



May 7, 2025

Secretary
Pennsylvania Public Utility Commission
400 North Street
Commonwealth Keystone Building, 2nd Floor
Harrisburg, Pennsylvania 17120

RE: Comments for Docket No. M-2025-3054271

Dear Secretary:

Please find enclosed our comments regarding the Public Utility Commission's April 24, 2025 en banc hearing on interconnection and tariffs for large load customers. These comments address specific concerns about the significant differences in risk profiles between existing state ratepayers and large technology companies developing data centers in Pennsylvania.

We appreciate the Commission's thoughtful approach to this important and timely issue. Data centers represent both significant economic opportunities and infrastructure challenges for the Commonwealth. Our comments focus on creating a fair and balanced approach that welcomes data center development while properly allocating costs and risks.

We believe that with proper regulatory frameworks, Pennsylvania can position itself as a competitive location for data center development while protecting the interests of existing ratepayers. Our comments address several critical challenges including: the non-diverse load patterns of data centers that increase peak capacity needs; the consumption of valuable retired or underutilized grid assets that might otherwise benefit existing ratepayers; rising energy costs due to increased natural gas demand; and newly identified physical and cyber security concerns associated with large data center interconnections as documented in a recent North American Electric Reliability Corporation (NERC) incident report¹. Pre-developed sites with appropriate utility infrastructure could provide Pennsylvania with a competitive advantage while ensuring reliability and fair cost allocation.

Thank you for the opportunity to provide these comments. We look forward to the Commission's continued examination of these important issues.

Sincerely,

Kevin Wright
President, ProtoGen, Inc.

¹ North American Electric Reliability Corporation. "Incident Review: Considering Simultaneous Voltage-Sensitive Load Reductions." January 2025, https://www.nerc.com/pa/rrm/ea/Documents/Incident_Review_Large_Load_Loss.pdf.

1 INTRODUCTION

ProtoGen, Inc., appreciates the opportunity to submit these comments in response to the Pennsylvania Public Utility Commission's ("Commission") April 24, 2025 en banc hearing examining interconnection and tariffs for large load customers, particularly data centers. ProtoGen is a Pennsylvania-based energy development company that partners with municipalities, utilities, airports, and other traditional large energy users across the Commonwealth. Our work focuses on energy security and resilience, with particular expertise in renewable energy microgrids, Virtual Power Plants (VPPs), and other flexible grid solutions that enhance system reliability and sustainability.

These comments focus on the need for regulatory frameworks that (1) recognize the significant differences in risk profiles between existing state ratepayers and technology companies developing data centers, (2) ensure fair cost allocation for infrastructure investments, and (3) promote strategic predevelopment of sites that would enhance Pennsylvania's competitive position while protecting ratepayer interests.

2 BACKGROUND

The growth of artificial intelligence, cloud computing, and other data-intensive technologies has driven unprecedented demand for data center capacity across the United States. According to industry projections, data center capacity nationwide is expected to more than triple, growing from approximately 25GW in 2024 to 80GW by 2030². This growth is already evident in regional grid planning, with PJM Interconnection forecasting significant electricity demand increases due primarily to data center proliferation³.

The April 24, 2025 en banc hearing provided valuable insights from various stakeholders, including electric distribution companies (EDCs), data center operators, and consumer advocates. However, as Vice Chair Barrow astutely noted during the proceedings, there appeared to be an incomplete representation of the full spectrum of large load growth drivers. As only data center representatives were present, despite discussions characterizing load growth from multiple sources including manufacturing onshoring and transportation/building electrification⁴.

3 DIFFERING RISK PROFILES

A fundamental concern that must inform the Commission's approach to data center interconnection and tariffs is the difference in risk profile that these facilities present when compared to traditional ratepayers.

² McKinsey & Company. "How data centers and the energy sector can sate AI's hunger for power." September 2024, <https://www.mckinsey.com/industries/private-capital/our-insights/how-data-centers-and-the-energy-sector-can-sate-ais-hunger-for-power>.

³ PJM Interconnection. "2025 Long-Term Load Forecast Report." January 2025, <https://insidelines.pjm.com/2025-long-term-load-forecast-report-predicts-significant-increase-in-electricity-demand/>

⁴ Pennsylvania Public Utility Commission. "Transcript of En Banc Hearing on Large Load Interconnection and Tariffs." April 24, 2025, Docket No. M-2025-3054271.

