

Reliability and Market Considerations for a Grid in Transition:

Reliability Gap Assessment Potential Market Design Improvements Part 3

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ICAPWG/MIWG

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Agenda

- **Background**
- **Reliability Gap Assessment**
- **Concepts for Addressing Potential Reliability Gaps: Other Markets and Processes & Tracking and Metrics**
- **Next Steps**

Background

A Grid in Transition

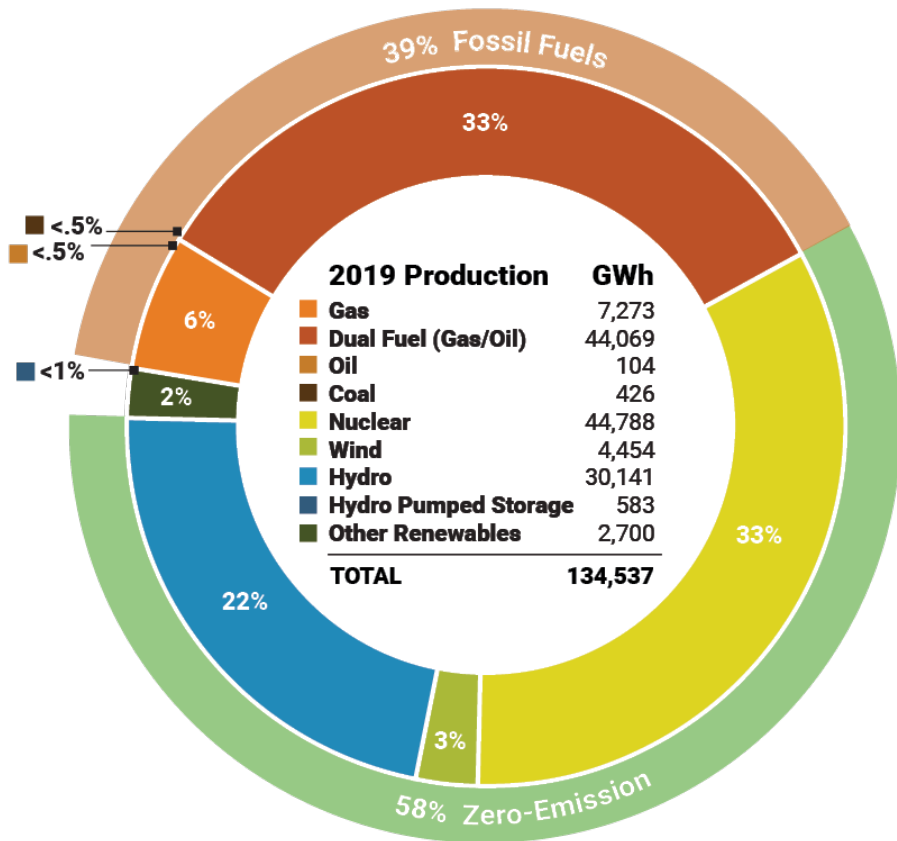
- The NYISO's competitive wholesale markets provide a framework for a changing grid
- The NYISO's Grid in Transition Report:
 - Describes emerging reliability and economic challenges facing New York's electricity sector
 - Identifies gaps to address
 - Proposes a path forward



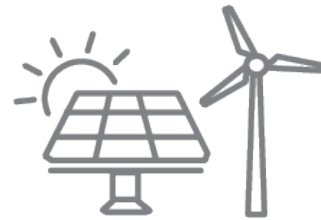
The Reliability and Market Considerations for a Grid in Transition report was published on December 20, 2019, and can be viewed here: <https://www.nyiso.com/documents/20142/2224547/Reliability-and-Market-Considerations-for-a-Grid-in-Transition-20191220%20Final.pdf/61a69b2e-0ca3-f18c-cc39-88a793469d50>

