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I appreciate the opportunity to participate in the Commissioner-led technical conference on Meeting the Challenge of Resource Adequacy in Regional Transmission Organization and Independent System Operator Regions on June 4-5, 2025. The supplemental notice for the conference raises important issues about the role of capacity markets in ensuring reliability as new patterns of electricity demand emerge and state and federal policies affecting the energy sector continue to evolve. Before addressing some of the specific questions for Panel 7, it is important to consider the fundamental role of capacity markets.

Capacity markets are designed to meet higher planning reliability standards than would occur in an "energy-only" market by attracting levels of investment necessary to satisfy target installed capacity margins. Accordingly, capacity markets typically set prices at levels at or above the net cost of new entry of supply when installed capacity margins are near a minimum target level and allow prices to fall as the installed capacity margin grows to moderate levels using sloped "demand curves" for capacity.

An efficient capacity market sets clearing prices in proportion to the marginal reliability value of capacity, allowing prices to vary based on the location, the season, and the availability characteristics of each capacity resource. These variations in prices help channel investment towards projects that provide a better overall mix of attributes relative to the costs. At the margin, this influences numerous decisions such as: (a) whether to retire a non-firm gas-fired unit in an import-constrained zone or a dual-fueled generator in an unconstrained area, (b) whether to build a battery storage system with two or four hours of storage capability, and (c) whether to award a long-term power purchase agreement for RECs to a particular wind or solar generation project. Thus, capacity markets affect not only the level of investment, but also *which* projects attract investment.

Robust capacity markets facilitate demand-side participation to the extent that load curtailment is more cost-effective than generation and transmission alternatives for satisfying planning reliability criteria. Transparent capacity price signals and cost allocation methods help price-sensitive loads adjust their consumption patterns to save money, improving reliability and lowering costs for the overall system.

Transparent capacity prices and accreditation methods also help inform policymakers and resource planners about the costs and benefits of regulatory policies and public policy-driven investments that affect reliability. Quantifying the capacity-equivalent benefits and/or cost savings from individual transmission projects facilitates a more efficient selection of projects in competitive solicitations and other regulated procurements.

These comments are structured as follows. The first section briefly addresses Panel 7 Questions 1 & 2, highlighting key challenges for resource adequacy for NYISO and ISO-NE over the coming decade. The second section addresses Questions 3 & 4 together, while Questions 5 and 6 are each addressed separately.

1. What is the state of resource adequacy in NYISO and ISO-NE in the near term (e.g., over the next five years) and over the longer term (e.g., ten years and beyond)? (a) What factors present the greatest uncertainty when projecting future resource adequacy challenges? (b) Are the capacity market constructs delivering resource adequacy in these RTOs/ISOs? Why or why not?

2. To what extent do uncertainties external to NYISO and ISO-NE—such as natural gas supplies or infrastructure constraints, supply chain limitations, and siting and permitting delays—affect resource adequacy planning in the Northeast? How can NYISO and ISO-NE better address those uncertainties?

NYISO's 2025-Q1 Short-Term Assessment of Reliability ("STAR") indicates that under the base case assumptions NYISO satisfies resource adequacy criteria through the ten-year study period, while unmet transmission security needs do not emerge on the bulk system for Zone J (i.e., New York City) until after the 2031-32 Capability Year.[1] ISO-NE's 2023 Regional System Plan ("RSP") did not identify unmet resource adequacy needs through the ten-year study period, although it stated that enhancements in capacity accreditation may lead to the recognition of unmet needs sooner in a future assessment. Both operators highlight potential risks that could lead reliability needs to emerge sooner such as: natural gas supply constraints, faster load growth, delays in new resource development, unexpected plant failures, and extreme weather.

Capacity markets have undoubtedly contributed to the excellent track record of reliability for both regions over the past 25 years even as wholesale market costs have generally fallen relative to inflation. Although the reliability planners forecast adequate resources in the short to medium term, there are key uncertainties regarding future load growth and the speed at which new investment can be mobilized to avoid reliability problems and/or increased costs for electricity consumers.

On the demand side, the following two components are causing the most uncertainty:

[1] NYISO and ISO-NE have zonal capacity market requirements that are set by transmission security needs when they require more capacity in a zone than needed for resource adequacy. While the expressed focus of this technical conference is on resource adequacy, these comments also consider capacity requirements driven by bulk system transmission security criteria to the extent that they require higher levels of capacity than resource adequacy alone.

- *Data center development* – Developers seek a mix of low costs, reliability, and rapid interconnection, so the pace of data center development is not strictly exogenous and will depend partly on the speed and cost of interconnection and the availability of surplus generating capacity in specific areas, making it more challenging to forecast.
- *Electrification of heating and transportation* – Load growth driven by state policies to encourage a transition to heat pumps and electric vehicles has consistently been over-forecasted in recent years as these programs have been less effective than necessary to satisfy the state policy targets. Reliability planners may be able to improve load forecasting by focusing more on the programs used to execute these policies and less on the policy targets.

