U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON ENERGY & COMMERCE, SUBCOMMITTEE ON ENERGY

Testimony of Asim Z. Haque
Sr. Vice President – Governmental and Member Services
PJM Interconnection

March 5, 2025

For Public Use

Executive Summary

On behalf of PJM Interconnection, L.L.C. (PJM), the largest electric grid operator in North America, I am honored to present our views on the steps being undertaken on a daily and hourly basis to ensure the reliability of the electric power grid in the 13 states that we serve along with the District of Columbia. As a regional grid operator we face many new challenges, as well as opportunities, given the changing mix of electric generation resources combined with increasing demand for electricity, which must be reliably supplied 24 hours a day, 7 days a week.

Specifically, in this testimony, I detail:

- How PJM integrates competitive markets, reliable operations and long-term planning to attract investment in needed infrastructure and ensure reliable, efficient and cost-effective electric supplies to the 65 million Americans we serve
- The significant new demand/load forecasted to enter the system, due primarily to data center proliferation but also due to expansion of the electric vehicle market, electrification of building heating systems and growth in U.S. manufacturing
- Concerning trends as we see the pace of supply/generation retirements far exceeding the addition of new supply/generation being added to the system
- Actions PJM has undertaken to bring new supply to the system and to continue to appropriately reflect supply/demand fundamentals in our market

We look forward to continuing to work with this Committee and members on both sides of the aisle, as we have done in the past, to address these issues constructively and proactively. We are heartened that the Committee is conducting this hearing and by the Committee's interest in these important issues. We thank you for your consideration.

Introduction

Chairman Latta, Ranking Member Castor, Chairman Guthrie, Ranking Member Pallone and Members of the Subcommittee:

Thank you for the invitation to participate in this hearing to provide PJM's perspective as it relates to preserving electric grid reliability during this period of heavy forecasted demand growth. My name is Asim Z. Haque, and I serve as Sr. Vice President of Governmental and Member Services for PJM Interconnection.

Based in Valley Forge, Pennsylvania, PJM ensures the reliable flow of power to 65 million customers in all or parts of 13 states and the District of Columbia. PJM has no profit motive, as it effectively functions as a not-for-profit entity that is fully regulated by the Federal Energy Regulatory Commission (FERC).

We liken our role to that of an air traffic controller, but for the electric grid. We don't own the high-voltage transmission lines that carry electricity where it is needed most, but we direct and balance the flow of that power throughout our footprint and to neighboring regions when they need it.

In addition to managing reliable operations, PJM also plans necessary enhancements to the grid to ensure reliability into the future, and operates electricity markets within its region to competitively procure capacity and to efficiently dispatch resources to meet electricity demand, or load, in real time. The purpose of these electricity markets is to cost-effectively reinforce reliable grid operations.

Testimony

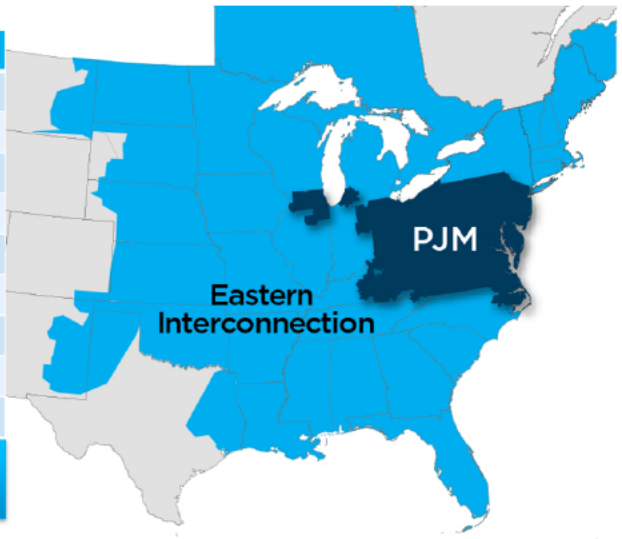
PJM and Its Role

PJM's footprint encompasses all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and Washington, D.C., as shown in **Figure 1.** As such, we are responsible for ensuring reliable and efficient delivery of electricity over the bulk electric system to one-fifth of the nation. We are fuel and technology neutral in carrying out this function, valuing resources using different fuels and technologies based on their reliability value and cost-effectiveness.