A Grid in Transition - Clean Energy Goals

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



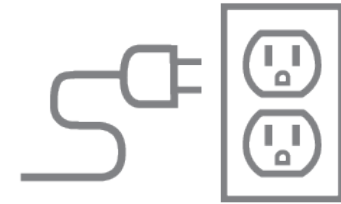
Climate Leadership and Community Protection Act (CLCPA) Goals



Renewables
70% by 2030

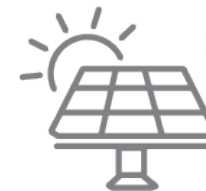


Offshore Wind
9,000 MW by 2035



Energy Efficiency
185 trillion British Thermal Units (BTU) reduction by 2025

Zero-Emission Electric Sector
by 2040



Distributed Solar Energy
6,000 MW by 2025



Battery Storage
3,000 MW by 2030

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.

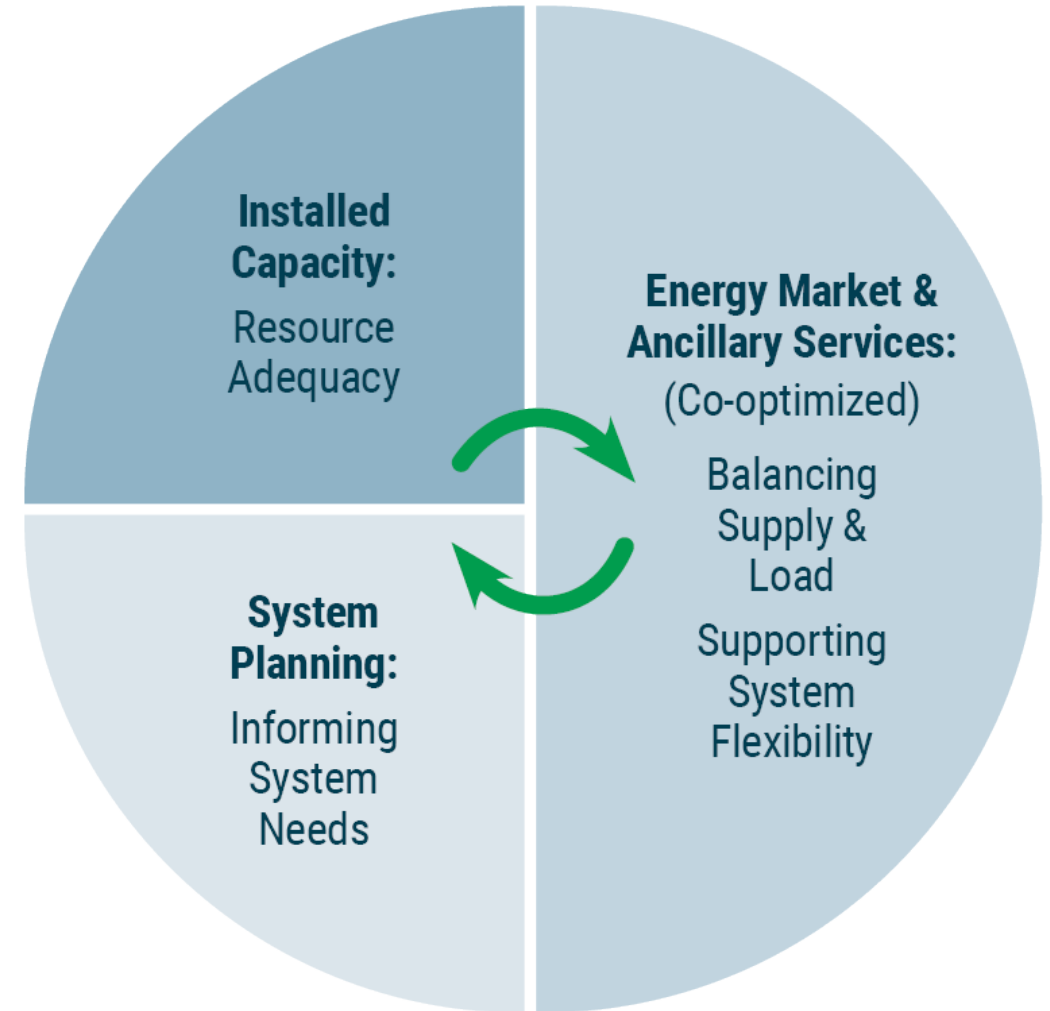


Reliability Challenges

- 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

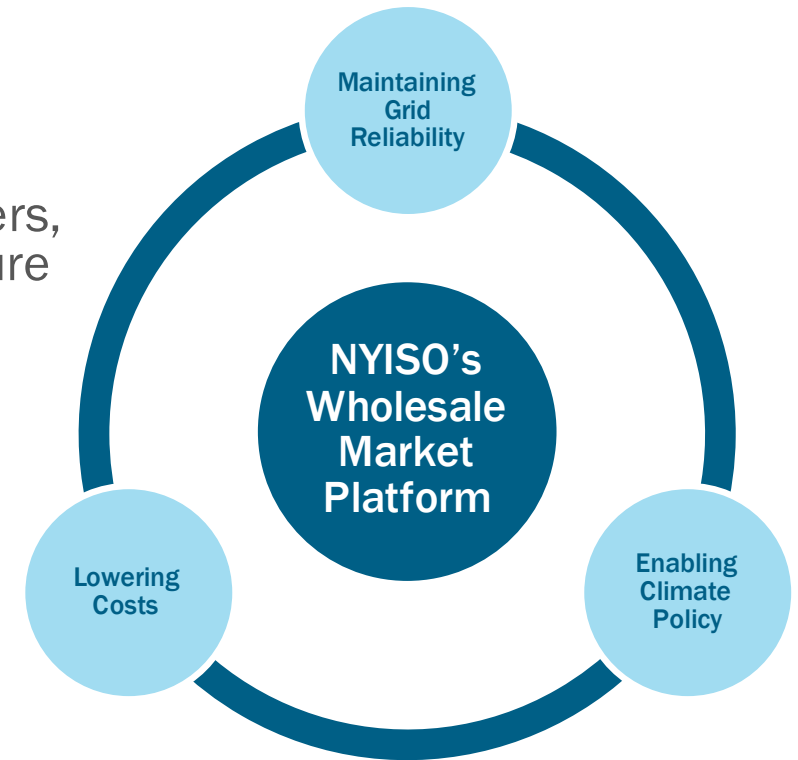
A Grid in Transition - Role of Markets

- **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
- Hybrid Storage 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



