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Docket No. M-2025-3054271

Hearing Date: April 24, 2025

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

En Banc Hearing Concerning
Interconnection and Tariffs for
Large Load Customers

Docket No. M-2025-3054271

OPENING STATEMENT OF MICHAEL FRADETTE ON BEHALF OF AMAZON DATA SERVICES, INC.

Dated: April 23, 2025

I. INTRODUCTION

Amazon Data Services, Inc. ("ADS") is submitting this Opening Statement as testimony pursuant to the Motion of Chairman Stephen M. DeFrank, dated March 27, 2025 in advance of the Pennsylvania Public Utility Commission's ("Commission") April 25, 2025 En Banc Hearing Concerning Interconnection and Tariffs for Large Load Customers. ADS thanks the Commission for taking the lead and proactively hosting this hearing to ensure Pennsylvania remains a leader in energy development and economic growth.

My name is Mike Fradette, and I represent ADS as a Large Load Customer operating within the data center industry. I am a Principal of Energy Strategy for Amazon Web Services, Inc., an affiliate of ADS (collectively "AWS"). My role is focused on ensuring AWS has reliable, cost effective, carbon-free, scalable power capacity to meet the needs of our customers in existing regions and new regions. Since launching in 2006, AWS has been providing world-leading cloud technologies that help any organization and any individual build solutions to transform industries, communities, and lives for the better. Amazon.com, Inc. ("Amazon"), the parent company of AWS, strives to be Earth's most customer-centric company. This means that we work backwards from our customers' problems to provide them with cloud infrastructure to meet their needs, so they can then innovate and redefine what is possible.

As part of this testimony, I will provide the Commission with a high-level overview of what data centers are and how they are integral in our daily lives. I will then touch on the challenges and opportunities we are facing today, followed by feedback regarding the prudent design of large load customer tariffs.

II. BACKGROUND

Despite its name, cloud computing doesn't live in the clouds – it lives in data centers, which are the foundation of our digital world. Every time you check your bank statement, stream a movie, connect with family online, or stream a live Commission hearing, you are using cloud computing, which is effectively enabled by data centers. Think of cloud computing like electricity – just as you flip a switch and the power company delivers electricity, organizations can access computing power, storage, and other IT resources on-demand as needed through the cloud. In addition to housing this critical computing infrastructure to power our everyday digital lives, data centers also generate significant economic benefits for the communities in which they reside through job creation, tax revenue for schools and social services, and substantial local investment.

More broadly, AWS data centers are the engine of the digital economy and the digital backbone of modern life. Millions of customers – including startups, enterprises, and government agencies – trust AWS with their most sensitive data and depend upon our services. From hospitals and banks, to first responders and government agencies, critical sectors also rely on this digital infrastructure every second of every day to power essential services and keep modern life running.

At AWS, we continue to see record demand from our customers across cloud computing, artificial intelligence ("AI"), and machine learning capabilities. Personally, when I look at my everyday life and that of my family, I find myself only increasing my daily interactions with the cloud… more video conferencing, more interactive learning experiences, more virtual banking, and even dabbling with AI to increase my efficiency. Simply put, the cloud and the technologies it enables are driving innovation across industries, from healthcare and scientific research to entertainment and commerce. To meet this growing demand, AWS is continuing to make

significant investments throughout the U.S., ensuring that our nation remains the global leader in AI and machine learning technology.

However, as U.S. electricity demands grow across several economic sectors, whether it is electric vehicle adoption, reshoring of American manufacturing, data centers, or the electrification of industry, we recognize the need for a balanced approach that supports technological advancement, sustainable energy practices, and fair cost allocations.

III. CURRENT LARGE LOAD CUSTOMER CHALLENGES AND OPPORTUNITIES

The rapid growth of electricity demand presents both challenges and opportunities for the US energy infrastructure. We understand the Commission's mandate to establish just and reasonable tariffs that provide open and non-discriminatory access to public utility systems while protecting existing customers from undue burdens and costs. At AWS, we share these concerns and are committed to being responsible partners in grid development and energy consumption. We've demonstrated this commitment through our Climate Pledge goal of reaching net-zero carbon emissions by 2040. Additionally, all of the electricity consumed across our operations – including our data centers, corporate buildings, grocery stores, and fulfillment centers – is matched with 100% renewable energy, seven years ahead of schedule.

We recognize that bringing on new sources of baseload, carbon-free energy is critical to meeting society's growing electricity needs and meeting our customers' demands. It is one of the reasons we are investing in a diverse portfolio of energy sources, including solar, wind, and advanced nuclear technologies. For instance, we've recently invested over $1 billion dollars in carbon free nuclear initiatives, including projects like the Susquehanna Nuclear Facility, and our equity investment in X-Energy to bring about 5 GW of new nuclear capacity by 2039.

Amazon also supports expanding and modernizing the U.S. power grid, including upgrading the physical infrastructure with advanced technologies (e.g., smart meters, grid enhancing technologies, battery storage), and implementing policies that enable rapid modernization, so that we can realize the benefits of a modernized power grid built on low or carbon-free power sources more quickly. We are taking tangible steps to support these efforts. We are innovating across the energy sector to bring new carbon-free power sources forward, encouraging investment in grid modernization technologies, and urging policymakers across the country to implement policies to accelerate grid modernization efforts.

That said, speed to market, coupled with ensuring we pay for our fair allocation of the costs to serve the electricity we consume, continues to be a priority as we work to meet growing demand from our customers, which directly influences how and where we make investments in both data center growth and energy development.

IV. RECOMMENDATIONS

With these challenges and opportunities in mind, AWS offers the following recommendations for the Commission's consideration.

First, AWS urges the Commission to continue operating in a non-discriminatory manner that focuses regulations based on load profiles and a cost-of-service model, rather than targeting individual customer or industry types. Such an approach ensures fairness and flexibility across industries and use cases, while keeping the focus on cost-causation principals.

Second, utilities and regulators should continue to consider, as a balanced overall commercial package, the adoption of mutual commitments like reasonable contract term lengths, fair collateral requirements, minimum demand charges, and appropriate exit provisions, balanced by corresponding commitments of service from the utility to the customer. These provisions ensure

that costs to support data center growth are not passed along to other customers, promote the efficient use of the transmission system, and need to be considered as an overall balanced package often developed based on the individual utility and regional needs, constraints, and opportunities.

Third, the above commercial provision should be structured so utilities are able to proactively attract and swiftly integrate large load customers like AWS onto the grid in a manner that fully recovers the costs to serve without shifting the financial burden on existing or remaining customers. Large load customers work alongside utility partners to cover their fair share of infrastructure costs, increasing reliability and investing in resources that reduce grid disruptions for all customers. Transparent cost structures for interconnection with expedited development opportunities for users willing to self-construct infrastructure like substation or system upgrades, and source generation capacity at their own expense, should enable speed to market. This speed enablement can come in different forms, most likely defined interconnection study timelines or service level agreements (SLA) for physical interconnection for load's that meet specified requirements.

Lastly, the development of such provisions should continue to account for the benefits that Large Load Customers bring to the system, again back to a cost-causation approach. Large Load Customer like Data Center's provide a stable, predictable load growth and profile, that are critical to economic growth and US leadership on cloud, gen AI, and machine learning. This growth is also supporting the re-investment in and modernization of the US electric grid for the benefit of all rate payers.

AWS believes these recommendations strike a balance between enabling rapid data center expansion and ensuring ratepayer protections. They also align with the Commission Chair's

considerations for expanding energy investments, expediting interconnections, and exploring innovative approaches to grid enhancement.

V. CONCLUSION

Large load customers like AWS can often provide significant benefit to the electricity grid, spreading fixed costs across a larger MW denominator. Integrating our load in a just, reasonable, and predictable fashion is critical to economic growth and will continue enabling U.S. leadership in cloud computing, AI, and machine learning.

We remain committed to working collaboratively with the Commission, utilities, regional transmission organization, and other stakeholders to develop solutions that benefit all Pennsylvanians.

Fykes
Statement 1

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

En banc Hearing Concerning Interconnection and Tariffs for Large Load Customers	))	M-2025-3054271

TESTIMONY OF LUCAS FYKES ON BEHALF OF THE DATA CENTER COALITION

Chairman DeFrank, Vice Chair Barrow, and Commissioners, thank you for this opportunity to present testimony regarding large load customer model tariffs for electric distribution companies. I commend the Commission for holding this *en banc* hearing and for seeking expertise from stakeholders before the electric distribution companies make proposals to address large load customer growth.

My name is Lucas Fykes, and I am the Director of Energy Policy for the Data Center Coalition. The Data Center Coalition or DCC is the national membership association for the data center industry. DCC represents and advances the interests of the data center industry, aggregates industry expertise, and offers thought leadership and collaboration with utilities, policymakers, regulatory bodies, and other stakeholders. DCC's membership includes 36 leading data center owners and operators, as well as companies that lease large amounts of data center capacity. Our membership includes both enterprise companies building data centers to support their own operations, as well as companies building or leasing space in data centers commonly known as "multitenant" or "build-to-suit" facilities.

Today, there is unprecedented demand for the digital services that have become central to our daily lives and modern economy – everything from the way we work and learn to how we buy groceries, bank, and even access medical care now occurs online. With an average of 21 connected

devices per household in the U.S.,[1] the role of data centers is expected to grow as consumers and businesses generate twice as much data in the next five years as they did in the past decade.[2] This growth is driven by the widespread adoption of cloud services, the proliferation of connected devices, and the rapid scaling of advanced technologies like generative AI, which alone could create between $2.6 trillion and $4.4 trillion in economic value globally by 2030.[3]

The importance of data centers is difficult to overstate, in part because nearly every sector of the modern American economy relies on cloud computing—a service facilitated by data centers—in some way. The importance of data centers can be measured financially, however. DCC commissioned a PwC 2025 impact study that shows the data-center sector is a major economic force.[4] In 2023, it supported 4.7 million U.S. jobs, including 603,900 direct jobs—up 51% since 2017. Those roles generated 404 billion in wages, a 93% jump over the same period. Direct contributions added 231 billion to GDP. Total annual contributions to U.S. GDP in 2023, including direct, indirect, and induced effects totaled 727 billion. Each data-center job now underpins more than six additional jobs across the economy. The industry also delivered 162.7 billion in federal, state, and local tax revenue in 2023, 146 % above 2017, highlighting its growing fiscal value.

After nearly two decades of relatively flat electricity consumption, the U.S. is experiencing a significant increase in power demand driven by several economic growth trends, including the onshoring of new manufacturing, widespread electrification of buildings, industry and

[1] Deloitte, *Consumers embrace connected devices and virtual experiences for the long term* (September 5, 2023), https://www2.deloitte.com/us/en/insights/industry/telecommunications/connectivity-mobile-trends-survey/2023/connectivity-mobile-trends-survey-full-report.html.
[2] JLL, Data Centers 2024 Global Outlook, https://www.us.jll.com/content/dam/jll-com/documents/pdf/research/global/jll-data-center-outlook-global-2024.pdf.
[3] McKinsey, *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.
[4] PwC, *Economic contributions of U.S. data centers, 2017-2023* (February 2025), https://www.centerofyourdigitalworld.org/2025-impact-study.

electrification, hydrogen fuel production, and growth in demand for data center services. As noted by Lawrence Berkeley National Laboratory in the 2024 U.S. Data Center Energy Usage Report, "This surge in data center electricity demand…should be understood in the context of the much larger electricity demand that is expected to occur over the next few decades from a combination of electric vehicle adoption, onshoring of manufacturing, hydrogen utilization, and the electrification of industry and buildings."[5] Supporting growing electricity demand through timely and prudent investments in new generation, transmission, and distribution infrastructure – along with investments in energy efficiency, grid enhancing technologies, and other innovative strategies – is essential to the nation's economic growth, global competitiveness, and national security.

As you are likely well-aware, utilities and regulators across the country are actively evaluating an array of approaches and provisions aimed at managing the challenges associated with load growth. DCC has been involved in, and is currently actively participating in, several regulatory proceedings in jurisdictions across the United States addressing large load tariffs. Those jurisdictions include Virginia, Ohio, Indiana, Michigan, Kansas, Missouri, and Oregon, and that list continues to grow by the week. In those proceedings, DCC has advocated for a set of "best practices" with respect to large load tariffs and has observed electric distribution companies begin to converge on some of those "best practices" as well.

While each of the sub-issues on which the Commission seeks testimony and comment are important to DCC and its membership, given today's time constraints, I will focus on addressing three issues for the Commission's consideration. First, I will address minimum contract terms and

[5] Lawrence Berkeley National Laboratory, *2024 United States Data Center Energy Usage Report* (December 2024), https://eta-publications.lbl.gov/sites/default/files/2024-12/lbnl-2024-united-states-data-center-energy-usage-report.pdf.

exit fee provisions. Second, I will address load ramping schedules. And third and finally, I will address financial security and collateral.

Let me preface my comments about those three tariff-related issues by noting that DCC supports tariffs that standardize several of the terms that have traditionally been a component of contracts between utilities and large customers but were bilaterally negotiated. However, you will hear me emphasize three themes as I discuss best practices on large load tariff design. The first is transparency. Tariff requirements, and the bases for those requirements, should be easily understood by customers and avoid leaving excessive discretion with the utility. The second is flexibility. While it is reasonable to require long-term commitments from large load customers, it is also reasonable to expect that businesses will change their operations and needs over the course of those long terms, and tariff requirements should reflect that reality. The third is diversity. The national data center market includes a diversity of companies, business models, and operations, and tariff terms that accommodate that diversity can help de-risk the utility.

Turning now to the first specific issue I would like to discuss: minimum contract terms and exit fee provisions. Minimum contract terms and exit fee provisions work hand in hand to create a measure of certainty for the utility, the large load customer and all other customers. These provisions can mitigate stranded asset risk by keeping the customer "on the hook" far longer than is typically required under most existing large customer tariffs. There is no "one size fits all" on minimum contracts—each utility service territory and jurisdiction is different. From DCC's standpoint, it is important to tailor contract terms and exit fees such that those provisions reasonably reflect the investments the utility will have to make to serve large load customers. It is also critical that exit fee provisions encourage the efficient re-allocation of capacity: from a customer whose plans have changed to another customer waiting in the queue.

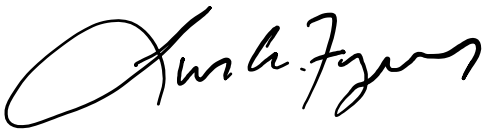
Turning now to the second issue, load ramping schedules. Load ramps help both the utility and the customer—they allow both parties the flexibility to ramp up their respective activities. To put a finer point on this dynamic, utilities will often require several years of lead time to build the generation and transmission infrastructure necessary to serve the full contract capacities of large load customers, and large load customers may require several years of lead time to ramp up operations to reach or near their full contract capacities. DCC supports tariffs that allow load ramps over a reasonable, even if limited, multi-year period, and allow contracting parties the flexibility to negotiate the specific terms of that load ramp.

And turning finally to the third and final issue I will address today, and that is financial security and collateral. The basic function of a collateral requirement is to mitigate the risk that a large load customer does not make payments or does not materialize, and as a general matter, incorporating such a mechanism into a utility large load tariff makes good sense. However, the details matter. DCC strongly believes that financial security provisions should be designed to avoid promoting homogeneity in the market. To better achieve diversity, customers should have the flexibility to post collateral through a variety of forms, including parental guarantees, letters of credit, surety bonds, and cash. And utilities must allow data center customers a realistic timeline to sign tenants and post collateral. Finally, tariffs should include structured collateral phase out schedules as utility risk decreases over time, such that the customer can manage long-term capital planning.

Again, Commissioners, I would like to thank you for your time and for the opportunity to speak directly to you on the subject of model large load tariffs. DCC and its member companies fully recognize the challenges associated with load growth and are committed to working collaboratively with the Commission, utilities, and other key stakeholders to develop solutions that

advance an affordable, reliable, and resilient electricity grid for Pennsylvania. I look forward to answering your questions.

Respectfully submitted,



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COMMONWEALTH OF PENNSYLVANIA

PUBLIC UTILITIES COMMISSION

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COMMENTS OF BRENDON BAATZ
ON BEHALF OF GOOGLE, LLC

Honorable Chairman DeFrank, Vice Chair Barrow, Commissioners Zerfuss, Coleman, and Yanora:

Google, LLC ("Google") appreciates the opportunity provided by the Pennsylvania Public Utility Commission ("Commission") to participate in today's hearing and submit written comments. My name is Brendon Baatz and I support Google's energy needs for our data center sites. Google currently operates 29 data center campuses across four continents, with 19 campuses operating in the US. While we are constantly evaluating opportunities for growth, we do not currently have any sites in Pennsylvania. We commend the Commission and Chairman DeFrank for proactively addressing the significant issues surrounding the integration of large new loads, such as data centers, onto the electric grid. We welcome the opportunity to provide testimony related to our recent experience on these issues to inform best practice policy development in Pennsylvania.

This is a critical and dynamic moment for the electric utility industry. Increased electric demand, driven by data centers, manufacturing reshoring, and broader electrification, requires thoughtful policy development to ensure continued safe, reliable, and affordable electric service for all Pennsylvanians. While presenting challenges, these new large loads also represent a tremendous opportunity for Pennsylvania in terms of jobs, economic growth, technological advancement, and potentially rate stability. Pennsylvania has an opportunity to lead in developing sensible policies that enable this growth while protecting consumers and advancing clean energy goals.

Google is committed to being a partner in developing workable solutions. As a major energy user, we offer perspectives on clean energy leadership, cost reduction opportunities, cost allocation considerations, large load tariff design, and managing investment risk.

Clean Energy Leadership

Google is proud to be a national leader on clean energy procurement. In 2007, Google committed to carbon neutrality in its operations. A decade later, with new tools at our disposal, we took another leap forward by becoming the first major company to match 100% of our annual electricity consumption with renewable sources. And we have done so since 2017 even as we have continued to grow.

In 2020, Google announced its intention to power its data centers with 24/7 carbon-free energy by 2030. That means we seek to match carbon-free generation with our consumption on an hourly basis, drawn from generating resources in the same market as our load. For our existing sites in PJM, this means that we are working to bring on a portfolio of new, round-the-clock carbon-free generation resources that can produce as much or more energy each hour than we consume. As one example, in 2021, we partnered with AES Clean Energy to develop a portfolio of carbon-free energy resources to power our data center facilities in Virginia. We expect the partnership to add 500 MW of new carbon free generation and provide our data centers with 90% carbon free energy measured on an hourly basis by 2030.[1]

Google is focused across our footprint on developing new models that can help bring new, carbon-free resources to market while fully covering all costs associated with these developments. In Nevada, Google partnered with Fervo Energy to support development of a first-of-its-kind enhanced geothermal project.[2] Fervo's project came online in the fall of 2023 and is currently generating about 15 MW of clean firm power on Nevada's grid. Building on the pilot's success, we partnered with the local utility, NV Energy, to introduce an innovative rate structure, the Clean Transition Tariff ("CTT"), that enables us to quickly bring enhanced geothermal from pilot to scale, supporting 115 MW enhanced geothermal to power our operations in Northern Nevada.[3] In addition, Google recently announced a deal with Kairos Power to directly fund and deploy 500 MW of advanced nuclear generation.[4] And in the Carolinas, Google is partnering with Duke Energy to develop a CTT to bring new clean

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[1] AES. "AES Announces First-of-Its-Kind Agreement to Supply 24/7 Carbon-Free Energy for Google Data Centers in Virginia." Press release, May 6, 2021. https://www.prnewswire.com/news-releases/aes-announces-first-of-its-kind-agreement-to-supply-247-carbon-free-energy-for-google-data-centers-in-virginia-301282750.html.

[2] Google. "Google and Fervo: Powering a Carbon-Free Future with Enhanced Geothermal." *Google: The Keyword*, Accessed on April 22, 2025. https://blog.google/outreach-initiatives/sustainability/google-fervo-geothermal-energy-partnership/.

[3] Google. "Google & Clean Energy: Partnerships Driving Progress." Google Sustainability. Accessed April 22, 2025. https://blog.google/outreach-initiatives/sustainability/google-clean-energy-partnership/.

[4] Kairos Power. "Google and Kairos Power Partner to Deploy 500 MW of Clean Electricity Generation." Accessed April 22, 2025. https://kairospower.com/external_updates/google-and-kairos-power-partner-to-deploy-500-mw-of-clean-electricity-generation/.

resources onto the grid.[5] We view these innovative partnerships as critical to meeting the challenge before us.

As a result of our efforts, we are one of the world's largest corporate purchasers of clean energy and we have brought nearly 14 GW of new, clean generation online worldwide. We estimate that we will spend approximately $16 billion by 2040 on clean energy purchases.

Cost Reduction Opportunities and Efficient Planning

While Google has placed significant emphasis on carbon free resource development, we are also focused on reducing system costs. There are many opportunities to minimize incremental costs for Pennslyvannia's general utility customer base while maintaining reliability. Utilities generally build infrastructure to meet peak demand, so we should begin with opportunities to shift or reduce those peaks. Since 2020, Google has used our carbon-intelligent computing platform to shift computing tasks and their associated energy consumption to the times and places where carbon-free energy is available on the grid.[6] In 2023, we expanded this capability to enable our data centers to respond to grid needs when called on by system operators.[7] Beginning in 2024, Google was proud to join the DC Flex initiative launched by the Electric Power Research Institute ("EPRI") which aims to demonstrate how data centers can support and stabilize the electric grid while improving interconnection and efficiency.[8] With the scale of data center demand across the U.S., demand flexibility has the potential to be an important resource. The Commission, utilities, and data centers should aggressively explore targeted voluntary demand response programs to help manage the total peak load for which the utility is building.

In addition to demand response, efficiency has long been core to Google's operations.[9] Google leads the industry in Power Usage Effectiveness ("PUE"), which is a measure of the "overhead" energy usage that goes to end uses like cooling and other facilities usage versus power used to deliver digital services.[10] Google publishes PUE metrics on each of our data center campuses on a quarterly basis, with our Loudoun County Virginia facilities achieving PUE metrics of 1.08 and

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[5] Duke Energy. "Responding to Growing Demand: Duke Energy, Amazon, Google, Microsoft and Nucor Execute Agreements to Accelerate Clean Energy Options." News release, April 15, 2024. https://news.duke-energy.com/releases/responding-to-growing-demand-duke-energy-amazon-google-microsoft-and-nucor-execute-agreements-to-accelerate-clean-energy-options

[6] Google. "Carbon-Intelligent Computing Platform: Shifting Compute Tasks and Their Associated Energy Consumption." *Google Sustainability*, https://blog.google/outreach-initiatives/sustainability/carbon-aware-computing-location/.

[7] Google. "Using Demand Response to Reduce Data Center Power Consumption." Google Cloud Blog. https://cloud.google.com/blog/products/infrastructure/using-demand-response-to-reduce-data-center-power-consumption.

[8] Electric Power Research Institute. "DC Flex: Demonstrating Data Center Flexibility and Grid Support." Accessed April 22, 2025. https://msites.epri.com/dcflex.

[9] Google, "Efficiency," *Google Data Centers*, accessed April 22, 2025, https://datacenters.google/efficiency/.

[10] *Id.*

1.07 in 2023. Policymakers should ensure that the entire data center industry is pursuing aggressive, on-site energy efficiency savings.

In addition to opportunities to promote greater efficiency across the data center industry, there is significant untapped demand side management potential beyond the data centers' fencelines. For example, in South Carolina, Google is partnering with local electric distribution cooperatives to fund low-income pre-weatherization and energy efficiency programs. In a settlement reached last year at the Indiana Utility Regulatory Commission, Google, Microsoft, and Amazon have proposed annual contributions of $500,000 each over a five year period totalling $7.5 million to directly fund the Indiana Community Action Association ("INCAA") to support income qualified customers in Indiana, including supporting health and safety to enhance weatherization opportunities.[11] In Virginia, Google announced a $250,000 contribution to the Virginia Energy Efficiency Council to expand its Energy Efficiency Workforce Initiative ("EEWI"). This contribution will help the EEWI in its effort to recruit, train, place, and retain workers in Virginia's energy efficiency industry.[12] As these programs are implemented, scaled, and replicated, we expect to show quantifiable positive impacts on the total energy system, driving down system demand and lowering costs for all ratepayers.

Finally, unlike new infrastructure which takes years to build and energize, demand side resources can be deployed now, and the benefits are immediate. Customers willing to fully fund system-benefitting demand side resources, including investments in energy efficiency, should receive credit for some portion of the additional capacity unlocked by those investments. The Commission should ensure the appropriate regulatory frameworks are in place to incentivize and reward demand side participation.

In a similar vein, the Commission, transmission owners, and large customers need to explore every opportunity to reduce new transmission investments through grid enhancing technologies ("GETs"), advanced reconductoring, and other non-wires alternatives. GETs and other advanced transmission technologies offer significant financial savings relative to new infrastructure deployment. A recent study from the Brattle Group concluded that GETs could save $5 billion in wholesale energy costs annually, if adopted nationwide.[13] Additionally, given local level

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[11] Order of the Commission. In The Matter Of The Verified Petition Of Indiana Michigan Power Company For Approval Of Modifications To Its Industrial Power Tariff – Tariff I.P. Cause No. 40097. February 19, 2025. Indiana Utility Regulatory Commission. https://iurc.portal.in.gov/_entity/sharepointdocumentlocation/2b48cf93-d9ee-ef11-be20-001dd80b8c52/bb9c6bba-fd52-45ad-8e64-a444aef13c39?file=ord_46097_021925.pdf

[12] Virginia Energy Efficiency Council. "Google and the Virginia Department of Energy Host a Grid Innovation Summit to Discuss Energy Infrastructure to Support Continued Economic Growth." *VAEEC*, Accessed April 22, 2025. https://vaeec.org/news/google-and-the-virginia-department-of-energy-host-a-grid-innovation-summit-to-discuss-energy-infrastructure-to-support-continued-economic-growth/

[13] Brattle Group. "Unlocking the Queue with Grid-Enhancing Technologies." Final Report, Public Version. February 2021.

challenges around permitting and constructing new transmission infrastructure, every effort must be made to get the most out of the existing infrastructure before building new. While there is significant opportunity in these areas, we also acknowledge that demand side management and GETs cannot solve all our needs; new infrastructure will also be needed.

For transmission infrastructure, to the extent possible, new projects should be regionally planned as part of PJM's Regional Transmission Expansion Plan ("RTEP"). Historically, local or "supplemental" transmission projects, which do not receive the same level of oversight as RTEP projects, have driven transmission growth in PJM. Across PJM, the New Jersey Board of Public Utilities estimates that between 2012 and 2022, spending on Baseline projects (i.e., those that are subject to a regional planning process) totaled only about $23 billion, whereas spending on Supplemental projects neared $43.5 billion.[14] In Ohio alone, the Ohio Consumers Counsel alleges that utilities added more than $6 billion in supplemental projects with no regulatory oversight as to the need, prudence, or cost-effectiveness of the projects.[15] Given the level of transmission infrastructure investment anticipated, robust regional and transparent planning processes will help ensure appropriate oversight and integration with long-term planning to ensure that investments are most prudent for the need.