Figure 1. PJM Service Territory

Key Statistics	
Member companies	1,110
Millions of people served	67+
Peak load in megawatts	165,563
Megawatts of generating capacity	182,036
Miles of transmission lines (BES)	88,333
Gigawatt hours of annual energy	800,004
Generation sources	1,486
Square miles of territory	369,054
States served	13 + DC

- 27% of generation in Eastern Interconnection
- 24% of load in Eastern Interconnection



As of 2/2025

Integrating Competitive Markets and Transmission Planning

As a large regional transmission organization, or RTO, PJM undertakes three core functions:

- Real-time operation of the bulk power grid
- Market operations to ensure the most cost-effective and efficient dispatch of resources to meet customer demand
- Planning the expansion of the electric transmission system to meet future customer needs

These three legs of the stool, as outlined in **Figure 2** below, operate in tandem to ensure that there is a reliable and economically efficient delivery of electricity to the 65 million Americans we serve, not just today but into the future.

Figure 2. PJM's Primary Focus of Reliability Served by Three Core Functions

Markets Help To Reinforce Grid Reliability

PJM's markets exist to reinforce grid reliability by ensuring that market signals work in tandem with regional reliability requirements and those of the North American Electric Reliability Corporation (NERC). For example, our capacity market is designed to procure resources available to meet projected peak demand and other contingencies three years ahead of time. Through our Day-Ahead and Real-Time energy markets, we economically dispatch the most cost-effective resources to meet the hour-by-hour demand for electricity within the physical limitations of the transmission system.

In addition, based on economics and needs, in any given hour, PJM facilitates the export or import of power to and from our interconnected neighboring systems, including: those systems to our south, such as Duke Energy in the Carolinas and the Tennessee Valley Authority (TVA); the Midcontinent Independent System Operator (MISO) to our west; and the New York Independent System Operator to our north.

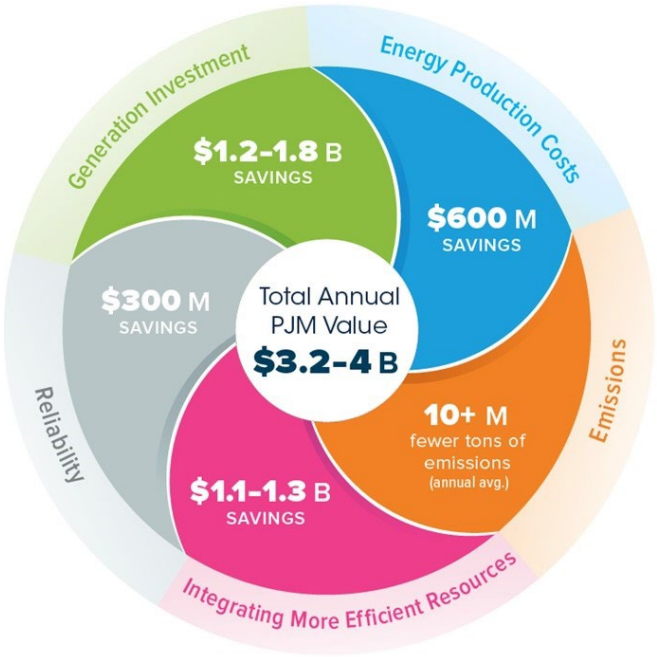
In fact, our strong interconnected ties with our neighbors have allowed us to facilitate exports to our neighbors in the MISO, TVA, Duke Energy-Carolinas and the Southwest Power Pool (SPP) during tight conditions, such as those experienced in Winter Storm Elliott in December of 2022, and have allowed end-use customers within the PJM region to benefit from lower-cost supplies of electricity from our neighbors during other times of the year.

These strong ties (which we refer to as "interregional transfer capability") help to support reliable and cost-effective operations throughout the entire Eastern Interconnection. PJM also is responsible for managing the interconnection of new generation seeking development in the region. In just a few years, we have seen our interconnection queue transform from one dominated by a few large natural gas projects to one today that is dominated by many, smaller, new renewable resources.

The Integration of Markets, Operations and Planning: Real Customer Savings

The efficiencies of this market-based approach to reliability, combined with our Planning functions and geographic scale, have resulted in real savings to customers, estimated at between $3.2 billion and $4 billion annually. Those savings fall into several categories as exemplified in **Figure 3**.

