

Reliability and Market Considerations for a Grid in Transition

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Agenda

- Background
- A Grid in Transition: Capacity Market Enhancements
- Next Steps: Stakeholder Engagement

| Topic | Working Group Date |
|---|--------------------|
| Energy Market Enhancements | 2/4/2020 |
| Capacity Market Enhancements | 3/6/2020 |
| Reliability and Market Considerations | 3/26/2020 |
| Inter-regional Coordination | 5/11/2020 |
| Future of Fossil Generation, Implications of a Carbon Neutral Grid | June 2020 |

Background

A Grid in Transition

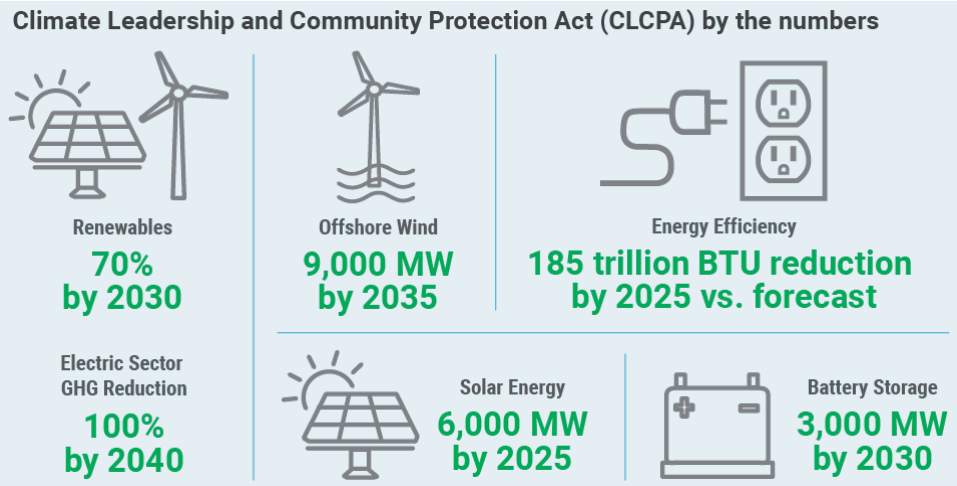
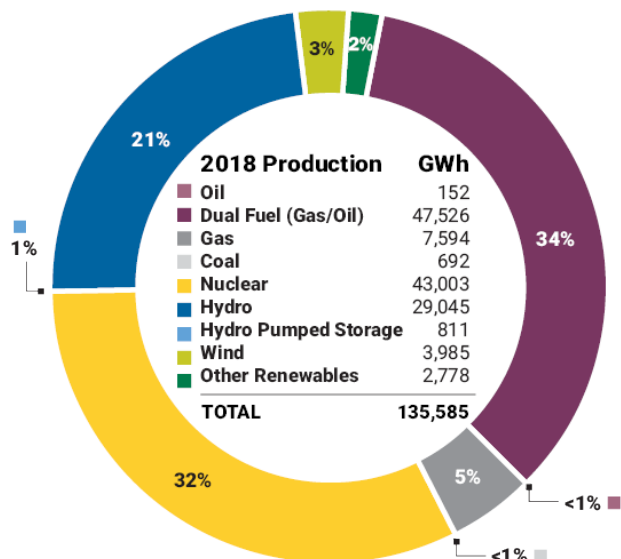
- The NYISO's competitive wholesale markets provide a framework for a changing grid
- The NYISO's Grid in Transition Report:
 - Describes emerging reliability and economic challenges facing New York's electricity sector
 - Identifies gaps to address
 - Proposes a path forward



The Reliability and Market Considerations for a Grid in Transition report was published on December 20, 2019, and can be viewed here: <https://www.nyiso.com/documents/20142/2224547/Reliability-and-Market-Considerations-for-a-Grid-in-Transition-20191220%20Final.pdf/61a69b2e-0ca3-f18c-cc39-88a793469d50>

A Grid in Transition - Clean Energy Goals

- New York's clean energy goals are reshaping the grid.



A Grid in Transition - Reliability Considerations

- New York's decarbonization policies are creating new challenges to meet NYISO's mission to support a reliable and economically efficient electric system.

