New York ISO
Independent System Operator

2023 Market Projects

Capacity, New Resource Integration, and Energy Market Design Teams

ICAPWG/MIWG

January 17, 2023

The NYISO Market Design Team

- The Market Design Team (led by Mike DeSocio) is composed of 3 focused teams
- Capacity Market Design (led by Zach T. Smith)
  - Team: Michael Swider, Maddy Mohrman, Nikolai Tubbs
- New Resource Integration (led by James Pigeon)
  - Team: Michael Ferrari, Harris Eisenhardt, Francesco Biancardi, Katherine Zoellmer, John Meyer
- Energy Market Design (led by Nate Gilbraith)
  - Team: Amanda Myott, Ashley Ferrer, Leila Nayar, Vijay Kaki

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Purpose

- **Our objective is to share the 2023 Capacity, New Resource Integration, and Energy Market Design projects including anticipated Q1 schedules and 2023 deliverables with stakeholders.**
  - The NYISO will return each quarter to discuss project status with stakeholders.
- **The following slides include the project description, schedule and deliverables of each project that was prioritized for 2023.**

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Capacity Market Design

Capacity Market Project Overview

2023 Capacity Market Design Projects	Q1	2023 Deliverable
Modeling Improvements for Capacity Accreditation	CD	Q4 Functional Requirements
LCR Optimizer Enhancements	CD	Q3 Market Design Complete
Demand Curve Reset	CD	Q3 Study Defined

2023 Capacity Market Ongoing and Implementation Projects	Q1	2023 Deliverable
Improving Capacity Accreditation	FR	Q4 Deployment
CRIS Expiration Evaluation	MDC	Q4 Functional Requirements

Key			
CD	Continued Discussions	MDC	Market Design Complete
ID	Issue Discovery	FR	Functional Requirements
SD	Study Defined	SD	Software Design Specification
SC	Study Complete	DC	Development Complete
CP	Market Design Concept Proposed	DEP	Deployment

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Modeling Improvements for Capacity Accreditation

Modeling Improvements for Capacity Accreditation

- **Background:**
  - As part of the 2022 Improving Capacity Accreditation project, limitations in the NYISO's current resource adequacy analysis software (GE MARS) were identified regarding the modeling of and accounting for attributes, such as correlated fuel unavailability for non-renewable resources, long start up notification requirements, non-fuel-related correlated outages, etc..
  - Resolving these limitations will enable more accurate calculations of the Resource Adequacy requirements needed to maintain reliability and the Capacity Accreditation Factors, which will reflect the marginal reliability contributions of each Capacity Accreditation Resource Class.

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Modeling Improvements for Capacity Accreditation

- **Deliverable: Q4 2023 – Functional Requirements**
- **Project Description:**
  - Working with stakeholders and the NYSRC, the 2023 effort will examine methodologies and enhancements to GE MARS and the inputs to the IRM/LCR model to more accurately reflect resource operating characteristics in the Resource Adequacy assessments and Capacity Accreditation Factor calculations.

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Modeling Improvements for Capacity Accreditation

- **Stakeholder Engagement Plan:**
  - Q1
    - Project kick-off
      - Overview of areas of potential needed enhancement in the Resource Adequacy assessments
    - Analysis of areas of potential needed enhancement in the Resource Adequacy assessments

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LCR Optimizer Enhancements

LCR Optimizer Enhancements

- **Background:**
  - Since 2019, the NYISO has utilized an economic optimization software ("LCR Optimizer") to establish the Locational Capacity Requirements (LCRs). The LCR Optimizer is designed to produce LCRs that maintain the Resource Adequacy criterion of a Loss of Load Expectation of no greater than one event-day in 10 years while minimizing the economic costs of meeting the LCRs.
  - Since implementing the LCR Optimizer, multiple concerns have been raised regarding the stability of the LCRs and the transparency of the optimization function. Re-examining this process and the methodology could lead to improvements in the stability and transparency of the LCRs.

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LCR Optimizer Enhancements

- **Deliverable: Q3 2023 – Market Design Complete**
- **Project Description:**
  - The objective of this project is to investigate the need for and develop any necessary modifications and enhancements to the LCR Optimizer to improve the stability and transparency of the LCRs.