Figure 3. PJM Value Proposition



The customer savings outlined above are annual estimated savings in the delivery of electricity at the wholesale level, i.e., the delivery of electricity to "load-serving" entities, which can be your traditional utility or, in retail choice states, a competitive service provider. Individual states then have a variety of means to pass those savings through to retail end-use customers. These pass-through vehicles include: fuel-adjustment and purchased-power-adjustment clauses, which are line items in individual customer utility bills in traditionally regulated states; competitive auctions (known as default service auctions); or direct customer choice programs in states that have restructured the delivery of electricity to retail customers.

What is key is that the competitive wholesale market structure that PJM has championed over the years is fully adaptable to states that have restructured their markets, as well as those that have maintained the traditional model of a single regulated supplier of electricity (known as "vertical integration").

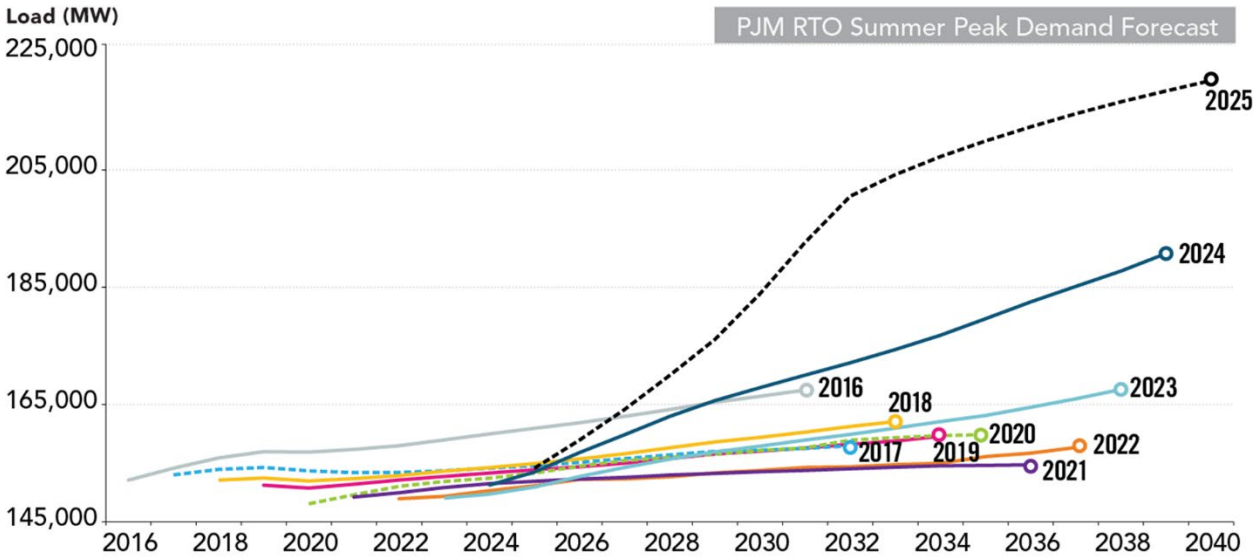
Major Demand Increases Forecasted

In January, PJM issued its 2025 Long-Term Load Forecast, which predicts significant growth in electricity demand looking out over a 20-year planning horizon, shown in **Figure 4**. It is also worth noting that this latest forecast includes substantial demand increases when compared to the one issued just one year prior, showing how quickly these industry dynamics are accelerating. Demand increases are being driven largely by data center proliferation, but also based on the growth in electrification (both EVs and for heating) and the onshoring of the manufacturing industry.

According to our most recent forecast, PJM expects its summer peak to climb about 70,000 MW, to 220,000 MW, over the next 15 years. The record summer peak for the PJM footprint occurred in 2006 at 165,563 MW.

While winter peaks will remain slightly lower, the forecast shows winter closing the gap in peak electricity use, estimated at 210,000 MW by 2039. PJM's record-high winter peak occurred in January, when PJM served a preliminary load of approximately 145,000 MW on the morning of Jan. 22, according to preliminary load estimates.