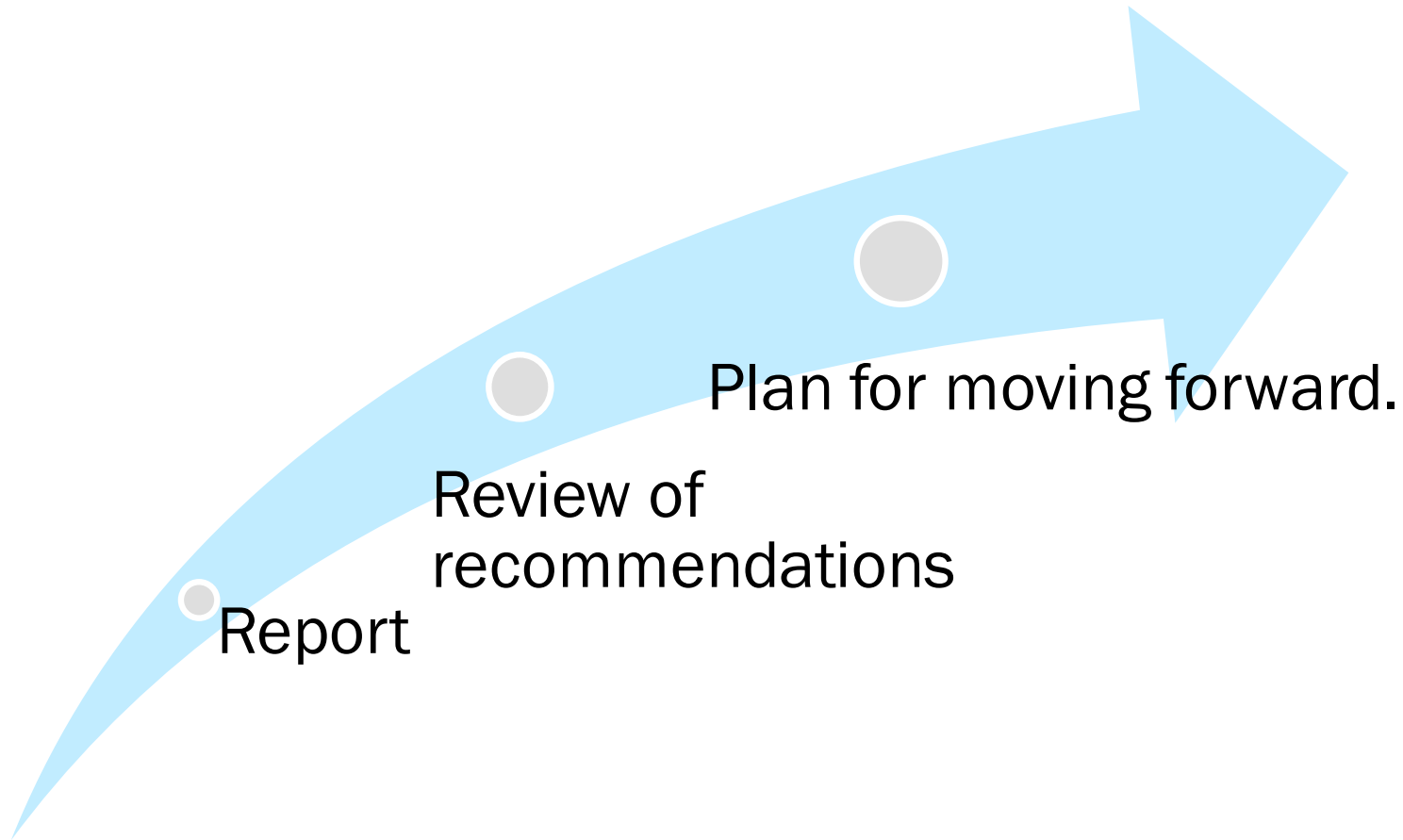
- **Enhancements to Resource Adequacy Models**
- **Revise Resource Capacity Ratings to Reflect Reliability Contribution**
 - Expanding Capacity Eligibility
 - Tailored Availability Metric
- **Capacity Demand Curve Adjustments**

