Exploring the Data Center Industry in the United States

Identified Impacts & Public Policy Considerations

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I. Executive Summary

Data centers are physical facilities with computing equipment that process, store, and distribute data in order to run web service applications.

This research report explores the data center industry in the United States, with a particular focus on artificial intelligence (AI) hyperscale data centers, and the impacts these centers have on the environment, local economies and communities, and the electric grid. Additionally, this report analyzes data center energy consumption overall, with projections accounting for the exponential increase of AI hyperscale data centers in the coming years. This report also examines the electric grid, shedding light on the current status of Delaware's relationship with the electric grid and utility rates, adding to a myriad of nuanced policy considerations for legislators.

Accordingly, this research report analyzes laws and regulations that Delaware and other states have introduced relating to data centers. Some legislation aims to mitigate negative impacts from data centers on residents and the environment, while other legislation aims to attract the data center industry for potential positive economic impacts. It is worth noting that the vast majority of legislation attempting to mitigate or monitor harmful data center impacts across the United States has failed to pass, either due to the fear of driving the data center industry elsewhere, perceived undermining of local government power, or an inability to balance conflicting stakeholder demands. Legislation incentivizing data center development, however, has become law across the country. Main proponents of regulating data centers are environmental groups and local residents, while main opponents are data center operators, labor unions, and economic groups.

As proposals for AI hyperscale data centers increase at a rapid pace across the country, local and state governments are faced with striking a balance between environmental, energy, and economic policy, while still prioritizing resident quality of life and safety.

II. What are Data Centers?

The first variation of data centers or "computer rooms" were created within office buildings in the 1960s, providing memory and storage reliability for an organization's entire IT infrastructure. As personal computers (PCs) gained popularity in the 1990s, traditional versions of data centers were created, using microcomputers and PC servers instead of computer mainframes. Accordingly, modern-day data centers are physical facilities comprised of routers, graphics processing units (GPUs), switches, servers, and storage systems, in addition to security measures like firewalls that are built into the systems. Data centers mainly consist of vertically stacked racks, which are metal frames used for organizing IT equipment, like servers and switches.

Data centers process, store, and distribute data in order to run an organization's web service applications. Email, file sharing, database storage, AI, and streaming all rely on data centers. Accordingly, there are roughly 11,800 data centers worldwide, and over 4,000 of these data centers are located in the United States alone. A third of U.S. data centers are located in just 3 states: Virginia, Texas, and California.

Types of Data Centers

Enterprise Data Centers

Enterprise data centers are private facilities that are owned and operated by specific organizations to meet their individual information technology (IT) infrastructure needs and requirements. Enterprise data centers are typically located at an organization's main campus, but can be located elsewhere depending on power availability, water accessibility, connectivity, and overall security. The servers, storage, and networking equipment in an enterprise data center is managed by the same organization's IT department. However, the power, cooling, and security infrastructure may be outsourced to third parties. Enterprise data centers are utilized by large, multinational corporations including Bank of America, Coca-Cola, and Walmart. They are around 70,000 square feet on average, with power capacities ranging from 10 to 50 MW.

Colocation Data Centers

Colocation data centers, or multi-tenant data centers (MTDCs), are used by 20 or more organizations in an off-site location. Colocation data center providers, like Equinix and Digital Realty, lease space within these data centers to organizations, offering flexible options for hosting data and adapting to an organizations' needs. Colocation data centers house each organization's computing hardware, servers, and supporting infrastructure, like cooling, power, and networking equipment. Within the colocation data center realm, there are 3 types of colocation facilities that cater to varying data infrastructure needs:

Retail colocation data centers provide services to organizations with smaller power capacity needs. As such, these data centers manage daily data operations, power capacity, security, and cooling, in addition to streamlining access to telecommunication carriers and internet service providers. Organizations utilizing retail colocation data centers are solely responsible for maintaining equipment within the cabinets and cages located in the data center. Retail colocation centers serve lower individual power capacity requirements, typically from 100 kilowatts (kW) to 1 megawatt (MW).

Wholesale colocation data centers are leased to a single customer, who is then in charge of managing everyday operations and building out a functioning data center. This differs from retail colocation data centers as no additional data center services are offered, just space and power. Wholesale data centers can accommodate large enterprises, including government agencies, in addition to retail colocation providers with main operational areas (servers, storage systems, and networking devices) that are 10,000 square feet or larger. Wholesale colocation facilities are leased on longer terms than retail colocation facilities and can handle individual capacity requirements ranging from 1 to 5 megawatts (MW).

Managed services colocation is offered by managed service providers, allowing organizations to outsource their IT operations to professionals that provide continuous monitoring and maintenance of servers, storage management, and overall data center facility operations. Managed services data centers can adapt to on-site, colocation, and hyperscale data center environments.

Edge Data Centers

Including micro data centers, edge data center facilities are smaller and decentralized, providing compute and storage in closer proximity to where data is generated and used. As such, the delay between data creation and data analysis is reduced and bandwidth is optimized, supporting the development of new applications. Edge data centers can be standalone facilities or integrated at telecommunications central offices, local cable distribution points, cell tower bases, or on the premises of an organization. They can accommodate individual power capacity requirements of up to 500 kilowatts (kW), or 50 data center racks. Edge data centers have gained popularity in recent years due to their ability to support emerging technologies by processing data in closer proximity, like 5G, artificial intelligence (AI), big data analytics, and automation.

Modular Data Centers

Modular data centers are prefabricated and manufactured structures with standardized data center features that are used to house computer servers and network equipment. Modular data centers reduce the time and cost of constructing a traditional data center by shifting on-site construction tasks to off-site manufacturing facilities.

Container data centers combine data center facility structure, IT equipment, power, and cooling system infrastructure into one structure. A container data center can accommodate 20 kilowatts (kW) to 250 kW, or 4 to 20 racks.

Prefabricated Data Halls consisting of several thousand square feet of space and 50 to 200+ racks, enable existing data centers to add main operational areas (servers, storage systems, and networking devices) using previously manufactured components. In turn, smaller data centers can transform into large wholesale or hyperscale data centers using prefabricated data halls.

Prefabricated Power and Cooling Modules are fully pre-engineered, integrated, and tested power and cooling systems that are manufactured by a third-party, off the premises of a data center. The modules can then be shipped to an already existing data center and immediately installed. Enclosed power modules have a capacity range of 250 kW to 500 kW, while prefabricated module designs can support higher capacities of 1 to 2 MW.

Hyperscale Data Centers

In the late 1990s and early 2000s, the delivery of web-based applications, or cloud services, became a reality. To support the ever-increasing equipment and power needs of cloud services, hyperscale data centers have surfaced across the country and world. Hyperscale data centers, also known as cloud data centers, are significantly larger than any other type of data center. They can consume over 100 megawatts (MW) of power, which is roughly the amount of power consumed by 70,000 homes in the U.S. These facilities support cloud service providers and large internet companies with substantial compute, storage, and networking requirements, including Amazon Web Services, Microsoft Azure, Google Cloud, and Meta Platforms. Hyperscale data centers are custom-built and operated by a single company, housing thousands of racks and servers across 50,000 to over 1 million square feet.

There are currently 1,136 hyperscale data centers worldwide, more than double the number of centers from 5 years ago, and over half of these hyperscale data centers are located in the United States alone. Amazon, Microsoft, and Google account for 59% of all hyperscale data centers, followed by Meta, Apple, and ByteDance. Additionally, as interest in artificial intelligence grows, AI hyperscale data centers are becoming even more common, with roughly 500 facilities in various stages of planning or construction across the United States.

Figure II.1. Source (Delaware Business Times)

For reference, there are two proposed industrial projects in New Castle County, Delaware that may be hyperscale data centers, in addition to one confirmed data center proposal. The St. George's Business Park site plans include 3.24 million square feet across three buildings, while the "Project Washington" site plans seen above include 6 million square feet across eleven buildings. Additionally, "Project Washington" would use an unprecedented 1.2 gigawatts (GW) of power to operate, which is over 1,000 megawatts (MW) and about the same amount of power used for 700,000 homes.

III. Data Center Energy Consumption

The earliest increase in data center energy consumption began in the early 2000s, primarily driven by the growth of the internet. With the improvement in energy efficiency, data center energy consumption was relatively the same from 2010 to 2020. But from 2020 onwards, there has been an exponential expansion of hyperscale data centers to allow for the operation of increased cloud services and AI technologies. These new technologies

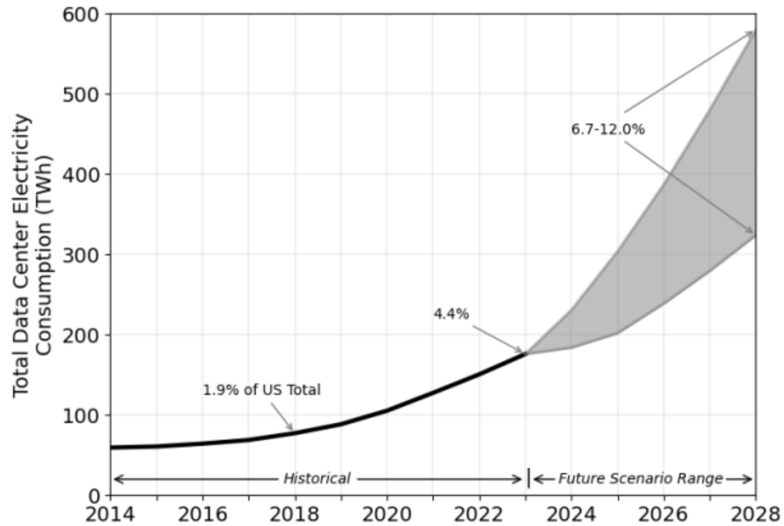

Figure III.1. Total U.S. data center electricity use from 2014 -2028 (Source: Berkeley Lab)

require significant computational resources, and without rapid improvements in energy efficiency, energy demand for today's data centers is likely to increase.