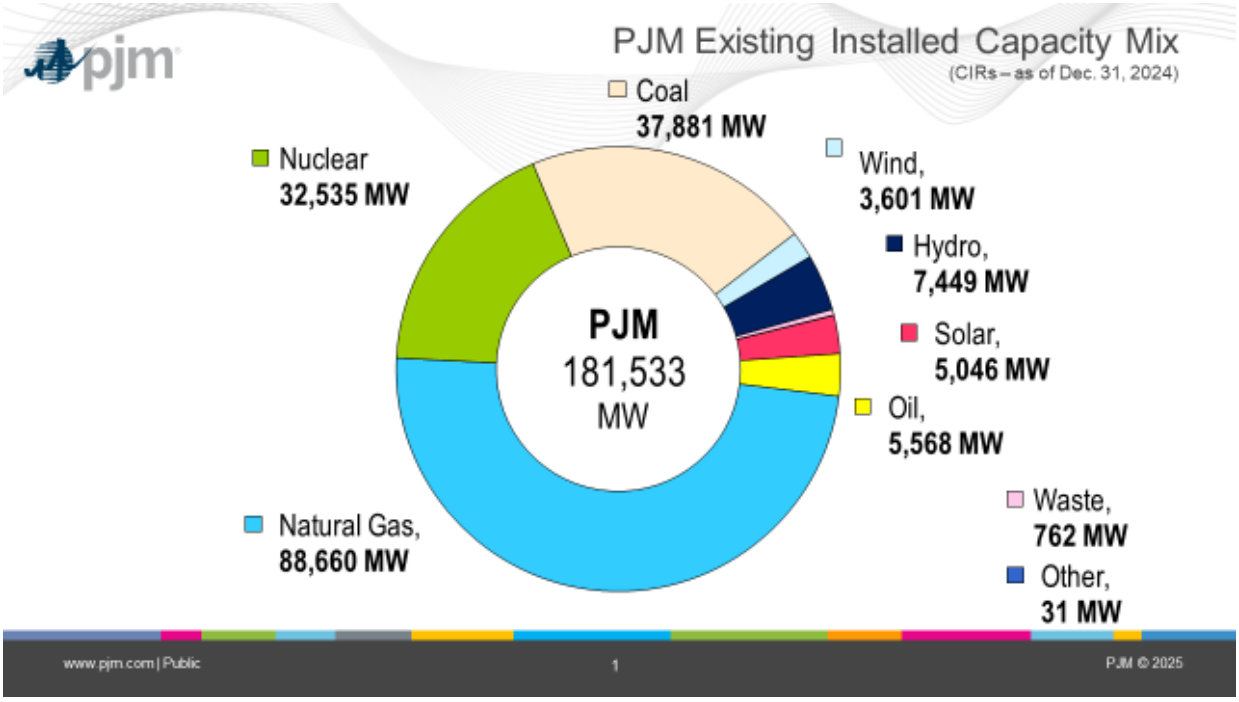
Figure 4. Electricity Demand Growth



Supply Decreasing on the System and New Supply Not Maintaining Pace

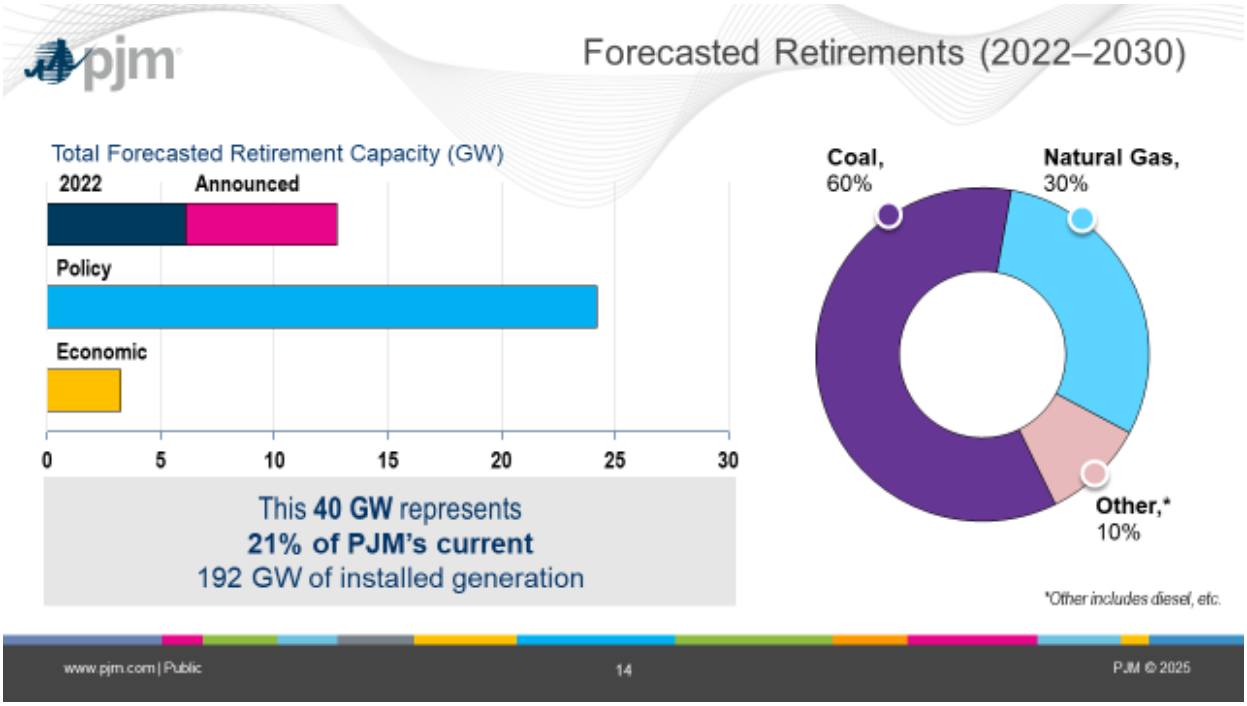
PJM has had a diversified portfolio of generation assets that have capably served to maintain grid reliability for many years.

