

# Balancing Intermittency: Project Kickoff

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**Vijay Kaki**

Market Design Specialist  
Energy Market Design

**Amanda Myott**

Market Design Specialist  
Energy Market Design

**MIWG/ICAPWG**

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# Agenda

- Background
- 2023 Project Plan
- Next Steps

# Background

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- **Leveraging the findings in the 2022 Grid in Transition Study, the Balancing Intermittency effort will evaluate grid characteristics, resource attributes, as well as potential new market products that may be necessary to continue reliably maintaining system balance, given a future grid characterized by high levels of intermittent renewable resources, ESR and DER.**
  - This project will also assess existing market rules and determine appropriate compensation mechanisms that incentivize needed attributes.
- **2023 Deliverable: Q4 – Market Design Concept Proposed**

# Background

## ■ Current Reserves Structure

- Day-ahead reserve requirements cause resources to receive schedules that notify them of the need to be ready to provide energy in real-time.
  - Resources are compensated for this readiness at the applicable reserve clearing price.
- Historically, reserve requirements were established to recover from specific contingency events.
  - Our future electric grid, and to some extent our electric grid today, will be expected to meet stringent reliability standards while at the same time experiencing greater uncertainty and variability of supply.
    - Contingency reserve requirements may not increase, but the additional uncertainty and variability adds system risk.

# Background

- **There is a broad recognition that electric grids face growing uncertainty and variability.**
  - NYISO stakeholders scored this project very high
  - Other ISO/RTOs are also evaluating or have introduced new product(s) to address uncertainty.
- **New reserve requirements and evolving reserve performance standards must seek to facilitate reliable operations via efficient markets.**
  - Our goal is to evaluate and, if justified, propose a product that facilitates efficient markets and reliable operations.

# 2023 Project Plan

# Four Components of the 2023 Project

- **Evaluating the need for a potential shorter-term "ramping" product**
  - Grid in Transition study indicated a ramp product is not necessary prior to 2030.
- **Evaluating the need for a longer-term reserve product, perhaps including a longer sustainability requirement**
  - Initial review of the Grid In Transition study indicates this may be more beneficial than a short-term ramping product prior to 2030.
- **Assessing any prudent changes to Operating Reserves Demand curves**
  - Do our current reserve shortage pricing levels accommodate changes in input costs, e.g., fuel price increases?
- **Regulation Requirements Study**
  - NYISO is updating the study that defines its Regulation service requirements



# Evaluating the Need for a New Reserve Product

## ■ Objectives:

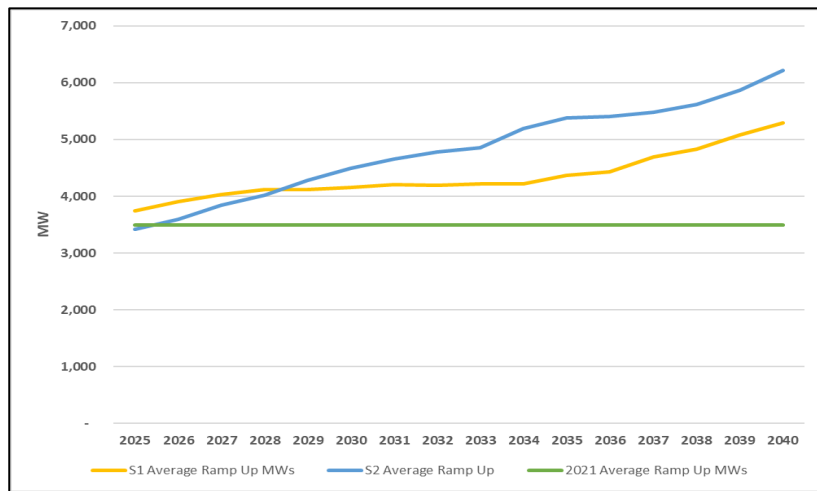
- Creating a new reserve product, or increasing existing requirements, will provide schedules to additional resources that may be necessary to maintain reliability in real-time. The associated compensation paid to these resources sends a market signal of the value these resources provide.
- Assess specific operational challenges driven by increased uncertainty that could potentially be addressed by a new reserves product.
- Analyze data to determine the necessary characteristics of a new reserves product based on expected operational needs.
- Can we better internalize out of market actions into reserve requirements/markets?