Figure III.1 provides an estimate for electricity consumption of data centers in the United States, factoring in servers, storage, and network equipment[1]. Data centers from 2014 to 2016 remained stable at about 60-terawatt hour (TWh). However, from 2017 onwards, energy consumption by data centers doubled due to expansion and utilization of AI technologies, such that by 2018 alone, data centers were consuming 76 TWh, representing 1.9% of total annual U.S. electricity consumption. By 2023, data centers continued to grow and expand across the U.S., reaching 176 TWh and representing 4.4% of total U.S. electricity consumption. Additionally, Berkeley Lab conducted various scenarios that project total data center energy use after 2023. These scenarios assume that a certain number of GPUs will be shipped each year pending manufacturers' ability to meet those demands. The scenarios reveal a range of total data center energy estimates, with the low and high end being between 325 and 590 TWH of electricity consumption by 2028 or 6.7% to 12% of total U.S. electricity consumption.

[1] Berkeley Lab: 2024 United States Data Center Energy Usage Report

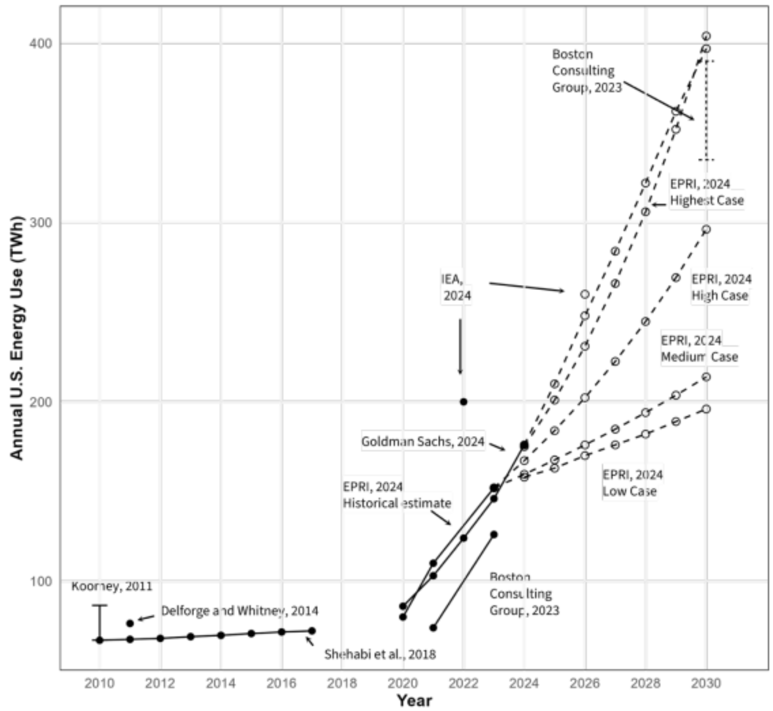

Figure III.2. Academic and industry studies projection estimates of data center energy consumption. (Source: Berkeley Lab)

Figure III.2 highlights various academic and industry studies and their projections (dashed lines) on data center energy consumption in the U.S. As illustrated, across all studies, an increase in energy consumption due to data center proliferation and expansion is likely.

Google's AI Energy Consumption Report

In a recently published report by Google, they revealed that their AI models (Gemini) consume 0.24 watt-hours of electricity for a medium range prompt, or less than nine seconds of television, and consume 0.26mL of water, or the equivalent of five drops[2].

Additionally, the report includes power usage for their AI chips, accounting for 58% of their total .24 watt-hours electricity demand, as well as power usage for equipment needed to support AI-specific hardware. This includes host machine CPU and memory (25%), backup equipment (10%), and cooling and power conversion (8%).

While comprehensive for medium range AI prompts, the report does not reveal what resources a high range AI prompt uses. Additionally, there is no information on non-text AI prompt consumption nor the amount of prompts the AI model Gemini computes per day[3]. The report enhances comprehension on the number of resources required to train and

[2] Measuring the environmental impact of delivering AI at Google Scale

[3] In the first two months of OpenAI launching ChatGPT, the company garnered 100 million global users.

operate AI models and the data centers that house them, shedding light on the significant energy demand that is entailed.

IV. The Electric Grid

Given the consensus around various academic studies indicating the proliferation of data centers and their significant energy demand, an essential question is raised regarding how the current electric grid will meet these demands. Understanding how the electric grid functions and factors that impact electric bills may give insight into whether Delaware's energy supply and electric infrastructure is apt to sustain constant high energy demand from data centers. For brevity, this section covers the authorities that oversee the electric grid, in addition to Delaware's energy profile and energy market.

Additional information on the electric grid can be found in *Appendix 1*.

Overseeing Authorities: Electric Grid and Electricity Pricing

The electric grid operates through three levels of authority: the Federal Energy Regulatory Commission (FERC), the North American Electric Reliability Corporation (NERC), and Public Utility Commissions (PUC) or Public Service Commissions (PSC).

At the federal level, the **FERC** is composed of five members appointed by the U.S. President and the Senate. Among the various functions of the FERC is regulating the transmission and wholesale of electricity in interstate commerce, monitoring and investigating the energy market, and protecting the reliability of the high voltage interstate transmission system through mandatory reliability standards[4].

The second level of authority, which the FERC delegates, is the **North American Electric Reliability Corporation (NERC)**. The NERC's duties are to set mandatory reliability and cybersecurity standards and monitor the health of the electric grid nationally. The NERC is able to achieve this through delegating its enforcement authority to six **Regional Entities (REs)**. While REs focus on reliability standards, other organizations, **Regional Transmission Organizations (RTOs)** or **Independent System Operators (ISOs)**, focus on markets and operational efficiency. These organizations ensure that there is enough supply to meet demand and setup auctions whereby power plants bid to sell electricity.

The third and final authority is at the state level under the **Public Utility Commissions (PUCs)** or **Public Service Commissions (PSCs)**. Depending on the state, PSCs are usually made up of 3 to 10 elected or appointed members. Their functions also differ across states; however, their overarching responsibilities include setting retail electricity rates for

[4] What FERC Does | Federal Energy Regulatory Commission

customers, regulating private investor-owned utility providers, and approving power plants and in-state transmission lines.

Delaware

Energy Profile

According to DNREC's 2024-2028 Delaware State Energy Plan, Delaware ranks 47th in the nation for energy consumption and ranks the lowest in energy production. In 2020, Delaware used approximately 70 times more energy than it produced.

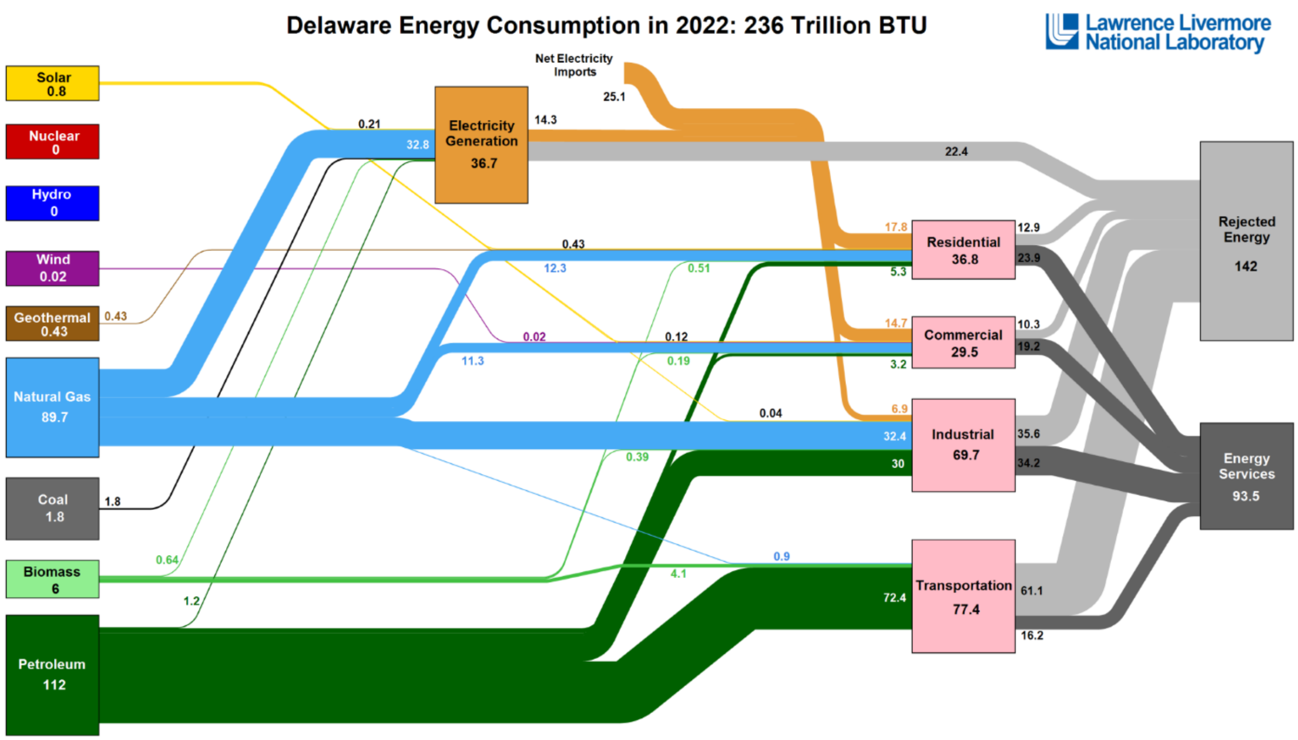

Figure IV.1. Delaware's Energy Flow Chart (Source: Lawrence Livermore National Laboratory)

In 2023, natural gas fueled 83% of Delaware's total in-state electricity generation, up from 51% in 2010. In 2023, Delaware was able to produce 3,140 MW of power from natural gas, oil, coal, and solar.