Cost Allocation and Undue Discrimination

It is unquestionable that data centers must pay their fair share of new infrastructure that is built to serve their needs. At the same time, when infrastructure benefits other customers, those customers should also pay an appropriate amount. These concepts are the foundation of sound revenue allocation and rate design. Data centers are not the sole driver of new infrastructure investments, nor are they the sole beneficiary.

As investment from large load customers continues to drive increases in demand, it will be critical that the Commission utilize the general rate case process to appropriately evaluate cost allocation and rate design to ensure that all ratepayers are appropriately covering their cost to serve. The Commission already has full authority to review and resolve cost allocation questions. It should never be accepted as a matter of course that any one particular customer class is "subsidizing" another customer class without due analysis and consideration. Fortunately, the general rate case process provides a transparent opportunity for such analyses to take place.

As Pennsylvania continues these discussions, sound rate design must focus on appropriate metrics associated with electric demand and energy usage, and the Commission should resist

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https://watt-transmission.org/wp-content/uploads/2021/02/Brattle__Unlocking-the-Queue-with-Grid-Enhancing-Technologies__Final-Report_Public-Version.pdf90.pdf.

[14] *See Answer of the New Jersey Board of Public Utilities in Support of the Complaint of the Office of the Ohio Consumers Counsel*, Docket No. EL23-105-000 (FERC, filed February 3, 2023), 6.

[15] *The Office of the Ohio Consumers' Counsel v. PJM Interconnection, LLC, et al.,* Docket No. EL23-105-000.

attempts to allocate costs based on a customer's end use of electricity. In August of 2024, the Federal Energy Regulatory Commission ("FERC") rejected a proposal from Basin Electric Cooperative to treat certain cryptocurrency loads differently from other loads on the basis that the proposal was not adequately supported and was not just and reasonable.[16] Indeed, the principles of "fairness" and "undue discrimination" comprise two of James Bonbright's eight rate design principles in the seminal 1961 book "Principles of Public Utility Rates."[17] Creating novel rate classes based on a customer's specific industry or end-use of electricity rather than based on metrics associated with electric system usage such as peak demand, is discriminatory ratemaking and undermines the fundamental obligation of utilities to serve all customers fairly and equitably. Such an approach could erode public trust, compromise integrated system planning principles, and invite similar attempts to isolate future customer segments, creating a slippery slope toward increasingly fragmented and less equitable rate structures. The Commission should carefully evaluate appropriate cost allocation and rate design in light of the changing customer profiles in general rate cases, including consideration of whether current rate class definitions and cost allocation methods continue to best serve the public interest of equity in rate making.

Offsetting Investment Risk and Providing Certainty in Forecasting

It is expected that a significant investment will be required to meet currently forecasted load growth. While utilities have traditionally borne the risk of accuracy in load forecasting, as we see scaled growth from new large loads it is appropriate to consider new policies that place the risk of customer-specific forecasting inaccuracy on the individual customer. Google recently signed onto two comprehensive and unanimous settlements in Indiana and West Virginia to ensure that when new large load customers - not just data centers but all other types of large load customers - request to interconnect, there are sufficient provisions to ensure that they pay for the costs associated with their expected service.[18,19] Google views the Indiana and West Virginia settlements as a model for material up-front financial commitments that recognizes the need to mitigate utility investment risk, afford appropriate protections to other customers, all while not discriminating against a specific industry. We are also seeing other utilities in PJM propose similar requirements for new large load customers, most recently in Appalachian Power Company and Dominion Energy Virginia rate cases.[20] The enhanced terms provide greater financial commitments from new large load customers, which provides an opportunity to leverage the retail requirements to drive certainty in the PJM RTO level load forecast.

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[16] *Basin Elec. Power Coop.,* 188 FERC **,i** 61,132 (2024).
[17] Bonbright, James, Principles of Public Utility Rates, 1961, page 291.
[18] Order of the Commission. In The Matter Of The Verified Petition Of Indiana Michigan Power Company For Approval Of Modifications To Its Industrial Power Tariff – Tariff I.P. Cause No. 40097. February 19, 2025. Indiana Utility Regulatory Commission. https://iurc.portal.in.gov/_entity/sharepointdocumentlocation/2b48cf93-d9ee-ef11-be20-001dd80b8c52/bb9c6bba-fd52-45ad-8e64-a444aef13c39?file=ord_46097_021925.pdf
[19] Commission Order. Application for Approval for Revisions to Schedules LCP and IP. Case No. 24-0611-E-T-PW. Public Service Commission of West Virginia. March 25, 2025.
[20] *See* Case Number PUR-2025-00058 (Dominion) and Case No. PUR-2025-00057 (Appalachian Power Company).

We are concerned about the pace and volume of load requests impacting the PJM load forecast. In the 2025 load forecast, PJM is projecting nearly 30 GW of load growth by 2030 - just five years from now. Load forecasting is a foundational input to all utility and RTO planning. To ensure transmission and generation infrastructure is developed in a responsible, timely, and efficient manner, we need to adapt load forecasting methodologies to meet emerging market conditions and adopt best practices to ensure robust and consistent forecasts. The PJM load forecasting process does not sufficiently vet large load adjustments provided to PJM by the Transmission Owners ("TOs") and the process each TO uses to compile and share large load adjustments with PJM varies significantly across the footprint. Absent added certainty in the load forecast, we risk potentially unnecessary cost increases, overinvestment, and - worst of all - stranded assets. On the flip side, underinvestment will lead to reliability challenges. Regardless, all parties should be aligned on the need to inject as much certainty as possible into the load forecast. Implementation of a model similar to Indiana, West Virginia, and under consideration elsewhere in PJM, that requires material up-front financial commitment can help ensure that large customers have skin in the game and would be expected to reduce uncertainty in the load forecast, giving regulators and utilities a much clearer sense of the appropriate level of load to plan for.

States play an integral role in PJM. It is imperative that PJM states (either through their energy offices or their utility regulators) take a more proactive role in PJM governance to ensure that PJM - who ultimately exists for the sole purpose of maintaining a reliable grid - is doing everything possible to give clear, reliable signals to generators and transmission owners about the scale of new infrastructure that will be needed.

Thank you again for your leadership and the opportunity to participate in today's hearing. We welcome continued engagement and collaboration.

Respectfully submitted,

Brendon J. Baatz

Brendon J. Baatz
Global Energy Market Development
GOOGLE,LLC
baatz@google.com

ENCLOSED

E-File

April 23, 2025
Matthew Homsher, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17120-3265

Re: En Banc Hearing on Interconnection and Tariffs for Large Load Customers
Docket No. M-2025-3054271

Dear Secretary Homsher:

Enclosed for filing on behalf of Vantage Data Centers, please find the testimony of Shawn Smith to be presented at the April 24, 2025 En Banc Hearing on Interconnection and Tariffs for Large Load Customers. If you have any questions regarding the information contained in this filing, please feel free to contact me.

Respectfully submitted,
s/ Shawn Smith
Shawn Smith
Vice President of Energy for Utilities and Regulatory
Vantage Data Centers

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

En banc hearing Concerning	)	
Interconnection and Tariffs for Large	)	M-2025-3054271
Load Customers		

TESTIMONY OF SHAWN SMITH ON BEHALF OF VANTAGE DATA CENTERS

Chairman DeFrank, Vice Chair Barrow, Commissioners, and staff:

Thank you for the opportunity to appear before you today. My name is Shawn Smith, and I am Vice President of Energy for Utilities and Regulatory at Vantage Data Centers in North American. Vantage serves the leading American-based technology companies with global footprints by providing innovative and scalable data center campuses to hyperscalers, cloud providers, and large enterprises. Founded in 2010, we are a privately held, Colorado-based company with approximately 1,800 employees. With 35 operating or developing data center campuses across five continents, Vantage is known for having a strong, collaborative approach in partnering with our customers to develop flexible data center solutions for cloud computing and AI, with the best-in-class customer service.

Vantage is interested in developing hyperscale data center campuses in Pennsylvania to meet the growing demand for digital infrastructure. By one estimate, data center capacity in the United States will grow from 25GW in 2024 to 80GW in 2030.[1] To continue to develop this infrastructure, it is critically important that the regulatory environment facilitates appropriate cost allocation for electricity generation and transmission, and the necessary approvals on a timescale that allows us and Pennsylvania to meet this unique moment in our nation's history. We appreciate the Commission's leadership in opening this dialogue

[1] **McKinsey & Company.** (2024, April). *How data centers and the energy sector can sate AI's hunger for power.* Retrieved from https://www.mckinsey.com/industries/private-capital/our-insights/how-data-centers-and-the-energy-sector-can-sate-ais-hunger-for-power

on how interconnection and tariffs can be modernized to better serve large load customers—while protecting the interests of all ratepayers and ensuring system reliability.

Today, I'd like to offer four recommendations for your consideration, based on our real-world experience navigating large load interconnections and co-located generation in Pennsylvania and across North America. These ideas focus on encouraging generation co-location, aligning financial requirements with project risk, applying consistent credit standards, specific contract terms that align with risk utilities and large load customers are taking, and tariff provisions that balance the needs of all parties.

1. **Recognize and Reward Generation in the Load Interconnection Queue**

First, we encourage the Commission to recognize the systemic benefits when customers bring their own new generation alongside new load. When a large load customer and/or developer co-locates with new generation, they are not simply adding demand. In reality, they are helping offset their own load, improving system resilience, and reducing net stress on the grid.

We encourage the Commission to consider policy tools that could prioritize such projects in the load and generation interconnection queue. This could include explicit scoring advantages, creating a separate queue track, for new load that brings new generation, and earlier access to system impact studies. Doing so would send the right market signals: that if a customer helps solve the grid problem, rather than contribute to it, they deserve a faster path forward.

This is especially important in constrained areas where large load interconnections are highly competitive. By prioritizing the interconnection of large loads that also brings new generation resources to the grid, it will maximize the ability to grow new load while minimizing stress on the power grid and avoiding any impact to ratepayers. The Commission has a timely opportunity to shape proactive policy in this space, encourage innovation and champion customers who are taking proactive steps to support reliability by giving those projects priority in the queue.

2. **Deposits or Financial Security from Large Load Customers**

Financial assurance requirements for large new loads must be fair, proportional, and grounded in actual risk. A one-size-fits-all approach fails to reflect the diversity of data center business models, credit profiles, and risk mitigation strategies already in place. For example, exempting large hyperscalers from collateral requirements while applying them

to third-party providers leasing to those same companies creates an uneven playing field and undermines healthy competition. We recommend a flexible framework that reflects utility risk and recognizes customer investments, as follows:

A. **Timing of collateral requirements**. Collateral should be required only when the utility's financial exposure is at its peak—typically within the year preceding energization. Requiring collateral earlier not only misaligns with the actual timing of risk but also unfairly strands significant customer capital—often hundreds of millions of dollars—well before the customer is expected to receive service. When a project remains several years from coming online, the utility retains ample opportunity to mitigate potential exposure.
   Further, collateral structures should align with the phased nature of large-load projects and should reduce over time as risk declines. Once a large load customer is taking service, there should no longer be a need to maintain as high an amount of collateral. Any tariffs related to a customer's collateral obligation should also include a schedule for how the collateral will be reduced overtime which is critical for customer capital planning. Utilities must also return collateral in a timely and transparent manner.

B. **Amount of collateral.** Collateral amounts should correspond to the utility's actual at-risk investments. Requirements should be based on a realistic assessment of potential loss, including the utility's ability to repurpose infrastructure, and a holistic approach to customer risk evaluation. Factors such as a customer's operational history, performance on prior projects, and the strength of equity backers provide meaningful insight. Additionally, if a data center developer has a lease signed with a creditworthy tenant (such as a well-known hyperscaler) the creditworthiness of the tenant should be the basis for setting the amount of collateral obligation. Failing to account for these relationships unfairly penalizes third-party operators. Utilities should have the discretion to grant exemptions where warranted by these broader indicators of creditworthiness.

C. **Form of collateral**. The form of collateral accepted must also be flexible. Customers should be able to meet obligations through a range of instruments—such as parental guarantees, letters of credit, surety bonds, or cash.

D. **Performance by the Utility**. By providing collateral, large load customers are significantly de-risking utility investment. Equally important, if customers are required to post collateral, utilities should commit to performance. Financial guarantees should be mutual. Utilities must provide firm commitments on

energization dates and ramp schedules, enabling customers to invest with confidence. Without these assurances, one-sided collateral obligations expose customers to undue risk and will limit private sector investors appetite to invest. Utilities should be held to enforceable delivery timelines or face consequences for delays. Contracting provisions need to have similar binding financial requirements on the utilities to meet their proposed energization timelines as the utilities put on customers to meet their requested in-service date.

3. **Minimum Charges and Contract Terms**

Vantage Data Centers secures long-term leases with hyperscale companies. It is important to have power certainty during the term of the lease while having options to continue the power at the conclusion of the contract period with automatic extension. Minimum contract terms should be in the eight to ten-year range assuming extension provisions are built into the contract terms.

We recommend demand charges not to exceed 75%, with ramping provisions in place, and implementation beginning no earlier than six to twelve months after energization. We have seen minimum demand charges in other jurisdictions, and they can be appropriate—provided they include ramping provisions that account for the phased buildout of data center campuses over multiple years. Vantage works closely with the utility and our customers on accurate load ramps. While demand charges are reasonable, we do not believe a minimum energy or consumption charge is necessary. Utilities must plan for adequate capacity to serve large loads, but actual energy consumption risk can be managed through energy market transactions based on real usage.

4. **Tariff Provisions and Appropriate MW Size Designations for Large Load Tariffs.**

Large loads should be classified based on their power demand, not industry type or sector, as their impact on the grid is determined by load size. Given the rising power demand across several industries—including manufacturing, mining, hydrogen production, and data centers—a minimum threshold of 50 MW is an appropriate and reasonable criterion for eligibility under the large load tariff.

Large load customers should be allowed to develop substation, distribution, and transmission upgrades. In many cases we have the same vendor to do these upgrades as utilities hire. Having appropriate tariff subcategories to accommodate such options will allow for faster deployment of resources without sacrificing reliability and safety. Additionally, large loads should be incentivized with expedited load interconnections to develop these resources.

Distinctions in tariff designs for firm service versus interruptible large load customers. We have participated in interruptible load programs in other service territories, and they can be successful. You will want to simplify the process and be able to assist the grid during high demand events. For example, structures that require utility customers to export energy to the grid and become a FERC Generator Operator are unnecessarily complex and may limit the participation of programs intended to provide stability to the grid. This program should also be incentivized with expedited load interconnections to develop these resources.

The tariff load interconnections should also have provisions that have transparency built into the rules. Similar to generation interconnection, queues should be published with amounts and timing of requested power. However, they should still keep the names of the entities and locations private to allow businesses to succeed. Further, the tariff needs provisions that have timelines for both study timeline requirements from the utility and large load customer progression to a project that is pulling power from the grid. The number of load studies should be done in three to six months depending on the number of studies in the queue. Once a study is complete there should be set progression milestones large load customers are needed to meet.

Your honor, commissioners, and staff, thank you again for the opportunity to testify today on these important topics for the state of Pennsylvania that can have significant economic benefits and serve the national security interest. By encouraging new generation co-location, aligning financial requirements with project risk, applying consistent credit standards, setting minimum contract terms that align with the risk utilities and large load customers are taking, and establishing tariff provisions that balance the needs of all parties, we can grow the grid in a safe, sustainable, and reliable way to meet the opportunities for your state. I look forward to your questions.

Lindsay Baxter
Senior Manager, Energy Policy and Public Affairs
lbaxter@duqlight.com
412-393-6224

April 23, 2025

VIA ELECTRONIC FILING

Matthew Homsher, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
2nd Floor, Room-N201
400 North Street
Harrisburg, PA 17120

Re: En Banc Hearing on Interconnection and Tariffs for Large Load Customers
Docket No. M-2025-3054271

Dear Secretary Homsher:

Enclosed for filing please find Duquesne Light Company's Testimony to be presented at the April 24, 2025 En Banc Hearing on Interconnection and Tariffs for Large Load Customers.

If you have any questions regarding the information contained in this filing, please feel free to contact me.

Sincerely,

Lindsay A. Baxter
Senior Manager, Energy Policy and Public Affairs

Enclosure

4-24-25
Exhibit
Davis-1

Testimony of C. James Davis,
Director
Rates, Energy Procurement, and Federal/RTO Affairs
Duquesne Light Company
April 24, 2025
Docket No. M-2025-3054271

I. Introduction

Good afternoon. My name is Jamie Davis, and I am the Director of Rates, Energy Procurement and Federal/RTO Affairs for Duquesne Light Company (DLC), the electric distribution company serving Pittsburgh and the surrounding region. It is my pleasure to participate in today's conversation on this important topic.

Duquesne Light has proudly served the Pittsburgh region for over 100 years, including serving as an important catalyst for economic growth and development through the height of heavy industry, the decline of the steel industry, the rise of higher education and world-renowned medical institutions, to the more recent evolution of the City as a hub for cutting edge technology in robotics, autonomous vehicles, and now artificial intelligence.

II. Background

As the region has transformed and continues to evolve, Duquesne Light stands ready to reliably and safely meet the needs of the community it serves. Data centers and specifically artificial intelligence, or AI, is transforming how we all live and work. But the extreme energy demands of data centers, if not managed correctly, could result in grid impacts and unintended shifting of costs to other customers.

To put this energy demand into perspective, consider that in 2024, DLC's Network Service Peak Load was nearly 2,700 MW[1]. A hyperscale data center will commonly range from 60 MW to several hundred megawatts[2]. There are a few examples within Pennsylvania where hyperscale data center have the potential to scale up to 900 to 1,000 MWs.[3][4] A single data center could account for as much as 30% of the current peak load in our entire service area in Allegheny and Beaver counties.

[1] https://www.pjm.com/-/media/DotCom/markets-ops/settlements/network-service-peak-loads-2025.pdf

[2] BenchMark | Hyperscale Data Centers and How to Power Them

[3] For reference, the Amazon Web Services data center seeking to directly connect to Talen's Susquehanna nuclear plant in Pennsylvania has a load of 960 MW.

[4] For reference, Energy Harbor Corp. (Acquired by Vistra Corp.) seeks to directly connect to Beaver Valley nuclear facility in Shippingport, Pennsylvania and would plan to purchase between 200-300 MWs of electricity which could scale up to 900 MW in subsequent phases.

Duquesne Light is committed to supporting large load growth in the Pittsburgh region; while ensuring adequate generation supply, reliability, affordability and the safety of the electric grid. Equally important, Duquesne Light seeks to avoid unreasonable cost shifts to other customers. Adhering to long standing principles of cost allocation ensures affordability and fairness in electric service rates. In today's economy, it's more important than ever to focus on affordability for customers.

My comments today are intended to inform the Commission on how best to foster economic development and beneficial load growth while appropriately preventing unreasonable cost shifting. At the outset, it is important to note that large load may be served by the distribution or transmission system. Large load customers may also seek to co-locate at the site of the generation resource, bypassing both the distribution and transmission system. Depending on the point of interconnection and configuration, there are different procedures and cost implications. Duquesne Light will further expand on these issues in our written comments. Today, my testimony focuses on best practices related to serving large load at the distribution level. While I will offer insights into Duquesne Light practices, it is also important to maintain flexibility as we contemplate what works best for Pennsylvania's diverse grid and unique characteristics.

Today, I offer two recommendations for the Commission's consideration:

1. The Commission should minimize unreasonable cost shifting by adhering to cost allocation rules to protect existing customers from bearing the costs to support new large load customers.
2. The Commission should ensure reliability of the grid by requiring large load customers to "bring their own generation"

III. Large Load Customers should Bear the Costs of Studies and Infrastructure Investment.

The cost of studies and infrastructure upgrades must be supported by large load developers when those cost are directly caused by the customer, and there is no material benefit to other customers within the class.

- Duquesne Light's existing interconnection requirements require large load developers to bear the cost of studies and infrastructure investment needed to serve that customer, so that those costs are not socialized to other customers. Doing so is consistent with long-standing cost-causation principles in ratemaking. Where cost causation is clear and can be directly allocated to a customer, it is appropriate to do so.
- Under the existing tariff, DLC requires a deposit in order for a large load developer to be assigned a position in the queue. This deposit pays for engineering and interconnection studies and is fully refundable if the customer decides not to move forward, less any costs already incurred. These large load developers also pay the actual costs of construction. Referred to as "open book" costs, these include direct and indirect costs, plus applicable taxes. This practice ensures that Duquesne Light existing customers are protected from paying for projects that never come to fruition.
- The tariff provides clarity on the process to prospective customers, as compared to negotiating individual contracts with each potential large-load customer.
- Rule 4 of Duquesne Light's tariff allows customers to pay over time through an adder on the bill with interest. This is another tool the Company has to encourage investment and economic development while ensuring that costs are not shifted to other customers.

- DLC maintains that consideration for contract size minimums and contract duration can ensure customers pay their fair share over a longer duration, regardless of their actual load. For example, provisions allowing for "ramp-up" considerations or "minimum charges" can be used by a utility; however, it should be noted that minimum charges may change how individual customer's Network Service Peak Load tags are assigned. Some examples include minimum charges based on a percentage of the customer's highest monthly billing demand in the past number of months, or a percentage of the customer's contracted demand.

IV. **Bring Your Own Generation**

Within the context of potential generation shortfalls in the PJM region, DLC recommends that large load customers be required to supply primary generation in order to reduce the impact the large load has on current customers and the larger grid. While the idea of "bring your own generation" has promise, the specifics of how this may be implemented should be well-defined to ensure that there are not unintended impacts on other customers and the larger grid. For example, considerations for further dialogue should include:

- What is a "large load" and can guidelines be established that sufficiently apply across all EDC service territories?
- Should the power supplied be new generation that is added to the grid, rather than a power purchase agreement (PPA) pulling generation from an existing source? For example, this new generation could be new construction, restarting retired generation, or additional capacity at an existing generating source. It is DLC's view that new generation should be added to the system to offset the demand of the new large load.
- Is the availability of generation matched up with the energy demand of the large load? For example, a PPA with an intermittent solar facility that produces during daylight hours cannot offset the demand of a 24-7 data center. While DLC supports the growth of new, clean, renewable generation, which benefits the grid, for the purposes of today's discussion we are focused on generation that is available to push electrons onto the grid anytime the data center is pulling electrons from it.
- Should there be operational considerations for whether the generation is: solely dedicated to serving that large load; already on the grid under a PPA; or on-site and available to feed back onto the grid?
- Should rules and operational controls be put in place to dictate what happens if companion generation is offline? For example, does that load go offline too, or is the grid expected to serve it? At the distribution voltage level, Duquesne Light has a standby rate to cover the costs of maintaining infrastructure to be ready to serve that load if and when needed. It does not currently have a similar rate for large load customers interconnected at the transmission voltage level.
- Should the large load be required or incentivized to shed load at peak periods?

In closing, the Duquesne Light Company commends the PUC for initiating this proceeding and looks forward to further engagement on the best practices that can be implemented in the Commonwealth to guide large load development.

Thank you for the opportunity to participate at today's hearing and I look forward to answering your questions.

Appendix A – Retail Tariff References
Duquesne Light Company
April 24, 2025
Docket No. M-2025-3054271

Duquesne Light Company Electric Service Retail Tariff References

Contracts, Deposits and Advance Payments – Rule 4 Contracts

The Company reserves the right to require non-residential customers to sign a written contract indicating the rate for electric service and to require a contract term which, in the judgment of the Company, is sufficient to justify the cost of any facilities installed for the exclusive use of the customer and to compensate the Company for other incremental costs of Nonstandard Service. Customers who have facilities extended for their exclusive use will be permitted to purchase electricity from an EGS according to the provisions of direct access and 66 Pa.C.S. § 2807. Extension of such facilities will not be conditioned on the customer's agreement to purchase supply from the Company. Receipt of electric service by any entity, however, shall constitute the receiver a customer of the Company, subject to its rules and regulations, whether service is based upon contract, agreement, accepted signed application or otherwise. The customer shall notify the Company, in advance of receipt of electric service, of the customer's name, address to which the electricity is to be delivered, the address to which the bill is to be mailed, the date delivery of electricity is to commence, and provide information requested by the Company regarding the customer's credit standing. The customer shall notify the Company to cancel electric service and the customer shall be responsible for payment for all electric charges until the customer has so notified the Company to cancel electric service.

The Company at its sole discretion may enter into special contracts for electric service with industrial or commercial customers to address changing business needs, operating conditions or less expensive competitive alternatives for energy. If requested by the Company, the customer shall provide to the Company, on a confidential basis, all information, records and financial analysis necessary to evaluate the customer's request for a special contract.

Terms and conditions of service will be mutually agreed upon by the Company and the customer and included in a signed contract, which will be filed with the Public Utility Commission. The Company at its sole discretion may request Public Utility Commission approval. The terms of the agreement will be confidential upon filing with the Commission. Rates established under special contracts will be sufficient to recover, at a minimum, all appropriate incremental costs. Any special contracts written to become effective on or after January 1, 2007, shall apply only to charges for the distribution service provided by the Company.

The contract shall contain all terms and conditions and the rates and charges to be paid for electric service.

The contract shall be for a period of no less than one (1) year and no greater than ten (10) years.

The contract will be terminated by the Company if the Company charges are not paid when due as specified in Tariff Rule No. 21, before the addition of the Late Payment Charge. Upon termination of the contract under these conditions, the regular electric tariff rates will be applied

to electric service rendered from that point forward. A new special contract will not be made available to a customer whose previous special contract was terminated because of failure to pay bills as specified in Tariff Rule No. 21.

For contracts that contain provisions governing the customer's rights under direct access, the Company will unbundle the customer's contract and the customer will be eligible to obtain electricity from an EGS only in accordance with the terms and conditions of the customer's contract. Upon expiration of their contract, special contract customers will default to Rider No. 9 – Day-Ahead Hourly Price Service.

Installation of Service Rule 8.2 Large Load Study Deposit

For a project to establish service to a new load of 300 kW or larger or to increase the load of an existing service by 300 kW or larger, the Company, at its discretion, may require a load study and report. The load study report will include high-level estimated timeline and costs associated with the project. The high-level estimated timeline and costs provided in the load study report are current as of the date the Company provides the load study report and are subject to change. The load study results are not binding on the Company. The Company will not commence work on the load study until it receives the following from the customer, applicant, or prospective customer: (a) a deposit for the load study, (b) proposed location of the project or potential project, and (c) sufficient technical details for the project or proposed project, including, but not limited to, the size of the project or proposed project in kW and estimated power factor. The applicant is responsible for, and must pay, all actual load study costs. The actual costs of the load study may exceed the deposit. If load study costs exceed the deposit, the Company will send the customer/applicant/prospective customer notification, and they must pay the additional costs in order for the study to proceed. If load study costs do not exceed the deposit, the Company will send the customer/applicant/prospective customer notification and the Company will return any unused funds to them. After receiving the aforementioned information and deposit, the Company will provide the load study report without unreasonable delay.

