Stakeholder Feedback for the NYISO on the GE Study and Market Design for DERs, SCRs, and ESRs

The signatories of these comments appreciate the NYISO's willingness to consider feedback on the GE Energy Consulting study on Valuing Capacity for Resources with Energy Limitations ("GE Study"), and the proposed market design changes for Distributed Energy Resources ("DERs"), Energy Storage Resources ("ESRs"), and Special Case Resources ("SCRs") that flow from it. We also commend the NYISO for their significant efforts in the DER and ESR Roadmaps to attract these resources and increase competition. Our comments are intended to ensure that the effort that has gone into the roadmaps results in effective market designs. Undercompensating for capacity value will doom implementation of the roadmaps, and so it is imperative to determine compensation methodologies that reflect the value these resources are able to provide to the market.

In this document, we first provide introductory comments on the NYISO's proposed treatment of DERs, ESR, and SCRs relative to traditional generation resources. We then provide specific feedback on the GE study, recommendations for next steps with respect to analysis, documentation of other relevant studies, and an example of data requests that parties interested in facilitating a separate study of the capacity value of energy-limited resources would need.

Introductory Comments

The GE Study significantly undervalues Energy Limited Resources ("ELR") including, but not limited to, DERs, ESRs, and SCRs. The NYISO's proposed market design resulting from the GE study creates discriminatory market treatment for these sets of resources compared to traditional generation resources. With unfavorable wholesale market treatment, these resources will avoid participating in the wholesale market, jeopardizing all the potential benefits of the roadmap, including strengthening competition, enhancing reliability, and lowering both costs and emissions.

Instead of having a capacity market that evaluates resources based on how they actually perform when the grid needs them most (during peak or scarcity conditions) and compensating or penalizing those resources accordingly, the NYISO is proposing a market that penalizes ELRs by 50% (for a four-hour ELR) before they ever have a chance to demonstrate their availability during actual peak or scarcity conditions. On the other hand, traditional generators can sell their entire output for capacity without the same upfront de-rate and, if they are unavailable during peak hours or scarcity hours, face virtually no penalty in the capacity market other than a minor adjustment to their EFOR-D. **Essentially, regardless of performance from an ELR and a generator during actual peak or scarcity conditions, a generator with the same MW output capability as an ELR could sell nearly twice as much capacity.** This is discriminatory and will lead to inefficient market outcomes. Moreover, if the ELR could ramp up to its full capability within a matter of seconds or minutes and be available for the first hour of a reliability event, and the generator took four hours to ramp up and was not available for dispatch during a scarcity event, the generator would still receive twice as much capacity value as the ELR**.**

Competitive markets should be meritocracies that compensate and penalize resources for the value they actually deliver. If the NYISO has concerns about how resources would perform during reliability events because of limited duration, then it should be reflected in the capacity market design, and penalties for non-performance should be structured accordingly. The NYISO has suggested it relies on the energy and

ancillary markets to incent flexibility and performance during periods of system need. However, this mindset fails to recognize that new investments are driven by capacity markets, and that NYISO will never have the flexible resources they need in the energy and ancillary markets if the resources are not built in the first place, or are built, but do not participate in the NYISO's markets.

As such, before taking any steps to de-rate ELRs, the NYISO should reconsider its proposed market design. If the NYISO is concerned about 600 hours of reliability events per year in a base case as detailed in the New York State Reliability Council's ("NYSRC") Installed Reserve Margin ("IRM") study assumptions,[1] then it is difficult to imagine that an EFOR-D construct that makes no distinction for capacity purposes between hours in which there are and are not scarcity events would be an appropriate market design. A far more efficient and meritocratic market design would evaluate the capacity value of resources based upon how they actually perform when the grid needs them most. Until that review is done, it is discriminatory to treat ELRs in a manner entirely different than generators. If the NYISO is not actually concerned about 600 hours of reliability events in a base case, then the value for ELRs should be determined based in a comparable EFOR-D manner to generators.

Feedback on the GE Study

- We have significant concerns about the methodology and findings of the GE study, and alternative analysis is required to accurately capture the capacity value of ELRs.

- Until such analysis is completed, the findings of the GE study should not be incorporated into the NYISO market design for DERs, SCRs, ESRs, or renewable resources.

- The NYISO should be open to considering, on a level playing field, analysis from other reputable consulting groups (if funded by other parties) that is NY-specific. As evidenced by the length of the GE Study, this type of analysis takes time, and the NYISO should allow parties sufficient time to present such analysis to the stakeholder community.

- Our specific concerns with the GE analysis include, but are not limited to:

    - Use of the set of assumptions for the NYSRC IRM analysis to determine the capacity value of ELRs; these assumptions result in a base case that do not resemble actual grid conditions and should not be used as the foundation of the GE study. To demonstrate, in the IRM base case, in which there are no ELRs, it appears that on slide 16 of the presentation of the GE Study results[2] GE suggests that there are 600+ hours of reliability events per year, nearly 100 hours of which look to be longer than four hours; it is unclear what system conditions triggers such an "event," but assuming it is close to NERC EEA Level 2, the average number of NYISO SCR hours dispatched over the last ten