While traditional utility customers – residential, commercial, and even industrial – tend to have relatively stable, predictable consumption patterns and long-term presence in communities, data centers represent a more volatile and potentially transient load with several distinctive characteristics:

1. **Massive, concentrated load requirements** - Data centers can require electricity equivalent to that of mid-sized cities, creating concentrated infrastructure demands that dwarf typical customer needs.
2. **Rapid deployment timelines** - Technology companies often seek to develop and energize facilities on expedited schedules that challenge traditional utility planning horizons.
3. **Uncertain long-term viability** - While data centers may promise decades of operation, technological changes, industry consolidation, or shifts in business models could result in premature facility closure or significant load reductions.
4. **Highly mobile capital** - Unlike traditional industrial facilities with significant local ties, data center operators can more easily relocate investments to other states or regions offering more favorable conditions.
5. **Flat load profiles with no diversity benefit** - Data centers typically operate at near-constant load levels 24/7/365, which means they do not provide the load diversity benefits that help utilities optimize resource planning. Instead, their flat load curves contribute directly to system peaks, necessitating expensive additional peak capacity investments.
6. **Consumption of optimal grid resources** - Data centers strategically target locations with existing, underutilized, or recently retired grid assets because these sites offer the most economical development options. This practice effectively removes these valuable resources from being available to meet traditional load growth or support grid reorganization efforts for existing ratepayers, making such efforts more expensive.

These characteristics create a fundamentally different risk proposition for utilities and their existing ratepayers. Infrastructure investments made to serve these facilities may become stranded assets if projects are delayed, scaled back, or abandoned. The Commission must ensure that these risks are properly allocated and mitigated through appropriate tariff structures.

4 CONTRADICTION IN DATA CENTER POSITIONS

During the April 24 hearing, a notable contradiction emerged in the positions taken by data center representatives. As Vice Chair Barrow highlighted, large load customers advocated against what they termed "discriminatory" ratemaking while simultaneously requesting special treatment in the form of flexible terms, expedited interconnection options, and preferential demand response considerations.

This contradiction deserves heightened scrutiny. If data centers require such high levels of flexibility and specialized treatment, this suggests they are fundamentally different from other customer classes and perhaps should be treated accordingly rather than attempting to fit within traditional utility tariff structures. Vice Chair Barrow's suggestion that data centers might be "in the wrong business" if they require such high flexibility merits serious consideration.

We recommend that the Commission develop a model tariff that:

1. Establishes data centers as a distinct customer class with rates and terms reflecting their unique characteristics and risks.
2. Implements appropriate financial security requirements proportional to the infrastructure investments needed to serve these facilities.
3. Creates clear cost responsibility mechanisms for grid upgrades that protect existing ratepayers from bearing undue costs.
4. Develops fair exit fee structures that recover stranded costs if facilities close prematurely.

5 DEMAND RESPONSE AND EMERGENCY CAPABILITIES

A critical consideration that emerged during the hearing was the issue of data centers' ability to reduce load during grid emergencies. Given the massive size and required infrastructure investments (poles, wires, transformers) for these facilities, there are three viable approaches to ensure grid reliability:

1. **Data center-provided flexibility** - Data centers could be required to build excess flexible, fast-starting demand response resources as a condition of interconnection.
2. **Transmission and distribution planning** - Tariffs could be structured to generate sufficient revenue for distribution utilities to strengthen grid infrastructure and implement advanced grid management systems to handle rapid load fluctuations.
3. **Third-party demand response procurement** - Data centers could be required to procure sufficient demand response capacity through third-party aggregators as a condition of service, leveraging the competitive market to efficiently source grid flexibility.

We believe the optimal approach would be a thoughtful combination of all three strategies, tailored to the specific circumstances of each interconnection. This balanced approach would appropriately allocate responsibilities among data centers, utilities, and competitive market participants while ensuring system reliability at the lowest reasonable cost to ratepayers.

To this end, we recommend that the model tariff include:

1. Minimum demand response capabilities as a percentage of peak load that data centers must maintain.
2. Clear performance standards for response time and duration during emergency events.
3. Financial penalties for non-performance during emergency conditions that reflect the true system costs of such failures.
4. Incentives for data centers that exceed minimum requirements, promoting innovation in flexibility technologies.

6 ENERGY MARKET IMPACTS

A significant concern that warrants the Commission's attention is the impact of data center growth on energy markets and consumer costs. The energy demands of new data centers will largely be satisfied by natural gas generation in the near term, creating several market consequences that should be addressed in the Commission's tariff design:

1. **Rising Electricity Costs** - Increased natural gas demand for power generation will drive up the fundamental cost of electricity for all ratepayers in Pennsylvania⁵.
2. **Consumer Energy Price Impacts** - Beyond electricity, the same market forces will increase costs for residential and commercial natural gas used for heating and cooking.
3. **Regulatory Barriers to Clean Energy** - Despite the economic case for renewables improving with rising natural gas prices, Pennsylvania has been slow to evolve its energy market rules to reduce barriers for renewable energy and storage development⁶.

