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RESEARCH REPORT

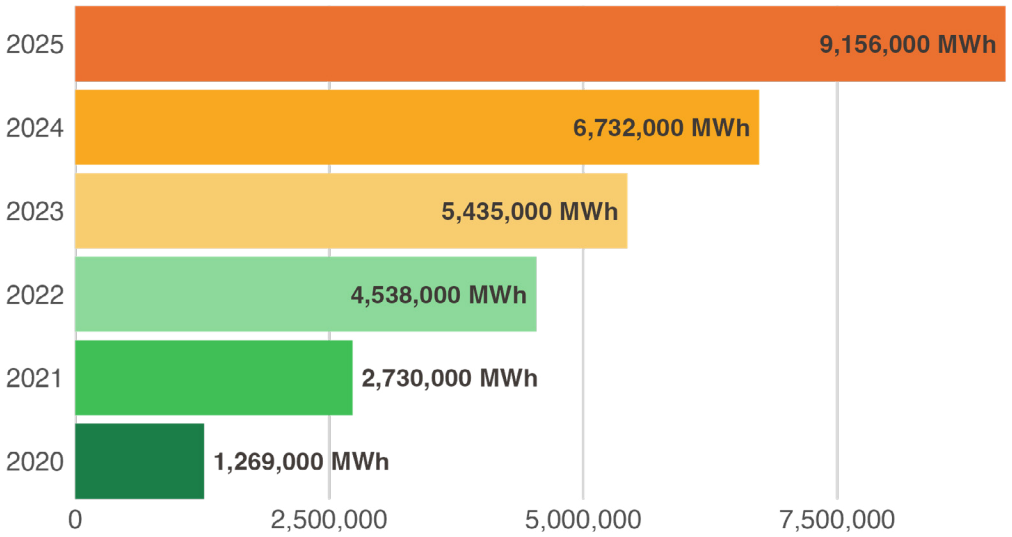
Powering the Boom: Data Centers and What They Mean for Tennessee's Energy Future.

Part I: Growing Electricity Demand and Affordability Challenges.

Data centers are rapidly reshaping electricity demand—and Tennessee is beginning to feel the effects. In recent years, data center electricity consumption has grown sevenfold in the Tennessee Valley region, leading to the first sustained increase in energy demand in two decades. Data centers represent billions of dollars in capital investment, and the state leads the nation with the fastest-growing tech workforce (36.6%). Yet, without careful planning, data center-driven growth could strain grid reliability and increase household costs.[1]

In the Tennessee Valley region, data centers' electricity consumption has increased by 7.2 times in five years—enough to power over 661,000 homes today*

Data Centers are facilities that hold essential IT infrastructure that builds, stores, and delivers applications and data.



Source: Tennessee Valley Authority (TVA), June 2026 Investor Presentation.
**Estimated using the most recent data (2024) on average annual electricity consumption (sales in MWh) per residential customer at 13.8 MWh (calculations are not exact due to rounding).*

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Tennessee is at a critical inflection point. Decisions made today about planning, pricing, and infrastructure will determine whether data center growth strengthens Tennessee's economy—or places new costs and risks on households and businesses.

Part I of this *Powering the Boom* two-part series, examines how data center-driven demand is changing the state's energy landscape, the risks it poses to reliability and affordability, and the need for proactive policy design. Part II will outline available strategies to capture economic benefits while protecting ratepayers and ensuring a more resilient grid.