The supply response to these factors is also affected by key uncertainties:

- *Policy-driven investment in renewables and battery storage* – Development of zero-emissions resources would satisfy a portion of future reliability needs, but the actual pace of development has lagged far behind policy targets, making it difficult to determine how much conventional generation will be needed to satisfy reliability needs.
- *Regulatory requirements to be considered emission-free resources in New York State* – Since 2019, New York State law requires a zero-emission power system by 2040, but there are still no clear regulations about what technologies will qualify in 2040, what technologies can be sited and permitted for use before 2040, or how public service law will prioritize reliability criteria versus emissions goals when both cannot be satisfied. This lack of clarity: (a) is a barrier to investment in conventional technologies that are capable of adapting to the 2040 zero-emission requirements in the future, and (b) deters investment in emission-free technologies whose future profitability would depend on the details of the regulations implementing the 2040 mandate.
- *Regulatory barriers to natural gas pipelines and generating capacity* – Although there are seemingly clear restrictions on the development of fossil fuel infrastructure in the Northeast, some restrictions could be loosened in the future to address reliability needs, clouding the outlook of investors in both clean and conventional resources.
- *Slow and costly interconnection* – The interconnection processes slow down the development of some projects. To be deemed deliverable, some projects are assigned inefficiently large transmission upgrade costs.

If rapid load growth, led by energy-intensive data center development, outpaces development of new supply, it will tend to degrade reliability. However, the inability to develop new electricity supply in a timely and cost-effective manner will discourage new investment by large load developers that have alternative investment opportunities, thereby slowing economic growth.

Resolving these problems efficiently will require a combination of market, planning, and policy solutions. Efficient capacity market design cannot fix siting and permitting barriers or bring stability to state and federal policies and procurements related to the development of clean energy resources, but the market can provide incentives that: (a) maximize the capability of the existing supply and of demand-side resources to curtail load to support reliability, (b) speed up interconnection by simplifying the deliverability component of the interconnection process, and (c) channel investment in large load facilities to areas where they can be accommodated more cost-effectively. Ongoing and potential capacity market enhancements to address these problems are discussed below in the responses to questions 3, 4, and 5.[2]

3. How do NYISO and ISO-NE consider electric-gas coordination issues in the context of resource adequacy planning and capacity resource accreditation?

4. How will state public policy requirements change the resource mix and expected seasonal or hourly demand patterns? Do state public policy requirements create challenges for your regions in achieving resource adequacy at just and reasonable rates?

The Northeast is transitioning from a conventional generation fleet relying mostly on natural gas and other fossil fuels to a fleet in which most resources are intermittent, duration-limited, or limited by gas pipeline constraints in the winter. This transition is the result of state and federal policies to encourage new development of clean resources and to restrict development of new gas pipelines and fossil-fuel generating capacity. Ongoing capacity market reform efforts are helping NYISO and ISO-NE cope with this transition cost-effectively, giving the region additional time before significant new infrastructure becomes essential for maintaining reliability and allowing for economic development.

NYISO and ISO-NE have wisely placed a strong emphasis on the development of seasonal capacity markets with marginal capacity accreditation. NYISO first implemented marginal capacity accreditation in May 2024 and has been working with stakeholders to develop winter capacity market parameters that adjust independent of summer parameters.[3] ISO-NE is working with stakeholders on a multi-prong effort to design seasonal markets with marginal capacity accreditation that distinguishes between firm and non-firm gas generation for implementation in

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2 In addition, we have recommended evaluating reforms outside the capacity market that would facilitate forecasting and interconnection of large load facilities. See *Post-Technical Conference Comments of Potomac Economics* in AD24-11 on "Co-Location of Large Loads at Generating Facilities," dated December 11, 2024.

3 Marginal capacity accreditation that properly distinguishes between firm and non-firm gas-fired generation will be implemented in the 2026/27 Capability Year.

May 2028. Overall, gas-electric coordination is an example of where state and federal policies have created a great deal of uncertainty, while the capacity market is playing an essential role in maintaining resource adequacy while avoiding major increases in costs to consumers.

When public policy transmission planning processes overbuild (i.e., build more than the efficient amount of) transmission on some corridors, capacity prices may be temporarily reduced in downstream areas and increased in upstream areas, causing price volatility and financial risk for generation investors that may undermine incentives for investment in affected areas. The adverse impact of transmission over-build on the competitive market can be avoided by subjecting proposed projects to rigorous cost-benefit assessments. Merchant investors naturally do this when they assess whether the future revenues are expected to justify the costs of a project, thereby helping to avoid saturating a particular area with excessive levels of investment that would harm existing suppliers in the area. In a similar way, transmission planners should avoid excessive and uneconomic investments that harm existing suppliers.

5. How might your capacity markets be improved to meet the challenge of resource adequacy?

As mentioned above, NYISO and ISO-NE are adapting their capacity markets to cost-effectively address reliability issues arising from limitations on natural gas infrastructure and the subsidization of intermittent and duration-limited resources. In this regard, the two key initiatives are marginal capacity accreditation and seasonal capacity markets. These reforms are expected to be implemented by winter 2028/29.