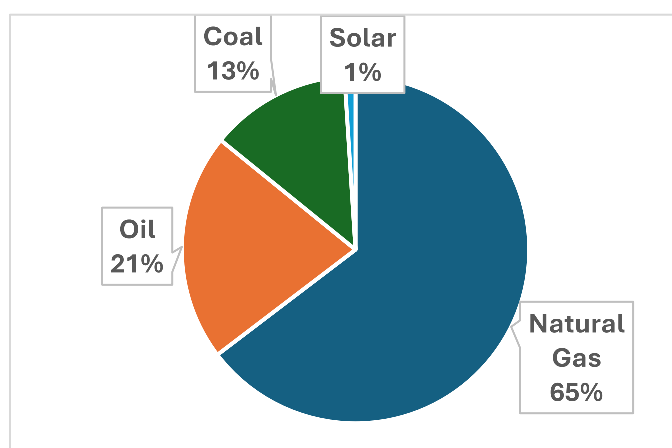

Figure IV.2 Spotlight Delaware

Utility Providers

Delaware operates under a deregulated market (*refer to Appendix 1*) where investor-owned utility (IOU) providers control only the distribution of electricity and have no generating assets. Delaware has 11 electric utilities that break down to 1 IOU (Delmarva Power & Light), 1 cooperative (Delaware Electric Cooperative), and 9 municipal utility providers collectively known as Delaware Municipal Electric Corporation. These utility providers differ in size and how they are regulated. Delmarva Power & Light (DPL) is the only IOU provider in the state and the only utility regulated by the PSC as DPL owns a majority of the distribution services in the State. Accordingly, DPL is barred from owning any generating assets in addition. The remaining utility providers in the State own some distribution services and generating assets, like solar panels and wind turbines.

Electricity Pricing

Delaware residents' electric bills can be broken down into four categories: customer price, supply charge, distribution charge, and other add-ons (taxes, state programs, Distribution System Improvement Charge (DSIC)). Because Delaware is an "energy choice" state, consumers have the option to choose third-party electric suppliers or default into what is called the standard offer service (SOS). When consumers choose a third-party supplier, their electricity is purchased by the third party in the PJM-operated wholesale market or regional entity, and the supply cost directly flows to the consumer. On the other hand, when consumers default to SOS, the utility provider runs an auction with suppliers submitting bids, PSC choosing the best price, and the utility provider passes that price to the consumer. This process showcases the supply charge for electricity. The distribution charge originates from a utility provider maintaining and operating the poles, wires, transformers, meters, and outages in each state.

In Delaware, the power source is the only item to be considered competitively priced given the various power generating sources in the state and the wholesale market. However, because the distribution and transmission of electricity throughout the state is primarily controlled by DPL, a natural monopoly, the PSC is able to regulate this portion of the electric bill through the formal process of **rate cases**. This is a process whereby a utility provider comes before the PSC and outlines the cost of investment and expenses they incur to operate and distribute their service to rate payers in the state. During the rate case process, the PSC determines whether investments were "prudently"[5] incurred, their

[5] Previously, Delaware's PSC determined the rate of return using the "business judgment rule" standard, whereby the PSC was not permitted to disallow the recovery of investment a utility provider invests in their equipment even if their investment could have been accomplished at a lower cost. However, in 2025 Delaware passed SB 59 and changed the standard to the "prudence" standard, giving the PSC the ability to deny, in whole or in part, certain expenses and costs.

operating expenses, the gross value of the utility's tangible and intangible property, and the utility's accrued depreciation[6]. Through a formula, these values are calculated to output the revenue requirement, which is the total cost incurred by the utility provider in the provision of service and the amount that is due to be recovered from ratepayers[7].

Revenue Requirement = (rate base * rate of return) + Expenses

Revenue requirement is the revenue a utility provider needs to cover expenses and gain profit.

Rate base is the capital investment required to provide service.

Rate of return is the return earned (determined by PSC) that is allowed to be returned on the rate base.

Expenses include operation, maintenance, deprecation, and taxes.

The most recent rate cases filed by DPL for increasing electricity rates[8] were filed in 2022 and 2025, and 2024 for gas rates. The 2025 electric rate increase request to the PSC cited a need for infrastructure upgrades, while also increasing the maximum profit DPL could earn by $9.4 million.

V. Data Center Impacts

Electric Grid Upgrades

Historically, utilities and power generators have been able to keep pace with a steady increase in energy demand. However, to meet the sharp increase in energy demand primarily driven by data centers and more specifically AI hyperscale data centers, the electric grid needs to be upgraded at both the generation level and distribution level. Namely, building new power generating plants[9] and adding or upgrading high-capacity transmission lines and substations.

However, the construction of and upgrades to transmission lines have been relatively stagnant comparative to demand. In 2024, the construction of new, high-voltage transmission lines marked the third slowest year of new construction for 345 kV+ transmission lines in the past 15 years: 334 miles of transmission lines were constructed,

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[6] Revenue Requirement - an overview | ScienceDirect Topics
[7] Delmarva Power and Light Co. Electric Rate Cases in Delaware: Accounting Concepts and Empirical Data
[8] Electric rate cases Docket #22-0897, Gas rate cases Docket #24-1044
[9] Data Centers Drive Buildout of Gas Power Plants and Pipelines in the Southeast

which is 3,660 miles less than what was constructed in 2013[10]. Additionally, the U.S. Department of Energy's (DOE) 2024 National Transmission Planning Study found that at least a doubling of the current regional transmission capacity and a quadrupling of interregional transmission capacity would be needed by 2050[11].

The costs for construction and upgrades to transmission lines are often allocated to utility customers, meaning ratepayers within the region bear some of the costs incurred by utility providers when building or upgrading transmission lines to power data centers. **While most upgrades to electrical infrastructure serve to maintain the overall system for ratepayers, AI hyperscale data centers require upgrades that would otherwise be unnecessary.**

In 2025, the Institute for Energy Economics and Financial Analysis (IEEFA) conducted a study to identify whether ratepayers in West Virginia would subsidize the construction of two transmission projects: MidAtlantic Resiliency Link and Valley Link. These transmission expansion projects were driven by data centers, according to PJM's reliability analysis[12]. The IEEFA study found that ratepayers in West Virginia would pay more than $440 million over the next 40 years for the two high-voltage transmission projects. PJM's cost allocation methodology allows for 50% of the cost for upgrades to go to PJM transmission zones that are expected to benefit from the transmission line upgrade, and the remaining 50% are spread across PJM zones. Accordingly, ratepayers across PJM are responsible for project costs inadvertently, even if one or both of the expansion projects are cancelled.

On January 16, 2026, 13 governors (including Delaware Governor Matt Meyer) signed an agreement with the Trump administration pushing for PJM Interconnection to bring $15 billion of new power online, paid for by data center companies. On the same day, the PJM Board of Managers released a decision detailing how PJM plans to integrate large new loads (over 50MW) while preserving reliability for customers and creating a predictable and transparent path for growth. The plan has been criticized by environmental groups for prioritizing fossil fuels, and other stakeholders for having an insufficient plan for new energy procurement.

Virginia's Joint Legislative Audit and Review Commission Report

In December 2024, Virginia's Joint Legislative Audit and Review Commission (JLARC) released a report on the overall impacts of data centers in Virginia. Virginia has 643 data centers in operation, including around 150 hyperscale data centers. As such, Virginia is

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[10] Report: Fewer New Miles: Strategic Industries Held Back by Slow Pace of Transmission
[11] Report: Fewer New Miles: Strategic Industries Held Back by Slow Pace of Transmission
[12] PJM Reliability Analysis Report 2022

considered the largest data center market in the world, accounting for 13% of all reported data center operational capacity globally and 25% of operational capacity in the Americas. Virginia's proximity to optimal fiber optic cables and water sources, cheaper and abundant energy sources, and competitive tax rates, incentives, and exemptions all contribute to the success of Virginia's data center market.

Energy Impacts

In the JLARC report, an independent forecast found that unconstrained demand for power (an assumption model where the electric grid has no limits) in Virginia would double within the next 10 years, with data centers being the primary drivers. Accordingly, new generation and transmission infrastructure would need to be built to meet the increasing energy demand. As of 2023, data centers accounted for 26% of Virginia's total electricity consumption.

Economic Impacts

According to the JLARC, current utility rates appropriately allocate costs to the customers responsible for incurring them, which includes proportionate costs for data centers. However, as data centers increase the overall demand for energy, costs will likely increase for all utility customers to cover system upgrades and increasing energy prices. For example, typical residential customers of Dominion Energy could experience an estimated increase of $14 to $37 per month by 2040. Establishing a separate utility customer class for data centers, distinguishing data center customers from residential customers, and adjusting utility rates on a regular basis may protect residential utility customers from statewide cost increases, according to the JLARC's report.

The JLARC found that, overall, the data center industry is estimated to contribute 74,000 jobs, $5.5 billion in labor income, and $9.1 billion in GDP to Virginia's economy annually. However, the JLARC also found that data centers primarily only benefit Virginia's economy during initial construction phases, as Virginia-based businesses provide materials and labor.

Five localities in Northern Virginia generate revenue from data centers' business personal property taxes and real estate taxes, amounting to anywhere between 1% and 31% of their total local revenue. These localities indicated that revenue from data centers has allowed them to lower real estate taxes, develop trust and reserve funds, and construct new schools. However, the extent of tax revenue depends on the size of the data center market and local tax rates, with some localities decreasing tax rates to attract data centers and therefore decreasing revenue.

Residential Impacts

While typically not in violation of local ordinances' noise decibel limits, the constant humming from data centers has been reported to negatively impact nearby residents, ranging from migraines and an inability to concentrate, to an overall poorer quality of life. Additionally, data center construction can be disruptive to nearby residents, as each building takes around 2 years to build, with large hyperscale data center campuses taking up to 7 years to be completed.