Figure 5. PJM Existing Installed Capacity Mix (Capacity Interconnection Rights – as of Dec. 31, 2024)



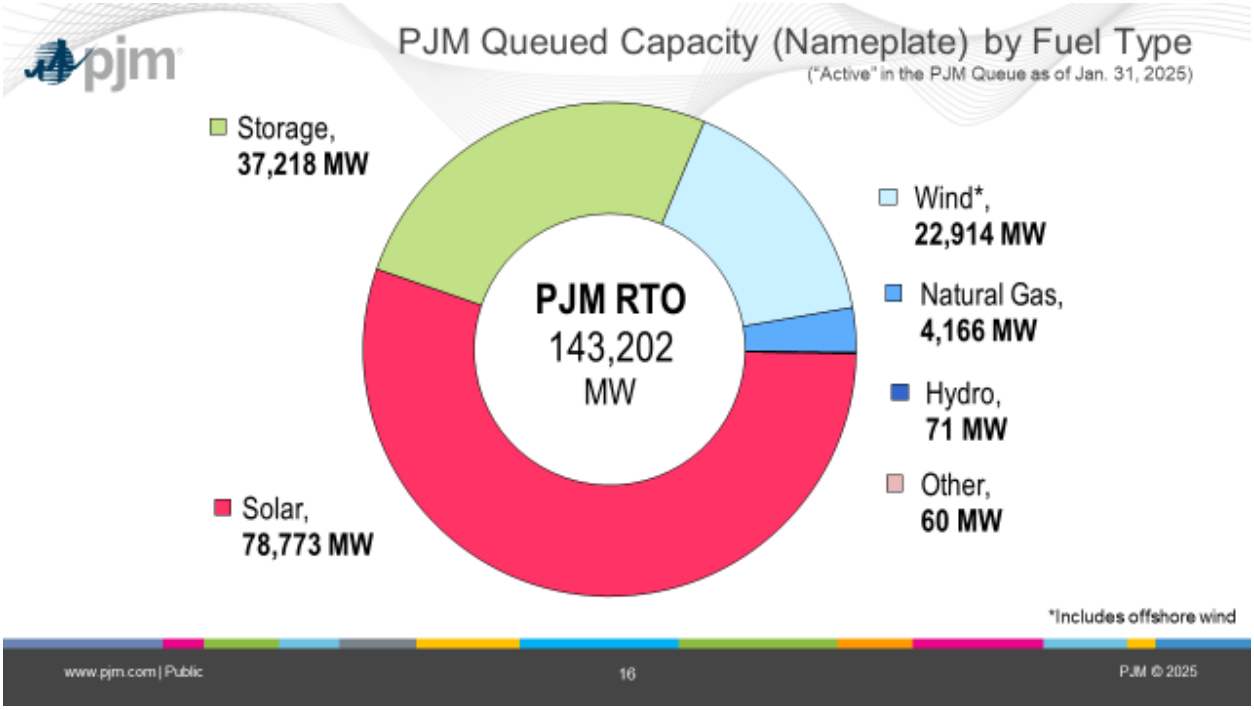
This portfolio is undergoing significant transition. Dispatchable generators, i.e., those generators that can quickly respond to directions from PJM operators regardless of weather, are retiring at a rapid, date-certain pace, largely due to state and federal policies. Although today the category of dispatchable generators largely refers to fossil-fuel-based resources, longer-duration batteries and potentially other technologies could also serve in this role in the future to the extent they can become more cost-effective and be deployed at scale.