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LCR Optimizer Enhancements

- **Stakeholder Engagement Plan:**
  - Q1
    - Project kick-off
      - Overview of areas of potential needed enhancement to the LCR Optimizer
    - Analysis of areas of potential needed enhancement to the LCR Optimizer

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2025-2029 ICAP Demand Curve Reset

ICAP Demand Curve Reset

- **Background:**
  - Every four years, the NYISO and its stakeholders undertake a comprehensive review, referred to as the ICAP Demand Curve reset (DCR), to determine the necessary inputs and assumptions for developing the ICAP Demand Curves for the four-year period covered by the reset. Each ICAP Demand Curve is based on the estimated cost to construct and operate a hypothetical new capacity supply resource in various locations throughout New York.

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ICAP Demand Curve Reset

- **Deliverable: Q3 2023 – Study Defined**
- **Project Description:**
  - The Demand Curve Reset will be ongoing from 2023-2025
  - The DCR process begins in 2023 and is applicable to years 2025-2029
    - The NYISO will select an independent consultant to conduct a study of the parameters, assumptions and methodology used to set the NYISO's Installed Capacity Demand Curves

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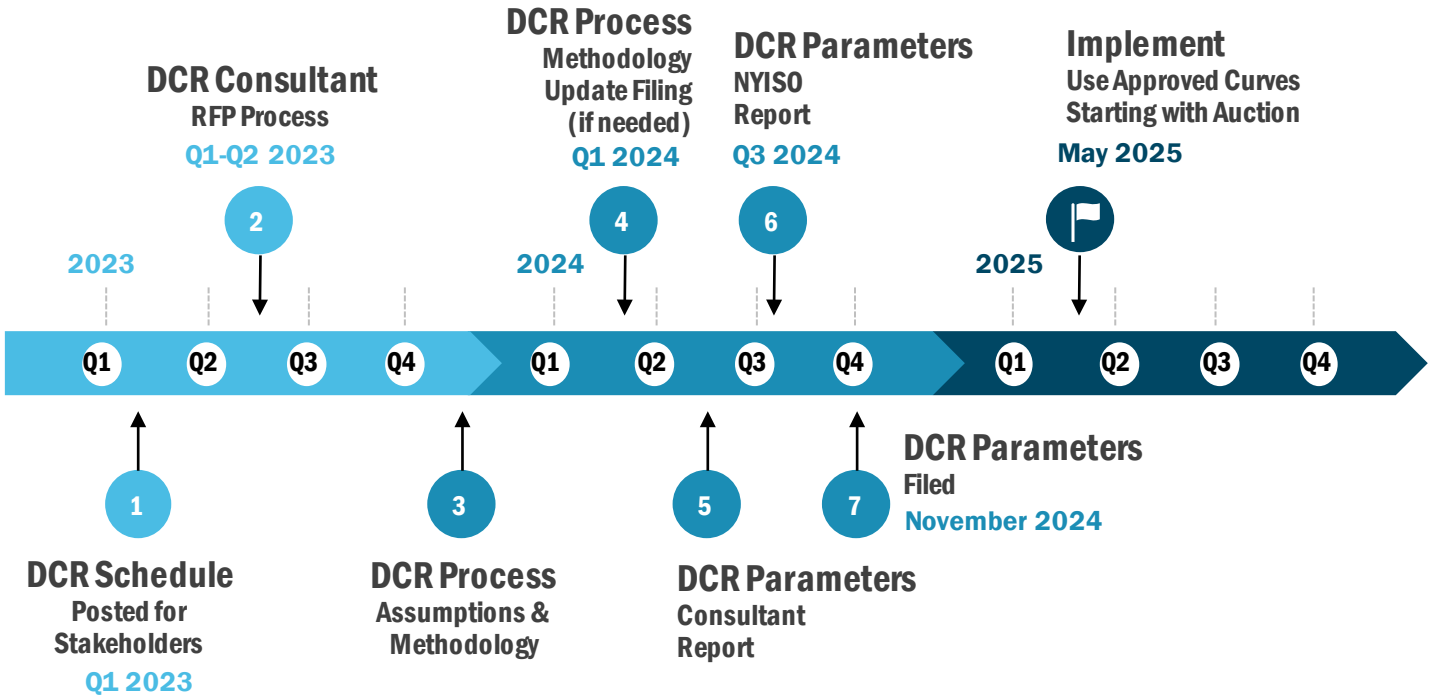
ICAP Demand Curve Reset



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ICAP Demand Curve Reset

- **Stakeholder Engagement Plan:**
  - Q1
    - Project kick-off
    - Discuss schedule for DCR
  - Late Q1/Early Q2
    - Issue the Request for Proposals for the independent consultant for the DCR