Rate HVPS – High Voltage Power Service Excerpt

Availability: Available to customers with Contract On-Peak Demands greater than or equal to 5,000 kilowatts (≥ 5,000 kW) where service is supplied at 69,000 volts or higher.

Contract Provision: Contracts shall be written for an original term of not less than five years for Contract Demand of 100,000 kilowatts or less, and not less than ten years for Contract Demands in excess of 100,000 kilowatts. Such contracts shall continue in force after the expiration of the original term until one year following the date of written notice of cancellation by either party. Such notice of cancellation may not be given earlier than one year before the expiration of the original term.

The Company reserves the right to refuse contracts hereunder if, in its judgment, its generating or transmission capacity is no more than adequate to meet the requirements of its existing customers

Facilities Charge: Customer must pay for all new or additional facilities installed with the exception of meters and metering equipment.

341 White Pond Drive
Akron, OH 44320

Tori L. Giesler, Esq.
(610)-921-6658

April 23, 2025

VIA ELECTRONIC FILING

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

Re: En Banc Hearing Concerning Interconnection and Tariffs for Large Load Customers
Docket No. M-2025-3054271

Dear Secretary Homsher:

In accordance with the Pennsylvania Public Utility Commission's Secretarial Letter issued on April 12, 2025, at Docket No. M-2025-3054271, FirstEnergy Pennsylvania Electric Company ("FE PA") hereby submits its prepared testimony that will be highlighted at the En Banc hearing scheduled for April 24, 2025 in the above-referenced proceeding. FE PA will be represented by Ms. Kelly Gower, Vice President of Finance and Regulatory, who will testify regarding the Company's perspective on the agenda item related to large load customers.

Ms. Gower can be reached by phone at (835) 201-9590 and by email at kgower@firstenergycorp.com. Please do not hesitate to contact Ms. Gower or me should you have any questions or need additional information.

Respectfully submitted,

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TLG/mlr
Enclosures

4-24-25
Exhibit
Gower-1

Kelly Gower - Vice President, Finance & Regulatory, FirstEnergy Pennsylvania
En Banc Hearing Concerning Interconnection and Tariffs for Large Load Customers
Docket No. M-2025-3054271
April 24, 2025

Introduction

Chairman DeFrank, Vice Chair Barrow, and Commissioners, good afternoon and thank you for the opportunity to testify today regarding the interconnection issues that are starting to manifest as data centers and other very large loads locate into Pennsylvania. I am Kelly Gower, Vice President of Finance and Regulatory for FirstEnergy Pennsylvania Electric Company (or "FE PA"), and I will be commenting on behalf of FE PA.

Our former distribution operating companies, Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company, and West Penn Power, consolidated in January 2024 to form FE PA. Altogether, FE PA serves approximately 2.1 million customers in 56 of the 67 counties throughout the Commonwealth of Pennsylvania. It is important to note that for purposes of today's conversation, preceding and as part of the January 2024 consolidation, each of the transmission systems once owned by any of FE PA's predecessor companies are no longer part of FE PA but rather helped form a collection of affiliated transmission operating companies under the FirstEnergy Corp. umbrella, including Mid-Atlantic Interstate Transmission, LLC, Keystone Appalachian Transmission Company, American Transmission Systems, Incorporated, and Trans-Allegheny Interstate Line Company.

Today, I will be testifying to you about the unique qualities that certain new large load customer requests have and the challenges that those qualities present as compared to our typical large industrial load for which our processes have traditionally been designed. I also offer perspectives on the work that FE PA and its sister companies are doing to tackle these challenges to address the needs of all stakeholders. Finally, I attempt to initially respond to the various questions posed by the PaPUC when setting this *en banc* hearing, recognizing that there will be further opportunity for input through written comments to follow.

Traditional Large Customer Load Connections

Traditionally, large customers apply for retail service through FE PA, which initiates a process that involves preparing detailed load studies ("DLS") that are provided to the customer, inclusive of details such as facility upgrades/requirements for both the customer and the utility, cost of utility upgrades and responsibility thereof, and timing for completion of all required upgrades. This load study process takes into account many customer-specific and system-specific details such as location, proposed diversified loads, basic project technical information, and any thermal or voltage violations this new load would cause to the grid in its current state. FE PA provides an estimated cost and an approximate time frame to complete the study. Once the customer signs the study application, pays the fee, and provides certain basic information, the DLS process begins.

The DLS process results in a technical draft that is then reviewed by a technical review team and a cost allocation team. This process not only provides for review of the technical solution to supplying service to the new customer, but also looks to determine proper cost allocation between the customer, FE PA and the transmission company. The technical outcomes of the study include the full scope of work required to mitigate any identified violations, work required to extend the electric grid to the point of interconnection while supporting the project's redundancy requirements, and the estimated cost and timeline to complete that work. The cost allocation review identifies network transmission facility costs, distribution facilities costs and the "contribution in aid of construction" or "CIAC" that the customer would be responsible for paying. In this cost allocation review, we would also determine if any tariff-based revenue credits might be applied. Once these working group reviews are done, FE leadership conducts a final review of the project scope, costs, and risks. The leadership team is comprised of appropriate staff in the business unit, engineering, finance, rates, and legal. This process results in a DLS document that is provided to the customer. The DLS document describes a plan for interconnecting the customer's load, the costs of the facilities that are necessary to connect the load, the allocation of costs between the transmission company and FE PA, and the CIAC costs that are to be paid by the customer. If the customer accepts the plan and chooses to move forward with the project, a "Construction Services Agreement" (or "CSA") is prepared and the customer is invoiced for its share of the upgrades required. Upon execution of this CSA and payment of the invoice, engineering and construction move forward to bring the project to completion.

As previously discussed, FE PA does not own the transmission systems serving its territory following the various transactions that have established stand-alone transmission companies which now own those assets. This construct means that while transmission-level retail customers see FE PA as their service provider, it is critical for FE PA to coordinate with and ensure ongoing service for these customers through the applicable transmission owner serving each customer's location. As a result, most large load requests invoke the standards, rates, rules, and policies of the transmission owner along with those of FE PA. Similarly, because these elements of transmission service are governed by the Federal Energy Regulatory Commission ("FERC"), it is important to remember that the details of serving large-load customers typically also require FERC jurisdiction. Given the scale of load needs presented by incoming data centers, hyper scalers, and the like, this coordination between FE PA, transmission owners, the PaPUC, and FERC are increasingly important.

One specific area in which this applies is in the determination of whether new transmission assets that are needed to support new large-load customers should be classified as transmission network facilities versus non-network facilities, which hinges on several key characteristics, as recognized by FERC. Namely, transmission network facilities typically reflect one or more the following criteria:

- Operate in parallel with other transmission facilities;
- Are used to serve multiple customers;
- Support the reliability of other transmission facilities;
- Allow for multi-directional energy flow;
- Enable coordinated operation of the grid; and/or
- Would affect the larger transmission grid in the event of an outage on the facility at issue.[1]

The costs for transmission network facilities that meet one or more of these criteria are shared across all customers who benefit from them. Since 1994, FERC's policy has held that network facility costs are to be recovered via "rolled-in" transmission rates charged to all customers that are served by the transmission network. By contrast, facilities that do not meet any one of these characteristics typically would be classified as non-networked, with the costs borne solely by the customer benefiting from them.

Features, Goals and Risks of Today's New Load Requests

The new class of large load requests that are increasingly coming to utilities are distinct in several key respects from the traditional large user or industrial load that our industry has historically served. As is true with any type of prospective load, FE PA strives to meet each of these incoming customers' unique needs and further economic development within its service territory to the benefit of not only the incoming customer or FE PA, but ratepayers and the communities we serve at large. This means that when reviewing these applications and determining system upgrade needs for interconnection, we are doing so in an equitable manner that not only follows well-accepted cost causation principles but also ensures that no customer is receiving undue benefit to the detriment of other customers.

[1] *E.g., Buckeye v ATSI*, Opinion No. 533, 148 FERC ¶ 61,174 at PP 12, 13 (2014), *and Mansfield v New England Power*, Opinion 454, 97 FERC ¶ 61,134 at 61,613 (2001).

While surety of timing and cost remains an important factor to these applicants in the same way customers of all varieties demand, the speed to market expectations of these applicants are often accelerated significantly when compared to other typical new service applications, including requests for shortened/fast-tracked study timelines. Nonetheless, in fairness to all customers, we determine the applicants' place in the queue of incoming interconnections in the same manner as any other applicant. For any customer application to interconnect, position in the interconnection queue is based upon the date when an application is considered complete (including execution of the DLS agreement and payment of the study fees), which means each application must await completion of other studies ahead of it. Once studied, there can be significant lead time on materials critical to those applicants' connection to the system and, given the scale of facilities needed to serve such customers, there can be a need to secure an outage window through PJM Interconnection, LLC ("PJM") in order to complete the necessary construction. Our experience has shown that this can be a frustrating realization for applicants whose ramp up is faster than the average large user, where timing expectations often do not reflect current supply chain and regulatory process realities.

The other significant distinction in the new load requests that we are discussing today is the size of the interconnection service capacity that they request and the associated costs of building the facilities necessary to serve loads of that size. Until recently, interconnecting large loads did not generally result in material network transmission upgrades due to the differing nature of their requirements. In contrast, the large loads that we are talking about today often require significant investment in the transmission system. Further, the requests we are discussing are often for new customers to be situated in geographic areas where electrical systems were not designed to support load needs anywhere near those which are now being requested. This often requires significant transmission buildout, which must first be analyzed thoroughly and involves substantial network investments.

Generally, the cost to construct or upgrade facilities to support a new interconnection has historically been determined to fall into one of two categories: (i) facilities that will serve only the new customer, and (ii) upgrades to the system that is used to service all customers. The first category, facilities that will only serve to benefit the new customer, usually are funded by the new incoming customer through a CIAC payment or, in limited circumstances, self-ownership. The second category of costs are for facilities/upgrades that serve or benefit the larger system's collective current and projected needs, in which case the new infrastructure would be treated as network upgrades, with costs to be "rolled-into" transmission rates for collection from all transmission customers. Both of these paths to funding for large-load customer requests create challenges to utilities in ways that have not historically been at play. New large-load customers can face significant CIAC charges for facilities that are built only to serve a single customer, and

also because a new large-load customer can require further material investment in the electric system that can lead to incremental rate increases for all customers that are served by the system. A further complication is that the industry has comparatively little experience with new large-load customers and, consequently, it is difficult to understand the entirety of the system impact without extensive study.

For example, there are open questions as to whether these large loads will materialize on schedule, whether they will persist for many years, and whether they will reflect high load factor patterns of usage or variable usage.

Where a customer self-funds through CIAC or a similar model, the payment covers the utility's capital investment, meaning that the utility (both transmission and distribution) is required to expend significant operations and maintenance resources from application through construction and does not have the opportunity to earn a return on its efforts, as the capital investment is fully funded by the customer and is not included in rate base. If these large-load customers fund the required work through CIAC, this model increases the amount of investment that the utilities must focus on projects that would not increase rate base, as compared to investment that is otherwise necessary to maintain the physical and financial health of the utility.

In the alternative scenario that the system upgrades are treated as networked and rolled-into network transmission rate base, other concerns arise. While the utility's capital investment rolls into rate base for recovery through rates that are charged to all customers, it must be recognized that there may be increased costs to all customers, as the rate base that is the basis for the utility's rates grows due to construction of the upgrades required by the new customer's load. Overall, the goal of the Company and its affiliates is always to balance affordability concerns with reliability and resiliency needs as best possible.

What can be done?

In light of the challenges I just outlined, the team at FirstEnergy has been exploring solutions on behalf of its family of companies, including reviewing solutions that have been leveraged in other jurisdictions to address these challenges in a workable way for all stakeholders. Central to this solutioning effort has arisen the recognition that for "unbundled" states like Pennsylvania, no one solution squarely falls within the state or federal jurisdiction, but rather the parameters of both jurisdictions must be accounted for in each such instance. Potential options include but are not limited to incorporation of critical tariff provisions, ratemaking structures, siting approvals, and the like. Further, the degree of complexity in addressing this challenge increases in certain respects in the case of FE PA, where the distribution utility is not the transmission utility. For example, if ultimately a construction agreement is to address both

transmission and distribution service, then the agreement likely will need to be signed by the customer, FE PA, and the affected transmission utility, and the agreement also likely will need to be filed with and approved both by the PA PUC (as to state jurisdictional matters) and with FERC (for the transmission-jurisdictional elements). As described earlier related to the interconnection process, this is predominantly handled through contracts outlining the critical provisions of necessary upgrades, expected load, cost allocation, security, etc., while living within the confines of all applicable regulatory and tariff requirements, as well as system planning policies and requirements.

Our review demonstrates that the industry still is in the early stages of dealing with each of the concerns I've outlined, and that more work needs to be done to address the FERC and state elements that are in play. We also plan to submit written comments as per the Commission's schedule. As such, we welcome this process and look forward to hearing from the Commission, our peers, and other stakeholders. Thank you.

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AN EXELON COMPANY

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April 23, 2025

Via E-Filing
Secretary Matthew L. Homsher, Esq.
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, Second Floor
Harrisburg, PA 17120

RE: **Docket No. M-2025-3054271**
Testimony of Richard G. Webster, Jr. on Behalf of PECO Energy Company Re: Pennsylvania Public Utility Commission En Banc Hearing Concerning Interconnection and Tariffs for Large Load Customers

Dear Secretary Homsher:

On March 27, 2025, Chairman DeFrank moved the Commission (the "Motion") to convene an *En Banc* hearing on April 24, 2025 (the "Hearing") to discuss the increasing number of large load customers, including hyperscale data centers supporting artificial intelligence and other operations. Ordering Paragraph 2 of the Motion directed individuals who are selected as panelists to file their testimony to the docket no later than April 23, 2025.

Richard G. Webster, Jr., Vice President of Regulatory Policy and Strategy for PECO Energy Company, was selected as a panelist for the electric distribution companies' panel. Accordingly, enclosed herewith is Mr. Webster's testimony on behalf of PECO Energy Company. Should you have any questions concerning this matter, please feel free to contact me at the email address or telephone number provided above.

Respectfully submitted,

/s/ Dawn Kurtz Crompton
Dawn Kurtz Crompton, Esq.
PA Bar Id. No. 311701

Enclosures

4-24-25
Exhibit
Webster-1

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

EN BANC HEARING CONCERNING
INTERCONNECTION AND TARIFFS FOR LARGE LOAD CUSTOMERS

DOCKET NO. M-2025-3054271

TESTIMONY OF RICHARD G. WEBSTER, Jr.
ON BEHALF OF
PECO ENERGY COMPANY

April 24, 2025 *En Banc* Hearing

Chairman DeFrank, Vice Chair Barrow, and Commissioners Zerfuss, Coleman, and Yanora, my name is Dick Webster, and I am the Vice President of Regulatory Policy and Strategy for PECO Energy Company. Thank for the opportunity to testify here today regarding issues of critical importance to the Commonwealth.

I would like to commend the Commission for holding this important hearing on the opportunities and challenges raised by the proliferation of large load projects that are seeking to locate in Pennsylvania. Like the resource adequacy proceeding the Commission launched in November 2024, today's hearing represents an important opportunity to discuss critical energy issues facing our state.

As Chairman DeFrank noted in his Motion to initiate this hearing, large load customers, such as data centers, present opportunities for economic development, job growth, technological advancement, rate stability, and strengthening our national security. PECO embraces these opportunities and is actively working with our customers, legislators, regulators, and other stakeholders to bring these benefits to its customers and the Commonwealth. Accompanying those opportunities are challenges to the electric distribution companies', or "EDCs", electric systems that will serve the large load customers. PECO, like other public utilities in the Commonwealth

and across the nation, has been evaluating these opportunities and challenges and how we can best serve our current and future customers. We are learning from our own experiences with large load customers and gathering additional information from our affiliates at Exelon and other peer utilities. We value the opportunity presented today to share our perspective and to hear from the Commission and other interested stakeholders.

While large load projects are important to the applicants and the communities in which they are seeking to locate, they also have the potential to impact other customers. PECO takes seriously its obligation to provide safe, reliable, and affordable electric service to all customers and appreciates that the Commission has initiated this discussion to appropriately balance serving large load customers in the Commonwealth while protecting other customers.

To aid in the Commission's consideration of designing a proposed model tariff, my testimony is focused on some of the most significant challenges PECO has experienced in connection with large load customers. First, many contemplated large load projects are substantially larger than customer projects we have served in the past. PECO is working with a number of large load projects that are considering connecting to PECO's distribution system. Four of these projects, which have reached an advanced stage, would potentially increase PECO's overall peak demand by 3.8 gigawatts, resulting in an almost 40% increase in the demand on PECO's distribution system. PECO is also studying an additional 24 proposed large load projects that, if implemented, would add another 8 gigawatts of demand to our system. This potential demand growth is unlike anything we have dealt with before and is a major departure from almost two decades of relatively flat growth.

Second, the number and size of these projects makes it challenging to evaluate their potential effects on the distribution system. Large load projects have the potential to impact

multiple EDC service territories as well as regional transmission systems, resulting in an extremely dynamic modelling and analysis environment. This means that it may be necessary to study proposed projects in groupings or clusters, and impact analysis completed one day can be altered the next day by interconnection requests filed in other regional transmission systems, even in other states. In addition, the number and type of required interconnection studies and agreements can vary situationally based on site-specific and customer-specific parameters, which may limit the degree of short-term certainty that EDCs can provide to these customers on the time and cost of new interconnections. Load profiles for data centers can also be quite different from those of other types of large load, such as industrial customers, and even the load profiles among data center customers can vary depending upon a customer's potential to hyperscale or provide increasingly mobile service over time.

Third, the advent of large load customers is occurring in the context of a rapidly evolving external environment. The Federal Energy Regulatory Commission, regional transmission organizations, independent system operators, and state utility commissions across the country are evaluating issues associated with the proliferation of data centers. Some states are competing for data center- and artificial intelligence-related development, while others are or may be considering imposing barriers to or guard rails around such development. Large load development is also susceptible to the persistent supply chain and workforce challenges impacting large infrastructure development more broadly in our nation, and economic uncertainty has the potential to alter the speed and trajectory of demand growth. Data center and artificial intelligence technology are also rapidly evolving, adding uncertainty to projected energy demand forecasts. In short, change can occur quickly in this space, and the future is uncertain.

PECO has maintained a consistent and straightforward approach to evaluating potential large load customers. As with all Pennsylvania EDCs, PECO's distribution interconnection processes are implemented through retail tariffs that treat all customers in a non-discriminatory manner, consistent with state laws and regulations.

After a potential large load customer contacts PECO, the customer is referred to our Economic Development group. The Company's current process is to provide the customer with an inquiry form so that PECO can obtain information regarding the customer, the contemplated project, and its electric and gas service requirements. The customer will also be asked to provide preliminary drawings and site plans. At a high-level, there are then three phases to connecting the customer: Phase 1 – conducting an Engineering Feasibility Study, Phase 2 – performing detailed design and engineering, and Phase 3 – completing construction to connect the customer to the Company's distribution system.

If a large load customer seeks to proceed with an Engineering Feasibility Study, it will be required to submit a deposit to PECO that will be utilized to pay for the initial analysis. PECO currently requires a $250,000 deposit. If the customer cancels the project, any unspent funds will be returned to the customer. If the initial deposit is not sufficient to pay for the study, the customer will be required to pay the difference between the initial deposit and the actual study costs. This process helps establish the viability of potential projects by requiring prospective applicants to demonstrate a financial commitment that is directly tied to PECO's investment of time and resources and protects existing customers from unduly subsidizing the project. Prior to moving to Phase 2, the Company will determine, and the customer will be required to pay to PECO, the customer's required Contribution in Aid of Construction, or "CIAC." Total construction cost and CIAC will be determined in accordance with Section 7 of the Company's electric tariff. As a

general matter, customers are responsible for the costs necessary to upgrade service to deliver the power they need, while system investments that provide benefits to the broader customer base are socialized through the ratemaking process. The Company may also require the customer to submit additional financial security, such as a letter of credit.

This process is intended to balance the interests of new and existing customers, and to protect existing customers from potentially stranded costs that could arise if PECO were to invest tens of millions of dollars in grid upgrades for planned large loads that do not materialize. For example, while applicants for new or expanded service are entitled to a credit against PECO's estimated total construction costs of their connection equal to the anticipated distribution revenues from that customer over their first five years after connection, if the customer's future load does not generate those expected revenues, PECO can recover the difference from the new large load customer to avoid imposing additional costs on existing customers.

If large load projects are added to the grid in a responsible manner, these projects can bring a multitude of benefits to our communities and our customers. They have the potential to create jobs that support local workforces. They may also be able to leverage sites with existing infrastructure and available capacity, and the amounts these customers pay for EDC service and connection may ultimately have the effect of decreasing system costs for other customers over time. And as we have already seen in Pennsylvania, these projects can drive the reactivation of generation facilities that were determined to be uneconomic just a few years ago, creating additional jobs, expanding the state and local economies, and benefitting local communities.

We are proud of PECO's collaborative work with large load project developers to advance projects in PECO's service territory. Our interconnection process evaluates large load customer opportunities in a manner that is fair and equitable to all of our customers. Our regulatory

environment should always consider cost causation principles and require all users, including large loads, to pay their fair share of the costs of building, maintaining, and using the grid.

In conclusion, the size, scale, security, and speed-to-market needs of large load data center developers are unprecedented, and dialogues, like this hearing, are essential to understanding the challenges and opportunities associated with serving these customers. Other states are exploring these issues as well, and engagement with our peers through our regulatory and industry organizations can assist us in identifying best practices to optimize growth opportunities. The Commission should provide EDCs flexibility in developing practices and procedures that are consistent with the public interest and that will encourage growth while providing existing customers with appropriate protections. PECO looks forward to continuing to collaborate with the industry, regulators, legislators, and stakeholders to seize key opportunities that benefit all customers and to work through the challenges that those opportunities present.

Thank you again for the opportunity to testify today. I will be happy to answer any questions.

Michael J. Shafer
Senior Counsel

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E-File

April 23, 2025

Matthew Homsher, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17120-3265

Re: En Banc Hearing on Interconnection and Tariffs for Large Load Customers
Docket No. M-2025-3054271

Dear Secretary Homsher:

Enclosed for filing on behalf of PPL Electric Utilities Corporation ("PPL Electric") please find the testimony of Joseph B. Lookup, Vice President-Transmission & Distribution Planning and Asset Management, in the above-captioned proceeding. This testimony is being filed pursuant to the March 27, 2025 Motion of Pennsylvania Public Utility Commission Chairman Stephen DeFrank and April 12, 2025 Secretarial Letter issued in this matter.

Pursuant to 52 Pa. Code § 1.11, the enclosed document is to be deemed filed on April 23, 2025 which is the date it was filed electronically using the Commission's E-filing system.

If you have any questions, please do not hesitate to contact me.

Respectfully submitted,

Michael J. Shafer

Enclosure

4-24-25
Exhibit
Lookup-1

Testimony of Joseph Lookup
Vice President – Transmission & Distribution Planning, and Asset Management
PPL Electric Utilities
Before the Pennsylvania Public Utility Commission
En Banc Hearing on Data Center Tariff Design
April 24, 2025

Good afternoon, Chairman DeFrank, Vice Chair Barrow, and Commissioners. Thank you for the opportunity to testify on behalf of PPL Electric Utilities Corporation ("PPL Electric") on issues around interconnection and possible tariff considerations for large load customers.

Background

As recognized in the Motion, data centers and their load represent a significant opportunity for Pennsylvania, including job growth, economic development, and bolstering our national security. In addition, these load additions also have the potential to lower rates for all existing customers, while enhancing reliability and rate stability. Accordingly, the Public Utility Commission ("PUC") is right to consider how this substantial influx of load will be interconnected, ensuring that the process is conducted in a fair and equitable manner.

PPL Electric is directly seeing the growth of data center development in Pennsylvania, with requests in advanced stages in excess of 9 GW of new load as reported during PPL Corporation's year-end earnings call. To put this into perspective, PPL Electric's current summer peak is 7.5 GW, and the new data center requests are poised to more than double PPL Electric's system peak within the next 5-6 years. PPL Electric has invested in the reliability and resiliency of its transmission system to better serve its customers. An additional benefit of this investment is that PPL Electric now stands ready to serve this influx of load with large load customers only having to cover the incremental cost of interconnecting their facilities.

It is important to note the potential positive impact that connecting large load customers may have on other customers' transmission rates. Through PPL Electric's FERC formula rate it recovers an appropriate revenue requirement to cover the investment in and cost of operating the transmission system. These costs are allocated to individual customers based on a customer's contribution to the system peak. It is anticipated that large load customers will make up a significant portion of PPL Electric's system peak once interconnected. What this means from a practical perspective is that PPL Electric will generally receive the same amount of revenue from transmission rates, but an increasingly larger portion of that revenue will be received from large load customers thereby reducing other customers' portion. In real terms the Company estimates that the first gigawatt of interconnected load will reduce other customers' transmission costs by 10%.

When interacting with prospective large load customers, perhaps the biggest question that we hear is not about transmission capacity, but whether generation capacity will be sufficient to serve this increased load. While not directly the subject of this hearing, any PUC policies that arise from this docket should also consider the impact that data centers will have on resource adequacy, particularly the effects on capacity costs and system reliability. To that end, I'd refer you to PPL's comments on resource adequacy and EDC investment in generation related to the PUC's November technical conference at Docket No. M-2024-3051988.

PPL Electric Policies on Interconnecting Large Load Customers

PPL Electric has been addressing the issue of interconnecting large load customers, specifically data centers, through its existing retail tariff. Data centers with large load requirements predominantly take service at or above 69 kV. Under our current retail tariff, this level of service is provided under the LP-5 rate schedule, which generally requires the customer to pay for all interconnection costs. Historically, this approach has worked well, as the system upgrade facilities needed to interconnect the LP-5 customer only benefited the interconnecting customer, justifying the customer covering the cost.

Now, however, hyperscalers and their load often require upgrades to the 500 kV and 230 kV bulk electric system, which benefit not only these customers directly but also the transmission and distribution system as a whole. Additionally, adding this amount of load to the system has the potential to significantly reduce other customers' transmission costs. Consequently, when determining cost allocation, PPL Electric evaluates necessary system upgrades and segregates the costs into customer-specific costs which will be paid through a contribution in aid of construction ("CIAC") and costs that will be socialized through rates. This case-by-case determination is based on whether the specific upgrade provides reliability benefits to the grid as a whole or if it only benefits the new customer.

