PJM Region Multi-State Technical Conference
Panel on supply and demand options for PJM
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To the 13 Governors who came together to hold this meeting and become more engaged in PJM matters, thank you for your interest and the invitation to speak. I am Rob Gramlich, Founder and President of Grid Strategies.[1]

States should take stock of the best practice market features that PJM has, and work on filling the gaps where the region (not just PJM Interconnection LLC as an organization but the region) falls short.

First, here is some context from my perspective:

PJM has provided massive benefits to consumers over its history. Competitive generation markets save consumers money and large Regional Transmission Organizations are necessary to capture these savings. PJM at times has conquered new frontiers of grid operation, with the first full implementation of locational marginal pricing (1997) and mixed integer programming in its real time and day ahead markets (2006) to enable very large regional efficient dispatch.

PJM staff is generally highly competent and well-intentioned. This was true when I worked there and true today.

Many of the issues are structural and out of the control of PJM Interconnection LLC or its staff.

The sudden capacity price increase is more than our political systems can handle. In the long run, capacity prices have been reasonable, and if consumers had been largely hedged, spreading the costs over more years, it would not have been the political and affordability problem it is today. Unfortunately, demand rose faster than most market

[1] Grid Strategies is a power sector consulting firm based in the Washington DC area. Our 17 experts research power systems and contribute to electricity policy and market design in federal, state, and regional proceedings. In 1999 I was a Senior Economist at PJM monitoring the early version of the capacity market. From 2001-2005 I was Economic Advisor to the FERC Chairman when FERC encouraged PJM to become an RTO and modified and approved the original functions and structure of PJM and other RTO/ISOs. I pay attention to most US regional markets and market structure and design in the US and around the world. Our clients include states, utilities, consumer groups, independent developers, environmental groups, and technology providers.

participants expected, supply was slow to be connected, and almost all end-use consumers were and are fully exposed to the sudden change in price.

Taking stock of PJM's market, here are some rough assessments relative to an ideal electric power structure.

PJM has these best practice features:

- Competition in generation. ☑
  - This puts investment risk on investors, saving consumers money relative to 2/3 of the country where utilities own generation.
- Large independent regional RTO. ☑
  - This enables generation competition and investment by IPPs with non-discriminatory interconnection and transmission, and improves efficiency of dispatch.
- Energy market using standard efficient features. ☑
  - Real-time and day ahead bid-based security-constrained economic dispatch with locational marginal prices and financial transmission rights
  - This enables least-cost dispatch and free-flow of power across a geographically large area, unlike the US West or Southeast.
- Highly competent RTO staff. ☑

These necessary features need to be developed at PJM and states in the region:

- Pro-active, multi-value transmission planning. 
  - PJM's approach has been reactive, incremental, and single-purpose as opposed to proactive and multi-value. The result has been a transmission grid that is not ready to accommodate today's load growth – the grid is not big enough, nor has it been built out in a way that maximizes benefits while minimizing costs for customers.
  - A challenge is that transmission owners control cost allocation, and the states and PJM Interconnection each have other roles. Significant leadership is required to bring the states, transmission owners, and PJM Interconnection all together into a cohesive whole.
  - To find consensus, I recommend the states, transmission owners, and PJM follow the approach strongly suggested by FERC in Order 1920-A with a robust core plan for economics and reliability, followed by other scenarios

that might have different cost allocation approach that still respect beneficiary pays principles.
    - PJM should have the right to make filings under Federal Power Act (FPA) Section 205 to its regulator on plans and cost allocation, as the other RTOs do. Technical collaboration between transmission owners and PJM staff on complex grid configuration questions should be encouraged rather than prevented, and at the same time, PJM should rely not only on sponsored projects but also on centrally determined projects which would allow for more efficient transmission solution development.
    - MISO and SPP are good models of proactive, scenario-based, multi-value transmission planning in multi-state regions.
    - Similarly, PJM should work with transmission owners on advanced transmission technologies. PJM staff bring substantial expertise and can recommend opportunities for efficient use of the existing transmission network. States and utilities should quickly employ grid-enhancing technologies and high-performance conductors such as carbon and composite core conductors and superconductors to significantly increase delivery capacity within existing corridors.