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Ongoing & Implementation Efforts

Ongoing & Implementation

- **Improving Capacity Accreditation**
  - Deliverable: Q4 2023 – Deployment
  - Project Description:
    - The NYISO will develop the necessary internal software updates to implement Capacity Accreditation in 2024
- **CRIS Expiration Evaluation**
  - Deliverable: Q4 2023 – Functional Requirements
  - Project Description:
    - Continuing the work from 2022, the objective of this project is to develop the software requirements to implement the CRIS expiration rules

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Energy Market Design

Energy Market Project Overview

2023 Energy Market Design Projects	Q1	2023 Deliverable
Balancing Intermittency (SOM)	CD	Q4 Market Design Concept Proposed
Dynamic Reserves (SOM)	CD	Q3 Market Design Complete
Emissions Transparency	CP	Q4 Functional Requirements
Evolving Financial Transaction Capabilities- Bilateral Transactions	CP	Q4 Software Design Specification
Enhancing Fuel and Energy Security	CD	Q4 Study Complete
Long Mountain PAR Operating Protocol with ISO-NE	CD	Q4 Market Design Complete

2023 Energy Market Ongoing and Implementation Projects	Q1	2023 Deliverable
Constraint Specific Transmission Shortage Pricing	SD	Q4 Deployment

Key			
CD	Continued Discussions	MDC	Market Design Complete
ID	Issue Discovery	FR	Functional Requirements
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Balancing Intermittency (SOM)

Balancing Intermittency (SOM)

- **Background:**
  - A grid characterized by high levels of intermittent renewable resources, Energy Storage Resources (ESR), and Distributed Energy Resources (DER) will require new thinking to adequately balance intermittency on the system and meet associated flexibility and ramping needs.

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Balancing Intermittency (SOM)

- **Deliverable: Q4 2023 – Market Design Concept Proposed**
- **Project Description:**
  - Leveraging the findings in the 2022 Grid in Transition Study, this effort will evaluate grid characteristics, resource attributes, as well as potential new market products that may be necessary to continue reliably maintaining system balance.
    - This project will also assess existing market rules and determine appropriate compensation mechanisms that incentivize such attributes.
  - The NYISO approaches this work with two guiding principles:
    - (1) all aspects of grid reliability must be maintained; and
    - (2) competitive markets should continue to maximize economic efficiency and minimize the cost of maintaining reliability while supporting the achievement of New York's climate policy codified in the CLCPA.

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Balancing Intermittency (SOM)

- **Stakeholder Engagement Plan:**
  - Q1
    - Project kick-off
      - Overview of project plan, targeted analysis, and concepts to research

Dynamic Reserves (SOM)

Dynamic Reserves (SOM)

- **Background:**
  - Today, the NYISO procures fixed quantities of operating reserves in specified regions across the state.
    - Under this structure, the static modeling of reserve regions and their associated requirements may not optimally reflect the varying needs of the grid to respond to changes in system conditions.
      - These system conditions are expected to become more variable as new resources enter the market in the coming years.

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Dynamic Reserves (SOM)

- **Deliverable: Q3 2023 – Market Design Complete**
- **Project Description:**
  - Building upon the 2022 Market Design Concept Proposed (MDCP)*, the 2023 effort will develop potential changes to the NYISO's market software and market rules to facilitate more efficient scheduling of operating reserves based on system conditions.
    - The market design involves dynamically accounting for the single largest source contingency or transmission capability into a region when determining reserve requirements.

*Dynamic Reserves MDCP Presentation: Slide 1 (nyiso.com)

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Dynamic Reserves (SOM)

- **Stakeholder Engagement Plan:**
  - Q1
    - Project kick-off
      - Overview of project plan and items to address in 2023
      - Scheduling and pricing examples for the Day-Ahead Market
      - Determining necessary updates to posting of reserve requirements

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Emissions Transparency

Emissions Transparency

- **Background:**
  - The emissions rates associated with the production of electricity in New York vary from hour to hour and location to location, but specific emissions rates may not be transparent to the market.
    - Transparency of this data will help inform end users, load-serving entities, generators, energy service companies, marketers, aggregators, and other Market Participants seeking to optimize their use, production, storage, or purchase of electricity based on emissions.

