Prepared Testimony of

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Introduction

Good morning, Chairman Yaw, Chairwoman Comitta, and members of the Senate Environmental Resources & Energy Committee. My name is Stephen M. DeFrank, Chairman of the Public Utility Commission (Commission or PUC). I appreciate the opportunity to testify before the Committees today on the topic of resource adequacy.

Discussion

Resource Adequacy

For nearly two decades, PJM Interconnection LLC (PJM) has been in a period of flat load growth and low capacity prices. After a final round of large natural gas plant development more than a decade ago, the overall market signal was to deactivate old or expensive-to-maintain plants. Paired with regulatory headwinds, the PJM region experienced a wave of retirements that have led to reduced available nameplate capacity. Now, with a sudden surge of demand from data centers, advanced manufacturing facilities, and other large load customers, both prices and concerns about grid reliability are rising.

The Commission sharpened its focus on the issue of resource adequacy nearly eighteen months ago, when it hosted a Technical Conference on Resource Adequacy in November of 2024. In the time since then, the PUC convened an *en banc* hearing on large load additions to the grid and issued a tentative and soon to be finalized model tariff for large load customers. That order, based on testimony and comments from hundreds of parties, included recommendations for many large load parameters, including:

- Megawatt (MW) Size – 50 MW for individual customers and 100 MW for aggregated customer accounts at a site.
- Contract Term – no less than five years.
- Load Ramp Term – up to five years, where the contract term would commence at the conclusion of the load ramp.
- Minimum Demand Charge – data centers never pay less than 80% of their monthly demand charges, regardless of usage pattern.
- Collateral Requirement – data centers must provide a sufficient amount of collateral to fully cover network improvement costs and interconnection facility costs.
- Contributions in Aid of Construction – EDCs may recover costs from data centers for costs directly incurred for interconnection and network upgrade that solely benefit the customer.

- Exit Fees – Exit fees will be applied to ensure any stranded costs from EDC system upgrades are recovered directly from the data centers causing the costs.
- Universal Service Fund Contribution – Data centers contribute, based on their size, between $250,000 and $1,000,000 annually into the EDCs customer assistance programs.
- Interruptible Service & On-Site Generation - EDCs may offer lower minimum demand charges to data centers enrolling in interruptible service or bringing their own generation.
- Infrastructure Upgrades by Data Centers – EDC tariff provisions will allow data centers themselves to upgrade electric infrastructure so long as it is done at EDC specifications.
- Public Interconnection Queue – EDC requirement to make available on a public website a list of data center interconnection applications, their location, MW size, and stage in the interconnection study.

The Commission recognized the importance of load forecasting and engaged a consultant to assist us with load forecasting and resource adequacy studies and has undertaken rulemakings that may be part of a comprehensive solution for addressing resource adequacy. While we've done many things already, much more work remains to ensure that our electric grid remains safe, reliable, and affordable.

When it comes to resource adequacy concerns, I have long encouraged the use of all means to address the issue. This means adding new generation to the supply stack as well as demand-side management.

Pennsylvania can facilitate new generation at both small and large scales. At the small end, reforming and rationalizing our net metering rules can add generation without expensive transmission upgrades, which is a savings to ratepayers. At the large scale, Pennsylvania can make it easier to site utility scale projects including new thermal generation resources. In fact, the Commission recently received a grant from the federal government to study our existing transmission system and look for sites – around retired plants, for example – that would be able to host new natural gas plants with minimal upgrades to the transmission system.

The other means to address resource adequacy concerns is demand-side management. Maximizing the effectiveness of the energy efficiency and conservation plans established by Act 129 and demand response can avoid the need for turning on – or of building in the first place – a new peaking unit. With system conditions as tight as they are, and prices as high as they are, we have to use every tool at our disposal.

Just as at the state level, there are two levers to pull at the RTO level to maintain resource adequacy – adding new generation and demand-side management. PJM needs to add new generation. I'll discuss in a moment some of the challenges that have prevented new capacity from coming online and some of the solutions that are being implemented or are under development. But as PJM is interconnecting significant new load for the first time in several generations, it must also explore ways to manage that load.