Improving Capacity Market Valuation



Reliability Gap Assessment

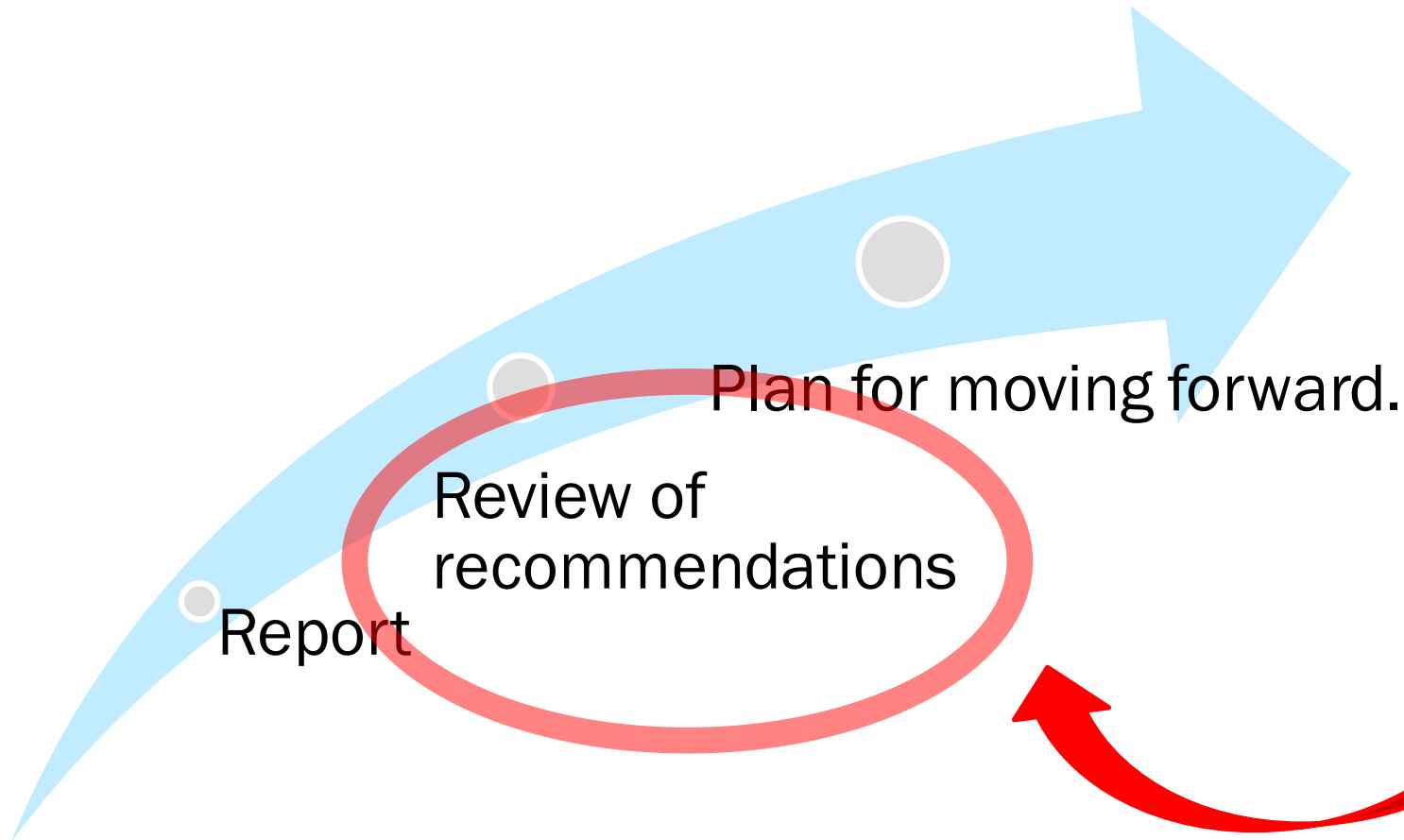
Grid in Transition Gap Analysis:



Will feed into :

- 2021 Master Plan
- 2022 and beyond project prioritization

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Reliability Gap Assessment

- The Reliability and Market Considerations for a Grid in Transition (Grid in Transition) white paper* includes a Reliability Gap Assessment (The full assessment is in Appendix B and a high level discussion is available starting on page 20).
- The NYISO presented the high-level market design improvements recommended in the Reliability Gap Assessment at the April 14 ICAP/MIWG and also reviewed recommendations related to NYISO's Operations processes at the June 10 ICAP/MIWG and Energy Market Mechanics (including items related to DAM, RTC, and RTD) at the July 7 ICAP/MWIG.
- Today's presentation is the third of several more in-depth discussions on the market design improvement recommendations.
 - The goal is to get feedback on the recommendations from stakeholders and move towards incorporating the market design improvements into the Master Plan for 2022 and beyond.
 - Key questions for stakeholders are
 - Is there anything missing in the Gap Assessment?
 - What should be the immediate focus and what should be done later?