Customer Load Commitment and Security

PPL Electric shares the Commission's desire to protect ratepayers against the risk of stranded costs associated with large load customers. While it is our intent to memorialize large load interconnection rules in the retail tariff at some point in the future, to accommodate data center customers' speed to market needs in the interim, the Company has been extending service under its LP-5 rate schedule and including load commitment guarantee terms in the customer's electric service agreement ("ESA").

The load commitment language in the ESA mirrors the Company's line extension guarantee terms in Rule 3 of the tariff for lower voltage service extensions. In addition to the customer's CIAC obligation, the customer guarantees to take service in an amount that the customer will pay electric service rates equal to the upgrade costs that are socialized through transmission rates. This is to ensure that the investments to interconnect these customers are justified and that other customers will not be left paying for stranded assets. This obligation will be secured by a letter of credit or

other form of security in the event of a breach of contract. The termination fee is the difference between the costs placed into rates less the revenues received from the interconnecting customer. These are important protections for our broader customer base.

PPL Electric does not evaluate projects based solely on MW size but rather on whether upgrades will be placed into rates and socialized. Practically, this means that only very large customers requiring upgrades to the bulk electric system will need to provide a minimum load guarantee.

The Company also does not have set minimum contract terms. Rather, each customer's guarantee length is dependent on the amount of costs placed into transmission rates, load ramp schedules, and the monthly revenues received by the Company. PPL Electric believes that this approach strikes the right balance of encouraging data center growth while adequately protecting other customers from the risk of the load not materializing.

PPL Electric has been monitoring how other jurisdictions are handling data center growth, and the Company believes its policies are in alignment with industry best practices. The specific details of large load interconnection requirements differ from jurisdiction to jurisdiction, but the general goal of balancing data center growth while mitigating existing customer risk is present in all policies. PPL Electric has designed its data center interconnection policies with this goal in mind.

Model Tariff vs. Policy Statement Guidelines

PPL Electric supports the goal of this inquiry and welcomes general guidance from the PUC on interconnecting large load customers, such as data centers. However, because of the latency of the market and the issues that are still emerging, PPL EU recommends that the PUC consider issuing guidelines through a policy statement rather than adopting a model tariff at this time.

Pursuing a model tariff that acts as a one-size-fits all regulatory regime may be too restrictive, which hinders innovation and flexibility when designing demand response or interruptible load provisions. Having a policy statement that outlines minimum requirements can provide boundaries that offer direction for developers while ensuring the right level of consumer protections. For example, articulating minimum provisions that must be included in a tariff, such as the ESA provisions noted above, which are based on an existing PUC-approved tariff, can provide the transparency that the PUC is seeking in this exercise. While data centers are driving the most investment in the near term, this may not always be the case – technological innovations and advancements in the manufacturing sectors may contemplate other needed solutions that we aren't contemplating at the moment.

Ultimately, data centers are retail customers, and provisions, at some point, will need to be incorporated into an Electric Distribution Company's ("EDC") existing retail tariff. Due to the speed at which data centers wish to interconnect in Pennsylvania and the quickly changing environment resulting from this load growth, PPL Electric encourages the Commission to allow for flexibility in EDC tariff development to both support this growth while protecting customers.

Conclusion

PPL Electric is committed to ensuring a fair and efficient process for interconnecting large load customers, including data centers. To that end, we support policies and methodologies that strike the right balance between encouraging data center development and protecting customer interests. Thank you for the opportunity to provide this testimony. I am happy to answer any questions you may have.

COMMONWEALTH OF PENNSYLVANIA

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April 23, 2025

Via Electronic Filing
Matthew L. Homsher, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

Re: Interconnection and Tariffs for Large Load Customers; Docket No. M-2025-3054271

Dear Secretary Homsher:

For the *En Banc* Hearing scheduled for April 24, 2025, in the captioned docket, please find enclosed the following documents on behalf of the Office of Consumer Advocate:

- Testimony of Darryl Lawrence, Acting Consumer Advocate
- Appendix: Preliminary Responses to the Topics that the Commission Seeks Testimony and Comment
- Verification of Darryl Lawrence

Copies have been served as indicated on the enclosed Certificate of Service.

Respectfully submitted,

/s/ Melanie Joy El Atieh
Melanie Joy El Atieh
Deputy Consumer Advocate
Email: MElAtieh@paoca.org

Enclosures
cc: Certificate of Service

4-24-25
Exhibit
Lawrence-1

CERTIFICATE OF SERVICE

Interconnection and Tariffs for Large Load Customers	: : : : : :	Docket No. M-2025-3054271

I hereby certify that I have this day served a true copy of the following documents:

- Testimony of Darryl Lawrence, Acting Consumer Advocate
- Appendix: Preliminary Responses to the Topics that the Commission Seeks Testimony and Comment
- Verification of Darryl Lawrence

upon parties of record in this proceeding in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant), in the manner and upon the persons listed below.

Dated this 23rd day of April 2025.

SERVICE BY E-MAIL ONLY

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Dated: April 23, 2025

PENNSYLVANIA PUBLIC UTILITY COMMISSION

***En Banc* Hearing Concerning Interconnection and Tariffs for Large Load Customers**

Docket Number: M-2025-3054271

Testimony

Darryl Lawrence, Acting Consumer Advocate

Pennsylvania Office of Consumer Advocate

Introduction and Summary

Good afternoon.

I am Darryl Lawrence, the Acting Consumer Advocate of Pennsylvania. I thank the Chairman, Commissioners, and Commission Staff for initiating this critical process to develop a proposed model tariff for large load customers.

The objectives of transparency, non-discriminatory access, fair cost allocation, and protection from stranded assets are achievable through a dedicated large load tariff. Moreover, there are ways to provide large load customers with the flexibility to meet legitimate business needs and further economic development. My comments today are focused on the essential elements that I believe are necessary to achieve these objectives.

Discussion

In the interest of brevity and maximizing the time for questions and discussion, I will keep my remarks short. Supplementing my oral testimony is an Appendix that provides our preliminary responses to the requested topics for comments listed in this hearing's April 12, 2025, notification. My office will also file comprehensive comments and reply comments as part of this proceeding to support the development of the proposed model tariff.

I will first highlight three contextual issues that the Commission and Staff should consider when developing the proposed model tariff and then discuss three critical elements that the tariff should contain.

First, these large loads have many similarities to generators. Of course, large load customers consume electricity instead of generating it. However, their size, transmission and distribution-related costs, potential for stranded investment, and interconnection safety and reliability issues are more similar to those of generators than the typical industrial customer. Furthermore, many large load customers will have primary or backup generation of commensurate size to its load, making them both a large load and a large generator. Thus, large load customers may need specialized studies and additional transmission and distribution infrastructure that typical industrial customers do not require.

Second, the companies behind developing these large load customers are generally highly sophisticated and well-financed. They have the technical, managerial, and financial resources to

work with utilities, manage the interconnection process, and safely and reliably operate their large load facilities. There are many ways to reduce uncertainty in the time and cost of interconnections, which is an important contributor to economic development. However, as with the case of hundreds of millions to billions-dollar investments, completely eliminating uncertainty may not be possible. The risks of these projects should not lead to stranded investment, not only because of fairness, but because these large load customers are in the best position to manage the risks of their projects.

Third, the connection between economic development and electricity tariffs is important for large load customers and other ratepayers. Any stranded investments from large load customers paid by ratepayers hinders economic development by raising the cost to businesses and reducing spending by residents. The impact of a clothing store that reduces its hours for its staff because families tighten their clothing budgets is not visible to the public. Its economic impact adds up across families and is just as important as the evident economic activity of building a data center. Thus, the pursuit of economic development, in addition to fairness, points to protecting ratepayers from stranded investment.

With these three issues in mind – the similarities between interconnecting large loads and generators, the extensive financial resources available to large load customers, and how the economic development of some ratepayers can adversely affect that of other ratepayers – I would like to discuss the three essential elements that the proposed model tariff should contain.

First, the definition of large load customers should be drafted to ensure that large loads are subject to the proposed model tariff. For instance, a large load should not be able to circumvent the application of the tariff's definition by connecting at multiple points to the grid, each below the definition's threshold. Another example is that a company's aggregate control of large load facilities, if of sufficient size, should be subject to the large load tariff even if each facility is below the size threshold. Other state jurisdictions have adopted tariff language to prevent these and similar situations.

Second, ratepayer protections, such as minimum contractual terms for the duration of large loads, load ramping provisions, deposits and other financial guarantees, exit and termination fees, and provisions for notification of changes in the demand profile of large loads should also be in place. These provisions are to avoid utilities planning and constructing facilities after the large load has been interconnected that assume that the large load customer continues to operate at its forecasted load, which turns out not to be the case resulting in stranded investment. As a NERC official testified before the Federal Regulatory Commission last week on April 17, large load safety and reliability standards are evolving. Thus, after interconnection, a large load may need additional studies performed and more equipment installed. Further complicating the interconnection of large loads are the number of proposed large load facilities, their size, their potential widespread impact on the grid, and the limited availability of personnel. It may not be possible for utilities to completely guarantee interconnection costs and timelines given the size and complexity of large load facilities and the ongoing dynamics in the industry.

Third, the proposed model tariff should accommodate many features that support the development of large load customers. Such customers may be able to construct some of their facilities, subject to appropriate safety and reliability requirements, transfer their tariff obligations to other large load customers under appropriate conditions such as the sale of their large load facility, select among options of deposit and collateral requirements that sufficiently ensure payment, be able to interrupt some of their load, and accommodate innovative study and interconnection provisions that shorten the time to interconnection and reduce associated costs. These and other features may help reduce the risks that large load customers face without transferring these risks to other ratepayers.

Conclusion

Again, thank you for today's opportunity to provide initial comments on developing a model large load tariff. I look forward to your questions and providing comments in this docket.

Appendix to Testimony of Darryl Lawrence:
Preliminary Responses to the Topics that the Commission Seeks Testimony and Comment

Below are the preliminary responses of the Pennsylvania Office of Consumer Advocate (OCA) to the topics on which the Commission requested testimony and comments.[1] The Commission labeled and grouped topics to facilitate responses, and the OCA's responses appear in italics. The OCA is researching these issues and will include all our findings in our written comments as appropriate.

Large Load Definition

- Appropriate MW size designation for large load tariffs

OCA Response: As a starting point, a size threshold of large load customers should be no greater than 25 MW (the size of a small generator) and perhaps even smaller. The definition of large load customers should prevent the splitting of large load customers into smaller units that do not trigger the definition. The definition should aggregate multiple facilities of an entity that individually may be below the size threshold and multiple interconnection and metering points to avoid circumventing the size threshold. The proposed model tariff should also aim to propose a state-wide standard definition of large load and the associated rationale and include a definition of and provisions for mobile data centers.[2]

[1] PAPUC, Notice of En Banc Hearing Concerning Interconnection and Tariffs for Large Load Customers – Docket Number: M-2025-3-54271, April 12, 2025.
[2] Energy Futures Group, Review of Large Load Tariffs to Identify Safeguards and Protections for Existing Ratepayers, January 28, 2025.

Provisions to Minimize Stranded Investment

- Deposits or financial security from large load customers
- Appropriate calculations of contributions in aid of construction
- Minimum contract terms
- Load ramping schedules for customers that may phase in their usage
- Exit or early termination fees

OCA Response: A package of these above listed provisions including notification requirements for changes in the demand profile of large loads is needed to help ensure that large load customers pay for their associated transmission and distribution costs, particularly if such loads are canceled, delayed, or reduced in size to ensure that costs are not stranded and shifted to ratepayers. Both the individual provisions and their combination must be considered to ensure that ratepayers are protected from stranded investment.

Time and Cost Certainty for Studies and Interconnection Related Facilities

- Maximum times for interconnection studies and agreements
- Appropriate fees or expenses for interconnections studies
- Transparent cost structures for interconnection

OCA Response: The Commission should develop a model tariff for large-load customers. Doing so would accomplish the goals of transparency, non-discriminatory interconnection times and costs with reasonable certainty and avoid a case-by-case consideration of individual contracts between large loads and utilities.

Large loads want certainty regarding timelines and expenses for interconnection studies and agreements. Reducing the uncertainty of interconnection times and costs is important but may not be able to be done entirely. Interconnection studies and timelines will vary based upon the individual requests of large load customers, the number of other studies and interconnections in progress, and the availability of personnel to conduct these studies. The size of large loads, the need to accommodate backup generation, and potential local and regional impact on the reliability of the transmission and distribution systems complicate these studies and timelines. Furthermore, additional facilities and equipment may be needed to address unforeseen safety and reliability issues since the reliability standards for these loads are evolving.[3]

Tariff Flexibility

- Distinctions in tariff designs for firm service versus interruptible large load customers
- Large customers bringing primary or backup generation to serve their load, and any prudent standby rates
- Optionality for infrastructure upgrades to made directly by prospective interconnecting large load customers, and appropriate tariff subcategories to accommodate such options
- Expedited interconnection for users willing to construct infrastructure or system upgrades at their own expense

OCA Response: Interruptible large loads and those with primary or backup generation could reduce the amount of transmission and distribution interconnection, upgrade, and expansion costs compared to large loads that do not have these capabilities.[4] *Thus, having large load tariff provisions that enable interruptible load and backup generation is appropriate so*

[3] Elevate Energy Consulting, An Assessment of Large Load Interconnection Risks in the Western Interconnection, February 2025.
[4] Norris, T.H., T. Profeta, D. Patino-Echeverri, and A. Cowie-Haskell, Rethinking Load Growth: Assessing the Potential for Integration of Large Flexible Loads in US Power Systems, 2025.

long as ratepayers are protected from stranded costs.

Flexibility, optionality, and other creative methods to reduce costs and timelines should be encouraged so long as they do not result allocating costs or risks to other ratepayers. These methods should be codified in the proposed model large load tariff so that they are transparent and documented.

Additional Practices and Provisions

- Best practices learned from other jurisdictions

OCA Response: The development of large load customer tariffs is evolving in many. To date, practices include the following:[5]

- *Define large load customers in some cases starting at 5 MW.*
- *Contain provisions that prevent circumventing the large load customer threshold via multiple facilities, interconnection points, or metering points.*
- *Have a package of provisions (e.g., minimum contract lengths, deposits and collateral and contributions in aid of construction, minimum load factors, exit fees, range for power factor, notification provisions for changes in demand profiles, etc.) to prevent stranded costs from being paid for by other ratepayers.*
- *Require utilities to track all costs to serve large loads and verify that the revenue collected is higher than the costs.*[6]

[5] Berkeley Lab, Electricity Rate Designs for Large Loads: Evolving Practices and Opportunities, January 2025 and Energy Futures Group, Review of Large Load Tariffs to Identify Safeguards and Protections for Existing Ratepayers, January 28, 2025.
[6] Evergy Missouri Metro's Special High-Load Factor Market Rate Schedule MKT cited in Energy Futures Group, Review of Large Load Tariffs to Identify Safeguards and Protections for Existing Ratepayers, January 28, 2025.

- *Contain provisions to curtail some or all a large customer's load during emergency conditions.*
- *Provide provisions for the option of interruptible service for the large load customer.*

- Any other procedure, rules, or tariff designs that can facilitate the efficient and timely interconnection of this unique category of electric customers

OCA Response: Three other proposed model tariff procedures should be considered.

The first is having an end-of-contract process that provides sufficient notice of a large load customer's renewal or closure so that the utility can appropriate plan to avoid any stranded assets in the future.

The second is a provision for protecting ratepayers from stranded investments associated with the reliable and safe operation of a large load facility after interconnection. The engineering understanding and standards regarding large loads and their safety and reliability implications are still evolving,[7] *and additional interconnection facilities may be needed to comply with future standards that were not in place at the time of interconnection.*

The third is, given the emerging and dynamic nature of large loads, the proposed model tariff should have appropriate reporting provisions so that the Commission is well informed regarding the number of requests under the tariff, the characteristics of the requesting interconnecting large loads, and the associated costs of direct transmission and distribution interconnections, local transmission upgrades, and regional transmission upgrades.

[7] NERC, NERC Seeks to Address Reliability Impacts from Large Load Integration, April 17, 2025 and Elevate Energy Consulting, An Assessment of Large Load Interconnection Risks in the Western Interconnection, February 2025.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Interconnection and Tariffs for Large Load Customers	:	Docket No. M-2025-3054271

VERIFICATION

I, Darryl Lawrence, Acting Consumer Advocate, hereby state that the facts set forth in my Testimony, are true and correct to the best of my knowledge, information, and belief, and that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

DATED: April 23, 2025

Signature: */s/ Darryl Lawrence*
Darryl Lawrence

Address: Office of Consumer Advocate
555 Walnut Street
5th Floor, Forum Place
Harrisburg, PA 17101

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
COMMONWEALTH KEYSTONE BUILDING
400 NORTH STREET, HARRISBURG, PA 17120

BUREAU OF
INVESTIGATION
&
ENFORCEMENT

April 23, 2025

Via Electronic Filing
Matthew L. Homsher, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

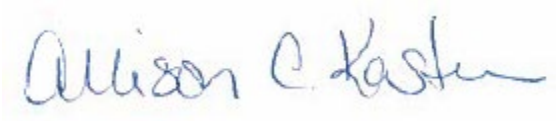
Re: En Banc Hearing Concerning Interconnection and Tariffs for Large Load Customers
Docket No. M-2025-3054271
I&E Testimony

Dear Secretary Homsher:

Enclosed for electronic filing please find the Testimony of Allison Kaster of the Bureau of Investigation and Enforcement in the above-captioned matter.

Should you have any questions, please do not hesitate to contact me.

Sincerely,



Allison C. Kaster
Deputy Chief Prosecutor
Bureau of Investigation and Enforcement
PA Attorney ID No. 93176
(717) 783-7998
akaster@pa.gov

ACK/ac
Enclosure

cc: Patrick Shaughnessy, Office of Chairman DeFrank (*via email – pashaughne@pa.gov*)

4-24-25
Exhibit
Kaster-1

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

En Banc Hearing Concerning Interconnection and Tariffs for Large Load Customers

Docket No. M-2025-3054271

Testimony

Of

Allison Kaster

Bureau of Investigation and Enforcement

April 24, 2025

Harrisburg, Pennsylvania

I am Allison Kaster and I represent the Pennsylvania Public Utility Commission's Bureau of Investigation and Enforcement. With me today is Lisa Gumby, the Manager of I&E's Technical Division, and Ethan Cline, who is an engineer in the Technical Division. I&E is responsible for protecting the public interest in proceedings before the Commission, which requires the balancing of the interests of ratepayers, the regulated utility, and the regulated community as a whole. I want to thank the Chairman and Commissioners for the opportunity to participate this afternoon.

The topics discussed today may eventually be addressed on a case-by-case basis in proceedings brought by utilities serving customers in the Commonwealth; therefore, I would first like to note that the opinions expressed today are my own and should not be used in future litigated proceedings.

I&E recognizes that Pennsylvania is an attractive location for data center operators due to low-cost rural land and property taxes as well as a currently abundant supply of natural gas and excess electricity; however, such growth also raises some concerns. For example, the impact data centers may ultimately have on electric rates is perhaps an unavoidable outcome of the proliferation of data center needs. Virginia lawmakers commissioned a study that found that Virginia's energy usage is expected to increase 183% by 2040, largely driven by data centers. Growth of this magnitude is going to require a likely unprecedented increase in generation and transmission capacity in the coming years. The capital costs of those necessary expansions will drive up the commodity cost for all electric users in the PJM region, regardless of where the data centers are actually sited. Beyond the almost certain impact on electric rates, it is

important to remember that data centers can also impact the demand for other resources. For example, there is the potential impact to gas costs if a data center's natural gas backup power source entails capital investments to increase capacity and the natural economic fallout of demand driving the commodity price. Moreover, data centers routinely require a large water supply for cooling purposes, which could impact system pressures and water source dependability, especially given the recent history of droughts and usage restrictions in Pennsylvania. Therefore, it is important not to lose sight of other potential impacts on Pennsylvania's utility customers.

So, what steps can be taken in Pennsylvania to ensure that costs associated with data centers are borne by those customers? I&E supports developing a model tariff that levels the playing field for utilities seeking to serve data center customers. Approaching this uniformly is important to ensure that Pennsylvania utilities are not competing against each other at the expense of captive customers. Moreover, utility tariffs are transparent as they undergo scrutiny in base rate proceedings by various stakeholders, ratepayers, Administrative Law Judges and ultimately require Commission approval.

It is undisputed that utility rates must be "just and reasonable" and, one of the primary tools to develop such rates, is through a cost of service study. A cost of service study categorizes the various parts of a utility's revenue requirement and allocates those costs across all rate classes based on factors determined from actual data, such as number of customers and usage characteristics. There are many different cost of service methodologies that a utility can choose to allocate costs, and it is undeniable that determining the most appropriate cost of service methodology and the appropriate

assignment of costs can be one of the more contentious issues in a base rate case. I&E does not propose a specific methodology at this time but would like to highlight that such studies provide the current basis for allocating costs between customer classes in Pennsylvania and can similarly be used for large data centers.

The cost of service study promotes transparency as it depicts all of the costs associated with the large load users and how those costs are allocated. The Commission would be able to keep the costs of the large load customers segregated from the other rate classes, likely by directly allocating costs to the large load customers. Once the revenue requirement for the large load customers is established, rates could then be designed through the calculation of a customer charge, usage rate, and demand charges similar to those of the existing industrial rate classes.

Another consideration is whether large load customers require firm or interruptible service. The determination of whether a data center request for firm service can be accommodated must be carefully analyzed by the jurisdictional utility. The Commission should be informed of all analyses performed to further ensure that jurisdictional customers will continue to receive safe and reliable service. The analyses performed by the local jurisdictional utility should be extensive and extend beyond its own jurisdictional borders when considering future capacity. If necessary, the utility should engage outside experts to analyze the proposed customer load relative to local generation and transmission capacity and anticipated demand growth in its own territory and from adjoining users of the grid segment. It is very important to analyze all of these aspects to make a properly informed decision as to whether a new large load customer can be

accepted as a firm customer or must be designated an interruptible customer. It would be far better to inform these new data center customers at the start if they should establish back-up on site generation instead of waiting until capacity is unavailable that could entail rolling blackouts or some other mitigation strategy that would harm all customers.

Finally, establishing protections for ratepayers from stranded costs must be at the forefront. For example, any determination of contributions in aid of construction that relies on an anticipated usage level and associated revenue should contain a provision requiring an alteration of assigned rates or an additional construction contribution in the event that anticipated usage levels do not materialize, or the project is terminated before completion. In short, all efforts must be taken to ensure that utility ratepayers bear no liability for stranded investments.

In summary, while this is a time of growth, the mandate to determine just and reasonable utility rates for Pennsylvania's utility customers is unwavering. I&E looks forward to working with the Commission, industry partners and other advocates so that Pennsylvania is ready to meet the demands of large load customers while continuing to ensure that existing utility customers receive safe and reliable service at just and reasonable rates.

Extracting Profits from the Public: How Utility Ratepayers Are Paying for Big Tech's Power

Eliza Martin
Ari Peskoe

March 2025

ENVIRONMENTAL & ENERGY LAW PROGRAM
HARVARD LAW SCHOOL

Extracting Profits from the Public:
How Utility Ratepayers Are Paying for Big Tech's Power

Eliza Martin and Ari Peskoe*

Executive Summary

Some of the largest companies in the world — including Amazon, Google, Meta, and Microsoft — are looking to secure electricity for their energy-intensive operations.[1] Their quests for power to supply their growing "data centers" are super-charging a growing national market for electricity service that pits regional utilities against each other. In this paper, we investigate one aspect of this competition: how utilities can fund discounts to Big Tech by socializing their costs through electricity prices charged to the public. Hiding subsidies for trillion-dollar companies in power prices increases utility profits by raising costs for American consumers.

Because for-profit utilities enjoy state-granted monopolies over electricity delivery, states must protect the public by closely regulating the prices utilities charge for service. Regulated utility rates reimburse utilities for their costs of providing service and provide an opportunity to profit on their investments in new infrastructure. This age-old formula was designed to motivate utility expansion so it would meet society's growing energy demands.

The sudden surge in electricity use by data centers — warehouses filled with power-hungry computer chips — is shifting utilities' attention away from societal needs and to the wishes of a few energy-intensive consumers. Utilities' narrow focus on expanding to serve a handful of Big Tech companies, and to a lesser extent cryptocurrency speculators, breaks the mold of traditional utility rates that are premised on spreading the costs of beneficial system expansion to all ratepayers. The very same rate structures that have socialized the costs of reliable power delivery are now forcing the public to pay for infrastructure designed to supply a handful of exceedingly wealthy corporations.

To provide data centers with power, utilities must offer rates that attract Big Tech customers and are approved by the state's public utility commission (PUC). Utilities tell PUCs what they want to hear: that the deals for Big Tech isolate data center energy costs from other ratepayers' bills and won't increase consumers' power prices. But verifying this claim is all but impossible. Attributing utility costs to a specific consumer is an imprecise exercise premised on debatable claims about utility accounting records. The subjectivity and complexity of ratemaking conceal utility attempts to funnel revenue to their competitive lines of business by overcharging captive ratepayers. While PUCs are supposed to prevent utilities

from extracting such undue profits from ratepayers, utilities' control over rate-setting processes provides them with opportunities to obscure their self-interested strategies.

Detecting wealth transfers from ratepayers to utility shareholders and Big Tech companies is particularly challenging because utilities ask PUCs for confidential treatment of their contracts with data centers, which limits scrutiny of utilities' proposed deals and narrows the scope of regulators' options when they consider utilities' prices and terms. Meanwhile, regulators face political pressure to approve major economic investments already touted by elected officials for their economic impacts. Rejecting new data center contracts could lead potential Big Tech customers to construct their facilities in other states. Indeed, Big Tech companies have repeatedly told utility regulators that unfavorable utility rates could lead them to invest elsewhere.[2]

In the following sections, we investigate how utilities are shifting the costs of data centers' electricity consumption to other ratepayers. Based on our review of nearly 50 regulatory proceedings about data centers' rates, and the long history of utilities exploiting their monopolies, we are skeptical of utility claims that data center energy costs are isolated from other consumers' bills. After describing the rate mechanisms that shift utility costs among ratepayers, we explain how both existing and new rate structures, as well as secret contracts, could be transferring Big Tech's energy costs to the public. Next, we provide recommendations to limit hidden subsidies in utility rates. Finally, we question whether utility regulators should be making policy decisions about whether to subsidize data centers and speculate on the long-term implications of utility systems dominated by trillion-dollar software and social media companies.

