uses in 2028 range from 325 TWh to 580 TWh. This range represents 6.7 to 12 percent of projected total United States electricity consumption.

In April 2025, President Donald Trump issued Executive Order 14262, entitled *Strengthening the Reliability and Security of the United States Electric Grid*[3] and Executive Order 14261, entitled *Reinvigorating America's Beautiful Clean Coal Industry and Amending Executive Order 14241*[4] to address the rising strain on the electric grid from large energy consumers, including AI data centers and expanded domestic manufacturing. Executive Order 14262 directs the Secretary of Energy to develop a uniform methodology to identify current and anticipated reserve margins across the bulk power system regulated by the Federal Energy Regulatory Commission (FERC) to identify regions with reserves below acceptable thresholds. The order also directs the Secretary of Energy to develop a protocol to identify which generation resources within a region are critical to system reliability. In response to the order, the United States Department of Energy issued the July 2025 report entitled *Evaluating the Reliability and Security of the United States Electric Grid*. The report identified the need for rapid reforms to bolster the nation's power grid to safeguard grid reliability and power data centers needed to win the AI arms race and preserve national security.

In July 2025, President Donald Trump issued Executive Order 14318, entitled *Accelerating Federal Permitting of Data Center Infrastructure*[5] to address the pursuit of large-scale industrial plans to bolster the United States' leading position on critical manufacturing processes and technologies that are essential to national security, economic prosperity, and scientific leadership. Executive Order 14318 directs the Secretary of Commerce to launch an initiative to provide financial support for qualifying data center projects, and the Department of the Interior and the Department of Energy to offer authorizations for federal land identified as appropriate for data center use.

DRIVERS OF DATA CENTER INVESTMENT AND SITING

The increased use of AI has contributed to a rising demand for data centers, which are known for high energy consumption and significant impacts on local electric grids. North Dakota has emerged as a competitive location for data center development due to its low energy costs and access to stable energy resources, favorable regulatory and taxation policies, and naturally cold climate.

Energy Sources and Infrastructure

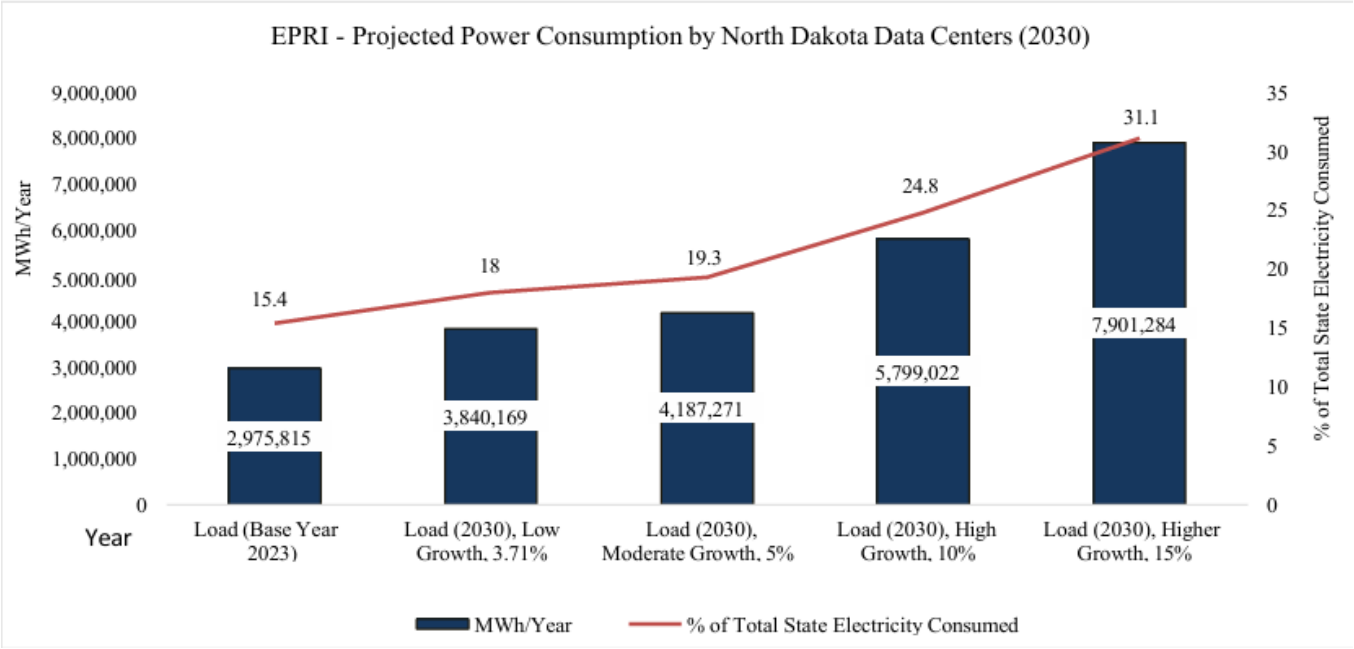
Grid Capacity, Generation, and Consumption