We recommend that the Commission incorporate provisions in the model tariff that:

1. Create financial incentives through distribution rate design for data centers that directly support renewable energy generation that offsets their consumption.
2. Develop streamlined interconnection processes within the PUC's jurisdiction (transmission and distribution infrastructure) that expedite renewable generation and energy storage project connections.
3. Commit to implementing equivalent regulatory effort toward renewable energy and energy storage interconnection barriers as is being devoted to data center tariffs.
4. Explore partnership opportunities with PJM for special renewable energy connection queues for projects associated with data center loads.

7 PHYSICAL AND CYBER SECURITY CONCERNS

The January 2025 North American Electric Reliability Corporation (NERC) report titled "Incident Review: Considering Simultaneous Voltage-Sensitive Load Reductions" highlights critical security and reliability concerns specific to data center interconnections. The report details a July 2024 incident where a single transmission line fault triggered the simultaneous loss of approximately 1,500 MW of data center load due

⁵ PJM Interconnection. "PJM Chooses 51 Generation Resource Projects To Address Near-Term Electricity Demand Growth." May 2, 2025, <https://insidelines.pjm.com/pjm-chooses-51-generation-resource-projects-to-address-near-term-electricity-demand-growth>

⁶ American Council on Renewable Energy (ACORE). "New Report: How PJM Can Reform Its Interconnection Processes to Expedite Battery Storage and Avoid Looming Electricity Shortfall." September 18, 2024, <https://acore.org/news/new-report-how-pjm-can-reform-its-interconnection-processes-to-expedite-battery-storage-and-avoid-looming-electricity-shortfall/>

to the interaction between utility auto-reclosing systems and data centers' voltage-sensitive protection schemes.

This incident demonstrates that data centers introduce new physical and cyber security attack vectors that could impact grid stability. The PUC should address these concerns by:

1. Requiring data centers to provide detailed dynamic response models as part of interconnection applications.
2. Establishing coordination requirements between data center protection schemes and utility transmission protection systems.
3. Developing contingency plans for large, simultaneous data center load loss events.
4. Working with PEMA, the PA Department of Homeland Security, and other state agencies to address planning gaps, security concerns, and community resilience measures.
5. Establishing load reconnection protocols to prevent system instability when data centers return to grid power after protective events.

8 PREDEVELOPMENT OPPORTUNITIES

We noted with interest the testimony of Vantage Data Center's representative, Shawn Smith, who indicated that government-led predevelopment of sites would be extremely valuable for data center operators. This observation presents a strategic opportunity for Pennsylvania to increase its competitiveness with other states and the Federal government.

Strategic predevelopment of data center sites would offer several advantages:

1. **Reduced timeline uncertainty** - Pre-developed sites with completed studies, permits, and preliminary infrastructure would significantly reduce the timeline for bringing facilities online.
2. **Cost certainty for developers** - Clear understanding of infrastructure requirements and costs before project commencement.
3. **Proper cost allocation** - Opportunity to structure cost recovery mechanisms that protect existing ratepayers while making Pennsylvania more attractive to data center investments.
4. **Enhanced reliability planning** - Coordinated approach to infrastructure development that accounts for system-wide impacts and resilience needs.

We recommend that the Commission work with the Pennsylvania Department of Community and Economic Development, local economic development authorities, and utilities to:

1. Identify and prioritize potential data center zones with favorable utility infrastructure access.
2. Develop a predevelopment program that provides preliminary interconnection studies, permitting assistance, and essential infrastructure.
3. Create a cost recovery framework that appropriately balances ratepayer protection with economic development goals.

4. Establish clear environmental and efficiency standards for participating sites to ensure sustainable development.

9 CONCLUSION

Pennsylvania stands at a critical juncture as it considers how to approach the significant growth in data center development. The Commission has a vital role in ensuring that the Commonwealth can capture the economic benefits of this growth while protecting existing ratepayers from inappropriate cost shifting, reliability risks, and market distortions.

We urge the Commission to develop a model tariff that:

1. Recognizes the fundamental differences between data centers and traditional customers, including their flat load profiles that do not contribute to system diversity;
2. Allocates risks and costs appropriately to prevent ratepayers from bearing the burden of stranded assets and higher energy prices;
3. Ensures grid reliability through clear demand response requirements and security protocols that address the unique vulnerabilities identified in recent NERC incident reports;
4. Mitigates natural gas price impacts by establishing accelerated pathways for renewable energy and storage development;
5. Creates a competitive advantage through strategic site predevelopment while addressing the consumption of optimal grid resources that might otherwise benefit existing ratepayers; and
6. Establishes a comprehensive security and resilience framework in coordination with other state agencies.

By taking this balanced approach, Pennsylvania can position itself as a leader in responsible data center development that benefits all stakeholders – from technology companies to everyday utility customers – while ensuring long-term grid stability, reasonable energy costs, and sustainable environmental outcomes.