Environmental Impacts

Almost all data center back-up generators in Virginia are powered by diesel. Diesel generators emit harmful pollutants like nitrogen oxides, and exposure to high concentrations of diesel generator emissions can negatively impact cardiovascular, respiratory, and nervous system health.

> ***"Since 2015, nitrogen oxides emissions from data center diesel generators have more than doubled, carbon monoxide emissions have tripled, and particulate matter emissions are five times larger. However, these emissions make up a small part of overall emissions in the region."***

The Virginia Department of Environmental Quality (DEQ) is conducting a 3-year study that will directly monitor data center generator emissions in Northern Virginia, potentially identifying adverse ***local*** impacts of data center diesel generators.

To function properly, data centers must have a mechanism to cool their computing equipment, using water evaporation with consistent water refills or water recirculation. The amount of water used depends on the size of the data center and computing capacity. Accordingly, hyperscale data centers used for artificial intelligence purposes use exponentially more water than traditional colocation or enterprise data centers.

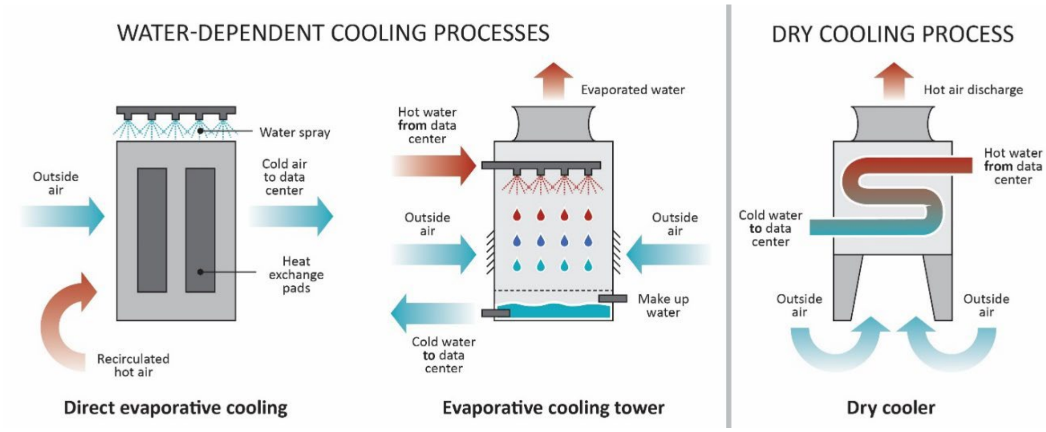

Figure V.1 JLARC synthesis of interview, government reports, and research literature (p.61)

Most data centers in Virginia used around 6 million gallons of water in 2023, and 11 data center buildings used over 50 million gallons.

> ***"In 2023, the data center industry [in Virginia] used an estimated 2.1 billion gallons of water, with just over a third coming from reclaimed water instead of new withdrawals. Data center water use accounted for less than 0.5 percent of total state withdrawals."***

The JLARC concluded that data centers in Virginia have comparable land and water impacts to other industrial developments, and a combination of state and local regulations successfully mitigate most effects. However, while Virginia's DEQ is responsible for ensuring water sustainability, there is less oversight of how available water should be shared across various uses in a locality, which may cause issues as more water is needed for higher square footage data centers.

AI Hyperscale Data Center Impacts

As hyperscale data centers solely dedicated to AI are a relatively new phenomenon, there is limited data available on their impacts. Additionally, as AI data centers materialize at an exponential rate, it is difficult to conceptualize the extent to which AI data centers can affect the environment, finite resources, and the economy, and by proxy, residents across the country.

However, in order to address the build-out of AI data centers sustainably, accurate and consistent disclosure of data from reliable sources on the impacts of hyperscale data centers is necessary. Developing strategies, and in turn, uniform policies, for the recycling and the responsible disposal of electronic wastes with constant data center upgrades is imperative to mitigate environmental contamination and local ecosystem impacts of data center construction and operation. Measuring AI's actual environmental impact calls for a standardized framework for energy consumption and emissions. Policies creating uniform definitions of AI, including AI systems that are embedded within other technologies, may assist to more accurately assess how AI and AI hyperscale data centers impact the environment as well.

xAI's Colossus – Memphis, TN

Elon Musk's artificial intelligence company, xAI, operates a 1 million square foot data center in Memphis, Tennessee. Since August 2024, this data center – known as Colossus - has been used to train and run the AI chatbot Grok.

Energy and Environmental Impacts

With the goal of two campuses being fully operational and using up to 300 MW of power, Colossus relies on its own gas turbines in addition to Memphis' fossil-fuel generated and power grid electricity. xAI requested a system-impact study from Memphis Light, Gas, and Water for up to 260 MW of power, raising concerns about straining local energy grids.

In May 2025, the Southern Environmental Law Center (SELC) flew thermal image drones over the facility and found that Colossus had 35 unpermitted methane gas turbines onsite, generating enough energy to power almost 300,000 homes, without the proper controls to combat pollution. Accordingly, the xAI data center has become the largest local emitter of nitrous oxides in Shelby County, contributing to an already elevated air-quality issue and an increased rate of respiratory illnesses in Memphis.

Economic Impacts

The Memphis Chamber of Commerce has stated that Colossus has brought 500 high-paying jobs to South Memphis. Representatives from xAI have also claimed that an average of 1,600 employees and contractors (over half hired from the Memphis area) have worked on the Colossus campus since 2024.

In August 2025, the Memphis City Council passed the Memphis Community Benefit Ordinance which sets aside 25% of xAI's city property tax – up to $100 million – for local community investments. Additionally, the City of Memphis has estimated that it will receive $13 million in tax revenue from Colossus in 2025. Comparatively, xAI is projected to make $1 billion in gross revenue in 2025, and $14 billion in gross revenue by 2029.

VI. Data Center Laws and Regulations

The surge of AI and, in turn, hyperscale data centers have a significant impact on the electric grid and the demand for energy overall. Although not studied as extensively, AI hyperscale data centers also have an impact on water supply, land use, local and state taxes, and communities.

Accordingly, as AI hyperscale data centers continue to expand and proliferate, state legislators have begun introducing legislation to mitigate negative impacts from data centers on residents and the environment, while other legislation aims to attract the development of data centers for tax revenue and employment opportunities. As such, lawmakers are faced with the ongoing challenge of balancing investments in the data center industry, while also safeguarding communities from the associated negative economic, environmental, and infrastructure impacts of data centers.

Tax Incentives for Data Centers

AI tech companies have spent an estimated $360 billion on capital expenditures for the development of data centers across the U.S. Currently, 37 states offer incentives for data centers through a combination of sales and use tax exemptions to property tax abatements, which are often tied to the level of investment their facilities will bring and the number of jobs they will create. Although not explicitly stated, **Delaware's Blue Collar Job Act** offers certain business engaged in "qualified activity," including business engaged in computer processing, data preparation, or processing services, tax credits if they are able to hire five or more qualified employees and are able to make an investment of at least $200,000 in a qualified facility[13]. While incentives for data centers vary across states, the underlying objective for these policy approaches is to encourage data center projects to develop within their states. Below is an overview of incentives being offered to data centers:

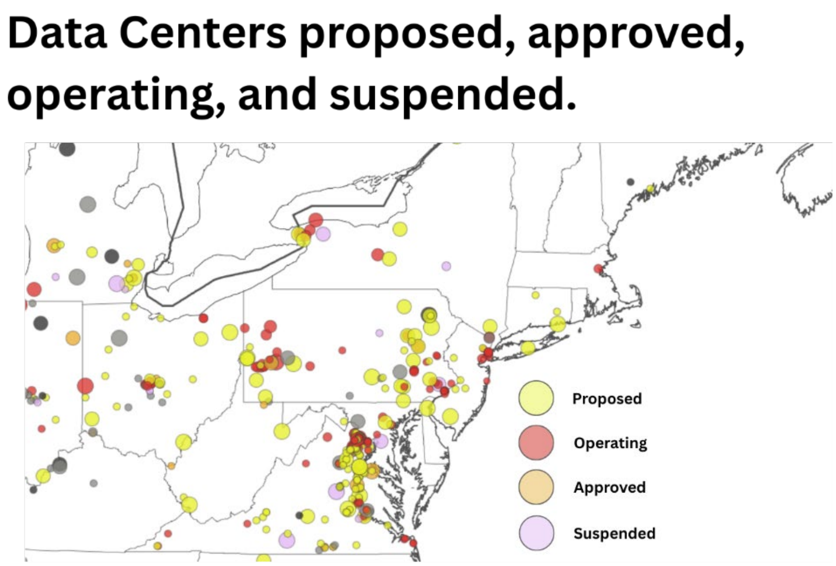

Figure VI.1 Fractracker Alliance

In 2021, **Pennsylvania** passed the Computer Data Center Sales and Use Tax Exemption Program. In order to qualify, data center developers must invest at least $75 million and create 25 jobs if they are located within a county that has a population of less than 250,000

[13] Blue Collar Job Act - Division of Revenue - State of Delaware

or invest $100 million and create 45 jobs if they are in a county with a population greater than 250,000. Additionally, annual compensation to employees must exceed $1 million in the aggregate for each year after the issuance of the certification to be exempt.

In 2024, **New Jersey** passed the Next New Jersey Program. The tax credit amount to an eligible business is calculated based on the lesser of 0.1% of the eligible business' total capital investment multiplied by the number of new full-time jobs or 25% of the eligible business' total capital investment or $250 million. Additionally, the business must create 100 new full-time jobs, and each job must be paid at least 120% of the county median salary[14].

In 2020, **Maryland** passed the Data Center Maryland Sales and Use Tax Exemption Incentive Program. The program allows data centers to be exempt for 20 years from sales and use taxes and 30 years if investment exceeds $200-$400 million depending on location. To be eligible, data centers must create at least 5 qualified positions and make a minimum investment of at least $2 million for a business located within a Tier 1 area and at least $5 million for a business located in any other area of the State. Additionally, the jobs created must be full-time and pay 150% of the state's minimum wage.

