

Load Growth and the Grid

U.S. electricity demand has grown at an average rate of 1% annually for the past 20 years.¹ However, with the rise of electrification and artificial intelligence, among other advancements, **demand is expected to increase by 4.7% over the next five years.**²

Expanding transmission capacity is **crucial to the future of the U.S. economy.** Without proactive planning processes, we will be unable to deliver electricity to load — undermining economic growth and decreasing U.S. competitiveness. Let's take a deeper look at which technologies will drive growth.

Data Centers

Every email sent, video streamed, and article published online relies on data centers to process, host, and store digital information. As the amount of data created and consumed continues to grow, developers will need to build more of these energy-intensive facilities.

Artificial intelligence (AI) is expected to be the biggest user of data in the future. Training a single AI model can consume more electricity than 100 homes use in an entire year.³ While data centers have become more energy efficient, these advancements have slowed in recent years. **Experts predict data center demand to more than double to 35 GW by 2030.**⁴

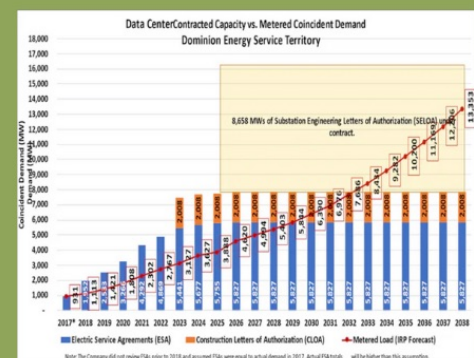
Electrification

Recent geopolitical events and market trends have led to electric equivalents replacing fossil fuel-powered technologies, like internal combustion engines and gas boilers. As a result, residential and commercial buildings, industry, and transportation could all experience widespread electrification in the coming decades. Electrifying industrial processes could increase the country's annual electricity demand by 10,000 TWh — **more than double our total national demand today.**⁵

The U.S. will also see increased demand from electric vehicle (EV) sales, which could make up one-third of all light vehicles sold in under a decade.⁶ Projected electric **load from EVs could reach 1,500 TWh annually by 2050** — an amount equivalent to 2018 U.S. residential sector electricity consumption.⁷

DOMINION ENERGY: INCREASE IN DATA CENTERS

Dominion Energy has received customer orders that could **double the amount of data center capacity in Virginia by 2028**, with a projected market size of 10 GW by 2035.⁸ That is a huge increase from current data center power use, which reached 2.67 GW in 2022. To deliver this future power, Dominion submitted plans for extensive transmission network upgrades, including proposals for multiple 500 kV lines.





Advanced Manufacturing

Advances in technologies from electronics to pharmaceuticals, as well as growing concerns over global supply chain security, are increasing domestic manufacturing opportunities. Like data centers, new manufacturing plants will significantly increase demand in the area they are constructed, presenting challenges for grid operators. The annual load from the more than 155 new facilities announced last year could be over 1,000 GWh.⁹ If domestic manufacturing continues to expand, **industrial load nationwide could increase 60% by 2050.**¹⁰

GEORGIA POWER COMPANY: UPDATED INTEGRATED RESOURCE PLAN

Georgia Power Company (GPC) updated their Integrated Resource Plan (IRP) in October of 2023 to say that they're expecting load growth of 6.6 GW between now and 2031, **"17 times greater than that previously forecasted."**¹²

This averages to 940 MW per year for the next seven years. GPC's current winter demand is around 15,000 MW, so their new load projections represent **nearly 46% growth in winter peak demand in the next seven years.**

This increase in load growth is due to an **"influx of new businesses coming to Georgia"** including manufacturers, the electric transportation industry, data centers, and other businesses.¹³

How Can We Meet Increased Electricity Demand?

To meet growing demand, electricity systems need to supply new generation, connect that generation to load, and connect new load to the system. We could risk missing out on economic development opportunities if the grid can't keep up, so **expanding transmission capacity is key.**

Accounting for the high load growth likely to occur under an expansion of building electrification, electric vehicle adoption, and other drivers, would require **more than doubling the existing regional transmission system — a 128% increase.**¹¹

If grid planners are not accounting for these drivers, load forecasts will be too conservative and the system will not be ready to meet demand. Such a failure in planning could have **real consequences for system reliability and the U.S. economy.**

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5. Simon, Eric. "Full industrial electrification could more than double US power demand. Here's how renewables can meet it." (May, 2023).
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