North Dakota's electrical grid has an installed utility-scale generation capacity of approximately 9,508 MW, which includes 4,048 MW from coal-fired plants, 4,250 MW from wind power although this receives a reduced accreditation of about 700 MW due to intermittency, and smaller contributions from

[1] National Conference of State Legislators, *Subsidizing Servers: How States Are Competing to Attract Data Centers* (April 2026).
[2] PFM Group Consulting LLC, *Prince William County, Virginia Data Center Fiscal Impact Analysis* (July 7, 2022).
[3] Exec. Order No. 14,262, *Strengthening the Reliability and Security of the United States Electric Grid*, 90 Fed. Reg. 15,521 (April 14, 2025).
[4] Exec. Order No. 14,261, *Reinvigorating America's Beautiful Clean Coal Industry and Amending Executive Order 14241*, 90 Fed. Reg. 15,517 (April 14, 2025).
[5] Exec. Order No. 14,318, *Accelerating Federal Permitting of Data Center Infrastructure*, 90 Fed. Reg. 35,385 (July 23, 2025).

natural gas and hydroelectric sources.[6] While coal remains the dominant source for baseload electricity generation, wind contributes over 30 percent of annual generation. Electricity generation in the state exceeds internal consumption, positioning North Dakota as a net exporter. For instance, in 2019, the state produced 42,904 gigawatt-hours of electricity but only consumed 22,862 gigawatt-hours.

Most electricity generation occurs in the western and central parts of the state, with high-voltage transmission lines distributing power to Minnesota, South Dakota, Montana, and Canada. The grid is managed by two major independent system operators--the Midcontinent Independent System Operator (MISO) and the Southwest Power Pool (SPP), which handle both transmission operations and market balancing for reliability. The Electric Power Research Institute (EPRI) estimated North Dakota's 2023 data center electricity consumption in both megawatt-hours (MWh) and as a percentage of the state's total electricity demand. Projections for 2030 vary based on four growth scenarios--higher, high, moderate, and low, with data centers expected to account for 9.1 percent, 6.8 percent, 5 percent, and 4.6 percent of total United States electricity consumption, respectively.[7] These estimates assume that all other electricity loads increase by 1 percent annually.



Necessary Grid Reliability Improvements

The North Dakota Transmission Authority (NDTA) commissioned Power System Engineering, Inc., to perform a transmission capacity study to explore the increasing energy demands from large consumers, including data centers, manufacturing expansions, and other electrifications. The first phase involved reviewing recent transmission studies, identifying projects, and summarizing the impact of proposed generation and transmission projects on North Dakota's grid.[8] The second phase focuses on conducting steady-state power flow analysis and potentially dynamic stability assessments. These technical evaluations aim to determine current constraints and inform strategic upgrades necessary to maintain reliability and resilience amid growth. Both MISO and SPP are working on energy policy updates that include revising generator interconnection rules and enhancing transmission planning models to address increased demand and accommodate new high-load users.

[6] Energy and Environmental Research Center, *North Dakota State Energy Security and Resiliency Plans* (September 2025).
[7] North Dakota Transmission Authority, *Grid Resiliency Plan and Report* (January 2025).
[8] North Dakota Transmission Authority, *Resilience of the Electric Grid in North Dakota: Annual Report* (July 2024).