KEY TAKEAWAYS

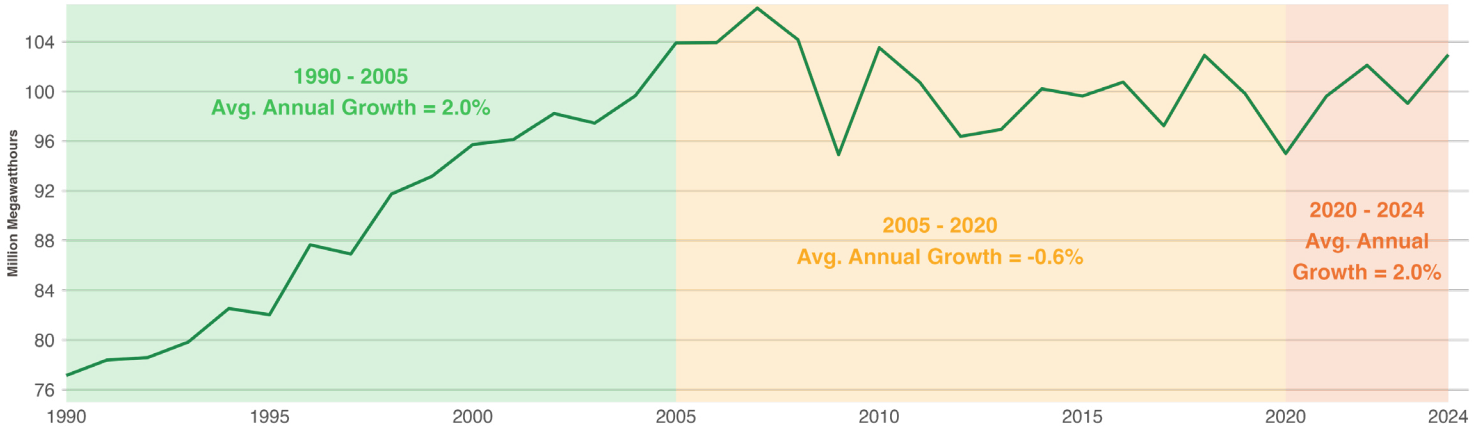
- After years of flat consumption, data centers are contributing to surging demand.
- Tennessee is an emerging data center market and has likely not yet seen the full scale of potential growth.
- Data center growth introduces risks, including straining grid reliability and expensive outage costs.
- Amid rapid data center growth, households are experiencing the largest increases in electricity costs.
- Tennessee is at a critical decision point for crafting policy before data center growth accelerates further.

After years of flat consumption, data centers are contributing to surging demand.

For 15 years, Tennessee's average annual electricity consumption growth had been negative (-0.6%) before reversing course in 2020—driven in part by data centers. In the Tennessee Valley region, data centers' electricity consumption has grown sevenfold in five years—reaching 9.2 million MWh in 2025.

Today, the state's demand capacity—the rate at which electricity is being consumed at any moment (MW)—of planned, operational, or under-construction data centers is 2,177.5 MW (5.3% of TVA's net summer capacity), the electricity needed to power over 1.3 million Tennessee homes in a year.[2,3]

After more than a decade of stagnant growth, Tennessee's electricity consumption is rising.



Tennessee's electricity sales to ultimate customers (consumption) and average annual growth (CAGR), 1990-2024.

Source: U.S. Energy Information Administration, Form EIA-861, Annual Electric Power Industry Report.

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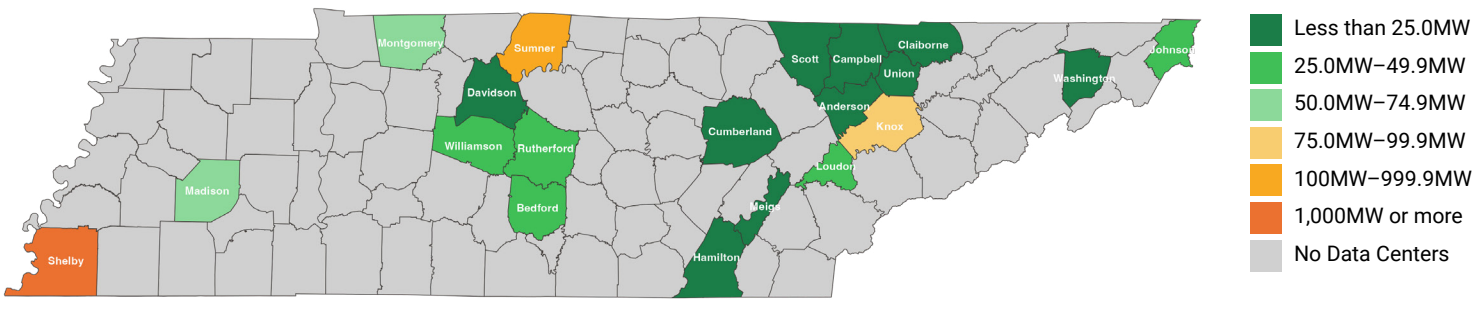
Regionally, data centers and other commercial customers are expected to lead demand growth. Forecasts for 2020-2027 anticipate the average overall electricity consumption to increase by 0.9% annually in the East South Central U.S. Census region (AL, KY, MS, and TN). Anticipated commercial electricity consumption is higher, at 1.2% in the same region.[4]

If demand exceeds projections, TVA might have to resort to costly emergency measures. TVA's 2026 Integrated Resource Plan (IRP) estimates between 0.5% and 1.5% of annual growth by 2050. If demand turns out to be higher, it could force TVA to purchase power at prices above its generation costs, trigger rolling blackouts and rate raises, and delay connections for other commercial and industrial customers.[5,6]

Tennessee's data center facilities are concentrated in the Memphis, Nashville, and Knoxville metropolitan areas.[7]



Source: U.S. Department of Energy, Accelerating Speed to Power.