New York's Internet Data Center exemption provides internet data centers exemptions from paying sales tax on the purchase or use of machinery, equipment, and services such as installation, maintenance, and repair of personal property.

Virginia offers retail sales and use tax exemptions. To qualify, data centers must create a minimum of 50 jobs paying at least 150% of the prevailing annual average wage in the locality. According to the JLARC, data centers saved $928.6 million in sales tax in FY2023 because of these exemptions, including state, local, and regional portions of the tax.

In 2023, **Alabama** updated its Alabama Data Processing Center Economic Incentive Enhancement Act to offer more explicit incentives to data centers by increasing abatements. Specifically, tax abatements can be extended from 10 to 20 years if a data center's capital investment exceeds $200 million during the 10 years following project completion.

Also in 2023, **Arkansas** passed HB 1654 which exempts data center equipment, eligible data center costs, certain services provided to data centers, and electricity used by data centers from gross receipts and compensating use taxes.

[14] Next New Jersey Program - AI - NJEDA

In 2017, **Florida** passed HB 7109 exempting data centers from sales and use taxes for the purchase of infrastructure, equipment, personal property, and electricity. For a data center to qualify, they must invest at least $150 million cumulatively in the acquisition, construction, installation, equipment, or expansion of the data center property. Additionally, data centers must have at least 100 MW of total power capacity and 1 MW of power capacity assigned to each owner or tenant of the facility.

According to this 2025 study[15], 10 states offering tax exemptions for data centers lost more than $100 million in tax revenue. Texas[16] and Virginia[17] lost more than $1 billion each, and Illinois lost $370 million in 2024. However, the study found that many states with tax incentives for the data center industry lack transparency, leading to limited information on how much data center tax revenue localities and states actually forgo per year.

On one hand, incentivizing the data center industry can spur moderate gross economic benefits for a locality or state, with direct negative and potentially indirect positive impacts on local residents. Imposing safeguards and regulations for data center development risks diminishing a state's data center industry potential for the direct benefit of residents. However, without a federal or multi-state approach to regulating data centers, residents across the country will eventually feel the impact of any neighboring states' data centers[18].

Water Use and Disclosure Requirements

Data centers are known to consume large amounts of water, both directly and indirectly. The main direct use of water is to cool and dehumidify server rooms, preventing overheating of critical equipment and the buildup of static electricity. Depending on the climate and location, the direct consumption of water that data centers use varies.

The main indirect water use occurs when power plants utilize water to generate electricity that is then supplied to data centers. However, accurate data on the amount of water that data centers use is often difficult to obtain due to the proprietary nature of said information[19]. Accordingly, it is difficult for legislators and regulators to assess the true impact data centers have on local water supply. Several states have explored requiring water disclosure reporting requirements in collaboration with site permitting applications, while other states have taken the approach of prescribing daily water usage maximums.

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[15] How Data Centers Are Endangering State Budgets - Good Jobs First
[16] Tax Exemptions and Tax Incidence Report
[17] Virginia Department of Accounts - Reports
[18] Cloudy-Data-Costly-Deals-How-Poorly-States-Disclose-Data-Center-Subsidies.pdf
[19] In a recent lawsuit in Oregon, where The Dalles city sued a local newspaper for requesting disclosure of Google's data center water consumption.

In June 2025, **New Jersey** introduced Bill A5892 requiring the New Jersey Department of Environmental Protection to conduct a study outlining the short- and long-term effects of water use by data centers. Additionally, the NJ legislature attempted to pass BILL S4293 that would require the owner or operator of data centers to submit water and energy usage report to the NJ Board of Public Utilities. However, a conditional veto was placed on that legislation. The bill, now Bill 5548, extends the deadline for data centers to report their energy and water usage from six months of the legislation being enacted to a year and a half.

New York introduced a comprehensive SB S6394A requiring data centers to annually disclose projected energy consumption, energy sources including renewable sources, water consumption, and their efforts to reduce reliance on fossil fuels to New York's PSC.

Virginia has introduced two bills aimed at addressing water consumption of data centers that have stalled in committee. HB 1288, introduced in the 2025 session, would have required electric and public utilities to include a separate classification for data centers. SB 899 would have given authorization to counties to include in its zoning ordinance provisions that would have required data center developments to submit water use estimates.

Michigan has introduced three bills in 2025 addressing data center water usage. SB 761 would cap entities withdrawing above an average of 2 million gallons of water per day from obtaining a water withdrawal permit. SB 762 would require Michigan's PSC to publish annual reports regarding the total energy and water usage of data centers. SB 763 would bar water utilities from passing infrastructure costs that accommodate data centers onto residential customers.

In 2025, **California** introduced and passed AB 93 which requires data centers applying for business licenses to disclose their water supplier and how much they are expected to consume. For existing data centers, it requires the disclosure of water use to renew business licenses. The bill however, was vetoed by the Governor, citing that the bill imposes "rigid reporting requirements" on a sector with impacts that are not fully understood.

Kansas passed SB 98 in 2025 which establishes tax incentives for data centers and tied eligibility to commitment from data centers to adhere to practices that will conserve, reuse, and replace water.

In 2025, **Minnesota** passed HF 16 establishing new requirements for water appropriation permits for data centers expected to consume more than 100 million gallons annually.

Additionally, the bill grants the Minnesota Department of Natural Resources to evaluate water conservation measures prior to issuing permits.

Utah introduced the Data Center Water Policy Amendments in 2025. The bill, if passed, would require data centers to report to the state how much water they consume annually. The Utah Division of Water Rights would then publicly report the data without revealing identifying information to protect the companies' intellectual property. Failure to adhere to the rules established could result in a $10,000 fine for each day the data center is not in compliance.

Renewable Energy and Emissions Standards

Modern day data centers consume large amounts of energy, traditionally from fossil fuels, which generate large amounts of carbon dioxide. A recent study revealed that data centers could generate 24 to 44 million metric tons of carbon dioxide annually by 2030, which is the equivalent of adding 5 to 10 million cars to U.S. roads.

Currently, natural gas is the biggest source of electricity for data centers in the United States, making up 40% of total energy consumed. Renewable energy is the second largest energy source with solar and wind making up 24% of energy consumption, followed by nuclear and coal supplying 20% and 15% respectively. The International Energy Agency (IEA) projects that natural gas will continue to supply the largest share of energy for data centers through 2030, followed by renewable sources due to the increasing electricity mix of most states and a commitment from data centers to invest in renewable projects. Additionally, nuclear power could also play a significant role in meeting the energy demand of data centers after 2030 due to the many purchase agreements[20] data centers have made with nuclear power startups.

The mission driving this transition is both environmental and economical. Data centers are seeking stable long-term energy costs that would maintain the resilience of the electric grid while also aligning with global climate goals like net-zero emission standards and sustainable energy. To push data centers towards that mission, several states have begun introducing regulations and legislative measures that align the growth of data centers with climate and energy objectives.

New Jersey introduced Bill S4143 in 2025 that would require AI data centers to run on only new/additional clean energy or nuclear power or a combination of both. However, this requirement is only triggered if the New Jersey Board of Public Utilities finds that most states in the PJM region adopt similar rules. Additionally, the legislation requires AI data

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[20] Meta, Google, Amazon, Oracle

centers to submit energy usage plans and detail how the data center will be powered without harming the clean energy supply on the grid prior to filing an application for local development.

Pennsylvania introduced HB 1834 requiring that any new data center contracting with the PUC supply at least 25% of electricity from renewable sources. Additionally, the legislation created a new fund that joins with a federal program, Low-Income Home Energy Assistance program (LIHEAP). Based on a set peak load limit, data centers would have to make annual payments to the fund which would be used to assist low-income families in paying their energy bills.

New York introduced SB S6394A in 2025 requiring energy reporting requirements and established that by 2030 at least one-third of all energy used by data centers must be renewable energy, two-thirds must be renewable energy by 2035, and by 2040 all energy used by data centers must be renewable energy.

Maryland passed HB 0270 in 2025 requiring the Department of Environment, Maryland Energy Administration, and the University of Maryland School of Business, to conduct an analysis of the likely environmental, energy, and economic impacts of data center development in the state.

Virginia introduced HB 2578 in 2025 that tied eligibility to receive tax and sales exemptions to purchasing a certain percentage of electricity from clean energy resources beginning in 2030.

Michigan adopted HB 4906 encouraging data centers that will use tax exemptions to take direct steps to adopt practices to mitigate negative environmental impacts of data centers and, “to the extent possible,” procure or contract power from renewable energy sources.

Connecticut introduced SB 1292 in 2025 requiring the Connecticut Commissioner of Energy and Environmental Protection to conduct a study concerning energy efficiency performance standards for data centers.

Utility and Ratepayer Protections

The biggest concern and most immediate impact states have encountered with inviting data centers to their states is higher utility rates for consumers. This is caused by the constant high energy flow required to power data centers, and the consumption of limited resources necessary to produce electricity. As noted earlier, hyperscale data centers consume large amounts of power, often requiring upgrades to the electric grid. These costs can include transmission and distribution line improvements and the addition of new generation capacity through the construction or opening of a new power plant. These costs are sometimes allocated across the utility's consumer base and across the PJM region. Furthermore, the resources needed to produce electricity, such as coal and uranium, are limited resources that must be extracted, processed, and transported. To meet the demand of energy to power data centers, these resources would need to be extracted and processed at a greater scale, often raising marginal costs. With the current rate of hyperscale data center growth, supplies cannot expand as quickly or as cheaply as needed.

Given the far-reaching implications of data centers on the electric market, and the limited ability of states to mitigate the impact of data centers on their consumers, efforts to reduce data center impacts on utility rates have taken two forms. First, states are introducing regulations and legislation aimed at restructuring how utility rates are set. This includes creating new classifications for large load electricity consumers and developing strategies to allocate the costs of local grid upgrades to hyperscale data centers. Second, states are collaborating with neighboring states to engage their RTOs in discussions on mitigating the impact of data centers on the electric grid.