Costs of Reliability Improvements

Studies commissioned by the NDTA include modeled cost projections related to the replacement of retiring dispatchable coal, gas, and nuclear plants with renewable energy sources and storage facilities. These projections reflect the capital and operational costs involved in maintaining grid reliability under the United States Environmental Protection Agency's proposed emissions rules. In the MISO region, the estimated additional cost is $381.9 billion through 2055. In the SPP region, the additional cost is projected at $65.6 billion, compared to the current operating costs of existing generation fleets. These figures highlight the significant financial impact of transitioning from North Dakota's lignite-based baseload generation to alternative sources like wind, solar, and battery storage. These costs are associated with ensuring sufficient replacement capacity to prevent rolling blackouts and meet reserve margin requirements, especially in scenarios where existing coal-fired capacity is forcibly retired.

The NDTA was established to support and facilitate the development of new transmission infrastructure across the state. Its involvement in transmission upgrades is contingent on the presence of an acceptable cost allocation methodology being developed and approved by FERC before any projects can move forward.[9] This condition ensures that no infrastructure expansion takes place without a clear and equitable framework for determining who pays for what portion of the transmission cost. The authority plays a proactive role in transmission development by working closely with regional transmission owners, federal and state regulatory bodies, and the regional transmission organizations (RTOs) such as MISO and SPP. This collaboration ensures that transmission cost allocation policies are aligned with both state interests and federal regulatory standards.

North Dakota's electric transmission needs are served primarily by the state's two RTOs, MISO and SPP. These organizations operate under the jurisdiction of FERC, and the transmission systems the organizations manage are governed by FERC-approved federal tariffs. Regional transmission upgrades, which are required to accommodate large energy consumers such as industrial facilities, have costs allocated according to tariff-based formulas. These formulas aim to distribute the financial burden among all beneficiaries, rather than placing the full cost on a single customer or generator. The allocation structures are monitored and reviewed through the joint efforts of FERC, RTOs, and the NDTA to ensure fairness and effectiveness in meeting growing demand.[10]

Transmission cost allocation in North Dakota distinguishes between two broad categories--generator interconnection upgrades and regional transmission upgrades. For generator interconnection upgrades, the responsibility lies with the generator, which pays for the cost of tie lines that connect the generator's facility to the main transmission grid. These interconnection costs are direct and local in nature and are not spread across other users. Regional transmission upgrades, which involve high-voltage infrastructure and cover broader service areas, are treated differently. These upgrades are required to connect new generation and ensure the system can accommodate large-scale energy consumers such as manufacturing plants or data centers. The costs for these types of upgrades are allocated across multiple users based on the principle that those who benefit should contribute accordingly. This cost-sharing approach is governed by FERC-approved tariff methodologies, with oversight from the NDTA to confirm fair and balanced frameworks are in place before development begins.

Effects of Congestion and Best Practices to Support Reliability

The *North Dakota Transmission Authority 2023 Annual Report* highlights the risk of congestion and capacity shortfalls due to the retirement of dispatchable baseload plants and increased load from high-demand developments such as data centers and electrified industry. The report indicates even with wind, solar, battery storage, and gas replacements, capacity shortfalls could worsen, leading to reliability issues and rolling blackouts.

[9] EmPower North Dakota Commission, *Empower North Dakota: Comprehensive State Energy Policy 2010-2015* (July 2010).

[10] North Dakota Transmission Authority, *Annual Report: July 1, 2022 to June 30, 2023* (2023).

System operators and regulatory authorities have implemented several best practices to support grid reliability and accommodate increased demand from high-load users, such as data centers and industrial facilities. These efforts include revising generator accreditation methods to reflect historical performance during periods of high system need and improving resource adequacy assessments. Capacity market design updates, such as MISO's shift from a vertical to a sloped demand curve, aim to strengthen investment signals for new generation capacity. The new reliability-based demand curve enhances reliability by providing a more effective capacity pricing mechanism to better support resource investment and retirement decisions in the MISO market. The reliability-based demand curve seeks to address the volatility of the legacy vertical demand curve that often led to near-zero clearing prices during small surpluses and high prices during minor capacity shortages. The SPP has introduced seasonal planning reserve requirements and updated outage coordination policies to enhance system flexibility and reliability.[11] Transmission planning models also are being refined to better account for extreme weather conditions and evolving demand patterns, with the goal of improving overall transmission capacity and operational resilience.