* <https://www.nyiso.com/documents/20142/9869531/Reliability%20and%20Market%20Considerations%20for%20a%20Grid%20in%20Transition%20-%2020191220%20Final.pdf/7846db9c-9113-a85c-8abf-1a0ffe971967>

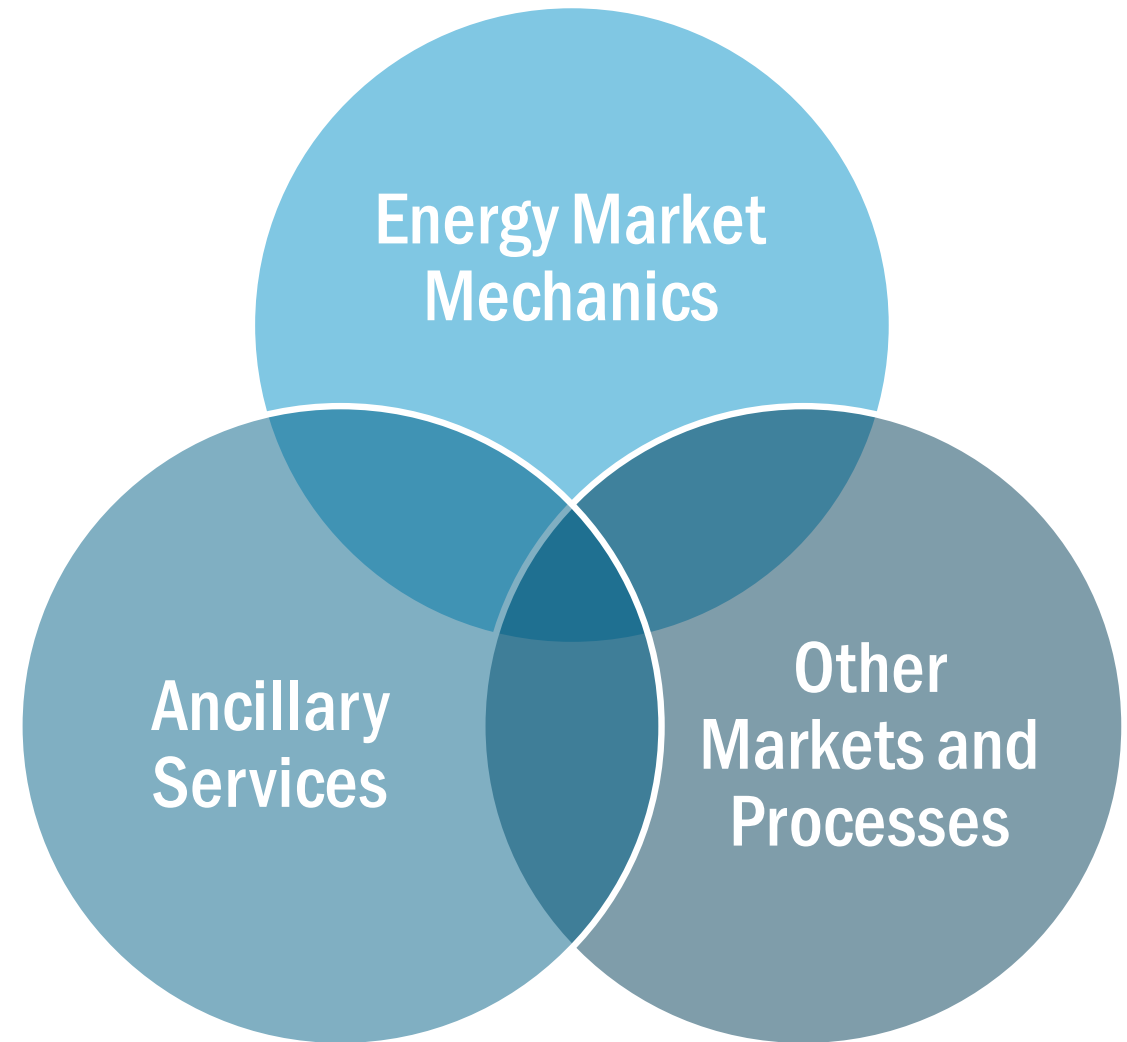
A Grid in Transition - Reliability Considerations