[1] Valuing Capacity for Resources with Energy Limitations. GE Energy Consulting Presentation on October 9, 2018. At p. 16
[http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_icapwg/meeting_materials/2018-10-09/09242018%20Capacity%20Value%20of%20Resources%20with%20Energy%20Limitations.pdf]
[2] ID at p. 16

years is between 5-20. These extreme discrepancies undermine the usefulness of the base case. A far more realistic base case would be to use the actual load levels and system conditions seen across NYISO from 2008-2018, with reasonable modifications for any expected future changes in load shape or renewable energy growth. **Future analysis could use this base case for determining the capacity value of the ELRs, or a more representative sample of load shapes and load multipliers that better mimic system conditions.**

- The GE Study assumptions for dispatching the ELRs reduces the effective capacity these resources are able to provide. Because the resources are dispatched as a single block to meet the peak hour, they are over dispatched for hours next to the peak hour and may not be available for other hours. Therefore, any future study should not assume that ELRs need to be dispatched for four contiguous hours. Also, given the distributed nature of DERs, SCRs, and ESRs, it is appropriate to assume that 50 MW block scheduling better approximates reality, and that not all of these resources would be dispatched at once.

- The GE Study[3] suggests that roughly 78% of events are four hours or less, and more analysis is needed to understand why the capacity value of a four-hour resource would be 50%. One should expect a stronger correlation between the percentage of events that are less than four hours and capacity value. The current explanations of factoring in event size and duration need greater clarity.

- The assumptions for renewable generation levels should better align with state energy goals, and not be capped at 4,000 MW. A more appropriate cap would be 10,000 MW.

- The GE study assumes no diversity with neighboring ISOs. Neighbor diversity can affect the duration of emergency resource activations if neighbors are able to provide assistance in emergency conditions.

- The scheduling of ELRs in the GE Study was performed after GE Multi-Area Reliability Simulation ("MARS") modeling runs were complete in a separate post-processing tool. To our knowledge, this is the first application for this particular post-processing application being utilized, and questions remain about how the dispatch prioritization was performed. If this tool is intended to be the basis of the capacity valuation of ELRs used in the NYISO capacity market, public vetting of the tool is critical. For example, the GE Study[4] shows that a 1,000MW unit that can continuously run for 6 hours or longer and has a 5% EFOR-D is assigned a capacity value of about 600MW or 60% of its capacity. This raises the question of whether all types of resources are to receive an equal treatment as conventional resources with a 5% EFOR-D and are not penalized in their capacity rating by more than 5%.

[3] ID at p. 16
[4] ID at p. 120

Application of Final Analysis, Program Design, and Next Steps

- Please see the introductory comments.

- It is inappropriate to consider changes to the SCR program within the DER roadmap effort, especially to effectively reduce the capacity value of this valuable and reliable resource without further study. The SCR program remains the only demand-side management program that has found success with broad participation within the NYISO-administered wholesale markets. It would be a significant misstep to incapacitate the only viable and scalable participation model for demand side resources before more expansive options for market participation are vetted and fully operational.

- **Recommended Next steps:**
    1. Develop consensus on parameters of additional analysis to be conducted and facilitate data requests required to complete a separate study, with results of analysis to be presented to stakeholders when they are available.
    2. Continue stakeholder discussions on DER Roadmap design elements not related to the GE Study, and vote on the DER Roadmap without integrating the impacts of the GE study or alternative analysis. Stakeholders have discussed the Roadmap for the last two years, and a new DER program can and should move forward without it being tied to agreement on the market design that results from the GE Study or alternative analysis. Per our earlier comments, a significant market redesign may be necessary that impacts many resources beyond DERs.
    3. Remove from the DER Roadmap and proposed capacity market design any consideration of SCR program reform. Changes to the SCR program should not be voted as part of the DER Roadmap, as they are two separate initiatives. We welcome discussion on SCR changes once the results of the alternate study are complete.

Other Recent Studies Considering Capacity Value for Energy Limited Resources

Please see the list below of studies that support capacity credit values for energy-limited resources higher than 50%. The studies mentioned below have been provided as separate attachments to these comments.

- IEEE - Estimating the Capacity Value of Concentrating Solar Power Plants with Thermal Energy Storage: A Case Study of the Southwestern United States. (2012) – Findings include thermal storage paired with solar can result in capacity values ranging between 79-92%.
- IEEE – A Dynamic Programming Approach to Estimate the Capacity Value of Energy Storage. (2014) – Findings include 4-hour storage has capacity values ranging from 70-80%.
- ICF – Unlocking the Hidden (Capacity) value in Energy Storage. (2016) – Findings include 4-hour storage should receive 100% of capacity value, while a 1-hour resource should be discounted by 50%.

Examples of Data Requests to Support Separate Analysis

- Please provide 2002, 2006, 2007 hourly load shapes
- Please provide wind, solar, and hydro hourly profiles used in the modeling.
- Please provide historical SCR activations from 2010-2018. Include activation time, duration, and response magnitude.
- Please provide separate cumulative generator outage probability distributions: 1) output from MARS simulations and 2) from actual operations
- Please provide emergency resource dispatch stack
    - It appears emergency energy requests from neighbors are after SCR. How are those resources modeled?
- Can all results in the GE presentation be provided in Excel format?
- Can the post-processing tool used to dispatch the energy limited resources be provided?
- Can any other GE MARS input files be provided?
- Can the list of generators, monthly capacities, and EFOR-D used in the simulations be provided?

Thank you for your consideration of these comments, and we look forward to working with the NYISO on these important matters.

Respectfully Submitted,

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