Figure 6. Forecasted Retirements (2022–2030)



PJM is simultaneously experiencing an accelerating transition toward intermittent renewable generation. Policies, economics and consumer choices are shifting the grid away from dispatchable, emitting generation resources toward intermittent generation with little-to-no carbon emissions.

Figure 7. PJM Queued Capacity (Nameplate) by Fuel Type ("Active" in the PJM Queue as of Jan. 31, 2025)



PJM is resource agnostic and is working to facilitate the entry of these resources onto the system. As demand increases, PJM will need not only a substantial amount of this mostly renewable generation in our queue to construct to keep pace, but additional supply that has not yet entered our queue to meet our forecasted demand increases in the out years.

However, the Committee should note that renewable resources do not replace thermal dispatchable resources "1 for 1," and any system will require multiple megawatts of renewable resources to replace one megawatt of a retiring dispatchable resource due to former's lack of availability/capability in certain hours of the day and seasons of the year.[1] Further, unlike traditional thermal generation, renewable resources do not provide certain "essential reliability services"[2] that are necessary to balance and maintain the power grid.

PJM believes that the forecasted increase in demand is an "all hands on deck" event, and that we will need all of our resources in order to meet both the opportunity and challenge that this demand increase presents.

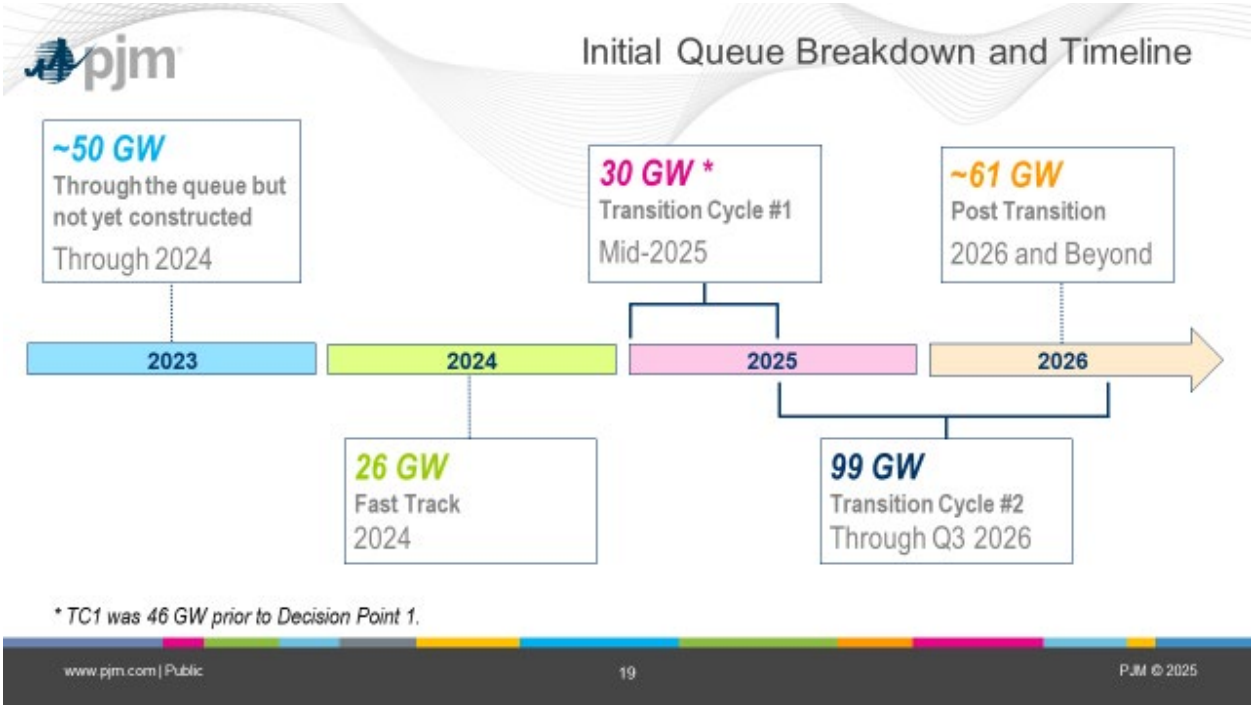
[1] Due to both natural resource constraints (the sun doesn't always shine and wind doesn't always blow) or technical and economic constraints (e.g., long-duration battery storage technology is still maturing), one megawatt of wind, solar or battery isn't enough to replace one megawatt of dispatchable thermal generation. It takes many megawatts, and usually a range of technologies available at different times, to effectively replace a megawatt of thermal generation.

