New York ISO
Independent System Operator

Grid Services from Renewable Generators: Revised Consumer Impact Analysis Methodology

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Background

- **Recent industry studies have indicated the ability of renewable generators to potentially provide additional grid services such as fast frequency response, inertial response, and ramping services[1,2]**
  - Based on the findings of those studies, stakeholders requested the NYISO to study the potential of renewable generators to provide grid services in New York by including Grid Services from Renewable Generators as a 2021 project
- **The NYISO conducted a study that investigated the ability of renewable generators to provide the Ancillary Services that it currently procures. NYISO also looked at other services renewable generators could potentially provide in the future**

1. Demonstration of Essential Reliability Services by a 300-MW Solar Photovoltaic Power Plant. https://www.nrel.gov/docs/fy17osti/67799.pdf.
2. *AvangridRenewables Tule Wind Farm: Demonstration of Capability to Provide Essential Grid Services*. 11 March 2020. https://www.caiso.com/Documents/WindPowerPlantTestResults.pdf

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Background (cont'd)

- **The study results presented at the May 19, 2021 ICAP/MIWG meeting indicated that the only additional grid service that renewable generators could potentially provide is regulation "down" service**
  - The creation of ~~a~~ separate regulation "up" and "down" products would increase accessibility for renewable generators, since it would be easier to qualify and provide regulation "down" than the current bi-directional product
- **Based on the study results, NYISO will conduct a consumer impact analysis of bifurcating the regulation market**
  - Currently, regulation "up" and "down" is a single service
  - The initial concept presented to stakeholders at the May 26, 2021 ICAP/MIWG meeting was limited to the potential consumer impact of renewable generator participation in the regulation market
    - The NYISO has revised the methodology to include a more comprehensive analysis in response to stakeholder feedback

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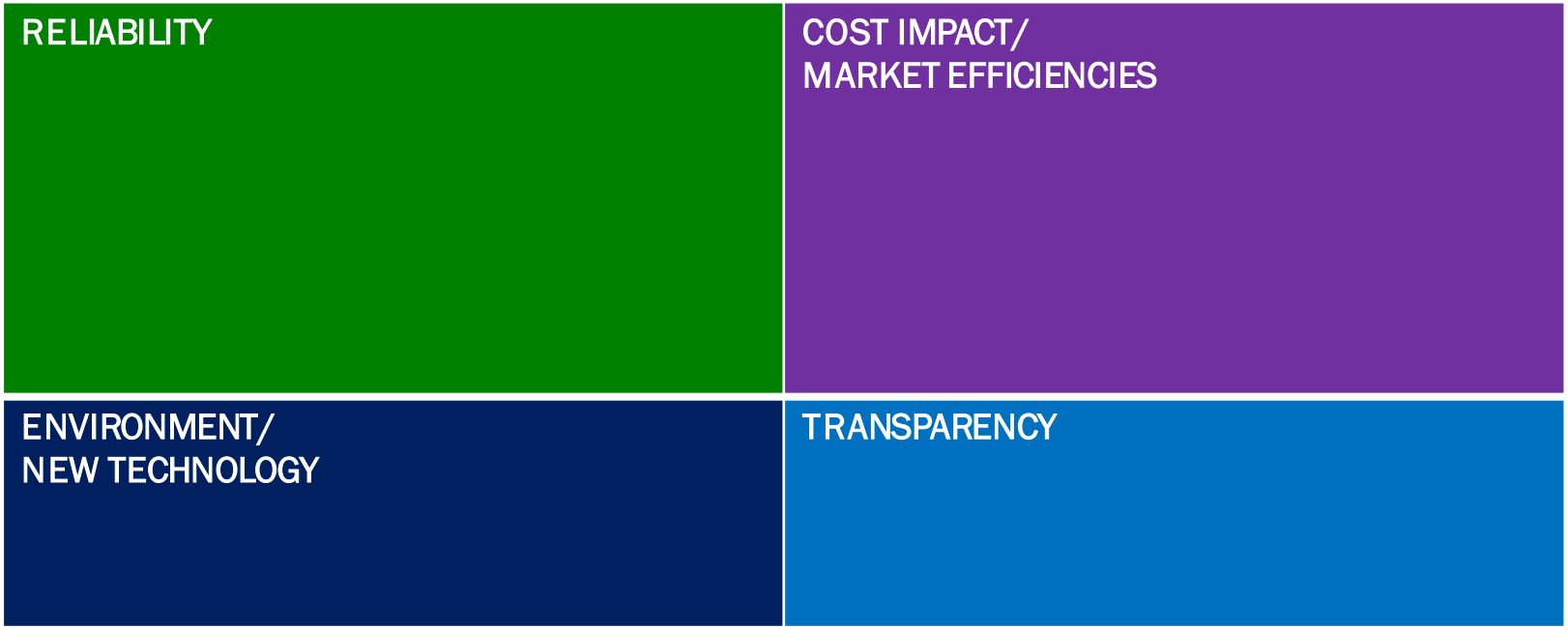
Consumer Impact Analysis (IA) Evaluation Areas