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I. Government-Set Rates Incentivize Utilities to Pursue Data Center Growth at the Expense of the Public

Data centers are large facilities packed with computer servers, networking hardware, and cooling equipment that support services like cloud computing and other data processing applications. While data centers have existed for decades, companies are now building much larger facilities. In 2023, companies began developing facilities that will consume hundreds of megawatts of power, as much as the city of Cleveland.[3] As several companies race to develop artificial intelligence (AI), the scale and energy-intensity of data center development is rapidly accelerating. By the end of 2024, companies started building gigawatt-scale data center campuses and are envisioning even larger facilities that will demand more energy than the nation's largest nuclear power plant could provide.[4]

The sudden and anticipated near-term growth of cloud computing infrastructure to accommodate the development of AI is driving a surge of utility proposals to profit from Big Tech's escalating demands. By 2030, data centers may consume as much as 12 percent of all U.S. electricity and could be largely responsible for *quintupling* the annual growth in electricity demand.[5] This growth is likely to be concentrated in regions with robust access to telecommunications infrastructure and where utilities pledge to quickly meet growing demand. Data centers could substantially expand utilities' size, both financial and physical, as they develop billions of dollars of new infrastructure for Big Tech.[6]

Data center growth is overwhelming long-standing approaches to approving utility rates. Nearly every consumer pays for electricity based on the utilities' average costs of providing service to similar ratepayers. A handful of special interests, particularly large industrial users, pay individualized rates that are negotiated with the utility and often require PUC approval. Data center growth could flip the current ratio of consumers paying general rates to special-interest customers paying unique contracts pursuant to special contracts. In this section, we summarize the potential for massive data center growth and then explore how this growth is challenging long-standing ratemaking practices and is causing the public to subsidize Big Tech's power bills.

A. Utilities Are Projecting Massive Data Center Energy Use

Industry experts and utilities are forecasting massive data center growth, and their projections keep going up. In January 2024, one industry consultancy projected 16 GW of new data center demand by 2030.[7] But by the end of the year, experts were anticipating data center growth to be as high as 65 GW by 2030.[8] Individual utilities are even more bullish. For example, Georgia Power anticipates its total energy sales will nearly double by

the early 2030s, a trend it largely attributes to data centers.[9] In Texas, Oncor announced 82 gigawatts of potential data center load,[10] equivalent to the maximum demand of Texas' energy market in 2024.[11] Similarly, AEP, whose multi-state system peaks at 35 GW, expects at least 15 GW of new load from data center customers by 2030,[12] although AEP's Ohio utility added that "customers have expressed interest" in 30 GW of additional data centers in its footprint.[13]

There are reasons, however, to be skeptical of utilities' projections. Utilities have an incentive to provide optimistic projections about potential growth; these announcements are designed in part to grab investors' attention with the promise of new capital spending that will drive future profits.[14] When pressed on their projections, utilities are often reticent to disclose facility-specific details on grounds that a data center's forecasted load is proprietary information.[15] This secrecy can lead utilities and analysts to double-count a data center that requests service from multiple utilities.[16] To acquire power as quickly as possible, data center companies may be negotiating with several utilities to discover which utility can offer service first.

Technological uncertainty further complicates the forecasting challenge. Future innovation may increase or decrease data centers' electricity demand. The current surge in data center growth is traceable to the release of ChatGPT in 2022 and the subsequent burst of AI products and their associated computing needs.[17] Computational or hardware advancements might reduce AI's energy demand and diminish data center demand.[18] For instance, initial reports in January 2025 about the low energy consumption of DeepSeek, a ChatGPT competitor, fueled speculation that more efficient AI models might be just as useful while consuming far less energy. Even if more energy efficient AI models materialize, however, their lower cost could lead consumers to demand more AI services, which could drive power use even higher.[19]

Nonetheless, investment is pouring into data center growth. At a January 21, 2025 White House press conference, OpenAI headlined an announcement of $100 billion in data center investment with the possibility of an additional $400 billion over four years.[20] Earlier that month, Microsoft revealed that it would spend $80 billion on data centers in 2025, including more than $40 billion in the U.S.[21] Two weeks earlier, Amazon said it would spend $10 billion on expanding a data center in Ohio.[22] And two weeks before that, Meta announced its own $10 billion investment to build a new data center in Louisiana.[23]

While the scale and pace of data center growth is impossible to forecast precisely, we know that utilities are projecting and pursuing growth. In the next section, we explore the ratemaking and other regulatory processes that socialize utilities' costs and risks. Unlike

companies that face ordinary business risks to their profitability, utilities rely on government regulators to approve their prices and can manipulate rate-setting processes to offer special deals to favored customers that shift the costs of those discounts to the public. This "hidden value transfer," a term coined by Aneil Kovvali and Joshua Macey, is a strategy employed by monopolist utilities to increase profits at the expense of their captive ratepayers.[24] Regulators are supposed to protect against hidden value transfers by aligning rates with the costs utilities incur to serve particular types of consumers. But this rate design strategy is rife with imprecision. In reality, ratepayers are paying for each other's electricity consumption, and data center growth could potentially exacerbate the cross-subsidies that are rampant in utility rates.

B. Utility Rates Socialize Power System Costs Using the "Cost Causation" Standard

The U.S. legal system bestows significant economic advantages on investor-owned utilities (IOUs), which are for-profit companies that enjoy state-granted monopolies to deliver electricity. Government-approved electricity prices reimburse utilities for their operational expenses and provide utilities an opportunity to earn a fixed rate of return on their capital investments. With a monopoly service territory and regulated prices designed to facilitate earnings growth, a utility is insulated from many ordinary business risks and shielded from competitive pressures.

Public utility regulators, or PUCs, must protect the public from a utility's monopoly power and, in the absence of competition, motivate the company to provide reliable and cost-effective service. To meet those goals, PUCs determine whether utility service is offered to all consumers within a utility's service territory at rates and conditions that are "just and reasonable."[25] This standard, enshrined in state law, requires PUCs to balance captive consumers' interests in low prices and fair terms of service against the utility's interest in maximizing returns to its shareholders. A utility rate case is the PUC's primary mechanism for weighing these competing interests by setting equitable prices for consumers that provide for the utilities' financial viability.

"Cost causation" is a guiding principle in ratemaking that dictates consumer prices should align with the costs the utility incurs to provide service to that customer or group of similar ratepayers. By approving rates that roughly meet the cost causation standard, PUCs prevent "undue discrimination" between utility ratepayers, a legal requirement that is typically specified in state law.

While the PUC makes the final decision to approve consumer prices, the utility drives the ratemaking process. In a rate case, the utility's primary goal is to collect enough money to

cover its operating expenses and earn a profit on its capital investments. A utility proposes new rates by filing its accounting records and other data and analysis that form the basis of its preferred prices. Once it establishes its "revenue requirement," the utility then proposes to divide this amount among groups of consumers based on their usage patterns, infrastructure requirements, and other characteristics that the utility claims inform its costs of providing service to those consumers. Typical groups, also known as ratepayer classes, include residential, commercial, and industrial consumers. Finally, the utility proposes standardized contracts known as tariffs for each ratepayer class that include uniform charges and terms of service for each member of that ratepayer class.

Under this ratemaking process, residential ratepayers often pay the highest rates because they are distributed across wide areas, often in single-family homes that consume little energy.[26] The utility recovers the costs of building, operating, and maintaining its extensive distribution system to serve residential ratepayers by spreading those costs over the relatively small amount of energy consumed by households. By contrast, an industrial consumer uses far more energy than a household and is likely connected to the power system through higher voltage lines and needs less local infrastructure than residential ratepayers. The utility can distribute lower total infrastructure costs over far greater energy sales to generate a lower industrial rate. Properly designed rates should "produce revenues from each class of customers which match, as closely as practicable, the costs to serve each class or individual customer."[27]

But ratemaking is not "an exact science," and there is not a single correct result.[28] In a utility rate case, various parties advocate for their own self-interest by contesting the utility's filing. Consumer groups and other parties urge the PUC to reduce the utility's revenue requirement, which could potentially lower all rates. But once the revenue requirement is set, consumer groups are pitted against each other as they try to reduce their share of the total amount. Their arguments are based on competing approaches to cost causation, with each party claiming that lower rates for itself align with economic principles, fairness, and other subjective values. Well-resourced participants, such as industrial groups that have a significant incentive to argue for lower power costs, hire lawyers and analysts to comb through the utility's filings and argue that their rates should be lower.

But parties face an uphill battle challenging the utility's accounting records, engineering studies, and other evidence the utility files to justify its preferred rates. Because it initiates the rate case and generates the information needed for the PUC to approve a rate, the utility is inherently advantaged. The information asymmetry between utilities and other parties, as well as the imprecision and subjectivity of the cost causation standard, can facilitate

subsidization across classes of ratepayers. We highlight three reasons that PUCs may purposefully or unwittingly approve rates that depart from the cost causation standard.

First, attributing the utilities' costs to various ratepayer classes depends on contested assumptions and disputed methodologies. Different approaches to cost allocation will yield different results. As a pioneer in public utility economics once explained, there are "notorious disagreements among the experts as to the choice of the most rational method of [ ] cost allocation — a disagreement which seems to defy resolution because of the absence of any objective standard of rationality."[29] Parties, including the utility, provide the PUC with competing analyses that are designed to meet their own objectives. For instance, industrial consumers will sponsor a study that concludes lower rates for the industrial rate class is consistent with the cost causation principle. Other parties favor their own interests in what can be a zero-sum game over how to divide the utility's revenue requirement.

Second, the PUC may have its own preferences. In most states, utility commissioners are appointed by the governor, but in ten states they are elected officials. Either commissioner may face political pressure to favor a particular ratepayer class. For instance, an elected commissioner may be inclined to provide lower rates to residential ratepayers who will vote on the commissioner's reelection. An appointed commissioner may choose to align utility rates with a governor's economic development agenda by providing lower rates to major employers, such as the commercial or industrial class. Other pressures may bias regulators in favor of other interests. As it weighs competing evidence about cost allocation provided by various parties in a rate case, the PUC has discretion to find a particular study more credible and may choose a rate structure that aligns with the sponsoring party's goals and the PUC's own preferences. While other parties may challenge a PUC's decision in court, courts are unlikely to overturn a PUC's judgment about cost allocation.[30]

Third, the utility may exploit its informational advantages and intentionally provide false information. A rate case is premised on detailed accounting records filed by the utility about the expenses it incurs to provide service. The spreadsheets and other information that the utility files are based on internal records not available to the PUC or rate-case parties. Even if the utility provides some of its records in response to a party's request, the information might be too voluminous for the PUC or other parties to verify. Ultimately, the PUC relies on the utility's good faith. However, recent cases show that utilities are filing fabricated or misleading records.[31]

A random audit of multi-state utility company FirstEnergy by the Federal Energy Regulatory Commission (FERC) found that the utility had hidden lobbying expenses tied to political corruption by mislabeling them as legitimate expenses in its accounting books. According to

the audit, the utility's internal controls had been "possibly obfuscated or circumvented to conceal or mislead as to the actual amounts, nature and purpose of the lobbying expenditures."[32] The audit concluded that the utility's mislabeling allowed the inappropriate lobbying expenses to be included in rates.[33] Rate cases did not detect this deception. Only an audit, informed by an extensive federal sting operation, revealed the utility's deceit. Regulators have recently uncovered other utilities filing false or misleading information in regulated proceedings.[34]

Once the regulators approve utility rates, some consumers can shift costs to other ratepayers by fine-tuning their energy consumption. As we discuss in more detail in part II.B.3, rates for commercial and industrial ratepayers typically include demand charges that are tied to each consumer's energy consumption during the utility's or regional power system's moment of peak demand that year. By anticipating when that peak will happen and reducing consumption of utility-delivered power at that moment, a data center or other energy-intensive consumer can substantially reduce its bill. While this "peak shaving" can reduce power prices for other consumers, it also forces other ratepayers to pay part of the energy-intensive consumer's share of infrastructure costs.

Despite its flaws, ratemaking continues to be the dominant approach to financing power sector infrastructure. Uniform, stable prices provide predictable revenue that motivates investors to fund utility expansion. Rate regulation typically insulates investors from many ordinary business risks by putting ratepayers on the hook for the company's engineering, construction, or procurement mistakes. For instance, regulators often allow utilities to increase rates when their projects are over-budget. The utility rarely faces financial consequences for missteps that would cause businesses that rely on competitive markets to lose profits.

Some energy-intensive consumers can be exempted from this ratemaking process that socializes costs and shifts risks to the public. The special rates for these consumers are set in one-off agreements that can lock in long-term prices and shield it from risks faced by other ratepayers. These contracts, which typically require PUC approval, allow an individual consumer to take service under conditions and terms not otherwise available to anyone else. Special rates are, in essence, "a discriminatory action, but one that regulators can justify under certain conditions."[35]

To protect ratepayers, some state laws authorizing special contracts require PUCs to evaluate whether the contract meets the cost causation standard.[36] However, the "notorious disagreements" about how to measure whether a consumer is paying for its costs of service still plague the special-contract cost causation analysis. And, as we describe

below, proceedings about special contracts present unique obstacles to evaluating cost causation.

In other states, however, laws authorizing special contracts do not prevent PUCs from approving below-cost contracts. For instance, Kansas law allows regulators to approve special rates if it determines that the rate is in the state's best interest based on multiple factors, including economic development, local employment, and tax revenues.[37] A recent law enacted in Mississippi strips utility regulators of any authority to review contracts between a utility and a data center.[38]

Regardless of the standard for reviewing special contracts, there is significant political pressure on regulators to approve these deals, even if such development results in higher electricity costs for other ratepayers. Regulators do not want to be seen as the veto point for an economic development opportunity, which may have already been publicized by the company and the governor. Because utilities may be competing for the profitable opportunity to serve a particular energy-intensive consumer, they have an incentive to offer low prices, even if that reduced rate results in higher costs for the utility's other ratepayers. As noted, despite their wealth, Big Tech companies seek low energy prices and make siting decisions based in part on price.[39] Regulatory scrutiny of special contracts is therefore a critical backstop for protecting ratepayers.

II. How Data Center Costs Creep into Ratepayers' Bills

When a utility expands its system in anticipation of growing consumer demand, it typically seeks to include the capital costs of new infrastructure in its rates. If approved, ratepayers share the costs of the utility's expansion pursuant to a cost allocation formula accepted by the PUC. This approach, while imperfect for the reasons described in the previous section, has facilitated population growth and economic development by forcing ratepayers to subsidize new infrastructure that will allow new residents and businesses to receive utility-delivered energy.

For many utilities, their expectations about growth are now dominated by new data centers. Rather than being dispersed across a utility's service territory like homes and businesses, these new data center consumers that are benefitting from utility expansion are identifiable and capable of paying for infrastructure that will directly serve their facilities. If PUCs allow utilities to follow the conventional approach of socializing system expansion, utilities will impose data centers' energy costs on the public. The easiest way for utilities to shift data centers' energy costs to the public is to simply follow long-standing practices in rate cases.

In our view, however, utilities are often using more subtle ratemaking methods to push data centers' energy costs onto consumers' bills.

In this section, we focus on three mechanisms that can force consumers to pay for data center's energy costs. First, special contracts between utilities and data centers, approved through opaque regulatory processes, are transferring data center costs to other consumers. Second, disconnected processes for setting federally regulated transmission and wholesale power rates and state-set consumer prices are: A) causing consumers to pay for interstate infrastructure needed to accommodate new data centers; B) putting consumers on the hook for new infrastructure built for data-center load that never materializes; and C) allowing data centers to strategically reduce energy usage during a few hours to reduce their bills and shift costs to other consumers. Third, data centers that bypass traditional utility ratemaking by contracting directly with power generators may also be raising electricity prices for the public. These co-location agreements between a data center and adjacent non-utility generator may trigger an increase in power market prices and distort regulated electricity delivery rates.

A. Shifting Costs through Secret Contracts

Special contracts are offered by utilities to energy-intensive consumers to attract their business. While regulators in many states are required to protect the public from such cutthroat practices that harm ratepayers, we explain in this section why we are skeptical about utility claims that special contracts for data centers do not force the public to pay for Big Tech's energy costs.

Our review of 40 state PUC proceedings about special contracts with data centers finds that regulators frequently approve special contracts in short and conclusory orders. While PUC rate case decisions are lengthy documents that engage with the evidence filed by the utilities and other parties, most PUC orders approving special contracts provide only cursory analysis of the utility's proposal. One challenge for PUCs is that few, if any, parties participate in these proceedings. As a result, the PUC has little or no evidence in the record to compete with the utility's claim that the contract isolates data center energy costs from other ratepayers' bills.

The PUC often deters parties from arguing against the utility's proposed special contract by reflexively granting utility requests to shield its proposal from public view.[40] The PUC's own grant of confidentiality adds a procedural barrier to greater participation and prevents the public from even attempting to calculate the potential costs of these deals.[41] But perhaps the greater impediment to third-party analysis of proposed special contracts is that

ratepayers believe that they have little at stake in the proceedings. Unlike rate cases, which set the prices consumers pay, a special contract will only have indirect financial effects on other ratepayers if it shifts costs that the energy-intensive customer ought to pay on to other ratepayers' bills. Because meaningfully participating in a special contract case has a high cost and a generally low reward, otherwise interested parties have typically not bothered to contest them. But the scale of data center special contracts demands attention because the costs being shifted to the public could be staggering.

A special contract shifts costs to other ratepayers when the customer pays the utility a price lower than the utility's costs to serve that customer. To cover the shortfall, utilities will attempt to raise rates for other ratepayers in a subsequent rate case.[42] The amount of the shortfall, and whether there is any shortfall at all, depends on how the utility calculates its costs of providing service to the data center. As discussed above, there are "notorious disagreements" about appropriate methodologies, and even the term "cost" can itself be subject to dispute. Experts debate, for instance, when to use average or marginal costs and whether short- or long-term costs are suitable metrics. When utilities use one metric in a rate case and another metric in a special contract proceeding, they could be causing spillover effects that harm ratepayers.[43]

The disagreements about methodologies and complexities of the calculations underscore a foundational challenge to reviewing a special contract rate. As discussed above, PUC rate case decisions do not purport to assign utility costs to individual consumers but instead apportion cost responsibility among similar ratepayers grouped together as classes. But in a special contract proceeding, the utility makes the unusual claim that it can isolate its costs to serve a single consumer. Without contrary evidence filed by interested parties, the PUC may have little basis for rejecting the utility's analysis.

Even without the benefit of third-party analyses in special contract proceedings, PUC orders may summarize cross-subsidy concerns raised by their own staff. But challenging the utility's analysis is costly and time-intensive, and staff may not have the resources to provide robust analysis. Similarly, state ratepayer advocates occasionally participate in these proceedings and raise cross subsidy arguments, but they are also often stretched too thin to provide a detailed response to the utility's proposal. As a result, we find that many PUC orders approving special contracts simply conclude that the proposed contract is reasonable without meaningfully engaging with the proposal.[44]

Such PUC orders are therefore not persuasive in assuaging concerns that the public may be subsidizing Big Tech's energy costs. Moreover, as discussed, state regulators may face political pressure not to veto a significant construction project in the state. The utility's

assertion that it is protecting other ratepayers may provide enough cover for regulators to approve a special contract. The obscurity and complexity of these proceedings provides utilities with opportunities to hide data center energy costs and force them onto other consumers' bills.

Recent litigation against Duke Energy, one of the largest utilities in the country, exposed that the company was acting on its incentive to shift costs of a special contract to its other ratepayers. Duke's scheme responded to a new power plant developer offering competitive contracts to supply small non-profit utilities that had been purchasing power from Duke.[45] Duke's internal documents disclosed through litigation revealed that the new company was far more efficient than Duke and the utility therefore could not compete for customers based on price. Nonetheless, Duke offered one of its larger customers a new contract that amounted to a $325 million discount compared to its existing deal with Duke.[46] Additional internal utility documents revealed that Duke developed a plan to "shift the cost of the discount" to its other ratepayers by raising their rates.[47] Duke's strategy to force its ratepayers to subsidize the special-contract customer's energy was discovered only because the power plant developer sued Duke in federal court under antitrust law.

While our paper focuses on how consumers are likely subsidizing Big Tech's energy costs through their utility rates, we acknowledge that the reverse is also theoretically possible. A data center taking service under special contracts could be *overpaying*. A utility proposing a special contract might prefer to overcharge one deep-pocketed customer through a special contract in order to reduce rates for the public. While this pricing strategy may seem politically attractive for the utility and PUC, it seems unlikely to attract new data centers.

Regardless of a utility's motivation, regulators are supposed to be skeptical of a sudden surge in utility spending. Superficial reviews of special contracts are insufficient when they are collectively committing utilities to billions of dollars for Big Tech customers. The recent Duke litigation illustrates how utilities take advantage of their monopolies to force ratepayers into subsidizing their competitive lines of businesses. Discounted rates can give a utility an edge in the data center market,[48] and hiding the costs of discounts in ratepayers' bills boosts utility profits. To prevent utilities from overcharging captive ratepayers for the benefit of their competitive businesses, both PUCs and FERC have developed regulatory mechanisms that attempt to prevent such subsidies.[49] For instance, FERC applies special scrutiny to contracts between utilities and power plants that are owned by the same corporate parent. FERC's concern is that because state regulators must let the utility recover its FERC-regulated costs in consumer's rates, "such sales could be made at a rate that is too

high, which would give an undue profit to the affiliated [power plant] at the expense of the franchised public utility's captive customers."[50]

Special contracts with data centers are the latest iteration of a long-standing problem with monopolist utilities. Policing cost-shifts in this context is particularly challenging due to the opaque nature of the proceedings, the complexity and subjectivity of assessing the utility's costs of serving an a single consumer, and political pressure on PUCs to approve contracts.

B. Shifting Costs through the Gap Between Federal and State Regulation

When a PUC approves a utility's revenue requirement, it must allow the utility to include interstate transmission and wholesale power market costs that are regulated by FERC.[51] In much of the country, utilities procure power through markets administered by non-profit corporations called Regional Transmission Organizations (RTOs). Market prices are influenced by a host of factors, such as fuel and technology costs, and ultimately reflect generation supply and consumer demand. If supply is constrained by a data center demand surge, market prices would likely increase, at least in the short term. Consumers' utility bills will include these higher power market prices.

PUCs can protect ratepayers from market price increases by allocating the costs of higher prices to data centers. But PUCs rarely order utilities to adjust the formulae that spread FERC-regulated market and transmission costs to ratepayers. In this section, we illustrate how ratepayers can pay more for power due to data center demand by focusing on FERC-regulated transmission costs. Federal law provides FERC with exclusive authority to set utilities' transmission revenue requirements and allocate a utility's transmission revenue requirement to multiple utilities. Under FERC's rules, costs of a new transmission line can be paid entirely by a single utility or shared among utilities if there is agreement that the new line benefits multiple utilities. When costs are shared, a region-specific formula approved by FERC divides costs roughly in proportion to the power system benefits each utility receives, such as lower market prices and improved reliability.[52]

Under either the single-utility or multi-utility approach, PUCs apply their own formula for dividing FERC-allocated transmission costs among ratepayer classes. These separate cost allocation schemes can allow data center energy costs to creep into other consumers' bills when new data centers trigger a need for transmission upgrades. We illustrate by discussing examples of each type of transmission cost recovery and then explain how rate designs embedded in special contracts or tariffs can allow data centers to reduce their bills at the expense of ratepayers.

1. *Separate Federal and PUC Transmission Cost Allocation Methods Allow Data Center Infrastructure Costs to Infiltrate Ratepayers' Bills*

In December 2023, the PJM RTO, a utility alliance stretching from New Jersey to Chicago and south to North Carolina, approved $5 billion of transmission projects whose costs would be shared based among PJM's utility members.[53] PJM identified two factors driving the need for this transmission expansion: retirement of existing generation resources and "unprecedented data center load growth," primarily in Virginia.[54] Pursuant to its FERC-approved cost allocation method, PJM split half of the transmission costs across its footprint based on each utilities' share of regional power demand and allocated the remaining half using a computer simulation of the regional transmission network that estimates benefits each utility receives from the new transmission projects.[55] Under this approach, PJM assigned approximately half of the total cost to Virginia utilities, approximately 10% to Maryland utilities, and the remainder to utilities across the region.[56]

Each state's PUC then allocates the costs assigned by PJM to ratepayer classes of each utility it regulates. In Maryland, across the state's three IOUs assign, an average of 66 percent of transmission costs are assigned to residential ratepayers.[57] The larger of Virginia's two IOUs includes more than half of its transmission costs in residential rates.[58] Thus, in both states, residential ratepayers are paying the majority of regional transmission costs that are tied to data center growth. From the public's perspective, this result appears to violate the cost causation principle. After all, residential ratepayers are not causing PJM to plan new transmission.

PJM's approach, however, recognizes that new regional transmission benefits all ratepayers by improving reliability, allowing for more efficient delivery of power, and providing other power system improvements that are broadly shared. PJM developed its cost-sharing approach with the understanding that new transmission would be designed primarily to provide public benefits. New transmission designed for a few energy-intensive consumers, and not broad public benefits, is inconsistent with PJM's premise. That said, by increasing transmission capacity, new regional transmission lines for data centers may provide ancillary benefits to all ratepayers. PJM's power system simulation, which it uses to allocate half the costs of transmission expansion, demonstrates the shared benefits of this new infrastructure. Proponents of transmission expansion argue that such power flow models validate the current approach of allocating transmission costs to benefiting ratepayers because the models can calculate with reasonable accuracy who benefits from new transmission and therefore who should pay for it.

But even assuming that ancillary benefits for all ratepayers are adequate to justify current methods for regional transmission cost allocation, PJM only spreads costs among the region's utilities. Each utility then has its own methods, approved by PUCs, for allocating transmission investment to its ratepayers. The PUC-approved methods typically presume that ratepayers share in the benefits of new transmission in proportion to their total energy consumption. This approach causes residential ratepayers in Maryland, which consume more than half of the state's electricity, to pay for the lion's share of Maryland utilities' costs of new PJM-planned transmission. Without reforms, consumers will be paying billions of dollars for regional infrastructure that is designed to address the needs of just a few of the world's wealthiest corporations.[59]

Obsolete PUC cost allocation formulas can also cause ratepayers to pay for transmission costs that are not regionally shared. For instance, in July 2024, Virginia's largest utility applied to the PUC for permission to build infrastructure that would serve a new large data center. PUC staff reviewing the proposal found that but for the data center's request, the project "likely, if not certainly, would not be needed at this time."[60] In its application, the utility told state regulators that the $23 million project would be paid for through its FERC-approved transmission tariff.[61] Under the utility's existing state-approved tariff, about half of all costs assigned through the FERC-regulated tariff are billed to residential ratepayers, and the remaining half are billed to other existing ratepayers.[62] The bottom line is that existing tariffs force the public to foot the bill for the data center's transmission.

