In the News Episode 10 – Challenges of Meeting AI Energy Demand

Hello and welcome back to The Energy Co-op's *In the News* series.

Today we're covering how the rapid expansion of artificial intelligence, or AI, data centers is affecting electricity demand in Pennsylvania and across the PJM region. We'll begin with an overview of data center growth, explore the impact on the power grid, and conclude with key impacts on consumers and the environment.

Overview of Data Center Growth

AI technologies rely on large-scale data centers that require significant amounts of electricity to run. A typical AI data center consumes as much electricity as 100,000 households (IEA), and the largest facilities now under construction are expected to consume 20 times as much.

In 2024, U.S. data centers consumed 183 TWh of electricity, 4% of the country's total (Pew Research). By 2030, demand from data centers is projected to grow by 133% to 426 TWh, accounting for nearly *half* of the projected electricity demand growth this decade.

Pennsylvania is a key state for the data center boom. Governor Josh Shapiro has supported accelerated permitting to position the Commonwealth as a hub for the next-generation technology. As of July 2025, in-state private investments in AI totaled $90 billion, including $20 billion from Amazon for two data centers near the Susquehanna nuclear facility and in the greater Philadelphia area (ICN). Sites like Three Mile Island have been repurposed to meet rising electricity demand, illustrating both the economic opportunities and environmental challenges posed as data centers proliferate across the state.

Managing Grid Impacts

As data center construction accelerates, electricity demand in PJM is growing faster than new supply can come online. This imbalance is threatening grid reliability and driving up wholesale electricity costs. Meanwhile, a backlogged interconnection queue continues to delay new generation and storage projects, exacerbating the imbalance.

In PJM's 2025-2026 capacity auction, which reached record-high prices, data centers accounted for an estimated $9.3 billion, or 63%, of the total price increase (IEEFA). The auction fell 6.6 GW short of its reliability target (Utility Dive) for the first time in PJM history, heightening concerns about blackouts if demand growth continues to outpace supply.

In response, Governor Shapiro and 12 other PJM-state governors issued a joint "statement of principles" with the White House to prevent future shortages and manage the costs associated with large-load additions. Recommendations include conducting an

emergency power auction to stabilize prices; accelerating more than $15 billion in new "reliable baseload" generation through 15 years of revenue certainty; and requiring data centers to pay for generation built on their behalf regardless of usage (DOE).

The same day, PJM released its long-awaited proposal to accommodate large-load additions while preserving reliability and affordability. The plan reforms interconnection rules and load forecasting practices; encourages data centers to bring their own power; and initiates a "reliability backstop" capacity procurement auction to boost supply (PJM).

Together, these actions reflect mounting pressure to manage unprecedented demand growth without compromising grid stability or shifting costs onto households.

Consumer and Environmental Impacts

While both proposals represent meaningful steps toward addressing reliability concerns, environmental advocates warn that they prioritize short-term capacity additions over long-term clean energy deployment. This approach could potentially undermine Pennsylvania's goal of reducing greenhouse gas emissions by 80% by 2050 and entrench fossil fuel dependence nationwide.

In 2024, natural gas supplied over 40% of electricity for data centers and is projected to supply the largest share through 2030 (IEA). The proposal's emphasis on "reliable baseload power" suggests PJM will prioritize natural gas plants in the backstop auction over the nearly 32 GW of renewable projects that have been stuck in the interconnection queue for years.

Yet, even under accelerated procurement pathways, new gas-fired generation cannot immediately meet demand. Demand for turbines has pushed completion timelines for new gas-fired power plants past 2028, and almost all the projects approved in PJM's fast-track last year are not expected to come online until 2030 or later (Canary). In the meantime, consumers may continue to bear the costs associated with rapid load growth and the transmission infrastructure to power it (WHYY).

PJM recently approved $11.8 billion in transmission projects, roughly double its previous two budgets (POLITICO), to fund major transmission and distribution upgrades. Utilities typically recover these investments through customer bills, although regulators are now debating whether the companies driving new demand should bear most of the costs, especially if the planned data centers do not come to fruition.

In the meantime, Pennsylvania has 52 data center projects either proposed or in early development, according to the citizen-run Pennsylvania Data Center Proposal Tracker. Nearly half are expected to build their own electric substation, indicating heavy reliance on

the grid (ICN, Tracker). Meanwhile, average residential electricity prices in Pennsylvania have already increased by nearly 50% between 2018 and 2025, according to the state's Independent Fiscal Office.

Public opposition to data centers reflects concerns over rising electricity prices and environmental risks. A recent Emerson College poll found that 42% of Pennsylvanians do not support data center construction in or near their communities (Spotlight PA). Legislative resistance extends across party lines, especially in districts directly affected by proposed projects.

As Pennsylvania weighs economic development, grid reliability, consumer protection, and climate goals, the central question remains: how will the Commonwealth manage rapid data center growth while supporting affordability, public health, and environmental progress?