Policies to promote investment in zero-emissions resources have dramatically increased the number of projects that must be evaluated for capacity deliverability in the interconnection processes. The deliverability of one project throughout a given capacity region depends on the existence of multiple other proposed projects, increasing the complexity of the interconnection process and requiring reassessments when some projects inevitably drop out of the process, thereby adding delays for some other projects in the interconnection process. Deliverability testing is necessary in the interconnection process to address a failure of capacity markets to reflect locational differences in capacity prices, but it would be more efficient to reform the capacity market to reflect these locational differences in value, which would also simplify the interconnection process. We have recommended that NYISO implement more granular zones in the capacity market, and NYISO has signaled that it intends to reform its capacity market to better reflect locational differences.[4]

[4] See NYISO's presentation to the Installed Capacity Working Group titled *Capacity Market Structure Review*, dated April 1, 2025, slides 30-35.

6. Would an alternative resource adequacy construct used by another RTO/ISO be more effective at delivering resource adequacy in your regions? If so, why?

The supplemental notice invites consideration of whether CAISO and SPP have alternative resource adequacy constructs that might perform well in regions that currently have capacity markets. Both alternatives rely on individual load serving entities to self-supply or contract bilaterally for sufficient capacity to satisfy their portion of a regional capacity requirement. Both alternatives are designed to build new generation when necessary to satisfy resource adequacy needs, while periodically retiring existing generators if they become more expensive to maintain than a new generator but otherwise paying the existing generators lower rates per MW-year.

Some NYISO stakeholders are currently advocating for two additional alternatives. The first is a bifurcated capacity market, which would establish two "market clearing" prices, one for existing units and a higher one for new units. The second is a capacity market with a GFC-based demand curve for existing units and long-term power purchase agreements as necessary to attract new generation. Currently, Potomac Economics is conducting a study comparing these two alternative constructs to NYISO's current capacity market using a capacity expansion model to assess implications for investment efficiency, consumer costs, and reliability.[5] Like the CAISO and SPP constructs, the NYISO-Bifurcated and NYISO-GFC proposals are intended to build new capacity when cost-effective while maintaining existing economic capacity at a lower overall cost to consumers.

The CAISO and SPP constructs and the two NYISO stakeholder proposals provide inefficient market incentives such as: (1) weak incentives for maintaining existing facilities leading to more frequent forced outages, (2) incentives for incumbent generators to export capacity leading to a need for more-costly new resources, (3) weak incentives for capacity imports unless they are paid more than other existing capacity, (4) poor incentives for demand response unless they are paid more than other existing capacity, (5) boom-bust cycles that lead to the retirement of existing generation followed by reliability violations and subsequent investment in higher-cost new generation, and (6) incentives for some existing resources that are economic to remain in service to threaten to retire unless they receive a cost-of-service contract.

As a result of these incentives, our ongoing study of the NYISO stakeholder proposals suggests that they would result in lower resource adequacy margins and much less efficient outcomes without delivering meaningful long-term savings to consumers. Our work most likely understates the value of uniform price capacity markets, which provide incentives for a wide

[5] See presentation to the Installed Capacity Working Group titled *MMU Analysis of Capacity Market Structure Review*, dated May 5, 2025.

range of decisions undertaken by existing resource owners, new developers and consumers beyond the direct knowledge of planners and regulators.

The competitive wholesale markets have an excellent track record of providing incentives for new capacity investment when prices are far below the net cost of new entry of a hypothetical new generator. For instance, over the past 15 years in NYISO, an estimated 2.8 GW of new generating capacity has been built on a merchant basis when capacity prices were far below the net cost of new entry estimated for a hypothetical new unit.[6] Presumably, these investors were able to take advantage of unique cost advantages or made errors in forecasting that redounded to the benefit of consumers. These benefits of the competitive market with uniform pricing will be lost if NYISO and ISO-NE adopt one of the alternative constructs.

Conclusion and Recommendations

I appreciate the Commission's efforts to support resource adequacy and the opportunity to participate in the technical conference. State policies are requiring NYISO and ISO-NE to transition to generation fleets with more intermittent generation, duration-limited capacity, and natural gas supply limitations in the winter. To cope with these changes more cost-effectively, the ISOs are wisely reforming their capacity markets to include distinct summer and winter requirements and other market parameters, marginal capacity accreditation, and better locational capacity pricing. It would be counter-productive to discard capacity markets with uniform pricing, which have evolved over the past 25 years. However, it would be beneficial for state policy makers to provide additional clarity on key regulations affecting the development of electric generation and natural gas infrastructure.

This concludes my written statement.

6 Most notably, this includes: the Empire generating station (2010), Bayonne Energy Center (2012 & 2018), CPV Valley generating station (2018), and Cricket Valley Energy Center (2019 & 2020).