[2] This term is defined by the North American Electric Reliability Corporation and includes physical grid concepts such as voltage control, frequency support, and ramping capabilities.

PJM is also responsible for managing the interconnection of new generation seeking development in the region. In just a few years, we have seen our interconnection queue transform from one dominated by a limited number of natural gas projects to one today that includes many, smaller, new renewable resources. You may have heard of delays in the processing of new generators' requests to interconnect, and these delays are not limited to PJM but faced by virtually all grid operators across the nation. They reflect the ever-increasing demand for developing new renewable resources through public policy initiatives as well as corporate goals and customer demands. However, these delays were exacerbated by our interconnection queues containing many speculative projects where developers would, at a very low cost, submit multiple hypothetical projects, even with intentions to only build one such project.

With the approval of FERC, PJM launched significant reforms that move the interconnection process from a "first-come, first-served" system of queue management to a "first-ready, first-served" system with progress payments and milestones designed to weed out speculative projects and the wasted time, resources and study work that resulted. The transition is expected to be completed next year, and below is a snapshot of the volume of projects that we have cleared, and expect to clear, through the queue.

Figure 8. Initial Queue Breakdown and Timeline



It is important to note that we currently have approximately 50 GW of resources that have cleared the interconnection process. Developers do not have any additional work to perform with PJM to study their safe and reliable interconnection to the power grid but are not proceeding to construction and operation expeditiously. In many instances, these developers are experiencing issues that are outside of their own control. These include project financing, global supply chain and permitting/siting lag or refusals. In 2024, PJM interconnected approximately 4,800 MW to the grid, not enough to keep pace with retirements and load growth.

Expediting Supply and Market Reforms to Support Reliabilty

In addition to processing thousands of megawatts of projects through the existing queue, PJM is doing everything it can within its given authority to expedite additional supply connecting to the grid. In December, PJM advanced three efforts to create lanes both within and outside of the queue process. These include:

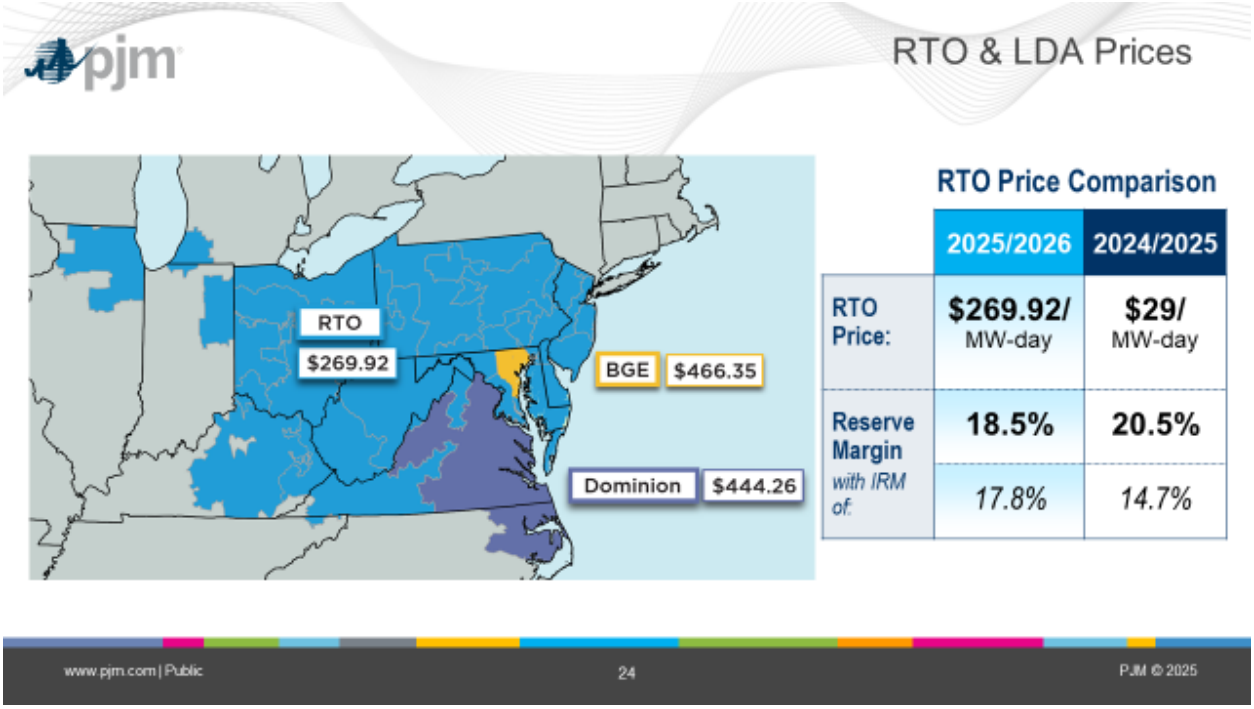
- **Capacity Interconnection Rights Transfer** – new generation resources swapping in for a deactivating generation resource at the same or similar location that then don't need to go through the generation interconnection queue (e.g., coal plant retirement and gas conversion or renewables swapping in)