- **The Grid in Transition Report identified the following areas of future reliability gaps:**

- 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

Three main areas

- In April, we reviewed the high-level, potential market design concepts for existing and future components of NYISO's wholesale energy markets.
- The recommendations can be grouped into three main areas.
- Within each area there are recommended enhancements and recommended metrics to track.
- The prior discussions were focused on Energy Market Mechanics and Ancillary Services enhancements.
- Today's discussion will be on Other Markets and Processes.
 - This includes such items as Resource Adequacy and Planning, Reactive Supplier Requirement, Voltage Support Requirements and recommended metrics and tracking.



Schedule and what comes next

- **The next discussion will focus on the plan for moving forward.**
- **It will be a review and prioritization of the items identified in the Gap Analysis and reviewed with stakeholders and will develop a plan for how we will move forward.**
 - The next meeting is scheduled for August 19.

Concepts for Addressing Potential Reliability Gaps: Other Markets and Processes & Tracking and Metrics

Energy Market Improvements (Cont.)

■ Potential Market Design improvements

- Resource Adequacy and Planning
 - Evolve current models and methods to account for
 - Uncertain peak – what happens if the load peak (net of BTM generation) is when there are outages?
 - Energy limited resources especially during periods of multi-day needs

Energy Market Improvements (Cont.)

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- Capacity
 - Explore multiple value pricing- a fundamental capacity market redesign where different resource classes have different demand curves based on their characteristics
 - Capacity value study

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 - Explore multiple value pricing- a fundamental capacity market redesign where different resource classes have different demand curves based on their characteristics
 - Capacity value study
- Planning timeframe modeling
 - Model the resources available in the future and simulate the DAM. Will there be
 - Inertia issues?
 - Voltage support issues?
 - System strength issues?

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 - Inertia issues?
 - Voltage support issues?
 - System strength issues?
- Monitor and manage sustainability of resources providing reserves

Energy Market Improvements (Cont.)

- **Tracking and metrics – establishing a baseline and an early warning system**
 - Net forecast uncertainty
 - Consider tracking thermal unit commitments and revenues
 - Consider ways to minimize or manage Net Load forecast latency
 - Consider tracking flexible resource uplift
 - Consider tracking self scheduling of flexible resources

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 - Consider tracking if increasing imbalances in RT are being met with regulation service
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 - Reserves and the providers of reserves
 - Is the NYISO getting significant amounts of DR providing reserves? If not why not?
 - Are synchronous resources providing 30 minute reserves receiving uplift payments?
 - Does the stepwise construct of the demand curves create inefficiencies with resource commitments?
 - Unit commitment in RTD/RTC: Are units being committed in RTC with high shadow prices?
 - Is the \$25 demand curve step setting prices in DAM, RTC, RTD?

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 - Unit commitment in RTD/RTC: Are units being committed in RTC with high shadow prices?
 - Is the \$25 demand curve step setting prices in DAM, RTC, RTD?
 - Consider tracking ELR energy balance over the operating day
 - Review storage pricing, dispatch and design

Questions for stakeholders

- **Are there additional potential improvements that we should consider?**
- **What should be the next focus and what should be done later?**

Next Steps

Next Steps:

- **We continue to encourage stakeholders to provide comments on the Market Design Improvements identified in the Reliability Gap Assessment as well as on any additional potential improvements that should be considered.**
- **The next discussion will be a review and prioritization of the items identified in Gap Analysis with the goal of developing a plan for moving forward.**
 - Scheduled for the Wednesday August 19 ICAP/MIWG

Questions?

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