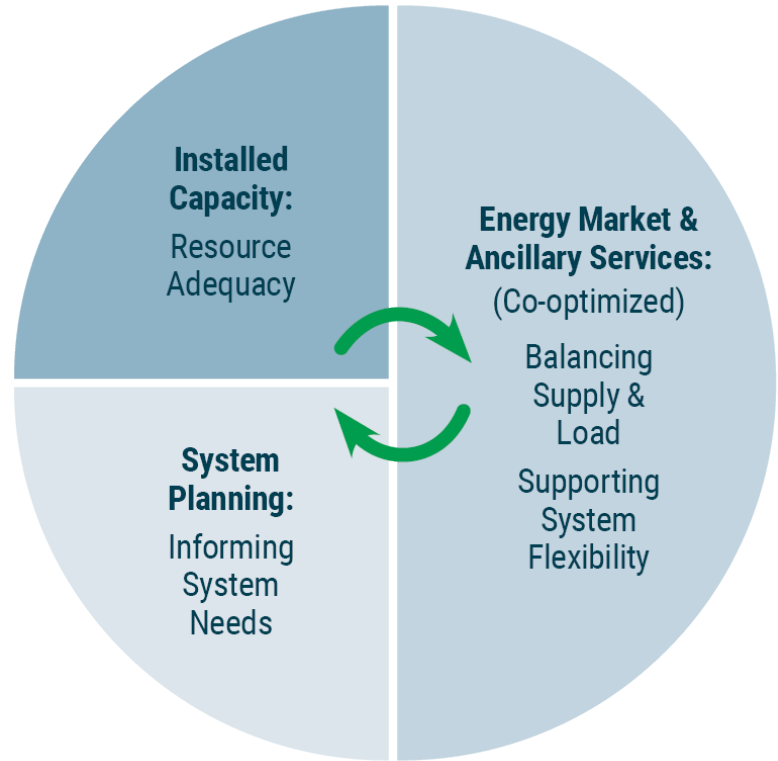


Reliability Challenges

- Balance Supply & Demand
- Maintain Ten-Minute Operating Reserves
- Maintain Total Thirty-Minute Operating Reserves
- Manage Daily Energy Needs
- Secure Transmission Operations with Congestion Management
- Coordinate System Restoration and Black Start
- Manage Voltage Support
- Maintain Frequency Response
- Maintain Resource Adequacy
- Coordinate Supply Outages

A Grid in Transition - Role of Markets

- **The NYISO supports reliability through three complementary markets for energy, ancillary services, and capacity.**
 - Each addresses distinct reliability needs through competitive market pricing that benefits New York consumers while reducing costs.
 - Together, energy, ancillary services, and capacity market revenues provide economic signals for new investment, retirement decisions, and participation by demand response providers.



A Grid in Transition – Path Forward

- **The NYISO’s wholesale markets can serve as an effective platform for achieving New York State environmental objectives.**
 - Through active engagement with stakeholders and policymakers, the NYISO is developing design improvements to meet the future challenges expected to arise with high levels of intermittent renewable and distributed energy resources.
- **The plan includes a set of market design enhancements that work together coherently and efficiently to satisfy New York’s changing grid reliability needs.**
 - Nine areas of market design opportunities across three main points of focus (discussed on the next slide) require immediate attention and are recommended for implementation in the next five years, through 2024.



A Grid in Transition – The Plan

- Carbon Pricing
- Comprehensive Mitigation Review
- DER Participation Model
- Energy Storage Participation Model

Aligning Competitive Markets and New York State Clean Energy Objectives



- Enhancing Energy & Shortage Pricing
 - Ancillary Services Shortage Pricing
 - Constraint Specific Transmission Shortage Pricing
 - Enhanced Fast Start Pricing
- Review Energy & Ancillary Services Product Design
 - More Granular Operating Reserves
 - Reserve Enhancements for Constrained Areas
 - Reserves for Resource Flexibility

Valuing Resource & Grid Flexibility



- Enhancements to Resource Adequacy Models
- Revise Resource Capacity Ratings to Reflect Reliability Contribution
 - Expanding Capacity Eligibility
 - Tailored Availability Metric
- Capacity Demand Curve Adjustments

Improving Capacity Market Valuation



Capacity Market Enhancements

Role of Markets: Capacity Market (ICAP Market)