- **Surplus Interconnection Service** – making it easier to add more generation to an existing site for generators that are not able to operate continually 24/7/365 (e.g., adding storage to a renewable site)

- **Reliability Resource Initiative** – a queue opened for new, shovel-ready resources that can come online quickly and that most effectively contribute to reliability (e.g., nuclear uprates, new nuclear, new gas, battery storage)

As to markets, PJM has also taken recent action to better reflect supply/demand fundamentals. Markets are essential in PJM to incentivize new generation entry from private developers as opposed to a paradigm where consumers pay for that new development. PJM is committed to its markets and the capacity market is an important tool that serves to procure enough supply to meet demand during a given year in the future. The price of capacity rose sharply in our most recent auction, reflecting the supply/demand concerns that we have been expressing for several years.

Figure 9. RTO & LDA Prices



Our reserve margin has declined, and as our reserve margin continues to decline, prices are likely to increase. Simply put, as supply decreases and demand increases, prices will go up. It is important to note that capacity prices are but one component of the total wholesale cost of power – meaning one part of a larger component (generation) of total wholesale power costs. In addition, the capacity market is a residual market, where power is procured only if you are not self-supplying or engaged in a bilateral contract. Further, for the end-use consumer, this cost can be hedged by these mechanisms or through state procurement auctions. The bottom line is that rising capacity prices are indicative of the tight supply/demand environment we are experiencing and could rise further should conditions persist or worsen.

PJM's Perspective Moving Forward and Policy Guidance

Grid reliability and, in particular, resource adequacy are national issues. NERC has identified that nearly two-thirds of the country is experiencing similar conditions to PJM. As demand rises, we must continue to maintain reliability for our consumers in as cost-effective a manner as possible. PJM has been warning of our concerns for some years now, and we are grateful to the Committee for the seriousness with which you are approaching this issue. After years of flat demand, the dynamics we are collectively experiencing now provide the opportunity for collaboration and advancement for the betterment of our nation.

As noted above, PJM is doing everything within its authority to try and tackle this supply/demand challenge. It is also very conscientious of maintaining cost-effectiveness for consumers while simultaneously attempting to balance the varied policy priorities of our policymakers.

PJM largely leaves the determination of policy to you and your counterparts at the state level. However, we urge that reliability considerations be built into the analysis of potential policies rather than either being taken for granted or considered only as an afterthought once legislation is enacted. To date, we have been able to manage reliability emergencies that are exacerbated by policy choices through various "reliability safety valves" that we sought to build into the rules, with use of the Secretary of Energy's Federal Power Act Section 202(c) emergency authority as a last resort when necessary.

Further, based upon the price increases that are likely to result from tightening supply/demand, rising costs should be considered as a natural byproduct of any policies that are enacted that exacerbate our current supply/demand challenge. Finally, anything this Committee can do to expedite the construction of new energy infrastructure, both generation and transmission, is welcome.

I thank you for the opportunity to present my testimony today. I look forward to your questions.