

July 14, 2026

Understanding Data Centers and their Impact on the Electric Grid

What is a Data Center?

A data center is a facility that centralizes an organization's IT operations and equipment, where data is stored, managed, and disseminated

Key components:

- Servers, storage systems, and networking equipment
- Power and cooling infrastructure
- Physical and cybersecurity systems

Data centers are highly energy-intensive building types, consuming 10-50 times the energy per floor space of a typical commercial office building. They require redundancies in power and storage, and infrastructure to cool the equipment and manage resulting waste heat.



Demand for digital services has skyrocketed, driven by 1) Cloud computing, AI, machine learning, and IoT; 2) Remote work and digital transformation; and 3) Streaming, gaming and social media

Understanding Data Center Impacts on the Grid



GENERATION

- Data centers require huge amounts of electric generation capacity, ranging from 10 MW for smaller data centers to 1 GW or more
- Data centers require extremely high levels of reliability and resiliency; often they seek to locate close to generation sources
- Data centers require baseload power that runs 24/7/365, with cooling needs creating some summer peak load requirement
- Under PA law, as large industrial customers, data centers purchase their energy supply through the competitive market



TRANSMISSION

- To ensure reliability and redundancy most data centers are interconnected to the interstate transmission grid and have significant impacts on the regional grid
- Data centers generally prefer to locate in areas with available transmission capacity or relatively modest upgrade requirements
- Transmission impacts must be modelled through the PJM process and mitigated if reliability impacts are identified
- The costs of transmission system upgrades are generally recovered through wholesale transmission rates approved federally and allocated by PJM



DISTRIBUTION

- Data centers generally involve very limited local distribution system upgrades
- Under regulatory principles and PECO's tariff, any distribution system upgrades are the responsibility of the data center project and paid upfront through CIAC
- Like all distribution projects, projects receive a 5-year credit against the CIAC for anticipated distribution revenues
- Data centers are billed on the same basis as other comparable Large Industrial Class (LCI) customers

Ensuring Reliability

PECO Transmission Studies

- Analyze the system impact of large load projects
- Model system conditions during peak load conditions and with a double contingency
- Identify prerequisite infrastructure reinforcement projects so that projects are executed before large loads are added to the system
- Mimic PJM Do No Harm studies which are required before new large loads are approved
- Ensure the safe and reliable operation of the grid

Why is Transmission System Analysis Critical?

- Ensures the reliability of the transmission grid, avoiding blackouts and system failures
- Models peak load system conditions



Impact on Falls Township Reliability

Question: What impact does the data center have on electric distribution system reliability for customers in Falls Township?

- PECO's first priority is maintaining the safe and reliable operation of the electric system. All proposed interconnections must be done in a safe and reliable manner consistent with PECO's tariff and engineering requirements.
- Under Pennsylvania law, PECO is required to interconnect all customers seeking service within its service territory on a non-discriminatory basis consistent with these safety and reliability obligations.
- The initial phase of the Falls Township project did not require significant transmission or distribution system upgrades and was energized in June. The only investment required for this phase was metering installations.
- The next phase of the proposed project is directly connected to PECO's high voltage transmission system, and PECO and PJM have done extensive modelling to confirm that the project can be energized safely and reliably with required upgrades to the transmission system.
- These projects must be completed before the next phase of the project is energized.

Impact on Electric Distribution Rates

Question: What impact does the data center have on PECO's electric distribution rates?

- PECO believes it is critical that data centers and other large load customers pay their fair share of the costs of building and maintaining the electric grid.
- The Falls Township project will not negatively impact PECO's distribution rates, as the first part of the project only required minimal system investment for metering installation.
- The project will contribute to the maintenance of the electric distribution grid through distribution rates in the same manner as any other Large Commercial & Industrial (LCI) customer.
- The second part of the project requires more robust upgrades that are backed by a “take or pay” contract which protects customers from project overbuild and project abandonment.

Thank you