CHESAPEAKE
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Data Centers & Energy Impacts

About this series

This series by the Chesapeake Bay Journal explores the impacts of data centers on natural resources.

Key points

- The power demands of data centers are driving the need to generate more energy and build more transmission lines.
- Data centers that support AI use far more energy than other data centers.
- The need for more energy is one reason cited for keeping fossil fuel-powered plants in operation.

Electrical energy may seem like an unlimited resource in the U.S., where grid operators are federally mandated to ensure the lights stay on. But the appetite of artificial intelligence has begun to strain the power system in a way that is also threatening environmental goals.

In some parts of the Chesapeake Bay region, fossil fuel-powered plants that were scheduled for decommissioning have been kept online to supply the grid's growing needs. And some people say that solar and wind energy are unreliable in a data-driven world that demands continual access to power.

Many people have yet to grasp the massive energy consumption associated with daily use of AI, even as it continues to be integrated into a growing number of daily routine tasks. The focus of technology companies and the federal government on winning a global "AI arms race" is showing no signs of slowing.

These changes are occurring even more rapidly in data center hotspots like Northern Virginia and the broader Chesapeake Bay region that supplies energy to data centers.

Data centers are the warehouse-like buildings clustered near power lines and fiberoptic cables that have for decades housed the infrastructure enabling the internet. But the newer data centers being built to train and run AI use far more processing power than their predecessors, resulting in exponentially greater energy demands.

A report in late 2024 found that, in Virgnia, supplying the energy to meet even half of the industry's projected future demands would require purchasing power from outside the state. But that may be more difficult as other states also work to attract and supply power to data centers.

A U.S. Department of Energy report found the amount of energy consumed by data centers tripled in the decade leading up to 2024. This increase in the country's total energy use followed about 15 years of relatively flat electricity demand, from the mid-2000s to the early 2020s.

The DOE report also predicted that data center energy consumption

would double or triple again by 2028 to consume as much as 12% of the country's electricity. Some industry officials say it could be even more.

Inflated projections

Predicting how much energy data centers and the AI industry will consume is inherently risky.

A 2025 report prepared by London Economics International LLC for the Southern Environmental Law Center found that many regional projections reflect tend to overstate future demand. That's in part because data center developers have an incentive to say they will build a given project in more than one jurisdiction to get in a queue for future power supplies. This results in some loads being counted more than once in projections of demand at both the regional and national level.

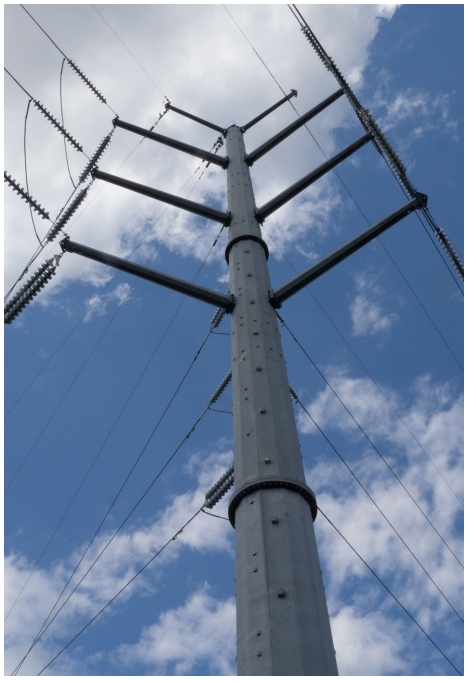
To determine how many projected data centers may actually come to fruition in the near term, LEI's analysis considered the global availability of the semiconductor chips that AI data centers require. For all the data centers projected in the U.S. from 2025 to 2030 to go forward, the report found it would require 90% of the global chip supply for that period be directed to the U.S. market.

LEI energy economist Marie Fagan said that "just isn't realistic" because the U.S. represents only half of the global demand for chips.

Under pressure

Still, federal and regional energy suppliers are using some of the highest projected energy demands to plan for extensive infrastructure investments — and some view the data center boom as a reason to keep fossil fuel plants running longer.

The Trump administration issued several emergency orders under the Federal Power Act to prevent aging infrastructure from retiring. In the case of the Eddystone Generating Station near Philadelphia, PA, the order directed the plant's natural gas and oil-fueled generators to continue running a day before its planned retirement at the end of May, which had been scheduled for nearly two years. Both the regional grid operator PJM and the plant's owner Constellation had agreed that it was "uneconomic" to continue running the aging units.



The increasing power demands of data centers are driving the need for more high-voltage transmission lines.

The California-based nonprofit GridLab also released an analysis of the report driving the DEO's energy emergency. It found that the department both overstated future demand and understated the amount of new capacity that would be added to the grid in the coming years to justify delaying the retirement of old plants.

In Virginia, which is home to about half of all data centers in the U.S., the data center industry already accounts for more than a quarter of the state's electricity use, according to a report by EPRI, a California-based research institute. And its demands for electricity had been doubling every year, then every six months. By the end of 2024, data centers in the state were consuming about 40 gigawatts of power, according to Dominion Energy. That's enough to power about 10 million homes in a state with 8.8 million residents.

This steady growth in energy demand has led to a flurry of new power generation projects in the state, including transmission lines to fuel them. Many cut through tree-lined backyards and are located near national battlefield parks.

Regional growth

Maryland and Pennsylvania have also begun seeing data center growth and of the types of energy generating projects that could fuel their future.

Amazon announced in June 2025 its plans to spend $20 billion on two data center complexes in Pennsylvania, including one that would siphon power directly from an existing nuclear power plant. In July 2025, President Trump appeared at the Pennsylvania Energy and Innovation Summit to announce that AI companies would be investing $92 billion in energy and related infrastructure in the state, including new natural gas-power stations.

The White House has also released an "AI action plan" aimed at accelerating the industry's growth nationwide. Maryland has sought to get in on the data center game too, with mixed results.

The Maryland's Office of the People's Counsel, an independent state agency that represents residential customers, filed comments with the Federal Energy Regulatory Commission in July declaring that, regardless of how many data centers are in the state, its residents are already footing the bill for the industry's regional growth.

"In future months and years," Maryland People's Counsel David S. Lapp said, "customers will see their utility bills rise significantly if regulators don't fix current policies." ■

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