# How to Evaluate the Need for a New Reserve Product?

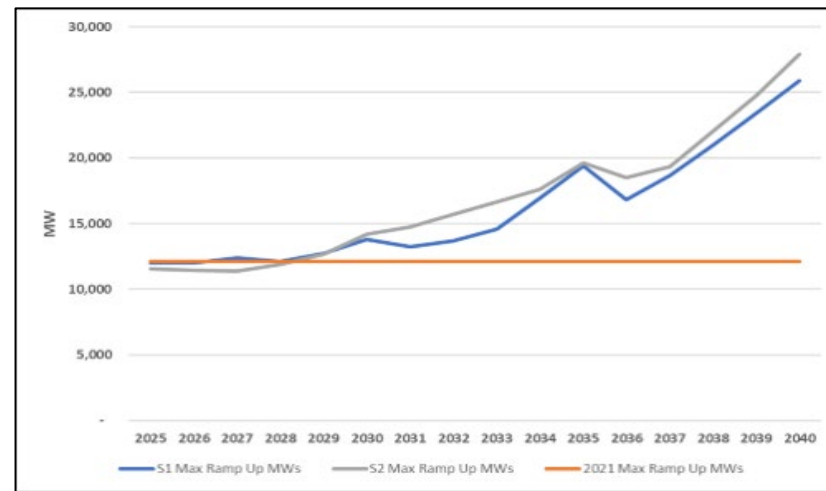
- **Two major avenues to explore:**
  - **Fleet Characteristics**
    - Assessment of the current fleet to understand whether the existing products appropriately value the fleet's characteristics.
      - This could involve examining data such as latent reserves and generator startup times.
  - **System Conditions**
    - Assessment of system conditions experienced during past events and expected system conditions in the future.
      - This could involve analyzing information such as wind lull duration, wind forecast uncertainty, duration of peak demand, ramp analysis from Grid in Transition (GIT) study, reserve shortage duration, emergency condition duration, and load forecast errors.

# How to Evaluate the Need for a New Reserve Product?

- The average multi-hour ramp up MWs, from the Grid In Transition Study, have been increasing steadily over the years identifying a potential sustained need over a longer horizon.

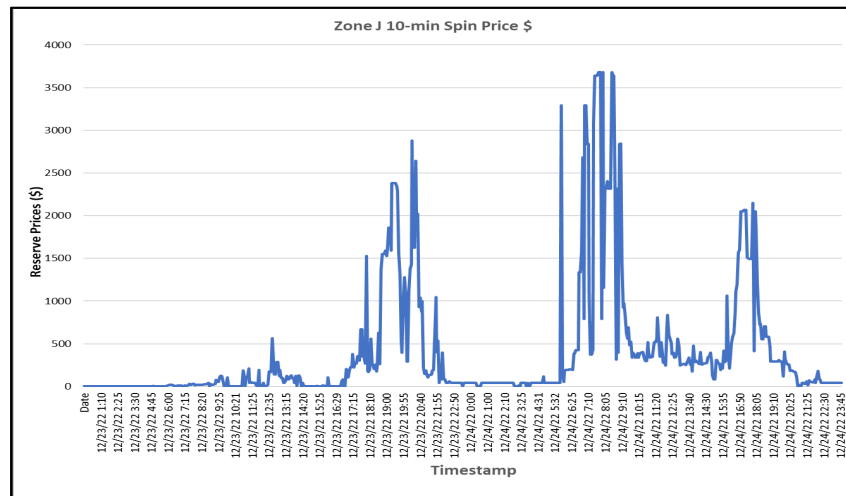
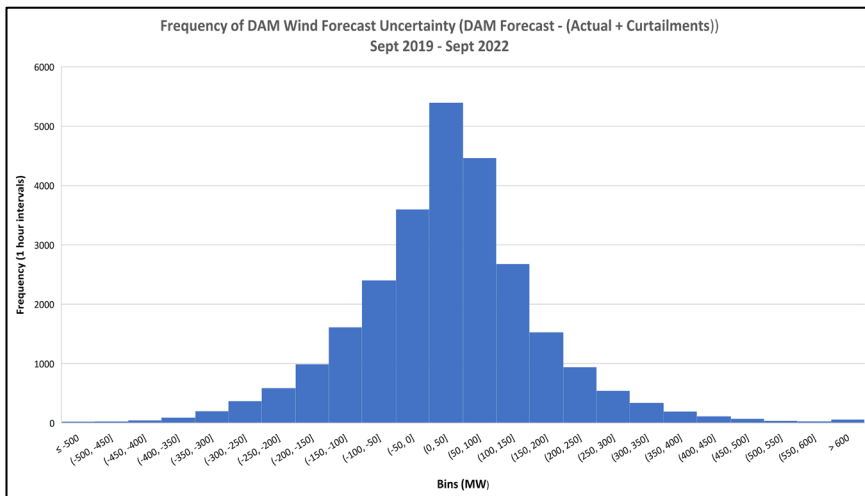