FERC Regulation on Co-Locating Data Centers

In the last few years, data center developers and operators have begun locating their data centers near new or existing power plants to reduce transmission losses that often occur when transmitting electricity over a longer distance, obtain energy at a lower cost by buying directly from power plants through Power Purchase Agreements (PPAs), and ensure a reliable and predictable supply of electricity. Additionally, by co-locating, hyperscale data centers avoid associated costs with overloading the grid or paying for upgrades as historically, PJM did not clearly define rules regarding these issues. In turn, these costs were passed on to consumers.

However, the FERC issued a new order in 2025 directing PJM to revise its generation interconnection procedures, to create four new transmission service options to facilitate co-located load, and to revise behind-the-meter generation rules to address reliability. Additionally, the FERC ordered PJM to report by January 19th, 2026, on the status of its proposals to speed up the addition of generating capacity.

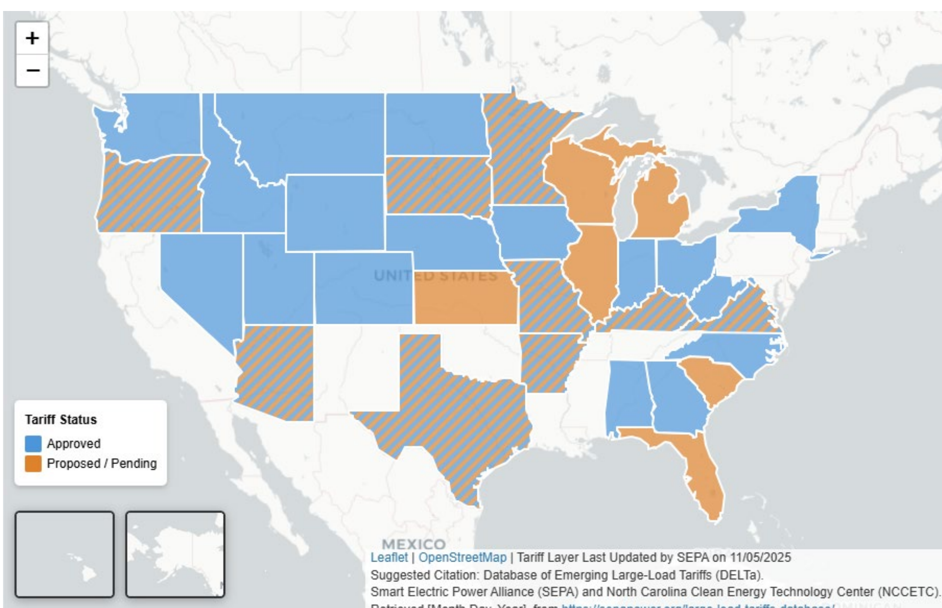
State Public Utility or Service Commission Regulations

Pennsylvania's Public Utility Commission recently proposed a model tariff for large-load customers in November 2025 through a tentative order. In the order, the Pennsylvania PUC is considering definitions for large-load customers and has suggested that large-load customers take greater responsibility for the costs of transmission upgrades and recommended that large-load customers contribute to utilities' low-income assistance programs. The order is currently pending and has considered suggestions and comments from stakeholders during the 30-day public comment period.

Virginia's State Corporation Commission recently approved the creation of a new rate class for large-load electricity users, GS-5. The new rate class will be comprised of customers requiring 25 MWs or more of electricity and will become effective January 1, 2027. The Commission is also requiring large-load data centers to pay a minimum of 85% of contracted distribution and transmission demand, and 60% of generation demand[21].

Ohio's Public Utilities Commission issued an order directing one of its retail electric utilities to file new tariffs applying to data centers. The order required data centers larger than 25 MW to pay 85% of their contract capacity each month, regardless of how much power they consume. Additionally, the order established provisions such as collateral requirements, exit fees, and capacity reassignment, which holds data centers accountable for costs if they cancel or delay developments.

Michigan issued an order in November of 2025 revising tariffs that now apply to any new customer with a load of 100 MW or greater at a single unit. The order also establishes minimum payment requirements of at least 80% for power data centers agreed to use, even if the large-load customer uses less energy than originally planned. In addition, the order directs the public utility, Consumers Energy, to design six alternative cost allocation strategies and rate design proposals in its next rate care.



[21] PUR-2025-00058 (p.23)

To find the latest proposals or approvals on large-load tariffs, refer to the Smart Electric Power Alliance database here.

State Legislation on Protecting Ratepayers

Pennsylvania introduced HB 1834 directing the Pennsylvania PUC to promulgate regulations aimed at protecting ratepayers from energy costs associated with data center development. The legislation also requires that the public utility not recover from ratepayers' costs that are associated to providing electric service to commercial data centers, and costs that would not have incurred but for the electricity demand associated with commercial data centers.

New York introduced SB S6394A directing the PSC to establish a surcharge and discount plan. Data centers would be required to pay a surcharge that would be used to cover any rate increases resulting from transmission and distribution system upgrades and any increases in energy supply costs directly resulting from the operations of data centers. The monies collected with the surcharge would be directed to New York's energy affordability program to assist low-income customers in paying their utility bills in the form of credits. Any violation of the legislation would subject data centers to a $10,000 fine and $10,000 for each day they are not in compliance. New York also introduced a similar bill, AB A9064.

New Jersey introduced Bill A5462 requiring electric utilities to develop and apply special rules for large-load data centers to protect non-data center customers from increased costs. The rules include establishing deposits that large-load centers would have to post to protect consumers should the data center cease to operate or take in less energy than anticipated over a 10-year period. In another recently passed bill, A5466, the New Jersey legislature directed the New Jersey Board of Public Utilities to study the effects of data centers on electricity costs in the State.

Oregon passed HB 3546 in June 2025 directing the PUC to provide a new tariff for large-load customers and that the tariff allocates the costs of serving large-load customers to that customer mitigating the risks to other retail electricity consumers. The bill also directs the PUC to report each even-numbered year to the Assembly related to energy on trends in load requirements and other implications from large energy use facilities.

Texas passed SB 6 directing the PUC to establish rules for IOUs to address the cost sharing and interconnection standards for new large-load customers. In SB 6, large load customers (75 MW) will be required to incur the costs associated with connecting to the grid. Under SB 6, applications for data center development will require proof-of-site control and financial commitments, and a minimum $100,000 fee for initial transmission screening. Large-load customers are also required to disclose on-site backup generation, which must be capable of meeting 50% of the sites' demand, to utility providers and the Electric Reliability Council of Texas (ERCOT). Under the bill, ERCOT has the authority to order large-load customers to switch to on-site backup generators or cut off power during volatile conditions of the grid.

Community Standards and Quality of Life

Virginia's HB1601, which had bipartisan support, was vetoed in May 2025 by Governor Glenn Youngkin, who cited state government overreach and potential loss in economic benefits as the reasoning for his veto. The bill would have required data center applicants to perform and submit a site assessment, examining the sound profile of the center on residential units and schools located within 500 feet of the property boundary. Additionally, the bill would have allowed localities to require that a site assessment also examine the effect of the proposed facility on "(i) ground and surface water resources, (ii) agricultural resources, (iii) parks, (iv) registered historic sites, and (v) forestland on the site or immediately contiguous land."

> HB1984 would have required any local government land use application for the siting of a data center only be approved for areas that are 1/4 mile or more from federal, state, or local parks, schools, and property zoned or used for residential use. However, this bill died in committee in 2025.
>
> HB2026, which died in committee, would have required localities to review and amend zoning ordinances to designate data centers as industrial uses, as well as the locations of zones allowing data centers by right, considering proximity to residential areas. The bill would have also required localities to review building heights in zoning ordinances with the intent to mitigate negative impacts on residential or other sensitive areas. The bill addressed reducing the likelihood of noisy data centers by requiring localities to consider zoning ordinance amendments, including limiting allowable locations and requiring sound modeling, and prohibiting the constant low-frequency noise of data centers from reaching residential areas.
>
> HB2712 would have allowed localities to require and consider water use estimates for proposed data center developments, sound modeling studies used to establish and enforce maximum allowable sound levels for operational data center facilities, including the use of alternative low-frequency metrics, including the requirements in zoning ordinances. However, this bill failed to pass either chamber.

SB1448 would have required the Virginia Department of Environmental Quality to develop an obligatory permitting process for the construction and operation of resource intensive facilities, including data centers, to protect the Commonwealth's natural resources environment and public health. However, this bill died in committee.

Minnesota's HF 1109 would have prohibited the development of data centers outside of industrial zones, but this bill failed in committee.

Tennessee's HB0946 would have required data center applicants to perform and submit site assessments examining the effects of the proposed facility on water, agricultural resources, parks, registered historic sites, and forestland located onsite or immediately contiguous land. Additionally, localities would be required to analyze site assessments for consistency with the locality's policies and compliance with noise ordinances, zoning ordinances, and other applicable laws and regulations. Tennessee's legislature failed to pass this bill.

Delaware Local and Statewide Action on Data Centers

As mentioned on page 8 of this report, there are up to 3 proposals for hyperscale data centers in Delaware. In January 2026, members of the Delaware Coalition for Open Government and other organizations have called on state leaders to enact a temporary moratorium on hyperscale data center projects, with the intent of gaining additional insight on the impacts of hyperscale data centers and ensuring there are proper regulations in place to protect the public.