2. *Utilities May Be Saddling Ratepayers with Stranded Costs for Unneeded Transmission*

If a utility's data center growth projections fail to materialize, ratepayers could be left paying for transmission that the utility constructed in anticipation of data center development. Claiming that it was addressing this "stranded cost" issue, American Electric Power (AEP) of Ohio proposed a new state-regulated tariff that that would require data center customers to enter into long-term contracts with the utility before receiving service. AEP's proposed contract would require the data center to pay 90 percent of costs associated with its maximum demand for a ten-year period, including FERC-regulated transmission costs.[63] According to the utility, this upfront guarantee protects AEP's other ratepayers from the risk that the utility builds new infrastructure for a data center that never materializes and prevents the utility from offloading all of these "stranded" costs on other ratepayers.

While these long-term contracts would at least partially insulate AEP's ratepayers from data center transmission costs, neighboring utilities pointed out that they could still be left paying

for stranded costs through PJM's allocation of transmission investments. Their protests explain that if AEP builds new transmission lines in anticipation of data center load growth, and those lines are paid for via PJM's regional cost allocation, then those costs would be split among all PJM-member utilities. As noted, PJM allocates half the costs of new transmission lines to its utility members based on their share of regional energy sales. If AEP's data center customers commence operations, AEP's own share of regional transmission costs would increase in proportion to its rising share of regional energy sales. In that scenario, other utilities in the region may not overpay for transmission needed for AEP's data center customers.

Protesting utilities in the Ohio PUC proceeding focus on the possibility that AEP's data center customers cancel their projects or consume less energy than anticipated after AEP has spent money developing new transmission to meet projected data center demand.[64] Under that scenario, total regional transmission costs would rise due to AEP's spending, but AEP's share of total costs would not increase proportionally. As a result, other regional utilities would face increasing costs to pay for infrastructure developed to meet AEP's unrealized data center energy demand. How much individual consumers pay for the new infrastructure would depend on how each utility allocates transmission costs to various ratepayer classes pursuant to a PUC rate case decision.

New transmission projects paid for by a single utility can also raise stranded cost concerns. In December 2024, FERC approved a contract that governed the construction of transmission facilities needed to provide service to a new data center.[65] Under the contract, the data center will immediately pay for new infrastructure needed to connect the facility to the existing transmission network but will not directly pay for necessary upgrades to existing transmission facilities. Instead, the utility AES pledged to include those upgrade costs in the transmission rates paid by all ratepayers through a subsequent regulatory process. A separate state-regulated tariff for energy-intensive consumers would require the data center, and not other consumers, to ultimately pay for the upgrades. In addition, the contract requires the data center to pay for the upgrades in the event it does not commence operations or uses less energy than would be required under the state-regulated tariff to pay for the upgrades over the time. Our understanding is that this approach to transmission cost recovery for new energy-intensive consumers is fairly common and not limited to data centers, but ratepayer advocates are concerned that data centers' commitments may be more uncertain than other types of energy-intensive consumers.

The Ohio ratepayer advocate therefore protested the contract, arguing that the language protecting other consumers from paying for the transmission upgrades was "unacceptably

ambiguous."[66] The Ohio advocate urged FERC to require "specific language to preclude shifting data center costs" to other consumers.[67] FERC nonetheless approved the contract because it found that these concerns were premature and noted that they may be raised in future proceedings that directly address any proposed cost shifts.[68] In a short concurrence, FERC Commissioner Mark Christie questioned whether the rate treatment proposed by the utility that could burden consumers with stranded costs is justified.

3. *By Slightly Reducing Their Energy Use, Data Centers Can Increase Ratepayers' Transmission and Wholesale Market Charges*

Like other ratepayers, data centers pay an energy price for each unit of energy they consume as well as a monthly flat fee. Data centers, and many non-residential ratepayers, also face utility-imposed demand charges that are tied to their peak consumption during a specified month, year, or other time period. These charges are intended to reflect the costs of building power systems that have sufficient capacity to generate and deliver energy when consumer demand is unusually high. In RTO regions, PUC-regulated data center special contracts and tariffs likely reflect FERC-approved demand charges that incorporate regional transmission costs and may also include costs of procuring sufficient power plant capacity to meet peak demand. By reducing their energy use during just a few hours of the year, data centers may be able to reduce their share of regional costs that are allocated to demand charges and effectively force other ratepayers to pick up the tab.

Electricity use is constantly changing, and it peaks when consumers ramp up cooling and heating systems during exceptionally hot or cold days. Meeting these moments of peak demand is very expensive. Consumers pay for transmission and power plant infrastructure that is mostly unused but nonetheless necessary for providing power during a few peak hours each year. While utilities have employed several methods for assessing demand charges, many energy-intensive consumers are billed based on their own consumption at the moment the regional system reaches its peak demand.[69]

Data centers and other large energy users have significant incentives to forecast when this peak hour will occur and reduce their consumption of utility-delivered power during that hour. To avoid shutting down or reducing their production during hours when the system might hit its peak, energy-intensive consumers may install backup generators that displace utility-provided power. Large power users may already have their own power generators to protect against outages or improve the quality of utility-delivered power.[70] Needless to say, most consumers that face demand charges, such as small businesses, do not have a sufficient incentive to forecast the system peaks or install on-site generation. As data

centers' share of regional energy consumption grows, Big Tech will be able to shift an increasingly large share of the region's costs to other ratepayers, particularly if their demand charges are easily manipulable.

PUCs can often prevent these cost shifts among consumers who take service from rate-regulated utilities in their states. Federal law requires only that the total costs allocated through FERC-approved tariffs must be passed on to utilities and then ultimately to consumers through PUC-regulated tariffs or special contracts. PUCs can choose their own methods for allocating those costs among ratepayers. Because data centers' special contracts are confidential, we often do not know whether utilities and PUCs are facilitating cost shifts through demand charges. Whether data centers are taking service under tariffs or special contracts, PUCs should ensure that rate structures are not allowing data centers to shift costs through manipulable demand charges.

That said, as we discuss below in part III.E, cutting peak consumption can reduce costs for everyone if utilities build their systems for a lower peak that accounts for a data center's ability to turn off or self-power. The problem is that utilities are expanding based on an assumption that data centers will operate at full power with utility-delivered power during peak periods. When a data center uses its own generation during peak periods to avoid demand charges, it is shifting the costs of an overbuilt system to the public.

C. Shifting Costs by "Co-Locating" Data Centers and Existing Power Plants

Power plant owners have developed their own scheme for attracting data centers that could shift energy costs from data centers to ratepayers. Under "co-location" arrangements, a data center connects directly to an existing power plant behind the plant's point of interconnection to the utility-owned transmission network. By delivering and taking power without using the transmission network, power plant owners and data centers argue that they ought to be exempt from paying utility-assessed energy delivery fees. Utilities have contested this arrangement because it denies them profitable opportunities to build new infrastructure to connect data centers to their networks.

In their haste to secure power as quickly as possible, data centers are looking to contract with existing generation, particularly nuclear power plants. By connecting directly to a power plant, data centers aim to avoid a potentially lengthy process administered by a utility to connect the data center to the utility's power delivery system. Locating load behind a power plant's point of delivery to the transmission network is not new. But the potential scale of data center growth and possibility that some significant share of that growth will co-locate has spawned disputes between power plant owners and utilities.

We highlight the key points about co-location by focusing on regulatory proceedings that involve Constellation, the largest owner of nuclear plants in the U.S., and Exelon, the largest utility in the U.S. that owns only delivery infrastructure and not power plants. Until 2022, Constellation and Exelon were housed under the same corporate parent. The company's restructuring into separate generation and delivery companies allows each of those businesses to independently pursue policies that best meet their financial interests. Data center growth began to rapidly escalate shortly thereafter and has revealed tensions between utilities and companies that compete in wholesale electricity markets for profits.

Co-location is a vague term. Because financial consequences will follow from any regulatory definition of co-location, utilities and power generators dispute how co-location technically functions. Constellation claims that because a data center co-located with one of its nuclear plants cannot receive power from the grid, it is therefore "fully isolated" from the transmission network.[71] Exelon counters that "as a matter of physics and engineering," the co-located data center is "fully integrated with the electric grid."[72] Utilities and other parties point out that a nuclear plant must operate in sync with the other plants connected to the transmission network and claim that the data center benefits from this arrangement even if the transmission system is not delivering power to it.[73]

This technical distinction could affect whether co-located entities are utility ratepayers that pay for delivery service. Constellation argues that because the utility is not delivering energy to the data center, the data center is not a utility customer, and it should not have to pay any FERC- or PUC-regulated delivery charges. Exelon opposes that result and has estimated that a single proposed co-location arrangement between a nuclear owner and a data center would shift between $58 million and $140 million of transmission and state-regulated distribution charges to other ratepayers.[74]

But Constellation and other generators dispute that calculation, claiming that this "phantom . . . 'cost shift' is, at best, merely a back-of-the-envelope estimate" of the revenue a utility would collect if the data center signed up as its customer.[75] Co-location, according to the nuclear plant owners, does not actually cause other ratepayers to pay higher transmission rates but instead precludes them from receiving lower delivery rates that they might pay when a new energy-intensive customer becomes a utility ratepayer and pays its proportional share of the utility's cost of service (a hypothetical that likely does not occur when the new customer receives a one-off price pursuant to a special contract).

But analysts are concerned that co-location can actually raise prices in interstate power markets. Across much of the country, generators are constantly competing through auction markets to supply power. In a few regions, market operators conduct separate annual,

monthly, or seasonal auctions for capacity to procure sufficient resources for meeting peak consumer demand. Each power plant can offer capacity into the auction equivalent to its maximum potential for energy generation. In the PJM region, nuclear plants accounted for 21 percent of total capacity that cleared the most recent auction.[76]

PJM's independent market monitor, who fiercely promotes and defends PJM's markets, recently warned that colocation could "undermine" PJM's markets. He posited that if all nuclear plants in the region attracted co-located customers, "the impact on the PJM grid and markets would be extreme. Power flows on the grid that was built in significant part to deliver low-cost nuclear energy to load would change significantly. Energy prices would increase significantly as low-cost nuclear energy is displaced by higher cost energy . . . Capacity prices would increase as the supply of capacity to the market is reduced."[77] Should this scenario play out, the region's ratepayers could be forced to pay higher prices due to data centers' purchasing decisions. However, as noted, steep increases in demand due to data center growth could increase wholesale market prices regardless of whether data centers co-locate with existing power plants.

For utilities, opposing co-location is not purely about protecting their ratepayers or upholding the integrity of interstate markets. Co-location threatens their control over power delivery by allowing data centers to take energy directly from a large power producer. In some states, utilities might claim that state laws prohibit co-location because they provide the utility with a monopoly on retail sales.[78] Co-location would also reduce the profits that utilities would otherwise stand to gain from constructing new infrastructure to serve data centers.

In an ongoing FERC proceeding, Constellation claims that utilities' opposition to co-location is an anti-competitive ploy to capitalize on their state-granted monopolies.[79] The company alleges that co-location arrangements at two of its nuclear plants are "being held hostage by one or two monopoly utilities . . . [that] have taken the law into their own hands, and are unilaterally blocking co-location projects unless the future data center customers accede to utility demands to take [ ] transmission services . . . from the utility and sign up for retail distribution services."[80] Utilities may be trying to delay Constellation's projects until FERC provides clear guidance on co-location arrangements, including whether data centers and nuclear plants will pay any transmission charges.[81]

Even if FERC sets new rules the two sides are likely to continue squabbling about the details. With billions of dollars on the line, each side might have an incentive to litigate, which would add risk to co-location schemes.

III. Recommendations for State Regulators and Legislators: Strategies for Protecting Consumers from Big Tech's Power Costs

Without systematic changes to prevailing utility ratemaking practices, the public faces significant risks that utilities will take advantage of opportunities to profit from new data centers by making major investments and then shifting costs to their captive ratepayers. The industry's current approaches of luring data centers with discounted contracts or lopsided tariffs are unsustainable.

We outline five recommendations for PUCs to better protect consumers from subsidizing Big Tech's data centers: A) establishing guidelines for reviewing special contracts, B) shifting new data centers from special contracts to tariffs, C) facilitating competition and the development of "energy parks" that are not connected to any utility-owned network, D) requiring utilities to provide more frequent demand forecasts;, and E) allowing new data centers to take service only if they commit to flexible operations.

A. Establish Robust Guidelines for Reviewing Special Contracts

PUCs rarely reject proposed special contracts with data centers. As we discussed, many states' laws provide PUCs with broad discretion to approve special contracts, do not specify a particular standard of review, and even allow the PUC to approve a contract that shifts costs to other ratepayers. Given the unprecedented scale and pace of data center special contracts, PUCs should establish more rigorous guidelines for reviewing special contracts that are aimed at protecting consumers.

In Kentucky, the Public Service Commission must make several findings on the record before approving a special contract.[82] Under the PSC's self-imposed guidelines, special contracts that include discounts are allowed only when the utility has excess generation capacity. The guidelines limit discounts to five years and no more than half the duration of the contract. The PSC must also find that the contract rate exceeds the utility's marginal costs to serve that customer and that the contract requires the customer to pay any of the utility's fixed costs associated with providing service to that customer.

Applying its guidelines, the PSC recently rejected a utility's proposed special contract with a cryptocurrency speculator because it found the contract did not shield consumers from the crypto venture's power costs.[83] The PSC was critical of the utility's projections about regional market and transmission prices and therefore did not find credible the utility's claim that the contract would cover the utility's cost to provide energy to the crypto speculator. Industrial

ratepayers, several environmental and local NGOs, and Kentucky's attorney general, acting on behalf of consumers, participated in the proceeding and criticized the proposed contract.

While the PSC's guidelines compel it to address vital consumer protection issues, the rule cannot force regulators to critically analyze the utilities' filing or prevent the PSC from merely rubber-stamping a utility's proposed special contract. Vigorous oversight cannot be mandated by law: it requires dedicated public servants. The effectiveness of any consumer protection guidelines depends on the people who implement it, including PUC staff that review utility proposals and the commissioners who make the ultimate decisions. Nonetheless, we believe that establishing guidelines that require regulators to make specific findings about a proposed special contract would improve upon the status quo.

B. Require New Data Centers to Take Service Under Tariffs

Special contracts are vehicles for shifting special interests' energy costs to consumers. Approved in confidential proceedings by PUCs facing political pressure to approve deals and often with no competing interests participating, special contracts allow utilities to take advantage of the subjectivity and complexity of their accounting practices to socialize energy-intensive customers' costs to the public. The existing guardrails that ostensibly allow regulators to police special contracts are not working to protect consumers.

Guided by their consumer-protection mandate, regulators should stop approving any special contracts and instead require utilities to serve data centers through tariffs that offer standard terms and conditions for all future data-center customers. Unlike a one-off special contract that provides each data center with unique terms and conditions, a tariff ensures that all data centers pay under the same terms and that the impact of new customers is addressed by considering the full picture of the utility's costs and revenue. This holistic and uniform approach ends the race-to-the-bottom competition that incentivizes utilities to attract customers by offering hidden discounts paid for by other ratepayers.

That said, standard tariffs are not a talisman for protecting consumers. As we have emphasized, cost allocation is an imprecise exercise that depends on myriad assumptions and projections. However, tariff proceedings and rate cases are more procedurally appropriate forums than a special contract case to consider and address cost-allocation issues. Unlike special contracts, tariffs are reviewed in open dockets that allow the public and interested parties to scrutinize proposals and understand long-term implications of proposed rates should they go into effect. Once approved, a data-center tariff can be revisited in subsequent rate cases where the utility proposes to increase rates and allocate

its costs among ratepayers, including data centers. All ratepayers will have an incentive to participate in those cases and offer evidence that challenge data centers' interests.

Several utilities have already been moving away from special contracts to tariffs. Recent and ongoing proceedings are highlighting issues that demand careful scrutiny, including whether to create new data-center-only tariffs and how to protect existing ratepayers from costs of new infrastructure needed to meet data centers' demands. We briefly canvas these issues.

A threshold issue is whether an existing utility tariff for energy-intensive ratepayers is appropriate for data centers or whether a new tariff is necessary to address issues that are unique to data centers. Ratepayer classes are generally defined by the similar costs that the utility incurs to serve members of that class. Data centers may, of course, oppose new tariffs that impose more expensive prices than they would pay if they took service under existing tariffs for energy-intensive ratepayers.

In Ohio, for instance, AEP proposed to create classes for new data centers and cryptocurrency speculators and require ratepayers in those classes to commit to higher upfront charges and for a longer period of time than other energy-intensive consumers.[84] To justify the new data center class, AEP argued that data centers' unique size at individual locations and in the aggregate, as well as uncertainty about their energy use over the long-term and minimal employment opportunities, distinguish data centers from other energy-intensive consumers.[85] Data center companies responded that AEP had "failed to justify its approach to exclusively target data centers" and claimed that the utilities' costs to serve data centers was no different from other energy-intensive consumers that operate around the clock.[86] As of February 2025, the Ohio PUC has yet to rule on AEP's proposal.

FERC addressed similar issues in August 2024 when a utility proposed a new ratepayer class for energy-intensive cryptocurrency operations. Like AEP, the utility claimed that significant but uncertain demand growth justified approval of the new rate class, and therefore higher upfront payment commitments and longer terms for this new customer class were appropriate.[87] According to the utility, crypto speculators can more easily relocate their operations as compared to other energy-intensive consumers, and this mobility amplifies the risk of stranded assets built for new crypto customers that quickly set up shop elsewhere. FERC rejected the proposal because it found that the utility had provided insufficient evidence that new crypto operations "pose a greater stranded asset risk than other loads of similar size."[88] FERC's finding does not foreclose a utility from creating a crypto or data center ratepayer class, but instead signals that FERC will demand more persuasive evidence to justify approval of a new class.

State legislatures could remove any evidentiary hurdles by requiring large data centers to be in their own ratepayer class. With large data centers in their own class, regulators could more easily understand the effects data centers have on other ratepayers. For instance, parties might introduce evidence in a rate case showing how various cost allocation methods that raise costs for data centers would lower costs for other ratepayers. To avoid any claims of undue discrimination, the new rate class might include any new consumer above a specified capacity threshold that, as a practical matter, would likely capture only data centers.

Separating large data centers from other ratepayers could facilitate more protective cost allocation methods that better isolate data center costs from other ratepayers. Again, state legislatures might have a role to play. In Virginia, a bill proposed in January 2025 would require state regulators to determine whether cost allocation methods "unreasonably subsidize" data centers and to minimize or eliminate any such subsidies.[89] Such clear language would provide the PUC with guidance as it balances its obligations to protect ratepayers and facilitate growth in the state. In addition, it would force PUCs to revisit decades-old methods for dividing FERC-regulated transmission costs, as we discuss above.

As data centers shift to new tariffs, the largest potential cost shift in many states could be from the costs of new power plants built to meet data center growth. In most states, utilities are the dominant generation owners and can earn a PUC-set rate of return that they collect from ratepayers on their investments in new power plants. In general, utility expenses on new power plants are spread among ratepayer classes under the theory that all ratepayers benefit from the utility's power plants. But the staggering power demands of data centers defy this assumption. Recent tariff proceedings highlight that many utilities are proposing schemes that are not adequately shielding ratepayers from the costs of new generation for data center growth.

In Indiana, the utility Indiana Michigan Power expects new data centers to increase the peak demand on its system from 2,800 to 7,000 megawatts.[90] To facilitate this growth, the utility proposed to create special terms for new customers that demand at least 150 megawatts of power, a threshold that in practice limits their applicability to new data centers.[91] Like AEP Ohio's proposal, the updated tariff would require a new data center to commit to paying 90 percent of the utility's costs of new generation and transmission capacity needed to meet the data center's demand.[92] This 90 percent capacity payment and the tariff's twenty-year term, according to the utility, would "provide reasonable assurance" that data centers' payments to the utility "will reasonably align with the cost of the significant investments and financial commitments the Company will make to provide service."[93]

Consumer advocates generally supported the utility's efforts to insulate ratepayers from data centers' energy costs but argued that the proposed terms were "insufficient for protecting existing customers from large potential cost shifts in the event of the closure" of a large data center.[94] One of their solutions was to "firewall" the costs of new power plants built to meet data center growth from other ratepayers by requiring the utility to separately procure or build generation for data centers, and then allocating all costs solely to data centers.[95] Consumer advocates also urged regulators to require other modifications related to contract termination and other provisions to protect ratepayers from stranded costs if data center growth failed to materialize or decreased following an initial spike.[96]

Data center companies argued the other side, claiming that the terms were too onerous and benefited the utility shareholders who "would be shielded from business risk, while reaping regulated returns on large potentially more risky expansion of rate base" that would be backed by data centers.[97] Amazon observed that the utility's proposed twenty-year term is based on the ordinary approach to cost recovery of utility capital investments. But instead of the utility building its own plants and earning a return on them, Amazon claimed that the utility could more efficiently support data center growth through short-term contracts with non-utility generators or purchases via PJM's regional markets.[98] Amazon argued that rather than "imposing virtually all risks" associated with power plant development on data centers and reaping all of the profits for itself, the utility should instead share the risks of infrastructure development with new data centers.[99]

The Indiana proceeding highlights how utility ownership of generation can exacerbate cost shifts that benefit utility shareholders. The traditional utility business model of decades-long cost recovery of new utility-owned power plants through consumer rates is not designed to address a near-term tripling of a utility's demand due to just a few giant energy-guzzling warehouses. While "firewalling" data centers' power plant costs from other ratepayers is a viable approach, regulators must ensure that utility proposals actually protect consumers.

Under its "Clean Transition Tariff," Nevada Energy claims to insulate other ratepayers from data centers' energy generation costs by contracting with new clean energy resources and then passing those contract costs directly to a specific data center or other customer. In theory, this arrangement could isolate generation costs, but public utility staff and other intervenors concluded that the new tariff would not actually firewall data centers' generation costs from other ratepayers.[100] They found that complex interactions between the new tariff's proposed pricing structure and existing tariffs would shift costs to other ratepayers. For instance, PUC staff focused on the utility's proposal to account for the revenue it would have earned if the data center took service under a standard tariff and then charge other

ratepayers for a portion of its "lost" revenue.[101] In February 2025, the utility agreed with intervenors to modify its proposal and defer consideration of some of these complicated cost allocation issues.[102]

A better option for protecting ratepayers from power plant costs would be to allow data centers to purchase energy directly from non-utility retailers but still pay the utility for delivery service. Several states allow for such retail competition for energy-intensive consumers. To even further isolate data center energy costs, regulators could cut the cord entirely between the utility and data centers. Off-the-grid energy parks or energy parks that only export energy to the utility could completely insulate ratepayers from data centers' energy costs.

C. Amend State Law to Require Retail Competition and Allow for Energy Parks

Competition can protect consumers from utility market power and insulate ratepayers from cost shifts. Starting in the 1970s, a few states began to allow limited competition for electricity service to certain energy-intensive consumers.[103] In the 1990s, about a dozen states permitted all ratepayers to shop for power supply while continuing to require them to pay state-regulated rates for utility-provided delivery service. Additional states allowed energy-intensive consumers to similarly choose a power supplier. To protect ratepayers, states could require new data centers to procure power through competitive processes rather than confining them to utility-supplied power. States could go further and allow or require new data centers to isolate entirely from the utility-owned network by creating new energy parks.

A mandate that new data centers procure power from non-utility suppliers would protect ratepayers from short-term costs and long-term risks. Requiring the data center to contract with a competitive supplier rather than with the utility would ensure that all stranded costs associated with the generation are allocated between the data center and its supplier. In addition, isolating the utility from the deal would obviate the need for the type of complex energy price calculations, integral to Nevada Energy's proposal, that link the data center's power price to the costs of the utility's legacy assets.

The costs of utility-built power plants for data centers could be astronomical. In the Indiana proceeding discussed in the previous section, the utility's own estimates revealed that if it met data center demand with self-built plants it could spend as much as $17 billion on new power plants over the next several years.[104] The utility's proposal to require data centers to commit to paying 90 percent of the infrastructure costs over a twenty-year period would

improve upon the status quo but would not completely isolate those costs from other ratepayers, particularly if data center demand did not meet the utility's forecasts.

Even with a state prohibition on new utility power plants for meeting data center demand, ratepayers could still face higher bills from cost shifts. A data center procuring energy from the market would still pay utility-imposed delivery charges that could obscure discounts for data centers or include various other cost shifts. Islanding the data center and its power supply from the utility-owned system is a sure-fire approach for protecting ratepayers.

An energy park, according to a recent paper by Energy Innovation, "combines generation assets, complementary resources like storage, and connected customers."[105] Unlike typical behind-the-meter arrangements where a customer installs some on-site generation to complement utility-delivered power, an energy park would provide sufficient power for the connected customers' operations. This arrangement is "particularly compelling for large customers due to the cost advantages of sourcing electricity directly from the cheapest, cleanest sources and due to the challenges of connecting large capacities to the existing grid."[106] Avoiding the protracted utility-run interconnection processes would be a benefit for Big Tech companies who tend to move faster than the lumbering utility industry.[107]

A fool-proof way to insulate utility ratepayers from data center energy costs is to isolate a data center energy park from the utility-owned network. Isolation may be difficult, however, as an interconnected energy park could be more financially attractive to developers, even if it is only able to export power to the transmission system and unable to import utility-delivered power.[108] Connecting an energy park would require a utility-run interconnection process and would likely lead to the utility imposing transmission charges on the energy park. While transmission charges associated with an export-only energy park could facilitate cost shifts, they are likely to be much smaller than those embedded in special contracts and other arrangements for serving data centers with utility-delivered power that we have outlined in this paper.

Both competitive generation and energy park development face the same legal obstacle: state protection of utility monopolies. Under many states' laws, an entity that delivers or sells power to another entity is a "public utility." For instance, if a generation company owns the park's generation assets and Big Tech company owns the data center, the generation company would be regulated as a public utility. This designation could doom the project. States typically prohibit competition for electric service and regulators and courts might enforce the state's monopoly protections by prohibiting a multi-owner energy park located within the territory assigned to the incumbent utility.[109] Even if a state allows the energy

park to move forward as a public utility, the PUC may be compelled to regulate its rates and terms of service in a way that render the project unviable.

One potential workaround is to locate an energy park outside a for-profit utility's service territory. But states' laws may nonetheless impose obstacles. In Georgia, for instance, state law allows a new energy-intensive consumer located outside existing utility service territories to choose a supplier but limits the premises to a single customer.[110] An energy park in Georgia could therefore include only one data center owner. Energy parks might also be able to locate within the service territory of a municipal or cooperative utility. The service territories of these non-profit entities may not be protected by state law, or they may not be financially motivated to defend their monopolies and might instead welcome an energy park's investment in their communities.[111] That said, some non-profit utilities may regard an energy park as an infringement on their monopolies.[112]

State legislatures could amend anachronistic laws that prevent energy park development and block data centers taking utility service from procuring non-utility generation. To avoid interminable utility complaints that competition harms consumers,[113] laws could be tailored to apply only to data centers or other energy-intensive consumers that would otherwise require a utility to incur significant costs to procure power or build new generation.