The PUC was a vocal advocate for PJM's concept of non-capacity-backed load (NCBL), which would have put data centers and other large loads first in line for curtailment at times when the grid was stressed by abnormally high demand. This proposal was part of the Critical Issue Fast Path that PJM launched last year to develop responses to data centers and other New Large Loads (NLLs). Essentially, any NLL that did not bring its own new generation to the grid at the time of interconnection would be subject to curtailment prior to any other customers on the PJM grid. Though that proposal was not adopted, my view at the time was that it would both encourage NLLs to bring new watts to the grid and insulate traditional load from any reliability issues caused by the NLLs.

More recently, PJM began a stakeholder process for a new Connect-and-Manage (CAM) policy. Much like its previous NCBL proposal, PJM's proposed CAM policy is seeking to create rules that would make certain new customers curtailable at moments of high grid stress. Again, as with NCBL, a data center or other large load customer would be able to avoid curtailment by bringing its own new generation to the grid, whether on-site or through a bilateral contract with a generator.

While I look forward to a time when sufficient capacity has been added to the system so that all customers have access to the affordable, reliable, and uninterrupted power that we should expect from our grid, the next few years may be challenging ones. In these circumstances, I think the CAM policy imposes a reasonable and manageable condition upon NLLs that are interconnecting rapidly throughout the region.

Load Forecasting

In the three decades since Pennsylvania restructured its electric system, some of the major functions and competencies of the Commission have changed. With generation development left to the market, the integrated resource planning process that was carried out by the utilities and overseen by the Commission became moot. With demand targets set for the whole region by PJM, it was no longer necessary for the PUC to maintain load forecasting expertise. The current environment, however, may require the Commission to chart new courses. In my mind, the most critical issue is ensuring accurate load forecasts.

The rapid increase in the number of interconnection requests for new data centers presents two problems for load forecasting. First, load forecasting is traditionally an annual activity. Now, the sheer speed and volume of new requests means that planners, developers, and

policy makers are trying to hit a constantly moving target. Second, there is more uncertainty around the forecasts of data center load than ordinary load sources.

The Commission recognized the importance of load forecasting and issued a request for proposals last year to engage a consultant. Our statement of work included performing a load forecast for Pennsylvania and the remainder of the PJM region, while assisting the PUC in rebuilding its own, internal load forecasting capabilities.

Making load forecasts as accurate as possible has never been as important as it is today. The General Assembly recognized that fact when it included electricity load forecast accountability in Act 45 last year. Act 45 provided additional authorities and responsibilities to the Commission to verify the accuracy of the load forecasts produced by the EDCs we regulate before those forecasts are built into the overall PJM forecast.

As we were ahead of many of our peer commissions in recognizing the need for independent load forecasts, we are working through OPSI to collect data from the entire PJM footprint and produce an independent load forecast, including an examination of potentially duplicative data center requests in different jurisdictions.

PJM Market Update

PJM is currently undertaking two major efforts in addition to its usual operation of the grid and administration of capacity markets. First, it is undertaking a reliability backstop procurement (RBP) to secure additional generation to meet the needs of NLLs. And second, it is about to launch a comprehensive review of market investment incentives.

The RBP, as initially proposed, will occur in two phases. First, PJM and a consultant will be managing a "match making" service to pair NLLs with developers of new generation in bilateral agreements. While nobody on either the supply or demand side will be forced to enter into a bilateral agreement, there is hope that PJM can pair together resources with NLLs that may not be aware of one another or may not be sophisticated enough market participants to proactively seek bilateral contracts.

The Commission supported this bilateral contracting period through the Organization of PJM States, Inc. (OPSI), which represents the utility commissions of the fourteen jurisdictions within PJM's service area. OPSI's goal is to secure enough new generation to meet the needs of NLLs without exposing other ratepayers to the risk of failed deals, either because a generator fails to deliver or because an NLL fails to materialize. The White House and the PJM governors have also insisted that data centers and other NLLs should absorb any costs they are creating without implicating residential and traditional business customers.