Delaware's General Assembly has yet to consider legislation specifically related to data centers, although the following bills have been introduced:

- HB 233, which is awaiting consideration in committee, requires regulated utilities to establish a separate rate for large energy-use facilities, meaning a facility that uses or is able to use 20+ MW, with the intent to mitigate the risk of costs associated with expanding infrastructure and maintaining grid reliability being shifted to residential, small business, and other electric customers. The PSC must consider a variety of factors for rate approval, including any conditions the commission may require in the interest of the public.
- SB 205 requires any person or entity seeking to operate a facility using 30 megawatts (MW) of electricity or greater to first obtain a Certificate to Operate ("COP") from the PSC. The 30+ MW threshold presumably includes most enterprise data centers and all hyperscale data centers. Applicants must include the impact of their plans on transmission capacity, if transmission upgrades are necessary,

power generation plans, impacts of the plan on Delaware electricity costs, and overall grid reliability. The PSC would have the authority to require financial commitments from applicants, including towards grid modernization for the project. The PSC would also have the discretion to grant the "COP" based on a variety of factors. For example, if PJM has completed all relevant studies confirming adequate energy and capacity supply to serve the proposed load, the impact on the State's economy, the impacts to the State's ratepayers, and whether the application is consistent with the achievement of the State's greenhouse gas emissions reduction targets and renewable energy standards, in addition to the impact of granting the "COP" on the health, safety, and welfare of the general public. SB 205 is currently awaiting consideration in committee.

On September 3, 2025, the Public Service Commission granted a request to open a docket to develop a large load tariff to ensure facilities like data centers do not shift energy infrastructure costs onto other ratepayers. Additionally, the PSC voted to pause the interconnection of any new large load facilities in Delmarva Power & Light ("Delmarva") territory until a large load tariff is established. Governor Matt Meyer and Public Advocate Jameson Tweedie have asked the PSC to place rules and regulations requiring any data center larger than 25 megawatts (MW) to pay its fair share to connect.

On a local level, New Castle County Council's[22] Substitute No. 2 to Ordinance No. 25-101 amends New Castle County's Unified Development Code and Use Regulations to address data center development considerations. The ordinance outlines parameters to mitigate noise and light pollution for residents, as well as parameters for water and energy usage. The ordinance has proven to be controversial and has been tabled multiple times since August 2025, with various councilmembers introducing substantive changes that alter the original intent of the ordinance.

VII. Considerations for Delaware Legislators

Studying the Impacts of Hyperscale Data Centers

As the hyperscale data center industry is relatively new, studying the impact of these projects on Delaware's electric grid infrastructure, environment, communities, and natural resources may provide valuable insight for Delaware lawmakers. Delaware could look to neighboring states (Maryland, New Jersey, Connecticut) who have passed or introduced legislation to study hyperscale data centers and their impacts. Some legislation directs state agencies to conduct studies on hyperscale data centers' impacts on energy and the

[22] New Castle County Council's Legislation Search function on their website

environment, while other legislation requires PSCs to study their impact on utility rates. Additionally, some states require a comprehensive study on the short-term and long-term overall impacts of hyperscale data centers.

Implementing Transparency and Disclosure Requirements

To conduct comprehensive studies on the impacts of hyperscale data centers and to better inform the public, Delaware legislators could implement certain disclosure reporting requirements for data center owners and operators. New York and New Jersey have introduced legislation requiring hyperscale data centers to disclose water and energy consumption. Minnesota requires water conservation measures to be demonstrated by data centers prior to permit application approval, and Kansas ties data center tax incentives to a commitment to conserve, reuse, and replace water.

Many data center disclosure reporting bills have failed to pass, primarily due to the recognition of proprietary information. To address this issue, Utah introduced HB 76 in December 2025. The bill would require data centers to report their water usage without sharing any identifying information.

Flexible and Proactive Legislation on Hyperscale Data Center Impacts

It is evident that hyperscale data centers have or will have some degree of impact on the electric grid, the environment, the economy, and the public as the industry grows at an exponential rate. Proactively collaborating with relevant stakeholders (i.e. tech companies, local governments and communities, utility companies, labor unions, environmental groups) may help identify and address hyperscale data center impacts on Delaware specifically. As such, Delaware lawmakers could consider introducing legislation focusing on one hyperscale data center impact at a time, offering well-informed, proactive, and timely solutions for a rapidly expanding industry as opposed to a reactive, all-in-one legislative approach later on.

For reference, Virginia has the largest data center industry in the United States. Between Virginia's 2024 Legislative Session and 2025 Legislative Session, 114 bills were introduced attempting to address various impacts from data centers. However, these bills either failed in committee or were vetoed.

VIII. Appendix 1

The Electric Grid Prior to the 1960s

Prior to 1960s, the U.S. electric grid operated mostly by individual utility companies where each utility company built its own power plants and lines, also known as vertical integration. During this period, minimal rules or oversight existed to manage the electric grid. However, in 1965, a tripping of a 230-kilovolt transmission line near Ontario, Canada caused a cascading tripping of additional lines, resulting in a power outage across the entire Northeastern transmission network. This event left 30 million people in eight U.S. states and several Canadian provinces without power for up to 14 hours[23], demonstrating how interconnected the U.S. electric grid is and prompting the creation of a self-regulatory and oversight body - the North American Electric Reliability Corporation (NERC)[24]. NERC was a voluntary-compliance organization and, despite the coalition of electric utility companies to set standards and maintain reliability of the electric grid, another major blackout occurred in 2003 due to a violation of NERC Reliability Standards.

Two years later, the Energy Policy Act of 2005 was passed, providing the Federal Energy Regulatory Commission (FERC) power to make grid reliability standards mandatory and to designate NERC as an Electric Reliability Organization (ERO). This move ultimately gave the NERC legal authority to enforce reliability standards and issue penalties when companies fail to follow reliability standards.

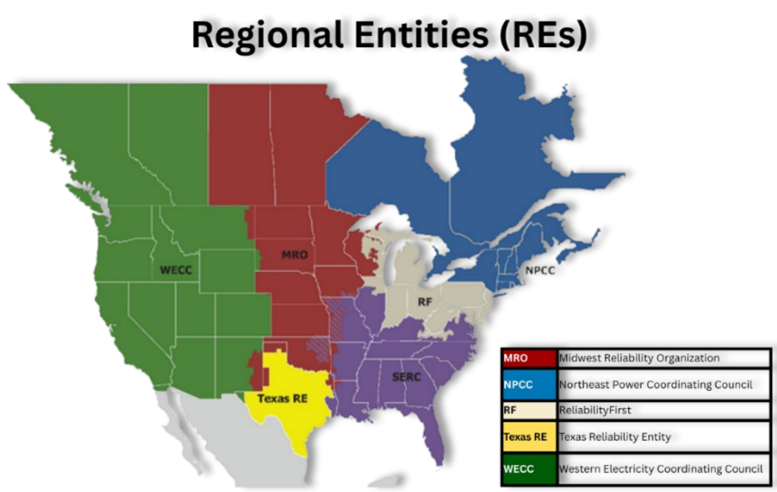


Figure VII.1 NERC

Figure VII.1. REs represent all stakeholders and segments of the electric industry made up of electric utility providers, federal agencies, power produces, and end-users of energy. REs have legal authority to enforce reliability standards locally and audit utility providers and grid operators.

[23] The Great Northeast Blackout | November 9, 1965, | HISTORY

[24] The History of the North American Electric Reliability Corporation (NERC)

Today, NERC oversees 6 Regional Entities (REs) and delegates its authority to oversee the reliability of the electric grid to specific geographic regions.[25]

The Electricity Market

There are two types of electric markets in the United States: a **traditionally regulated market** and a **deregulated market**. Under a traditionally regulated market, utility providers are typically vertically integrated monopolies, meaning utility providers own all production and distribution facilities of the electric industry. The price of electricity in this market is set by the PSC based on recovering the utility's operating and investment costs. Under this structure, many states require utility providers to demonstrate the need for investment through an integrated resource planning (IRP) process. While a traditionally regulated market sets the rate of return on investments to prevent utility providers from overcharging consumers, consumers under this market bear the risk of investment.[26] Additionally, because vertically integrated utility companies are typically investor-owned utilities (168 companies in 2017[27]) there is an incentive to maximize profit through investment, creating tension between regulators whose goals are to achieve just and reasonable rates.

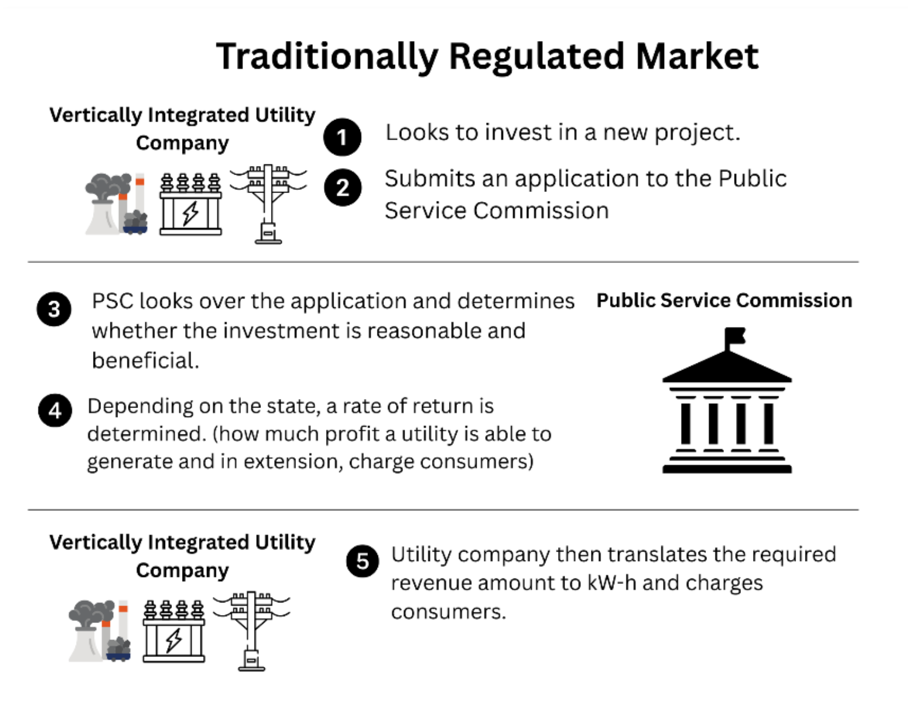


Figure VII.2 Traditionally Regulated Market

[25] ERO Enterprise | Regional Entities
[26] SCE&G customers to pay another $2.3 billion for failed nuclear project, regulators decide
[27] Investor-owned utilities served 72% of U.S. electricity customers in 2017 - U.S. Energy Information Administration (EIA)

The second type of market is a **deregulated market**. This type of market began in the 1990s as many states deregulated their electricity systems to create a competitive wholesale market. Accordingly, this change dissolved the monopolies of many utility providers, leading to the sale of generating assets, and in turn creating independent energy suppliers (suppliers that only own power generation).