D. Require Utilities to Disclose Data Center Forecasts

For competition to be effective, market participants need information about potential data centers' location and power demands. When utilities withhold that information, they prevent generators and other infrastructure and technology developers from offering data centers solutions that compete with the utility's offering. PUCs could require utilities to file monthly or quarterly load forecasts, which would reduce utilities' informational advantages and better enable other companies to offer solutions that would protect ratepayers from a utility's ability to shift data centers' costs to other consumers.

In the AEP Ohio proceeding, a trade association representing non-utility companies that sell electricity to consumers uncovered that AEP was withholding information. It documented that the utility's demand forecasts it filed in prior proceedings were inconsistent with its projections about data center growth it revealed to justify its data center tariff proposal.[114] The trade association's analyst explained that by holding back information AEP "conferred a *de facto* competitive advantage to build transmission rather than allowing a market response from competitive merchant generation" to meet data center demand.[115] The analyst also conjectured that AEP's concealment might directly harm ratepayers if it delayed

development of generation that might be needed to meet growing regional demand, which could lead to increased prices in PJM's capacity auction.[116]

PUCs can order utilities to provide demand projections more frequently and specify that utilities include new energy-intensive consumers at various stages of development. Utilities could also provide potential locations and demands of new energy-intensive consumers with enough specificity to be useful to market participants but sufficiently obscured to protect consumers' potentially confidential business information. Because many utilities have substantially increased their demand forecasts over the past year,[117] new reporting rules would be well justified as a means of protecting consumers, enabling competition, and ensuring reliability.

E. Allow New Data Centers to Take Service Only if They Commit to Flexible Operations that Can Reduce System Costs

State regulators could require utilities to condition service to new data centers on a commitment to flexible operations. This approach could benefit all ratepayers by avoiding or reducing the need for expensive infrastructure that would otherwise be needed when a new data center increases the utility's maximum demand. A study by researchers at the Nicholas Institute for Energy, Environment & Sustainability estimates that 76 GW of data centers could connect to the system if utilities curtail energy delivery for just a few hours per year.[118]

As discussed above, utilities and RTOs plan power system expansion to provide sufficient capacity for meeting consumers' maximum energy demand, which usually occurs on the hottest and coldest days of the year. Because the system is planned for these extreme weather days, a large portion of a power system's generation and delivery infrastructure is underutilized for most of the year. If a data center commits to reducing its consumption of utility-supplied power during peak demand periods, utilities could deliver power to the data center without building new infrastructure.

To implement a flexibility mandate, PUCs could order utilities to modify their tariffs and classify data center loads as interruptible customers whose power can be turned off under specified circumstances. Similarly, regulators could also require utilities to modify their interconnection procedures to designate data centers as controllable loads that must reduce their consumption under certain conditions.[119] These strategies could defer the immediate need for costly infrastructure upgrades to serve new data centers. Utilities, however, have historically been hostile to regulatory attempts to require measures that would defer or avoid the need for costly infrastructure upgrades that drive utilities' profits.

IV. Subsidies Hidden in Utility Rates Extract Value from the Public

Utility rates have always been a means of achieving economic and energy policy goals. By financing favored investments through utility rates, rather than through general government revenue, policymakers can avoid having to raise taxes and instead conceal public spending through complex utility rate increases. From the public's perspective, hiding subsidies in utility rates may be acceptable if the benefits of the favored investments exceed their costs. For data centers deals, however, utilities do not publicly demonstrate that ratepayers pay lower rates as a result of the contract. To the extent data center development offers other benefits, such as expanding the local economy or advancing national security interests, we argue that these secondary effects are either already accounted for through other policies or irrelevant to utility regulators.

The economic harm to ratepayers from data center discounts extends beyond the short-term bill increases that utilities are imposing on the public. We are concerned that meeting data center demand is delaying opportunities to initiate power sector reforms that would benefit all ratepayers. To power new data centers, utilities are proposing more of the same: spending capital on large central-station power plants and transmission reinforcements. These types of projects have been fueling utility profits for generations, but the power sector today can do so much more. Deploying advanced technologies and adopting new operational and planning practices could squeeze more value from existing utility systems, but these low-capital-cost solutions are not profitable for utilities and therefore not pursued.[120] By approving special contracts for data centers and tariffs that do protect ratepayers from Big Tech's energy costs, PUCs may be inadvertently fostering an alliance between utilities and Big Tech that could reinforce the industry's technological status quo.

A. Data Center Subsidies Fail Traditional Benefit-Cost Tests

When a utility spends money to supply a new data center, the data center should pay for those investments. However, if ratepayers ultimately benefit from new infrastructure needed for a data center, it may be reasonable for the utility to charge ratepayers a portion of the costs. The "beneficiary pays" principle, an analogue of the cost causation standard, justifies short-term bill increases when they are offset by longer term benefits that reduce ratepayers' bills. Just as consumers should pay costs that reflect a utility's cost to serve them, a utility may charge consumers for projects that ultimately lower their rates.

PUCs have applied the beneficiary pays approach in numerous contexts. For example, many states fund energy efficiency programs through utility rates. These programs directly benefit the ratepayers that make use of the program's discounts for energy audits, new appliances,

and other interventions that can reduce power use. All ratepayers are billed for these subsidies that flow directly to a handful of individual consumers that take advantage of these benefits. PUCs approve of this spending when programs ultimately lower peak system demand or otherwise reduce power system costs more than the costs of funding the efficiency program. We acknowledge, however, that these calculations are premised on assumptions and judgments and can be as imprecise as the cost allocation exercises we critique in this paper. The best regulators can do is conduct these analyses transparently, which allows for judicial review, limits the potential for arbitrary regulatory decisions, and provides a basis for changing the policy in response to new evidence.

In special contract proceedings, utilities and PUCs offer no such transparency about data center deals. Instead, billion-dollar contracts are proposed and approved without public accounting of the costs and benefits. Given the stakes and the incentives of the parties, the burden ought to be on utilities to prove publicly that ratepayers are benefiting from these deals, or at worst are being held harmless.

Ratepayers should not be saddled with costs due to data centers' purported strategic national importance. In January 2025, the Biden administration declared that AI is "a defining technology of our era" that has a "growing relevance to national security."[121] "Building AI infrastructure in the United States on the time frame needed to ensure United States leadership over competitors," according to the Biden administration, will "prevent adversaries from gaining access to, and using, powerful future systems to the detriment of our military and national security."[122] If this frightening scenario proves true — that AI will be a privately owned global weapon — it's not clear what it has to do with utility rates.

Data center proponents also tout the economic benefits of new development, but the public is already paying for local job growth through their taxes. Apart from discounted utility rates, many data centers separately receive generous state and local subsidies that governments rationalize based on the supposed economic and employment benefits of permitting new development. Several states, for instance, offer sales tax exemptions that allow data center companies to purchase computers, cooling equipment, and other components without paying state tax. In Virginia, the exemption saved data center companies nearly a billion dollars in 2023 alone.[123] Data centers may also benefit from one-off incentive packages. Mississippi is providing an Amazon data center with nearly $300 million of workforce training and infrastructure upgrades.[124] Mississippi will also reimburse Amazon for 3.15 percent of the data center construction costs and provide tax exemptions that could be worth more than $500 million. In lieu of taxes, Amazon will pay approximately $200 million in fees to the county over five years.[125]

B. Data Center Subsidies Interfere with Needed Power Sector Reforms

The power sector needs major upgrades. Investment in new high-voltage transmission is historically low,[126] despite an acute need for new power lines that can connect consumers to cheaper and cleaner sources of energy and improve network reliability.[127] With low interconnectivity, the utility industry is siloed into regional alliances that make little engineering or economic sense. Meanwhile, utilities have been sluggishly slow to adopt monitoring, communications, and computing technologies that can improve the performance of existing high-voltage networks.[128] At the local level, utilities are failing to unlock the potential of distributed energy resources to lower prices.[129]

Data center growth provides utilities with an excuse to ignore these inefficiencies. Utilities don't have to innovate to supply Big Tech's warehouses and are instead offering to meet data center demand with transmission reinforcements and gas-fired power plants, which have been the industry's bread-and-butter for decades. Some utilities are even propping up their oldest and dirtiest power plants to meet data center demand.[130] Neither data centers nor regulators are challenging utilities to modernize their systems.

Power sector stagnation is the fault of utilities and the regulatory construct that incentivizes inefficient corporate decisions. Rate regulation enables excessive utility spending that crowds out cheaper alternative investments. Because they are monopolists, utilities do not face competition that might expose their inefficiencies. Regulated rates rarely punish utilities for inefficiencies or reward them for improving their operations through low-cost technologies. Ultimately, regulators must try to align utility performance with consumers' interests, but achieving this straightforward objective is dauntingly complex.

Data center growth now overwhelms many PUC agendas. By law, regulators must respond to utility proposals about rate increases, special contracts, infrastructure development, and other issues. Utilities' messaging to regulators and investors is that meeting data centers' growth targets is an urgent priority. The implication is that there's no time to act differently. With utilities' push for growth dominating their dockets, PUCs may find it even harder to reform inefficient utility practices and block unneeded investments. For ratepayers, beneficial projects will remain unfunded, and wasteful utility practices will persist.

As utilities wring profits from the public through special contract approvals, they may be developing a new alliance with Big Tech. Uniting utilities' influence-peddling experience with the deep pockets of Big Tech could further entrench utility control over the power sector. Utilities are already among the largest donors to state elected officials and have a century of experience navigating state legislatures and agencies to protect their monopoly control and

otherwise advance their interests. A long-term partnership to push the common interests of utilities and data centers at statehouses, PUCs, and other forums could undermine reform efforts and harm ratepayers.

While energy-intensive consumers typically have a financial incentive to participate in PUC proceedings and argue for their own self-interest by opposing wasteful utility spending, we are concerned that a different scenario may play out for data centers. If utilities' growth predictions are realized, some utilities will have invested billions of dollars to serve data centers that will consume *a majority of all power* delivered by the utility. Under this scenario, the utility will be dependent on its data center customers for revenue and will need to retain them in order to justify its prior and future expansion. To prevent data center departures and attract new data center customers, utilities might continue to offer discounted rates. Rather than acting as watchdogs in PUC proceedings, data center companies may instead focus on securing more discounts. Insulated by special contract deals and favorable tariffs with friendly utilities, data center companies would focus on defending their discounts rather than disciplining the utility's spending in rate cases.

Outside of formal proceedings, utility-Big Tech alliances could amplify pro-utility political messages. Utilities have a pecuniary interest in the laws that govern PUC decisionmaking and push for changes that benefit their bottom lines. Utilities formally lobby state legislators and also pursue an array of public relations strategies to secure favorable legislative and regulatory outcomes. Big Tech has the financial capacity to significantly increase the amount of money supporting of pro-utility bills and regulatory actions.

An alternative approach — which requires data centers to power themselves outside of the utility system — sets up a formidable counterweight to utilities' monopoly power. If Big Tech is forced to power itself, it might defend against utility efforts to limit competition and return to the pro-market advocacy that characterized the Big Tech's power-sector lobbying efforts prior to the ChatGPT-inspired AI boom.

Appendix A

Big Tech Companies and Data Center Developers Testifying that Utility Prices Inform Where They Build New Facilities

- AEP Ohio Proposed Tariff Modifications, *supra* note 2, Motion to Intervene and Memorandum in Support of Sidecat, an Affiliate of Meta (Jun. 10, 2024) ("The applicable electricity rates and corresponding electric service tariffs for AEP Ohio will be a significant consideration for Meta when evaluating possible sites for new facilities, expansions at existing facilities, and otherwise operating its data center assets.").
- AEP Ohio Proposed Tariff Modifications, Direct Testimony of Brendon J. Baatz in Opposition of the Second Joint Stipulation and Recommendation, at 4 (Nov. 8, 2024) ("the terms and conditions in Schedule DCT are far more restrictive and burdensome than those imposed by investor-owned utilities in other states, which could prompt some data center customers to consider investing outside of Ohio").
- AEP Ohio Proposed Tariff Modifications, Second Supplemental Direct Testimony of Michael Fradette, on Behalf of Amazon Data Services, Inc., at 18 (Nov. 8, 2024) ("By rejecting a stipulation that unfairly discriminates against data centers, the Commission can help ensure that Ohio continues to be a leader in attracting investment from this vital industry.").
- AEP Ohio Proposed Tariff Modifications, Motion to Intervene of Data Center Coalition, at 4 (May 24, 2024) ("AEP Ohio's proposals, and potential proposals made by intervenors in the case, may have a significant impact on existing and planned data centers in AEP Ohio's service territory.").
- AEP Ohio Proposed Tariff Modifications, Direct Testimony of Brendon J. Baatz, at 11 (Oct. 18, 2024) ("If AEP Ohio's proposal is adopted, it would create an unfavorable environment for data center development in the state, potentially causing companies to reconsider their investment plans.").
- AEP Ohio Proposed Tariff Modifications, Direct Testimony of Kevin C. Higgins on behalf of The Data Center Coalition, at 7 (Oct. 18, 2024) ("If approved, the DCP tariff will adversely impact planned data center development in the Company's service territory."); *id.* at 11 ("At the same time, it is important that the Commission not take actions that would depress the growth of an important emerging industry by imposing unjust and discriminatory terms.").
- Indiana Michigan Power Proposed Tariff Modification, *supra* note 15, Direct Testimony of Kevin C. Higgins on behalf of The Data Center Coalition, at 6 (Oct. 15, 2024) ("If

approved, the IP Tariff changes could adversely impact planned data center development in the Company's service territory.").

- Indiana Michigan Power Proposed Tariff Modification, Direct Testimony of Justin B. Farr on behalf of Google, at 23 (Oct. 15, 2024) ("Modifications . . . have the potential to limit opportunities for . . . the development of shared solutions that can provide significant benefit to I&M's system by removing the financial incentive for I&M to collaborate with its customers to pursue innovative solutions to support their growth.").
- Indiana Michigan Power Proposed Tariff Modification, Direct Testimony of Michael Fradette on behalf of Amazon Data Services, Inc., at 37 (Oct. 15, 2024) ("The proposed [tariff] is not reasonable and in fact has a negative impact on Amazon's view for future investment actions within I&M's service territory. I&M has offered no reasonable justification for revising Tariff I.P. as proposed.").
- Contracts for Provision of Electric Service to a New Large Customer's Minnesota Data Center Project, Minn. Pub. Util. Comm'n Docket No. 22-572, Petition, at 28 ("The customer has made clear that the CRR Rate is critically important to its decision to select a site in Minnesota for its new data center. Without the CRR Rate, the economic feasibility of this new data center would be jeopardized.").
- In re Application of Pub. Serv. Co. of Colorado for Approval of a Non-Standard EDR Contract, Pub. Util. Comm'n of Colorado Proceeding No. 23A-0330E, Direct Testimony & Attachment of Travis Wright on behalf of Quality Technology Services, at 8 (Jun. 23, 2023) ("QTS selects its new locations extremely carefully. Electricity is one of the major costs to operating a data center, so the low EDR rate provided by Public Service, and the term of the EDR agreement, is a critical factor in determining to locate in Aurora."); *id*. at 10–11 ("Given that approximately 40 percent of the Aurora QTS Campus's operational expense will be attributable to utilities, with electric being the largest component, the cost per kWh can easily make or break a project, or drive QTS or its customers to invest resources elsewhere. The EDR ESA that we have negotiated with Public Service and are requesting approval of in this Proceeding, is a critical component of our business model for the Aurora QTS Campus."); *id*. at 16 ("Was the cost of electricity a critical consideration for QTS in deciding where to site its new operations? Yes. 40 percent of the operational cost of a data center is electricity, and this will usually be the largest line item on the budget. Additionally, this cost will continue for 40 years, and will scale the business. In contrast, real estate and development costs are one-time, up-front expenditures that are watered down as the

volume of business increases. The largest and fastest growing operations in our portfolio are in markets where electricity costs are competitive.").

- In re Application of Ohio Power Company and New Albany Data Center, LLC for Approval of a Reasonable Arrangement, Pub. Util. Comm'n of Ohio Case No. 23-0891-EL-AEC, Joint Application, at 7 (Sep. 28, 2023) ("Without this reasonable arrangement, NADC could construct its own dedicated substation and take lower-cost service under AEP Ohio's transmission voltage tariff – to the extent it would decide to develop its facilities in AEP Ohio's service territory.").
- Application of Nevada Power Company for Approval of an Energy Supply Agreement with Lumen Group, Pub. Util. Comm'n of Nev. Docket No. 19-12017, Application, Attachment A: Long Term Energy Supply Agreement White Paper, at 17 (Dec. 19, 2019) ("The ESA provides Google with important benefits . . . the blended rate provided for in the ESA is cost-effective and competitively priced compared to other available options, the fixed-price nature of the agreement provides Google with important cost-certainty into its energy expenditures . . .").

Endnotes

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[1] *See, e.g.*, JOHN D. WILSON, ZACH ZIMMERMAN & ROB GRAMLICH, STRATEGIC INDUSTRIES SURGING: DRIVING US POWER DEMAND 8 (Grid Strategies, Dec. 2024) [hereinafter Grid Strategies Report]; Alastair Green et al., *How Data Centers and the Energy Sector Can Sate AI's Hunger for Power*, MCKINSEY & CO., ("Much of data center growth — about 70 percent — is expected to be fulfilled directed or indirectly (via cloud services, for instance) by hyperscalers by 2030"); EPRI, POWERING INTELLIGENCE: ANALYZING ARTIFICIAL INTELLIGENCE & DATA CENTER ENERGY CONSUMPTION 7 (May 2024) [hereinafter Powering Intelligence]; Jennifer Hiller & Katherine Blunt, *Inside the Audacious Plan to Reopen Three Mile Island's Nuclear Plant*, WALL ST. J. (Nov. 10, 2024), ("Analysts at Jefferies estimate Microsoft will pay between $110 and $115 per megawatt hour of electricity").

[2] *See, e.g.*, In re *Application of Ohio Power Company for New Tariffs Related to Data Centers*, Pub. Util. Comm'n of Ohio Case No. 24-508-EL-ATA [hereinafter AEP Ohio Proposed Tariff Modifications], Direct Testimony of Kevin C. Higgins on behalf of The Data Center Coalition, at 7 ("If approved, the [proposed] tariff will adversely impact planned data center development in the Company's service territory."); *id.* at 11 ("At the same time, it is important that the Commission not take actions that would depress the growth of an important emerging industry by imposing unjust and discriminatory terms."). *See* Appendix A for additional evidence.

[3] *See, e.g.*, Rich Miller, *Skybox Plans 300-Megawatt Campus South of Dallas*, DATA CENTER FRONTIER (Nov. 20, 2023); City of Cleveland, Office of Sustainability & Climate Justice (noting that the city has a 300-megawatt system).

[4] Palo Verde is the largest nuclear power station in the U.S. Its three reactors produce approximately 3.3 gigawatts. Meta announced a two-gigawatt data center development in December 2024. *See* Dan Swinhoe & Zachary Skidmore, *Meta Announces 4 Million Square Foot, 2 GW Louisiana Data Center Campus*, DATA CENTER DYNAMICS (Sep. 5, 2024).

[5] *See generally* Powering Intelligence; Alastair Green et al., *How Data Centers and the Energy Sector Can Sate AI's Hunger for Power*, MCKINSEY & CO.

[6] *See, e.g.*, Grid Strategies Report ("[A]nnual peak demand growth will average 3% per year over the next five years. While 3% growth may seem small to some, it would mean six times the planning and construction of new generation and transmission capacity.").

[7] *See* FED. ENERGY REG. COMM'N, SUMMER ENERGY MARKET & ELECTRIC RELIABILITY ASSESSMENT 46 (May 23, 2024) (showing 19 GW actual demand in 2023); Newmark, 2023 U.S. DATA CENTER MARKET OVERVIEW & MARKET CLUSTERS 7 (Jan. 2024) (projecting 35 GW in 2030); *AI is Poised to Drive 160% Increase in Data Center Power Demand*, Goldman Sachs (May 14, 2024).

[8] *See* Grid Strategies Report, at 12.

[9] *See* Georgia Power Company, Georgia Pub. Serv. Comm'n Docket No. 56002, Budget 2025: Load and Energy Forecast 2025 to 2044 (Jan. 31, 2025); Drew Kann and Zachary Hansen, *Data Centers Use Lots of Energy: Georgia Lawmakers Might Make Them Pay More*, THE ATLANTA JOURNAL CONSTITUTION (Feb. 13, 2025) (stating that Georgia Power executives stated that 80 percent of the company's forecasted electricity demand growth is due to data centers).

[10] Press Release, *Oncor Electric Delivery Company, Oncor Reports Third Quarter 2024 Results* (Nov. 6, 2024),.

[11] Robert Walton, *ERCOT Successfully Navigates Heat Wave, New Peak Demand Record*, UTILITY DIVE (Aug. 26, 2024).

[12] *See* Ethan Howland, *AEP Faces 15 GW of New Load, Driven by Amazon, Google, Other Data Centers: Interim CEO Fowke*, UTILITY DIVE (May 1, 2024); American Electric Power, 4th Quarter Earnings Presentation (Feb. 13, 2025).

[13] See, e.g., In re Application of Ohio Power Company for New Tariffs Related to Data Centers, Pub. Util. Comm'n of Ohio Case No. 24-508-EL-ATA [hereinafter AEP Ohio Proposed Tariff Modifications], Direct Testimony of Matthew S. McKenzie on Behalf of Ohio Power Company [hereinafter Ohio Power Company Testimony], at 2 (May 13, 2024)

[14] Indeed, investors are taking note. The authors have on file numerous reports from utility stock analysts that tout the potential of data center growth. Utilities' presentations to investors claim that data center growth will drive future earnings. *See, e.g.,* AEP 4th Quarter Earnings Presentation, *supra* note 13, at 13 (stating that "Load Growth Supports Financial Strength" and noting it is being driven by data centers).

[15] *See, e.g.*, In re *Verified Petition of Indiana Michigan Power Company for Approval of Modifications to its Industrial Tariff*, Indiana Util. Reg. Comm'n Cause No. 46097 [hereinafter Indiana Michigan Power Proposed Tariff Modifications], Testimony of Indiana Consumer Advocates, at 4 (Oct. 15, 2024) ("There has been a significant lack of transparency with these new loads . . . For example, with respect to new large loads coming to I&M's service territory, Google and Microsoft refused to answer CAC data requests about their anticipated load and electricity consumption, and Microsoft also refused to identify its forecasted load factor. CAC counsel reached out to counsel to these parties and requested to execute a non-disclosure agreement with each respective company so that CAC could obtain this pertinent information, but thus far, we have not received a proposed non-disclosure agreement or the confidential information."). Most of the figures in the Georgia Power filing cited at note 9 are redacted.

[16] *See, e.g.*, AEP Ohio Proposed Tariff Modifications, Ohio Power Company Testimony, *supra* note 13, at 2 ("Currently, AEP Ohio has limited ability to distinguish customers who are merely speculating on potential data center investments from customers who are willing to make long-term financial *commitments* to data center investments.") (original emphasis); *Large Loads Co-Located at General Facilities Technical Conference*, FERC Docket No. AD24-11-000, Transcript, at 26 (Aubrey Johnson, Vice-President, Systems & Resource Planning for the Midcontinent Independent System Operator explaining that "in many cases, these data centers are showing up in multiple places, so I have many members submitting loads that are all the same. So how do we have more clarity . . . to understand what the actual true load is?").

[17] *See generally* Powering Intelligence, at 7.

[18] *See, e.g.*, David Uberti, *AI Rout Sends Independent Power Stocks Stumbling*, WALL ST. J. (Jan. 27, 2025), ("DeepSeek's efficient approach have 'created panic among investors who question the sustainability of US data center and AI investments,' Guggenheim analysts wrote in a note"); JONATHAN KOOMEY, TANYA DAS & ZACHARY SCHMIDT, ELECTRICITY DEMAND GROWTH AND DATA CENTERS: A GUIDE FOR THE PERPLEXED (Bipartisan Policy Center & Koomey Analytics, Feb. 2025).

[19] The Grainger College of Engineering, *Why DeepSeek Could be Good News for Energy Consumption*, (Feb. 6, 2025); James O'Donnell, *DeepSeek Might Not be Such Good News for Energy After All*, MIT TECH. REVIEW (Jan. 31, 2025).

[20] *See* Deepa Seetharaman and Tom Dotan, *Tech Leaders Pledge Up to $500 Billion in AI Investment in the U.S.*, WALL ST. J. (Jan. 21, 2025).

[21] Jordan Novet, *Microsoft Expects to Spend $80 Billion on AI-Enabled Data Centers in Fiscal 2025*, CNBC (Jan. 3, 2025).

[22] Press Release, State of Ohio, *Governor DeWine Announces $10 Billion Investment Plan from Amazon Web Services in Greater Ohio* (Dec. 16, 2024).

[23] Dan Swinhoe & Zachary Skidmore, *Meta Announces 4 Million Sq Ft, 2 GW Louisiana Data Center*, DATA CENTER DYNAMICS (Dec. 5, 2024).

[24] *See generally* Aneil Kovvali & Joshua C. Macey, *Hidden Value Transfers in Public Utilities*, 171 PENN. L. REV. 2129 (2023).

[25] KEN COSTELLO, ALTERNATIVE RATE MECHANISMS & THEIR COMPATIBILITY WITH STATE UTILITY COMMISSION OBJECTIVES, NATIONAL REGULATORY RESEARCH INSTITUTE 2 (Apr. 2014).

[26] *See* U.S. Energy Information Administration, *Electric Power Monthly, Table 5.6.A. Average Price of Electricity to Ultimate Customers by End-Use Sector* (showing average residential, commercial, and industrial rates in each state).

[27] Alabama Elec. Co-op., Inc. v. FERC, 684 F.2d 20, 27 (D.C. Cir. 1982).

[28] Co. Interstate Gas Co. v. Fed. Power Comm'n, 324 U.S. 581, 590 (1945).

[29] JAMES C. BONBRIGHT, PRINCIPLES OF PUBLIC UTILITY RATES 338 (1961).

[30] *See, e.g.,* Off. of Consumer Counsel v. Dep't of Pub. Util. Control et al., 905 A.2d 1, 6 (Conn. 2006) ("In the specialized context of a rate case, the court may not substitute its own balance of the regulatory considerations for that of the agency, and must assure itself that the [department] has given consideration of the factors expressed in [the statute]."); Iowa-Ill. Gas & Elec. Co. v. Ill. Com. Comm'n, 19 Ill. 2d 436, 442 (Ill. 1960) (explaining that deference to the Commission is "especially appropriate in the area of fixing rates"); Farmland Ind., Inc. v. Kan. Corp. Comm'n, 37 P.3d 640, 650 (Kan. App. 2001) (providing that the Kansans Corporation Commission "has broad discretion in making decisions in rate design types of issues"); Ohio Consumers' Counsel v. Pub. Util. Comm'n, 926 N.E.2d 261, 266 (Ohio 2010) ("The lack of a governing statute telling the commission how it must design rates vests the commission with broad discretion in this area.").