- However, the maximum multi-hour ramp up MWs, from the Grid in Transition Study, have remained nearly flat until 2030 while being close to the 2021 maximum ramp up levels.



# How to Evaluate the Need for a New Reserve Product?

- Wind forecast uncertainties between the DAM forecast and actual output can be studied to understand if there is a need for a new reserve product in terms of sustainability or a longer lead time.
- A snapshot of the 2022 Christmas event's 10-min spinning reserve prices shows sustained shortage conditions over multiple hours.



# How to Evaluate Appropriateness of ORDC prices?

- **Current reserve demand curve prices are based on costs to commit a quick-start resource and gas prices.\***
  - Higher input costs (e.g., higher natural gas prices) have led to NYISO ‘going short’ (i.e., relying on the ORDC) more often in the Day-Ahead Market.
- **Ongoing considerations to update the shortage prices to account for current fuel price trends.**

\* Information on the previous updates to Ancillary Services Shortage Pricing can be found here: [Ancillary Services Shortage Pricing and Reserves for Resource Flexibility: Manual Updates \(BIC 09/14/2021\)](#)

# Regulation Requirements Study

- Regulation and frequency response requirements are established consistent with North American Electric Reliability Council (NERC) criteria. The requirements may vary by hour and by season.
- Regulation requirements are established to address the variability of net load that may occur within a 5-minute dispatch interval.
  - Net load in this context refers to the sum of Load - Wind Generation - Solar Generation
  - For each hour of each month, the net load delta variability corresponding to a 3-sigma level is calculated to determine the NYCA regulation requirement
- **Analysis of the net load variability at different wind/solar penetration levels and forecasted load levels is performed to establish NYCA regulation requirements on a going forward basis**
  - This methodology is consistent with the tracking and recommendations made in the recent *Reliability and Market Considerations for a Grid in Transition Report*
  - Specifically, within *Appendix B: Reliability Gap Assessment*, recommendations include “addressing net load balance variations could be through a substantial increase in the amount of regulation capability that would be scheduled and available for real-time operations”

# Project Timeline

- **Assuming stakeholders continue to prioritize the Balancing Intermittency project, as expected, the anticipated timeline for any new market product, and/or shortage pricing updates based on the 2022 Master plan, would be as follows:**
  - 2023: MDCP (includes Consumer Impact Analysis)
  - 2024: FRS
  - 2025: Deployment
- **Deployments may be staggered to align with the timing of system needs.**

# Next Steps



# Next Steps

## ■ March

- Stakeholder discussion at ICAPWG/MIWG to discuss initial analysis results