As such, utility providers (that can distribute the purchased electricity) now purchase electricity through a wholesale market that is overseen by a regional transmission organization (RTO) or Independent System operator (ISO). These organizations ensure that there is enough supply to meet demand and setup auctions in which power plants bid to sell electricity. RTOs are composed of members ranging from five voting blocs or "industry sectors": generation owners, transmission owners, other suppliers, electric distributors, and end-use customers.

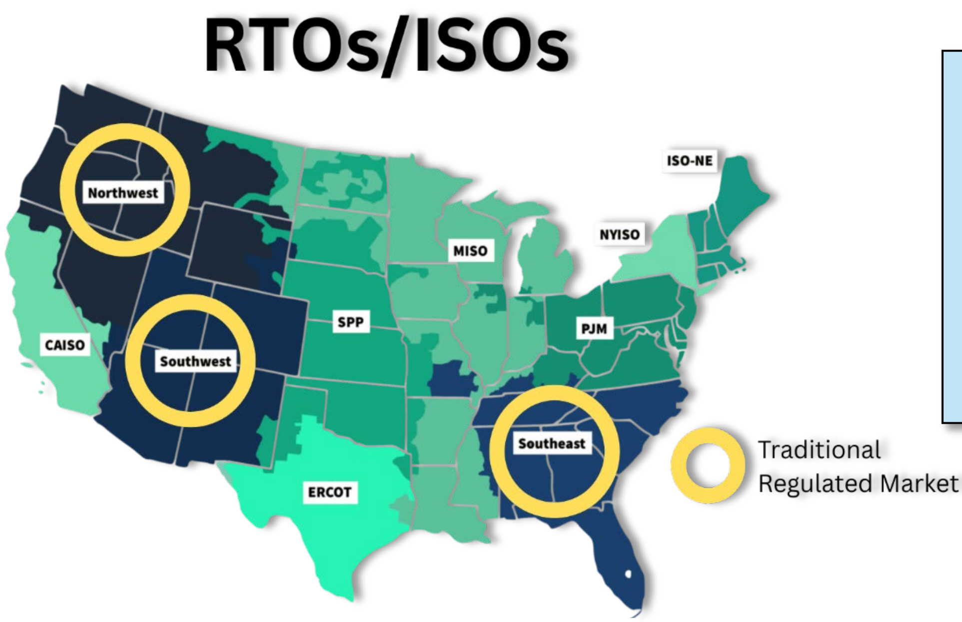


Figure 4. Regional Transmission Operators (RTOs) and Independent System Operators (ISOs) function as organizations that oversee the marketplace for wholesale electricity. Their difference rests in the size of the region they cover and in how they price services.

Figure VII.3 PCI Energy Solutions

Electricity Wholesale Markets

Each RTO and ISO operate various markets, but the most common are day-ahead and real-time markets. In the **day-ahead market**, power generators submit bids to sell electricity and utilities, and retail electricity suppliers submit bids to buy electricity for delivery the next day. This market operates throughout the whole day and prices are driven by forecasted demand and available energy for each hour. This gives RTOs and ISOs time to meet demand and also to make preparations for electric transmission line congestion, which can drive up the cost of electricity in a specific region on the grid. The majority of energy market transactions take place in the day-ahead market. To understand how bids and auctions function in the wholesale market, **figure VII.4** outlines an example.

Because demand and supply factors continuously change, the **real-time market** tries to balance supply and demand on a five-minute hourly bases based on the conditions of the grid. This helps address issues that can occur in the grid like unplanned outages, unexpected levels of congestion on transmission lines, or increase in demand due to weather conditions.

There are also two other markets: capacity markets and ancillary services. Under a capacity market, RTOs and ISOs oversee transactions where commitments from power suppliers are made to provide future electricity needs. Ancillary services are products that help the electric grid remain operative and functioning reliably.

Wholesale Market

Power Plants

The first step in the wholesale market is the process of generating power. In the U.S., these power plants are owned by companies like: NextEra Energy, Duke Energy, and Exelon.

Power plants tell PJM that this is the price we are willing to sell the electricity per MW.

	Power Plant - A	Power Plant - B	Power Plant C
Total Capacity	600 MW	300 MW	150 MW
Bid Price	$50 per Megawatt Hour	$100 per Megawatt Hour	$150 per Megawatt Hour

PJM

PJM projects that its region would need 500 MW demand in a given hour. PJM orders the bid prices from lowest to highest and picks which power plant should run to meet the electricity demand in its region at the lowest price. In this example, power plant A or $50 per Megawatt / hour. This is called “clearing” the market.

For example, if demand for electricity climbs, from 500 MW to 800 MW, PJM would then dispatch power plant B and the new price for the wholesale of electricity would be set to $100 per Megawatt / hour.

Utilities/ Suppliers

Electric retail suppliers and utilities are then able to purchase electricity at the wholesale price.

Figure VII.4 Wholesale Energy Market and Auction Process

Retail Electricity Market

Once a transaction is made between wholesale power suppliers and utilities, the delivery of power flows to the end-user. For consumers who opt into third party electric suppliers, their power flows directly to the utility distributor and then to the consumer. For consumers opting for SOS, power rates are determined after the utility distributor procures power from wholesale suppliers through a bidding process or a Request for Proposal (RFP). Based on demand and lowest price bid, the utility provider procures power from the supplier and the power flows to the end-user. The PSC's role during this process is to mainly regulate the rate of distribution (delivery).

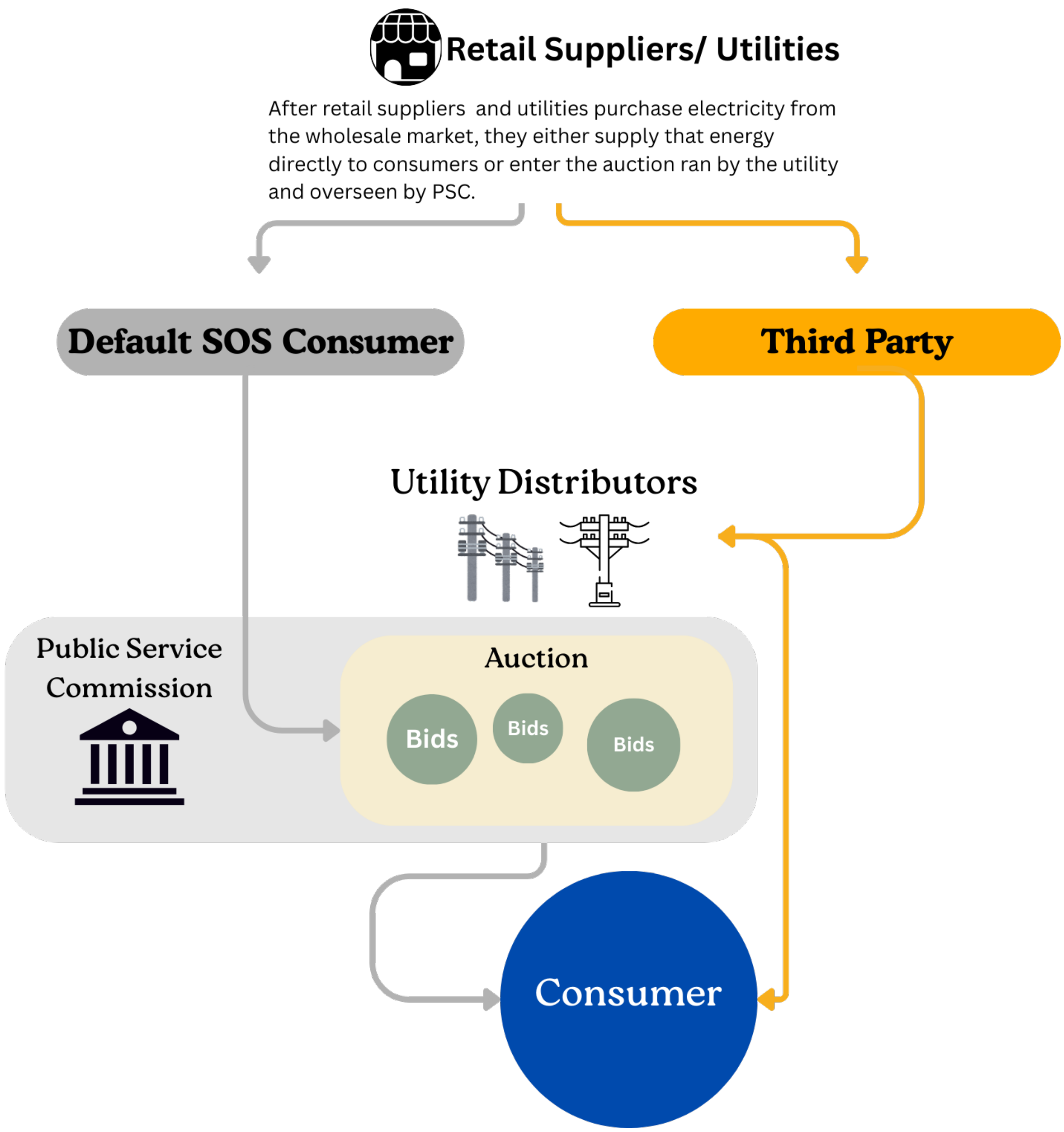


Figure VII.5 Retail Energy Market