Regulatory Environment

In North Dakota, a certificate of public convenience and necessity is a regulatory requirement under North Dakota Century Code Chapter 49-03.1 for any public utility, excluding electric public utilities and certain telecommunications or motor carriers, before the utility begins construction or operation of a utility plant or system. The certificate must be obtained from the Public Service Commission (PSC), following a formal application process that includes the submission of financial and service-related documentation, a public hearing, and a review of factors such as service need, applicant capability, and the impact on existing utilities. The commission is authorized to approve, deny, or conditionally issue the certificate based on public interest and may waive the hearing requirement if no objections are filed within the stipulated notice period. A utility is prohibited from exercising any franchise rights without this certification unless the utility continues a noninterrupted service under a renewed or replacement franchise. Violations may result in cease and desist orders and enforcement actions by the PSC.

Although the PSC is responsible for regulating utility rates, approving the siting of energy conversion and transmission facilities, and overseeing investor-owned utilities, the commission does not have statutory authority to regulate data centers directly.[12] While the PSC retains regulatory jurisdiction over utilities that supply energy to data centers, its oversight does not extend to operational practices, energy usage, or sustainability measures specific to those facilities. In the absence of direct regulatory authority, data centers are constructed and operated without comprehensive oversight related to their energy demand, environmental impact, or integration with the state's two RTOs. This regulatory gap raises concerns regarding the grid's ability to accommodate the growing energy requirements of data centers in rural regions and the broader implications for North Dakota's environmental and energy policy objectives.[13] The PSC faces jurisdictional limitations when it comes to overseeing data centers' locations and power needs.[14] Facilities served by unregulated energy providers or developed independently of investor-owned utilities fall outside the commission's jurisdiction. As North Dakota continues to attract investment in digital infrastructure, consideration may be warranted regarding whether the current statutory framework sufficiently addresses the long-term implications of data center growth on grid reliability, resource planning, and environmental sustainability.

Tax Incentives

Section 57-39.2-04.17 provides a sales and use tax exemption for enterprise IT equipment and computer software purchased for use in a qualified data center. For purposes of the exemption, a qualified data center is a facility that serves as a centralized repository for the storage, management, and dissemination of electronic data and information, located on a single parcel or contiguous parcels,

[11] Southwest Power Pool, Market Monitoring Unit, *State of the Market 2024* (May 28, 2025).
[12] A. Stewart and J. Mowery, *Navigating Data Center Regulation: The Case for North Dakota*, 45 N.D. J. Pol'y & Dev. 56 (2023).
[13] *Id.*
[14] Jeff Beach, *PSC Conference to Explore Issues Around Power-Hungry Data Centers*, North Dakota Monitor (July 30, 2024).

comprised of one or more buildings consisting of a minimum aggregate amount of 15,000 square feet, of which no fewer than 50 percent is used for data processing, and which was newly constructed or substantially refurbished after December 31, 2020. The data center must be certified by the Tax Commissioner as a qualified data center and have a sophisticated fire suppression and prevention system and enhanced security features.

To qualify for the exemption, the equipment or software must be incorporated into or physically located within the qualified data center. The exemption includes purchases of upgraded or replacement equipment or software. To receive the exemption at the time of purchase, a qualified business must receive a certificate from the Tax Commissioner verifying the enterprise IT equipment or computer software the business intends to purchase qualifies for the exemption. If a certificate of exemption is not received before the purchase, the qualified business may apply to the Tax Commissioner for a refund of the applicable amount of tax paid. If a contractor purchases or installs the enterprise IT equipment or computer software, the qualified business may apply for a refund of the amount of sales tax paid by the contractor on qualifying items.

For purposes of the exemption, computer software includes software used or loaded at a qualified data center, software maintenance, software licensing, and software customization. Enterprise IT equipment includes computer hardware, servers, routers, cooling systems, and cooling towers; temperature control and power infrastructure used for transformation, distribution, or management of electricity used for the maintenance and operation of a qualified data center; exterior dedicated business-owned substations, backup power generation systems, battery systems, or other related infrastructure; and racking systems, raised flooring, cabling, or trays necessary for the maintenance and operation of a qualified data center.

The exemption was enacted as a tool to enhance the state's ability to attract data centers to the state when coupled with the state's cold weather and abundant sources of electricity. The exemption was viewed as a way to diversify the state's economy, generate employment opportunities, and add to the tax base.