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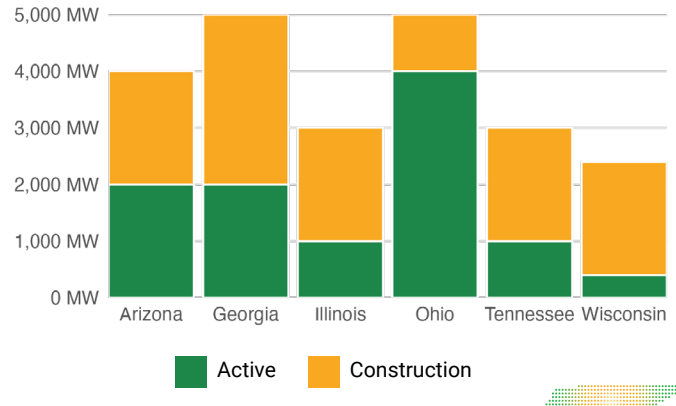
Tennessee is an emerging data center market and has likely not yet seen the full scale of potential growth.

Today, nearly two-thirds (64%) of upcoming data center capacity is occurring outside of the traditional markets (Northern Virginia, Dallas-Fort Worth, and Silicon Valley). Among the emerging data center markets, Tennessee accounts for 16.7% of data center capacity currently under construction.[8]

Our state is attractive for developers due to ample land availability, business-friendly environment, and abundant energy sources—including a diverse energy portfolio, renewable power sources, and distributed generation options. **Tennessee also has the fastest-growing tech workforce,** leading the nation with a 36.6% increase in tech employment from 2019 to 2025.[9,10]

TVA's pipeline already shows requests well above current demand. In July 2025, the company had 11,000 MW in requests from data centers—5.0 times more than its existing demand.[11]

Tennessee projects under construction account for 16.7% of the upcoming data center capacity among growing markets.



Source: Jones Lang LaSalle IP, Inc.

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Data center growth introduces risks, including straining grid reliability and expensive outage costs.

More data centers in Tennessee could bring real risks for Tennessee electric consumers.

Data centers in Virginia and Texas demonstrate potential increased risks of widespread outages. Grid systems in both states experienced sudden and simultaneous disconnections from data centers—triggering emergency interventions from operators to prevent mass outages.

- Around 60 data centers, a total of 1,500 MW, in Virginia's Data Center Alley dropped off the grid in 2024, resulting in a sudden surplus of energy. Providers were required to rebalance the grid's supply to prevent outages. Texas' ERCOT has similarly experienced up to 400 MW load reductions.[12,13,14,15]

Sudden drops in data center electricity consumption can lead to costly electricity outages. The economic cost of power interruptions—known as the Value of Lost Load (VOLL)—is substantial. Each hour of unserved electricity translates to $35,685 in lost economic activity, on average, with data centers facing the highest losses.*[16]

Grid reliability is already a concern in Tennessee. During 2026's Winter Storm Fern, 345,000 Tennessee customers lost power—more than in any other state. It took nine days to restore power to all customers. Even without major events, the average Tennessee customer lost power for 159.5 minutes (ranking #39 nationwide), during 1.8 outages (#45) in 2024.[17,18]

Grid failures would cause the largest economic losses to commercial and industrial customers—including data centers.

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- Medium and Large Commercial and Industrial Customers ↓ $7,413/MWh
- Small Commercial and Industrial Customers ↓ $1,268/MWh
- Residential Customers ↓ $7/MWh

Even brief outages can cause significant losses for data centers—exceeding $1 million for one in five data center operators.[19]

Source: The Brattle Group.

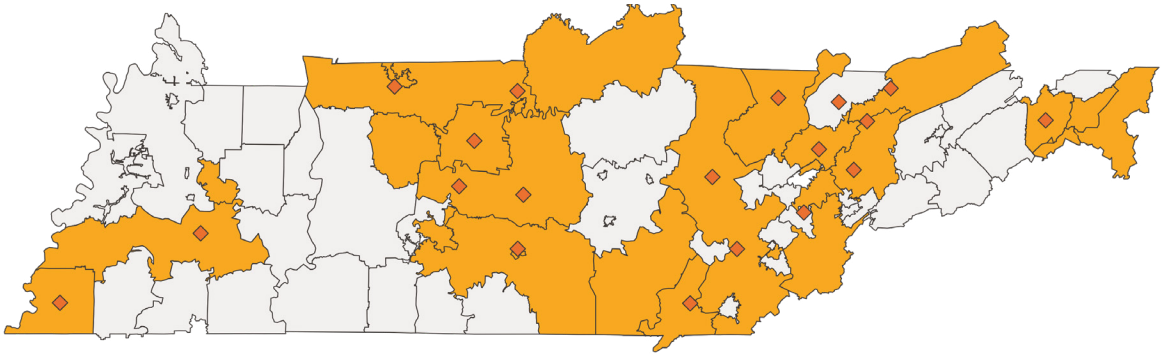
The value of lost load (VOLL) is a proxy for the economic costs electric power customers incur due to a power outage or interruption. Because residential, commercial, and industrial sectors are impacted differently by the outages, their VOLL can significantly vary. Residential VOLL is the customer's willingness to pay to avoid the outage, commercial and industrial VOLL represents the estimated economic losses resulting from the outage.