- NYISO's market design is structured to allow resources to compete to provide reliability services
- The ICAP market is designed to attract and retain sufficient resources to efficiently meet resource adequacy needs
- The identified ICAP market enhancements outlined in the Grid in Transition report are intended to maintain appropriate price signals to integrate new technologies and enable New York State's policy objectives while maintaining system reliability

Role of Markets: Installed Capacity Market

- **In order to enhance the ICAP market, it is important to improve the resource adequacy models and better align compensation with performance as the grid continues to change**
 - Notable efforts are being made to evaluate potential changes to the NYISO's existing ICAP market buyer-side mitigation (BSM) rules in order to facilitate the Climate Leadership and Community Protection Act (CLCPA) goals while preserving competitive price signals and maintaining reliability
- **The NYISO has several ICAP market efforts currently being pursued with support of its stakeholders, as well as several efforts which are being considered by NYISO and its stakeholders to study and prioritize in coming years**

Ongoing ICAP Market Efforts

■ Comprehensive Mitigation Review

- The NYISO has been continuously making changes to align mitigation measures with changes in the market through a holistic evaluation of the BSM rules and methodology
- Comprehensive Mitigation Review is intended to preserve competitive price signals and economically efficient market outcomes required to maintain system reliability, while facilitating achievement of the CLCPA goals

Ongoing ICAP Market Efforts

- The NYISO continues to focus on Enhancements to Resource Adequacy Models and has recently made updates to adapt to emerging technologies and any changes in the dynamics of the system
 - The following have been included in modeling updates:
 - Storage and other duration limited resources
 - Intermittent renewable resources
 - Demand response

Ongoing ICAP Market Efforts

- **Revise Methodologies of Calculating Unforced Capacity for Certain Resource Types to Better Reflect Their Reliability Contribution**
 - As the hours of reliability risks shifts, resource ratings will need to evolve as well to reflect the marginal contribution to reliability
 - The NYISO has recently established new compensation rules for duration-limited resources and is currently finalizing the evaluation of potential enhancements to the methodology for determining resource ratings
 - The following projects address these enhancements:
 - Tailored Availability Metric
 - Expanding Capacity Eligibility

Potential Future ICAP Market Efforts

■ ICAP Demand Curve Adjustments

- Incremental adjustments to the ICAP demand curves may be needed to provide sufficient resource adequacy as system conditions evolve
- The NYISO recommends a targeted effort to review the efficacy of the shape and slope of the ICAP Demand Curves

■ Locational Marginal Pricing of Capacity (CLMP)

- A ICAP market pricing framework where the procurements and clearing price at each location is set in accordance with the marginal reliability value of ICAP at each location is being investigated

■ Ensuring Year-Round Resource Adequacy through Dynamic ICAP Requirements

- The NYISO could consider procuring different amounts of capacity during the Summer and Winter Capability Periods that reflect the underlying capacity need in that season

Next Steps: Stakeholder Engagement

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■ Comprehensive Mitigation Review

- Q1-Q4 2020: Discussions with stakeholders to solicit input and discuss the NYISO proposal(s)
- The NYISO is aiming to bring initial proposals to the March BIC and MC to be implemented for the current ongoing Class Year (2019)

■ Expanding Capacity Eligibility

- 2020/2021: Updates to manuals, guides, training material

■ 2019-2020 ICAP Demand Curve Reset

- Q4 2020: The NYISO is required to file with FERC the results of the DCR, as approved by the Board no later than November 30, 2020

Next Steps: Stakeholder Engagement

- **Locational Marginal Pricing of Capacity**
 - Q1-Q3 2020: Discussions led by Potomac Economics and the NYISO will facilitate education sessions to develop issue knowledge and solicit potential feedback
- **Tailored Availability Metric**
 - Q1 2020: Continue discussion and analysis based off of the Market Design Concept Proposal
 - Q2 2020: Market Design Complete for 2021 implementation

Next Steps: Stakeholder Engagement

- The NYISO has received a request from a stakeholder to present on Capacity Market Enhancements at a later date in March
- On March 26th, the NYISO will be presenting on Reliability and Market Considerations
- Stakeholders interested in presenting at a future working group meeting should contact Emily Conway at econway@nyiso.com and Ashley Ferrer at aferrer@nyiso.com

Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit 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 policymakers, stakeholders and investors in the power system



Questions?