ECONOMIC INTERESTS[15,16]

Nationally

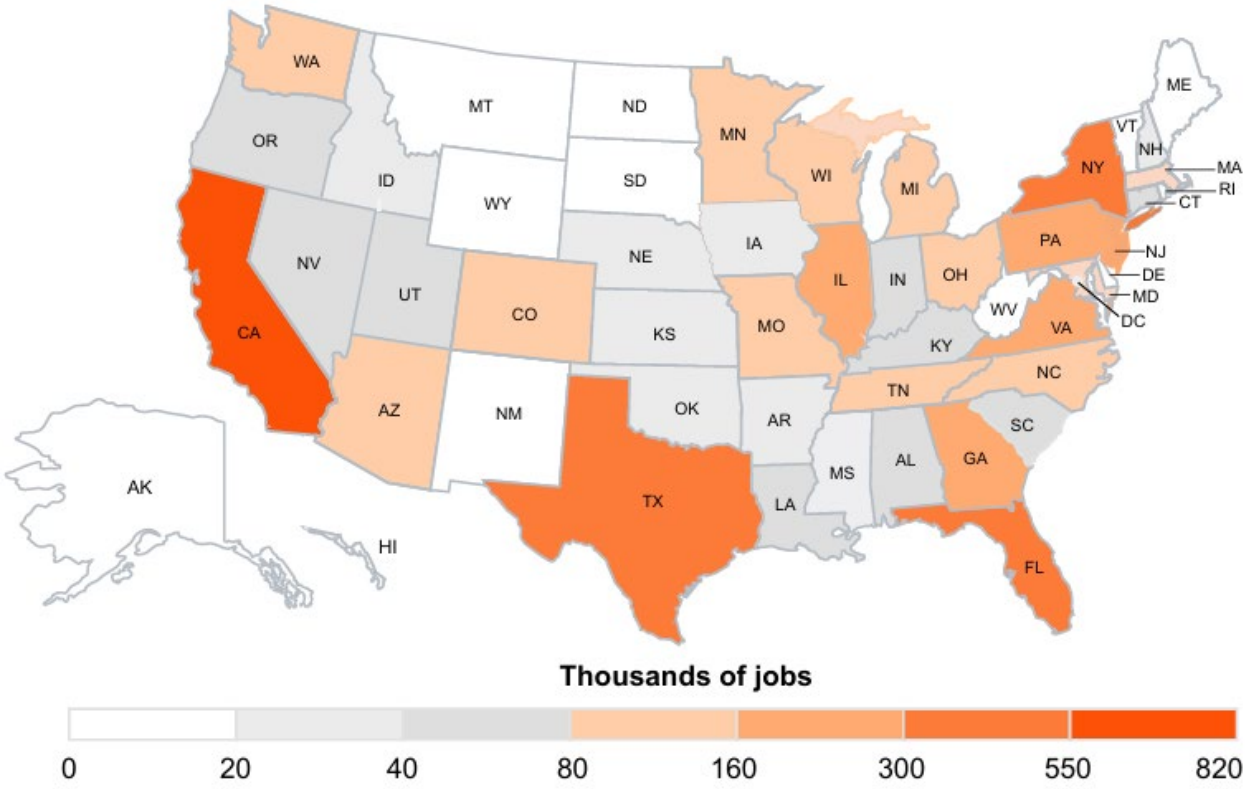
Data centers contribute to both local and national economies through job creation, capital investment, and increased tax revenues. Data centers require substantial capital expenditures and may encourage additional economic activity by attracting related industries and infrastructure investments.

Employment

From 2017 to 2023, the United States data center industry demonstrated consistent growth in employment impacts. Direct job creation rose from 400,100 in 2017 to 603,900 in 2023, reflecting a 51 percent increase. Indirect and induced employment increased from 2.53 million in 2017 to over 4.07 million in 2023, a growth of approximately 61 percent. Total employment impact, combining direct, indirect, and induced effects, increased from 2.93 million in 2017 to 4.68 million in 2023, showing an overall growth of 60 percent during the 7-year period. In 2024, the United States data center industry directly employed 1,005,080 individuals. From 2023 to 2024, the data center industry's total annual employment contribution grew from 4.7 million to 5.5 million, reflecting a 17 percent increase.

In 2024, the five states leading in the number of jobs supported by the data center industry were California, with 818,160 jobs; Texas, with 548,110 jobs; Florida, with 400,100 jobs; New York, with 312,380 jobs; and Georgia, with 230,140 jobs. The following map illustrates the distribution of data center employment by state in 2024:

[15] PwC, *Economic Contributions of Data Centers in the United States 2017-2023* (February 2025).
[16] PwC, *Economic Contributions of Data Centers in the United States 2023-2024* (May 2026).