Amid rapid data center growth, households are experiencing the largest increases in electricity costs.

In communities with data centers, residential electricity bills rose even as commercial bills fell. Electric bills are rising more prominently in areas with data centers, and residential customers' bills are increasing while commercial customers' bills decrease.

- Areas in Tennessee hosting data centers saw electricity bills rise 1.6%, on average, between 2023 and 2024, compared to the statewide average of 1.3%.
- Residential customers absorbed a 3.2% increase, with electric bills reaching an average of $149.10/month. While commercial customers saw electricity bill reductions of 0.2%, on average.

Residential customers near data centers are paying more with higher-than-average electric bill increases, while commercial customers—including data centers—pay less.



Utility service territories where increases in residential bills exceed changes in commercial bills* (2023-2024); diamonds indicate counties that host operational or under-construction data centers (December 2025).

Source: U.S. Energy Information Administration; U.S. Department of Energy.
**Includes cases where residential bill increases exceed commercial bill increases and cases where residential bills increased while commercial bills decreased.*

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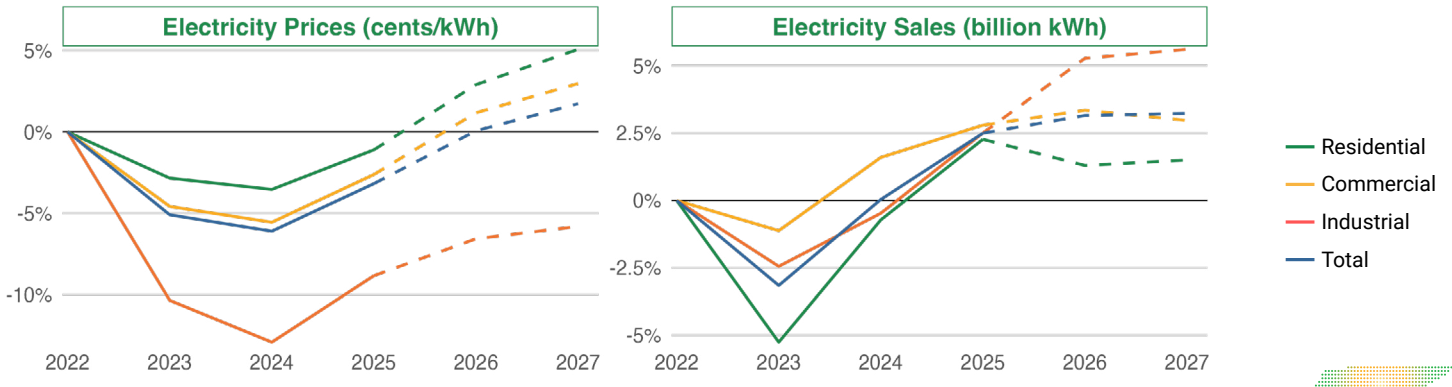
Regional forecasts show a similar pattern: residential electricity prices are projected to rise faster even though commercial demand is projected to grow more quickly. In the East South Central U.S. Census region, consumption from commercial customers (3.0%) is projected to increase at twice the rate of residential customers (1.5%). Yet, residential electricity prices are projected to increase the fastest rate among all sectors—by 5.1% by 2027 relative to 2022 prices.[20,21]

In the East South Central region, residential customers will face the highest price increases, despite projections for the slowest consumption growth.



Source: U.S. Energy Information Administration, Short-Term Energy Outlook.

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Tennessee is at a critical decision point for crafting policy before data center growth accelerates further. Data centers can bring economic opportunity to Tennessee with billions of dollars in capital investments. Yet they also bring significant infrastructure needs and electricity demands. Policies set today will determine whether this growth strengthens Tennessee's economy—or shifts costs and risks onto households. In Part II of our *Powering the Boom* series, we will examine three policy choices to enhance grid utilization, drive prosperity across communities, and protect ratepayers.

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