[31] *See 2024 FERC Rep. on Enforcement*, FERC Docket No. AD07-13-018, at 51 (Nov. 21, 2024) ("Most audits find that public utilities recorded non-operating expenses and functional operating and maintenance expenses

in [Administrative and General] expense accounts, leading to inappropriate inclusion of such costs in revenue requirements produced by their formula rates"); *see also infra* note 34.

[32] *FirstEnergy Corp.,* FERC Docket No. FA19-1-000, Audit Report, at 48 (Feb. 4, 2022).

[33] *Id.* at 16.

[34] *See, e.g.*, *Application of Southern California Gas Company for Authority to Update its Gas Revenue Requirement and Bas Rates*, California Pub. Util. Comm'n Application 22-05-015, Decision 24-12-074, at 7 (Dec. 19, 2024) ("The decision [to use one-way balancing accounts] highlights a pattern of misclassification of costs at Sempra Utilities, where the company has charged ratepayers for lobbying, political activities, and expenses related to outside legal firms. These costs have been improperly booked as above-the-line expenses when forecasting future costs."); *Order Instituting Rulemaking*, California Pub. Util. Comm'n Rulemaking 13-11-005, Decision 22-04-034 (Apr. 7, 2022) ("As an experienced utility, SoCalGas should have known that its billing of lobbying against reach codes implicates several basic legal principles that are central to its duties to the Commission and to customers . . . Thus, aside from billing ratepayers for lobbying contrary to the intent of the Commission, SoCalGas appears on the face of the record to have misled staff about the direction of its lobbying…."). *See also 2024 FERC Rep. on Enforcement*, FERC Docket No. AD07-13-018, at 58 (Nov. 21, 2024) (summarizing that FERC audits revealed "improper application of merger-related costs; lobbying, charitable donation, membership dues, and employment discrimination settlement costs; improper labor overhead capitalization rates….").

[35] Costello, *supra* note 25, at 44. *See also Investigation into the Reasonableness of Rates & Charges of PacifiCorp*, Utah Pub. Serv. Comm'n Docket No. 99-035-10, 2000 WL 873337 (2000) ("[E]ach class of service does not pay precisely its 'share' of costs. This is true, for example, of the large customer groups, or special contract customers, according to some views of allocations.").

[36] *See, e.g.*, MINN. STAT. § 216B.162, subd.7 (2024); COLO. REV. STAT. ANN. § 40-3-104.3 (West 2018); MICH. COMP. LAWS § 460.6a(3).

[37] KAN. STAT. ANN. § 66-101i.

[38] *See* MISS. CODE ANN. § 77-3-271(3) ("A public utility may enter into a large customer supply and service agreement with a customer, which may include terms and pricing for electric service without reference to the rates or other conditions that may be established or fixed under Title 77, Chapter 3, Article 1, Mississippi Code of 1972. No approval by the commission of such agreement shall be required. With respect to such an agreement…the agreement, including any pricing or charges for electric service, shall not be subject to alteration or other modification or cancelation by the commission, for the entire term of the agreement….").

[39] *See* Appendix A.

[40] *See, e.g.*, *Application of El Paso Electric Company for an Economic Development Rate Rider for a New Data Center*, Pub. Util. Comm'n Texas Docket No. 56903, Order No. 1 (Aug. 2, 2024) (issuing standard protective order with no analysis); *Petition of Duke Energy Indiana for Approval of a Special Retail Electric Service Agreement*, Indiana Util. Reg. Comm'n Cause No. 45975, Order (Nov. 20, 2023) (granting Duke Energy's motion for confidential treatment); In re *Cheyenne Light, Fuel & Power Co. Petition for Confidential Treatment of a Contract with Mineone Wyoming Data Center LLC*, Wyoming Pub. Serv. Comm'n Docket No. 20003-238-EK-24 (Record No. 17600), Letter Order (Oct. 9, 2024) (authorizing confidential treatment); In re *Xcel Energy's Petition for Approval of Contracts for Provision of Service to a New Large Customer's Minnesota Data Center Project*, Minn. Pub. Util. Comm'n Docket No. E-002/M-22-572, Order (excising significant portions of the proposed service agreement and staff analysis because it is a "highly confidential trade secret"); *Tariff Filing of Kentucky Power Company for Approval of a Special Contract with Ebon International, LLC*, Kentucky Pub. Serv. Comm'n Case No. 2022-00387, Order (Dec. 4, 2024), at 3 (granting confidential treatment for utility filing and providing that the information "shall not be placed in the public record or made available for public inspection for five years or until further order[ed]").

[41] *See id; see also* Daniel Dassow, *University of Tennessee Professor Sues TVA for Records of Incentives to Bitcoin Miners*, KNOXVILLE NEWS SENTINEL (Oct. 29, 2024) (explaining how there was no information about the incentives that TVA gave a cryptocurrency company to build within its footprint, but that the company used 9.4 percent of all Knoxville Utilities Board electricity in 2023 while employing just thirty people).

[42] *See* Costello, *supra* note 25, at 21.

[43] *See* Peter Lazare, *Special Contracts and the Ratemaking Process*, 10 ELEC. J. 67, 68–70 (1997) (quoting a Commonwealth Edison filing that argues long-run costs are appropriate for rate cases and short-term costs are appropriate for special contract proceedings and explaining the implications of using different metrics).

[44] *See, e.g.*, In re *Application of Ohio Power Company and New Albany Data Center, LLC for Approval of a Reasonable Arrangement*, Pub. Util. Comm'n of Ohio Case No. 23-0891-EL-AEC, Order Approving the Application with Modification ("The proposed arrangement meets the burden of proof for obtaining a

reasonable arrangement under Ohio Adm. Code Chapter 4901:1-38. Furthermore, we find that the proposed arrangement, as modified by Staff, is reasonable and should be approved."). Occasionally, a state PUC applying its public interest standard will gesture at a utility's static marginal cost analysis or no-harm analysis for analytical support. *See, e.g.*, *Petition of Duke Energy Indiana for Approval of a Special Retail Electric Service Agreement*, Indiana Util. Reg. Comm'n Cause No. 45975, Order of the Commission (Apr. 24, 2024) ("In making such a determination [that the proposed agreement satisfies Indiana Code], two considerations are important: whether the rates negotiated between the utility and its customer are sufficient for the utility to cover the incremental cost of providing the service to the customer and still make some contribution to the utility's recovery of its fixed costs, and whether the utility has sufficient capacity to meet the customer's needs. As explained by [Duke Energy's Vice President of Rates and Regulatory Strategy], the Agreement requires that Customer cover the incremental costs of providing service to it, as well as contributing to Petitioner's recovery of fixed costs…Based on the evidence of record, we find and conclude that the terms and conditions contemplated in the Agreement are just and reasonable…Therefore, we find that the Agreement is in the public interest and is, therefore, approved…."); In re *Idaho Power Company's Application for Approval of a Special Contract and Tariff Schedule 33 to Provide Electric Service to Brisbie, LLC's Data Center Facility*, Idaho Pub. Util. Comm'n Case No. IPC-E-21-42, Order No. 35958 ("Commission Discussion and Findings: The Commission has jurisdiction over this matter under *Idaho Code* §§ 61-501, -502, and -503…We have reviewed the record in this case and find the Company's August 30, 2023, Filing including an amended ESA, revised Schedule 33, and additional modifications is consistent with the Commission's directive in Order No. 3577.").

[45] See Duke Energy Carolinas, LLC v. NTE Carolinas II, LLC, 111 F.4th 337, 344–46 (4th Cir. 2024).

[46] *Id.* at 347.

[47] *Id.* at 349.

[48] *See* Appendix A.

[49] *See generally* Kovvali & Macey, *supra* note 24.

[50] Cross-Subsidization Restrictions on Affiliate Transactions, 73 Fed. Reg. 11,013 (2008) (codified at 18 C.F.R. pt. 35).

[51] *See, e.g.,* Nantahala Power & Light Co. v. FERC, 476 U.S. 953 (1986).

[52] *See, e.g.*, Nat'l Ass'n of Reg. Util. Comm'rs v. FERC, 475 F.3d 1227, 1285 (D.C. Cir. 2007); Entergy Services, Inc. v. FERC, 319 F.3d 536 (D.C. Cir. 2003); South Carolina Pub. Serv. Auth. V. FERC, 762 F.3d 41 (D.C. Cir. 2014).

[53] PJM, *PJM Board of Managers Approves Critical Grid Upgrades*, PJM INSIDE LINES (Dec. 11, 2023).

[54] Sami Abdulsalam, Senior Manager, PJM Transmission Planning, Reliability Analysis Update at Transmission Expansion Advisory Committee Meeting (Dec. 5, 2023). *See also PJM Revisions to Incorporate Cost Responsibility Assignments for Regional Transmission Expansion Plan Baseline Upgrades*, FERC Docket No. ER24-843, Protest and Comments of Maryland Office of People's Counsel (Feb. 9, 2024) [hereinafter Maryland People's Counsel Protest].

[55] *See generally PJM Interconnection*, 187 FERC ¶ 61,012 at P 6 (2024); Maryland People's Counsel Protest, Affidavit of Ron Nelson, at 5.

[56] *See* Maryland People's Counsel Protest, Affidavit of Ron Nelson, at 5.

[57] *See Delmarva Power & Light Co. Modification of Retail Transmission Rates*, Maryland Pub. Serv. Comm'n Case No. 8890, Revised Tariff, Attachment E (Jul. 2, 2024) (allocating 68 percent of transmission costs to residential customers); *Potomac Electric Power Co. Modification of Retail Transmission Rates*, Maryland Pub. Serv. Comm'n Case No. 8890, Revised Tariff, Attachment F (Jul. 2, 2024) (allocating 53 percent of transmission costs to residential customers); *Baltimore Gas & Elec. Co. Updated Market-Priced Service Rates, Administrative Charges, and Retail Transmission Rates under Rider 1*, Maryland Pub. Serv. Comm'n Case Nos. 9056/9064, Attachment 2: Development of the Retail Transmission Rates (Apr. 30, 2024) (allocating 78 percent of transmission costs to residential customers).

[58] *Application of Virginia Electric and Power Co.*, Virginia Corp. Comm'n. Case No. PUR-2021-00102, Report of Chief Hearing Examiner Alexander F. Skirpan, Jr., at 9–10 (Jul. 14, 2021).

[59] The cost causation principle could require a shift from transmission rates based on average — or static marginal — costs, to dynamic marginal cost analyses. *See* In re *Application of Pub. Serv. Co. of Colorado for Approval of a Non-Standard EDR Contract*, Colorado Pub. Util. Comm'n Proceeding No. 23A-0330E, Commission Decision Denying Exceptions to Decision No. R24-0168 and Adopting Recommended Decision with Modifications, at 11–12 (May 15, 2024) ("[W]e emphasize that the Commission's review of future Non-Standard EDR contracts must entail detailed examination of how the addition of large loads to the Public Service's system may create a dynamic need for multi-billion new generation and transmission capacity investments that unpredictably show up with no meaningful notice to this Commission and may not be easily

captured in a static marginal cost analysis . . . To that end, the marginal cost analysis that Public Service applied to the EDR ESA with [the data center customer] may not be adequate in future proceedings where the Commission reviews a similar Non-Standard EDR contract especially in light of the rapidly evolving and dynamic interaction between rising demand and the potential costs of serving that growth.").
[60] *Application of Virginia Electric Power,* Virginia Corp. Comm'n. Case No. PUR-2024-00135, Report of Hearing Examiner Bryan D. Stogdale, at 47 (Feb. 14, 2025).
[61] *Application of Virginia Electric Power,* Virginia Corp. Comm'n. Case No. PUR-2024-00135, Report of Hearing Examiner Bryan D. Stogdale, at 23 (Feb. 14, 2025).
[62] *Supra* note 58.
[63] *See* AEP Ohio Proposed Tariff Modifications, Ohio Power Company Testimony, at 18–20 (May 13, 2024).
[64] *See* AEP Ohio Proposed Tariff Modifications, Prepared Direct Testimony of Dennis W. Bethel on Behalf of Buckeye Power, Inc. and American Municipal Power [hereinafter Buckeye Power Comments], at 18–19 (Aug. 29, 2024).
[65] *Dayton Power & Light Co.*, 189 FERC ¶ 61,220 (2024).
[66] *Dayton Power & Light Co.*, FERC Docket No. ER25-192, Protest of the Office of the Ohio Consumers' Counsel [hereinafter Protest of the Office of Ohio Consumers' Counsel], at 4 (Nov. 13, 2024); *Dayton Power & Light Co.*, FERC Docket No. ER25-192, Limited Comments of Buckeye Power (Nov. 21, 2024).
[67] Protest of the Office of the Ohio Consumers' Counsel at 5.
[68] *Dayton Power and Light Co.*, 189 FERC ¶ 61,220 at P 23 (2024).
[69] *PJM Interconnection and Virginia Electric and Power Company*, 169 FERC ¶ 61,041 (2019).
[70] *See, e.g.,* Walker Orenstein, *Amazon Wants to Limit Review of 250 Diesel Generators at Its Minnesota Data Center,* MINNESOTA STAR TRIBUNE (Feb. 17, 2025) (noting that Amazon wants to install 600 megawatts of on-site diesel-powered generators at its new data center).
[71] *Constellation Energy Generation v. PJM*, FERC Docket No. EL25-20, Complaint Requesting Fast Track Processing of Constellation Energy Generation, LLC [hereinafter Constellation Complaint], at 20–21 (Nov. 22, 2024).
[72] *Constellation Energy Generation v. PJM*, Docket No. EL25-20, Exelon Comments in Opposition to the Complaint, at 3 (Dec. 12, 2024) ("Constellation refers to Co-Located Load as being 'Fully Isolated' and repeats that term again and again, but it remains untrue. If the loads at issue were truly 'isolated,' the PJM Tariff would not apply to them; no FERC-jurisdictional tariff would. And there would be no reason for this proceeding. As further discussed . . . the loads — whether they are what Constellation labels 'fully isolated' or not — unavoidably rely upon and use grid facilities and grid services in multiple ways. As a matter of physics and engineering, the load is fully integrated with the electric grid — this is the opposite of 'Fully Isolated.'").
[73] *See, e.g.*, *Constellation Energy Generation v. PJM*, FERC Docket No. EL25-20, Comments of the Illinois Attorney General, at 12–13 (Dec. 12, 2024); *Large Loads Co-Located at General Facilities*, FERC Docket No. AD24-11-000, Post Technical Comments of the Organization of PJM States, Inc., at 4 (Dec. 9, 2024) (stating that "[t]ransmission customers have paid the costs of supporting the grid necessary to allow [ ] nuclear facilities to operate").
[74] *PJM Interconnection, LLC*, FERC Docket No. ER24-2172 [hereinafter Susquehanna Nuclear Interconnection Agreement], Protest of Exelon Corporation & American Electric Power Service Corporation, Declaration of John J. Reed & Danielle S. Powers, at 4 (Jun. 24, 2024).
[75] Susquehanna Nuclear Interconnection Agreement, Motion for Leave to Answer and Answer of Constellation Energy Generation and Vistra Corp., at 11 (Jul. 10, 2024).
[76] *See* PJM, *2025/2026 Base Residual Auction Report*, at 11 (2024).
[77] *See 2024 Quarterly State of the Market Report for PJM: January Through September*, MONITORING ANALYTICS 3 (2024). *See also* Buckeye Power Comments, at 15 (Aug. 29, 2024) ("Co-location of data centers at existing multi-unit generators (nuclear plants are considered ideal) appears, at first blush, to be attractive as it can 'free-up' transmission capacity by reducing the net output of the generators that the transmission system must deliver. But co-location is a complicated scenario that can disrupt power markets and shift costs by removing large blocks of reliable base load power that will need to be replaced by other sources that will likely require transmission expansion elsewhere."); *Constellation Energy Generation v. PJM*, FERC Docket No. EL25-20, Comments of the Illinois Attorney General, at 3–4 (Dec. 12, 2024) ("The OAG's primary concern regarding co-location arrangements is the impact on resource adequacy and electricity energy and capacity prices . . . . The effect of removing the Illinois nuclear power plant capacity from the ComEd zone and from the PJM market generally can be expected to drive up prices . . . . In light of these multiple factors that are currently putting pressure on prices, co-location arrangements that reserve large blocks of power for discrete customers and prevent them from serving the grid as a whole can be expected to affect the 2027/2028 [capacity prices] . . .

. The OAG is concerned that co-location arrangements that abruptly remove large resources with high capacity values from the grid will cause further devastating price increases while the PJM markets struggle to respond.").
[78] *See infra* Section III.C.
[79] *See Constellation Energy Generation v. PJM*, FERC Docket No. EL25-20, Constellation Complaint, at 6–7 (Nov. 22, 2024) ("competition to serve data center loads [is] a threat to [utilities] bottom line").
[80] *Id.* ("Exelon's utilities already have taken the position that this Commission has decreed that Fully Isolated Co-Located Load is 'impossible' — and shut down any attempt by customers to co-locate data center load in their utility systems. As detailed in their petition for declaratory order filed in Docket No. EL24-149, Exelon is refusing to process necessary studies on these grounds, demanding expensive upgrades under their unified interconnection procedures, delaying agreed-upon work which will force a nuclear plant to take additional outages, and forcing additional services to be procured.").
[81] *See PJM Interconnection, LLC*, 190 FERC ¶ 61,115 (Feb. 20, 2025) (instituting a show cause proceeding pursuant to section 206 of the FPA, and directing PJM and the Transmission Owners to either (1) show cause as to why the Tariff "remains just and reasonable and not unduly discriminatory or preferential without provisions addressing the sufficient clarity or consistency the rates, terms, and conditions of service that apply to co-location arrangements; or (2) explain what changes to the Tariff would remedy the identified concerns if the Commission were to determine that the Tariff has in fact become unjust and unreasonable or unduly discriminatory or preferential, and therefore, proceeds to establish a replacement Tariff").
[82] *See In the Matter of: Electronic Tariff Filing of Kentucky Power Company for Approval of a Special Contract with Ebon International, LLC*, Kentucky Pub. Serv. Comm'n Case No. 2022-00387, at 2–4 (Aug. 28, 2023) (citing *Investigation into the Implementation of Economic Development Rates by Electric & Gas Utilities,* Kentucky Pub. Serv. Comm'n Admin. Case No. 327 (Sep. 24, 1990), *aff'd*, Kentucky Power Co. v. PSC of Kentucky, Franklin Circuit Court, Div. 1, Civil Action No. 23-CI-00899 (Dec. 30, 2024)).
[83] *Id.*
[84] *See* AEP Ohio Proposed Tariff Modifications, Ohio Power Company Testimony, at 2 (May 13, 2024). AEP Ohio requested PUC approval to create two new customer classifications: data centers with a monthly maximum demand of 25 MW or greater, and mobile data centers (cryptocurrency miners) with a monthly maximum demand of 1 MW or greater. AEP's proposed tariff would include new obligations for these customer classes, including a minimum demand charge of 90 percent for data centers, and 95 percent for cryptocurrency facilities, as opposed to the standard 60 percent minimum demand charge for other customers in the general service rate class. AEP Ohio would also require: the two customer classes enter into energy service agreements (ESAs) for an initial term of at least ten years, as opposed to the typical term of one to five years; requirements to pay an exit fee equal to three years of minimum charges should the customer cancel the ESA after five years; collateral requirements tied to the customer's credit ratings; requirements to reduce demand on AEP Ohio's system during an emergency event; and requirements to participate in a separate energy procurement auction than standard offer service customers
[85] *Id*. at 7–8.
[86] AEP Ohio Proposed Tariff Modifications, Initial Comments of Data Center Coalition, at 9–12 (Jun. 25. 2024).
[87] *Basin Electric Power Cooperative*, 188 FERC ¶ 61,132 at PP 15–16, 61 (2024).
[88] *Id.* at P 95.
[89] *See* H.B. 2101, 2025 Gen. Assemb., Reg. Sess. (Va. 2025).
[90] *See* Indiana Michigan Power Proposed Tariff Modifications, *supra* note 15, Direct Testimony of Andrew J. Williamson on Behalf of Indiana Michigan Power Company, at 5 (Jul. 19, 2024).
[91] *Id*. at 3, 6–7.
[92] *Id.* at 14.
[93] *Id.*; *id.* at 16 (tariff terms ensure data center provides "reasonable financial support for the significant transmission and generation infrastructure needed to serve large loads").
[94] Indiana Michigan Power Proposed Tariff Modifications, *supra* note 15, Direct Testimony of Benjamin Inskeep on Behalf of Citizens Action Coalition of Indiana, Inc. [hereinafter Citizens Action Coalition of Indiana Testimony], at 25 (Oct. 15, 2024).
[95] *Id.* at 36.
[96] *Id.* at 24–31.
[97] Indiana Michigan Power Proposed Tariff Modifications, *supra* note 15, Direct Testimony of Carolyn A. Berry on Behalf of Amazon Web Services, at 16 (Oct. 15, 2024).
[98] *Id.*
[99] *Id.*

[100] *See generally Application of Nevada Power Company to Implement Clean Transition Tariff Schedule*, Nevada Pub. Util. Comm'n Docket No. 24-05023 [Nevada Power Clean Transition Tariff], Direct Testimony of Manuel N. Lopez on Behalf of Regulatory Operations Staff (Jan. 16, 2025); Nevada Power Clean Transition Tariff, Direct Testimony of Jeremy I. Fisher on Behalf of Sierra Club, Docket No. PUCN 24-05023, at 10–20 (Jan. 16, 2025).
[101] *See generally* Nevada Power Clean Transition Tariff, Direct Testimony of Manuel N. Lopez on Behalf of Regulatory Operations Staff, at 7–8 (Jan. 16, 2025).
[102] Nevada Power Clean Transition Tariff, Stipulation (Feb. 7, 2025).
[103] *See, e.g.,* GA. CODE ANN. § 46-3-8 (allowing utilities to compete to provide service to certain new customers demanding at least 900 kilowatts).
[104] *See* Indiana Michigan Power Proposed Tariff Modifications, *supra* note 15, Citizens Action Coalition of Indiana Testimony, at 11 (Oct. 15, 2024) ("Using I&M witness Williamson's example portfolio that has an average resource cost of $2,000/kW and has an average accredited capacity of 50%, I&M will also need to make $17.6 billion in new generation investments to serve 4.4 GW of new hyperscaler load.").
[105] ERIC GIMON, MARK AHLSTROM & MIKE O'BOYLE, ENERGY PARKS: A NEW STRATEGY TO MEET RISING ELECTRICITY DEMAND 7 (Energy Innovation Policy & Technology, Dec. 2024).
[106] *Id*. at 8.
[107] *See id.* at 19.
[108] *See id.* at 8–21.
[109] *See, e.g.,* State ex rel. Utilities Commission v. North Carolina Waste Awareness and Reduction Network, 805 S.E.2d 712 (N.C. Ct. App. 2017), *aff'd per curiam*, 371 N.C. 109, 617 (2018).
[110] *See* Sawnee Electric Membership Corporation v. Public Service Comm'n, 371 Ga. App. 267, 270 (2024) (". . . [T]he text of the Act assigns each geographic area to an electric supplier but also includes the large load exception to allow customers to choose their electric supplier if certain conditions exist . . . the premises must be 'utilized by one consumer and have single-metered service").
[111] *See generally* David Roberts, *Assembling Diverse Resources Into Super-Powered "Energy Parks:" A Conversation with Eric Gimon of Energy Innovation*, VOLTS (Jan. 15, 2025) (featuring an Energy Innovation author describing energy parks in rural cooperative territory in Texas).
[112] *See, e.g.,* Paoli Mun. Light Dept. v. Orange County Rural Elec. Membership Corp., 904 N.E.2d 1280 (Ind. Ct. App. 2009) (ruling in favor of a cooperative utility that sued to prevent a municipal utility from providing electric service to a facility owned by that municipality but located within the cooperative's service territory).
[113] *See, e.g.,* Power for Tomorrow (last visited Jan. 29, 2025), which claims to be "the nation's leading resource" about the "regulated electric utility model" and generally opposes competition with utilities, in part by claiming that competition harms residential consumers. The effort is funded by utilities. *See* Energy and Policy Institute, *Power for Tomorrow* (last visited Jan. 29, 2025).
[114] AEP Ohio Proposed Tariff Modifications, Testimony of Paul Sotkiewicz on Behalf of the Retail Energy Supply Association, at 9–10 (Aug. 29, 2024).
[115] *Id.* at 15.
[116] *Id.* at 14–15.
[117] The trade group's analyst observed that in January 2023 AEP projected only 248 megawatts of data center growth through 2038, but one year later AEP projected 3,700 megawatts of data center growth by 2030. *Id.* at 10 (citing PJM reports).
[118] TYLER NORRIS ET AL., RETHINKING LOAD GROWTH: ASSESSING THE POTENTIAL FOR INTEGRATION OF LARGE FLEXIBLE LOADS IN U.S. POWER SYSTEMS 18 (Nicholas Institute for Energy, Environment & Sustainability, 2025).
[119] *Id*. at 5–6.
[120] *See* Ari Peskoe, *Replacing the Utility Transmission Syndicate's Control*, 44 ENERGY L. J. 547 (2023).
[121] Exec. Order No. 14,141, 90 FR 5469 (2025).
[122] *Id*.
[123] Va. J. Legis. Audit & Rev. Commission 2024-548, Report to the Governor & the General Assembly of Virginia: Data Centers in Virginia, at viii (2024).
[124] Brody Ford & Matt Day, *Price Tag Jumps for Amazon's Mississippi Data Centers Jump 60% to $16 Billion*, BLOOMBERG (Jan. 31, 2025).
[125] *Id.*
[126] *See generally* NATHAN SHREVE, ZACHARY ZIMMERMAN & ROB GRAMLICH, FEWER NEW MILES: THE US TRANSMISSION GRID IN THE 2020S, GRID STRATEGIES (Jul. 2024).
[127] U.S. Department of Energy, *National Transmission Needs Study* (Oct. 30, 2023).
[128] *See* Ari Peskoe, *Replacing the Utility Transmission Syndicate's Control*, 44 ENERGY L. J. 547 (2023)

[129] Sonali Razdan, Jennifer Downing & Louise White, *Pathways to Commercial Liftoff: Virtual Power Plants 2025 Update*, U.S. Department of Energy Loan Programs Office (Jan. 2025).
[130] *See, e.g,* Mississippi Power Company's Notice of IRP Cycle, Mississippi Public Service Comm'n Docket No. 2019-UA-231 (Jan. 9, 2025) (stating that because the utility has entered into two contracts with 600 MW of new load it will keep at least one coal plant open that had been slated for retirement); Mississippi Power Special Contract Filing, Mississippi Public Service Comm'n Docket No. 2025-UN-3 (Jan. 9, 2025) (showing that at least one of the two special contracts is with a data center).