For any additional NLL needs that are not secured through bilateral contracting with new supply, PJM will administer a centralized procurement. This is a necessary second step to ensure that we have sufficient megawatts to keep our system affordable and reliable. While it is a necessary step, however, I do have some

concerns. Namely, as currently proposed, any costs of securing capacity through this centralized procurement be allocated out to the jurisdictional electric utilities. The Commission will work with our electric distribution companies to allocate these costs directly to the NLLs causing them, however, the risk exists that failed deals will impose costs on other ratepayers.

The second major push at PJM is to comprehensively review all of its markets – including its capacity, energy, and ancillary services markets – to determine if they are delivering the correct incentives to maintain existing capacity while encouraging investment in new generation. This process should be ramping up in June, and I intend to be heavily involved personally, through the Commission, and through OPSI.

Barriers to Entry for New Generation

New supply to the grid has been constrained for a number of years. For a long time, the primary problem was the PJM interconnection queue. In short, PJM would study every generator to determine what impact it would have on the local and regional grid. The generator was then responsible for the cost of any grid upgrades necessary to interconnect it without disrupting reliability throughout the system. For decades, this meant PJM was studying a handful of projects per year, each of which would be adding hundreds or even thousands of megawatts to the system. Think of a natural gas combustion turbine or coal plant.

Over the past fifteen years, however, the composition of new interconnection requests has changed drastically. With falling installation costs and favorable regulatory treatment, more and more of the new development in the PJM footprint was coming from solar, wind, or battery projects. Instead of studying a dozen projects per year that averaged a higher megawatt output per unit, PJM was studying thousands of projects per year with lower megawatt output per unit.

In short, the drastic change in the number and type of interconnection requests swamped the process that PJM had been using since its creation. The resulting backlog eventually required closing the interconnection queue to new requests while PJM redesigned its entire process. This was a necessary pause. While I believe PJM also needs to add new dispatchable thermal generation to its system, small renewables are going to make up an increasing share of our generation mix going forward.

PJM has finally worked its way through the entire backlog that developed before it closed the queue. Unfortunately, very few of these projects have actually converted to construction or energization after completing their studies. There are many reasons for this failure to energize, some of which rest solely with developers and some of which lie with PJM or with various government bodies.

For instance, developers often requested studies for very speculative projects that had not yet secured site control, necessary permits, or crucial financing. Under the old process, there was very little cost or risk to doing so. Unfortunately, due to the long delay in processing interconnection requests, even projects that were developed in good faith and had achieved those milestones often failed because of long delays at PJM. State and local governments can also present problems, delaying or denying permits for projects and stalling development. After many years with the queue stalled and other regulatory obstacles, many developers have looked for more favorable places to invest their time and capital.

However, there is good news on this front. PJM is about to close its Cycle 1 cluster, the first group of totally new projects to work through the streamlined queue. These projects are much more likely to energize as they are fresh projects and have faced more stringent conditions to be studied by PJM, including higher deposits and proof of having achieved various milestones such as site control. Within the next several months, we should finally see developers responding to new conditions in the PJM footprint.

Finally, I would like to mention headwinds that make the addition of new thermal generation to the PJM grid a challenge at the present moment. There are only three major companies in the world that manufacture gas turbines: GE, Siemens, and Mitsubishi. It is important to remember that in addition to ordinary economic growth in places like China and India – and the increased electric demand that goes with it – the massive expansion in data center demand is happening worldwide. In sum, turbine manufacturing timeframes may not match the pace of surging electric demand.

As a result, the supply chain for gas turbines has become extremely tight. In some instances, a developer ordering a turbine today may not receive that turbine for five or more years. This is another major bottleneck constraining the addition of new generation to our power system. And lastly, even developers with sites and turbines prepared may have trouble securing natural gas. Pipeline capacity is another constraint on the system, exacerbating the other challenges we face in bolstering the supply of new megawatts to the grid. The intersection of transmission assets in both the gas and electric sector has been a focus of my work as Chairman of the NARUC Gas Committee.

Conclusion

This is an extremely challenging time for our electric grid, but also an exciting one. All challenges present opportunities. Given our natural resources, our workforce, and our long history of energy development, I believe Pennsylvania can be a major driver of solutions to the resource adequacy challenges in our region. I look forward to working with the General Assembly to ensure that Pennsylvania meets these challenges and benefits from the opportunities that go with them. I welcome any questions.