- Speedy generator interconnection. 
    - There are modest improvements being implemented that should have happened years ago.
    - PJM should move towards SPP's Consolidated Planning Process approach. A clearer, consistent and predictable entry fee will stabilize queues and enable much faster processing. Alternatively, an open season for available capacity could be employed.
    - PJM should move towards California ISO's pro-active planning of transmission to connect needed generation by zone.
    - PJM should pursue options to interconnect resources more quickly through generator replacements and flexible interconnection services such as Provisional and Surplus Interconnection Service and explore ways to further speed up study timelines.
    - Markets and interconnection should enable diverse resources. The basic market design does this inherently, and allows state and federal governments to provide incentives to resources they choose. Market design should not second-guess policy makers. ISO/RTOs should not resuscitate costly MOPR policies targeting state public policies.

- Speedy generator permitting. 
    - States should adopt New York-style central project permitting to enable faster generation and transmission permitting.

- Hedging for all customers. 

- Mass retail load in the PJM region and through the whole Northeast US is largely unhedged. This was an unintentional result of largely failed retail market design. Whereas successful retail markets have sophisticated load-serving entities who procure power in long-term PPAs on behalf of the load they serve, resulting in price protections for all consumers, this does not happen in restructured PJM states beyond some short-term (<=1 year typically) by competitive retailers, leaving most retail customers exposed to sudden capacity price swings as we are witnessing.
- This is the same problem California had in its first attempt at electricity restructuring in 2000-2001, costing $40 billion. Now the California PUC directs load-serving entities to procure capacity through long-term power purchase agreements.
- Confusion has reigned about who has responsibility for hedging in restructured Northeast states. I believe it is the states'. It is not FERC nor RTO/ISOs' responsibility to perform economic hedging long term or dictate the risk tolerance of retail customers.
- In 2020 I wrote: "States have an opportunity to facilitate better resource procurement and benefit customers by ensuring there are entities equipped to hedge on behalf of customers, enabling less reliance on capacity markets."
- State-directed procurement can be consistent with the law including the *Hughes*[2] case. The Allco case[3] provides a roadmap. As I understand the law, the goals of the program need to be focused on state objectives (as opposed to aiming at federally regulated markets), it cannot require any particular action in federally regulated markets, and the load-serving entity should be directed to meet the objectives with some flexibility to execute specific contracts, and those contracts should be subject to FERC review.
- States can choose how much they wish to rely on retail competition vs monopoly load-serving; in either case, states should ensure retail customers are hedged to some extent. In Texas and Australia retail competitive markets, load-serving entities hedge for the load they serve.
- PJM should enable and encourage these bilateral contracts by providing technical analysis on issues such as capacity accreditation, and enable a clear path for load-serving entities to receive credit for their procurement so the LSE (and the load it serves) only needs to procure the net unhedged amount out of the central PJM capacity market (Base Residual Auction). In other words, let's put the 'R' back in BRA.

- Firm financial commitments by all interconnection generation and large loads. 
  - Many observers support firm financial commitments by large loads to reduce the risk of stranded costs, and to improve the accuracy of forecasting.

[2] *Hughes v. Talen Energy Marketing LLC*, 578 U.S. 150, 163 (2016).
[3] *Allco v. Klee*, 861 F.3d 82, 87 (2d Cir. 2017)

  - PJM and states can look at Alberta's new approach which includes financial commitments.
  - PJM can accept load forecasts based on quality of information which in turn can be based on firm financial commitments of the new large loads in LSE forecasts.

- Interregional transmission planning. 
  - There has been minimal interregional transmission planning between PJM and its neighbors, which has the effect of raising capacity and energy prices in the region.
  - There should be credit for quantifiable load and generation diversity between regions, and the transmission capacity that enables its value to be captured.[4] New imports should be allowed to sell capacity into PJM.

- Seasonal capacity market. 
  - The capacity market (which is essential if the state or region has no hedging as is the case in PJM, but optional otherwise), should be a prompt seasonal market, and more aligned with neighbors MISO and New York ISO.
  - Seasonal designs better account for various resources' varying capabilities during those seasons.

- Active demand side participation. 
  - States and load-serving entities can do a lot more to exploit demand-side opportunities.
  - PJM should actively work with states to foster beneficial energy efficiency and demand response, through ISO/RTO markets as appropriate.
  - Everyone should see a price if they want it and be able to be dispatched, especially larger loads. ISO/RTOs including PJM should advance its central optimization computing power with AI.

[4] See Brooks, Silverstein, and Gramlich, "Resource Adequacy Value of Interregional Transmission," https://gridstrategiesllc.com/wp-content/uploads/GridStrategies_RAValueInterregionalTx_250601.pdf