- The potential impact on all four evaluation areas



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Potential Energy Market Impact

Regulation Market

- **The NYISO regulation market is relatively small**
  - Requirements are static for the year and vary both hourly and seasonally, typically ranging between 150MW to 300MW with roughly 1,000MW of suppliers offering in the current market
  - Average annual costs of the regulation market are on the order of $20M, compared with annual energy and capacity market costs on the order of $5B[1]

[1] Information on costs of NYISO markets can be found in the monthly Market Operations Reports presented at the Business Issues Committee. Meeting materials can be found at: https://www.nyiso.com/business-issues-committee-bic-

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Consumer Impact Proposed Approach and Assumptions

- **Separating the NYISO's regulation market into "up" and "down" products would have consumer cost impacts that are beyond the scope of this study, but are prudent to consider**
  - The NYISO expects that creating separate regulation "up" and "down" products would decrease consumer costs, as this market change would increase supplier eligibility
    - Not only would renewable generators have greater ability to participate in a regulation "down" market, but other resources that are currently precluded from receiving regulation schedules due to inability to move both up or down could now be able to provide regulation service in only one direction
    - For example, a Generator sitting at Mingen (would not be able to provide Regulation Service today) might become able to provide regulation "up"
  - This comprehensive consumer impact analysis will examine the full impacts of restructuring the regulation market, which will inform project prioritization efforts going forward, as well as provide advance insight into a potential future project that would develop revisions to the regulation market
    - The analysis will assume that the quantity of regulation capacity procured will remain the same or similar to the existing requirements

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Consumer Impact Proposed Approach and Assumptions (cont'd)

- **To estimate the consumer impact of bifurcating the regulation market, the NYISO proposes to calculate potential savings resulting from lower prices during "high-priced" regulation intervals**
  - The increase in regulation suppliers enabled by separate regulation "up" and "down" products will potentially result in lower prices during "high price" regulation intervals, which will result in lower regulation clearing prices, and consequently, lower consumer costs
  - To conduct the analysis, the NYISO will consider, for the 3-year period from June 2018 through June 2021:
    - Status quo annual regulation market costs
    - Annual regulation market cost with a 5% reduction in "high-priced" regulation intervals, and
    - Annual regulation market cost with a 20% reduction in "high priced" regulation intervals
- **There are no expected capacity market consumer impacts for this project since the ICAP demand curve proxy unit does not provide regulation service**

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Energy Market Methodology

- The NYISO proposes to examine historic real time regulation prices from June 2018 through June 2021
- Assume several possible levels of price reductions during "high-priced" regulation intervals to provide multiple estimates of consumer impact rather than focus on a single estimate:
  - Observed historic regulation costs,
  - -5% during "high-priced" regulation intervals
  - -20% during "high-priced" regulation intervals
- The analysis will multiply the regulation clearing price deltas by the actual corresponding demand during the historic three-year period to estimate an annual consumer impact

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Additional Impacts

Other Impacts

- **Evaluate other Impacts:**
  - Reliability Impacts
  - Environmental Impacts
  - Impact on Transparency

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Feedback?

- Email additional feedback to: deckels@nyiso.com

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system

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