Source: PwC, *Economic Contributions of Data Centers in the United States 2023-24*

Income

From 2017 to 2023, labor income associated with the United States data center industry showed sustained growth. Direct labor income in the form of wages and salaries paid to employees working directly in data center operations increased from $43 billion in 2017 to $105 billion in 2023, representing a 144 percent increase over the 7-year period. Indirect and induced labor income rose from $166 billion in 2017 to $299 billion in 2023, an increase of approximately 80 percent. The total labor income impact, combining earnings from direct, indirect, and induced sources, grew from $209 billion in 2017 to $404 billion in 2023, reflecting a 93 percent increase. From 2023 to 2024, the total labor income supported by the industry rose from $431.1 billion to $525.3 billion, reflecting a 22 percent increase.

Tax Revenue

Between 2017 and 2023, the United States data center industry's contributions to federal, state, and local tax revenues increased across all major categories. Social insurance contributions, such as employer and employee payroll taxes, grew from $20.3 billion in 2017 to $44.9 billion in 2023, an increase of approximately 121 percent. Over the same period, corporate income tax contributions rose from $5.6 billion to $18 billion, a 221 percent increase, while personal income tax contributions increased from $20.2 billion to $49.6 billion, up nearly 146 percent. Property tax contributions rose from $8.1 billion in 2017 to $18.3 billion in 2023, and sales and use taxes increased from $9.1 billion to $22.5 billion over the same period. Other payments, including miscellaneous fees and levies, more than tripled, increasing from $2.9 billion to $9.5 billion. The total tax impact from the industry increased from $66.2 billion in 2017 to $162.8 billion in 2023, reflecting a 146 percent overall growth.

The United States data center industry's contributions to social insurance contributions grew from $48.2 billion in 2023 to $58.6 billion in 2024, reflecting a 22 percent increase. Corporate income taxes rose from $22.6 billion to $28.9 billion, a 28 percent increase, while property tax contributions rose from $19.4 billion to $24.9 billion, and sales and use taxes increased from $44.5 billion to $55 billion over the same period. The total tax impact from the industry increased from $164.7 billion in 2023 to $204.4 billion in 2024, reflecting a 24 percent overall growth.

North Dakota

Employment

In 2022 and 2023, the data center industry in North Dakota contributed to statewide employment both directly and indirectly. In 2022, data centers directly employed 680 individuals. In early 2023, that number fell to 520 individuals, representing a 24 percent reduction. By late 2023, data centers directly employed 1,150 individuals, which decreased to 1,130 individuals in 2024. Indirect and induced employment, excluding cross-border effects and reflecting jobs supported by local supply chains and consumer spending, amounted to 2,050 in 2022, and declined to 1,810 in 2023. The industry's indirect and induced total annual employment contribution increased from 2,700 in 2023 to 3,740 in 2024.

Income

In 2022, $55 million in wages and salaries was earned by those directly employed in the data center industry. That amount declined by 11 percent, to $49 million, in early 2023. By late 2023, $100 million in wages and salaries was earned by those directly employed in the data center industry. This amount increased to $103 million in 2024, a 4 percent increase. The indirect and induced labor income without cross-border spillover effects, which includes earnings supported through local supply chains and consumer activity, amounted to $126 million in 2022. That amount declined to $112 million in early 2023. By the end of 2023, this amount had increased to $187 million. In 2024, the indirect and induced labor income amounted to $275 million, representing a 47 percent increase.

In 2022, data centers directly contributed $121 million in gross domestic product in the state. That figure fluctuated to $118 million at the beginning of 2023, to $169 million by the end of 2023, and to $168 million in 2024. Indirect and induced gross domestic product impacts amounted to $198 million in 2022 and $175 million in early 2023. Indirect and induced gross domestic products increased by 44 percent, from $303 million in late 2023 to $436 million in 2024.

Tax Revenue

In 2022, the total federal, state, and local tax contributions generated by the data center industry in North Dakota amounted to $30 million. This amount decreased to $29 million in 2023. The total federal, state, and local tax contributions generated by data centers in North Dakota by the end of 2023 amounted to $40 million and increased by 36 percent in 2024, to $54 million.

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