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Emissions Transparency

- **Deliverable: Q4 2023 – Functional Requirements**
- **Project Description:**
  - This effort will seek to enable publishing of marginal and average emissions rates concurrent with the release of Locational Based Marginal Pricing (LBMP) results.

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Emissions Transparency

- **Stakeholder Engagement Plan:**
  - Q1
    - Project kick-off
      - Discussion of project plan and approach
      - Draft proposal

Evolving Financial Transaction Capabilities- Bilateral Transactions

Evolving Financial Transaction Capabilities- Bilateral Transactions

- **Background:**
  - Current NYISO software capabilities facilitate internal bilateral transactions. However, current functionality does not enable ESRs to be a sink in bilateral contracts.
    - To the extent there is increasing demand for ESRs to use bilateral transactions to contract output from specific resources, an opportunity exists for NYISO to enhance its bilateral transaction functionality to meet this demand.

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Evolving Financial Transaction Capabilities- Bilateral Transactions

- **Deliverable: Q4 2023 – Software Design Specification**
- **Project Description:**
  - This project will enhance bilateral transaction functionality by creating the opportunity for bilateral contracts in which an ESR can be a sink.

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Evolving Financial Transaction Capabilities- Bilateral Transactions

- **Stakeholder Engagement Plan:**
  - Q1
    - Project kick-off
      - Discuss approach for enabling enhancements to bilateral functionality
      - Project plan

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Enhancing Fuel and Energy Security

Enhancing Fuel and Energy Security

- **Background:**
  - Future changes to New York's fuel supply mix and extreme weather scenarios and climate change impacts may challenge the ability to meet electric system demands under stressed system conditions
  - NERC, NPCC and NYSRC are all currently considering new mandatory standards for prolonged cold weather events and/or natural gas supply/transportation disruptions.
  - The NYISO previously conducted a Fuel and Energy Security Report in 2019 with the Analysis Group

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Enhancing Fuel and Energy Security

- **Deliverable: Q4 Study Complete**
- **Project Description:**
  - This project is a refresh of the 2019 Enhancing Fuel and Energy Security project in recognition of the ongoing transformation of the bulk power system to assess emerging operational and grid reliability concerns
  - The 2023 project will examine potential new reliability standards and the changing nature of the supply mix and load patterns and quantify the amount of resources that will be required based on a wide array of study assumptions

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Enhancing Fuel and Energy Security

- **Stakeholder Engagement Plan:**
  - Q1 2023
    - Project Kickoff
      - Discussions on the report's assumptions and the scenarios analyzed
  - Q2 2023
    - Overview of initial findings
  - Q3 2023
    - Final Report Completed

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Long Mountain PAR Operating Protocol with ISO-NE

Long Mountain PAR Operating Protocol with ISO-NE

- **Background:**
  - There is a planned PAR installation on the Long Mountain-Cricket Valley 345kV (#398) intertie between NYISO and ISO-NE which is an upgrade from the AC Public Policy Segment B project.
  - The operation of the PAR is expected to impact power flows at the NYISO/ISO-NE border
  - The NYISO does not currently have an operating agreement with ISO-NE for this PAR.

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Long Mountain PAR Operating Protocol with ISO-NE

- **Deliverable: Q4 Market Design Complete**
- **Project Description:**
  - With the addition of a PAR on the NYISO/ISO-NE border, an operating agreement is necessary to guide PAR control actions that reduce the overall cost of congestion and maintain reliability
  - The objective of this project is to develop an operating protocol with ISO-NE for the new Long Mountain PAR

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Long Mountain PAR Operating Protocol with ISO-NE

- **Stakeholder Engagement Plan:**
  - Q2-Q3 2023
    - Discussions on ongoing coordination with ISO-NE
  - Q4 2023
    - Vote on Joint Operating Agreement Plan

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Ongoing & Implementation Efforts

Ongoing & Implementation

- **Constraint Specific Transmission Shortage Pricing (SOM)**
  - Deliverable: Q4 2023 – Deployment
  - Project Description:
    - The NYISO will develop the necessary internal software updates to implement Constraint Specific Transmission Shortage Pricing.
    - NYISO plans to deploy in October 2023, after DER, and as a result, the NYISO currently plans to file the enhancements previously approved by stakeholders with FERC in the first half of 2023.

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New Resource Integration

New Resource Integration Project Overview

2023 NRI Market Design Projects	Q1	2023 Deliverable
FERC Order 2222 Compliance	CD	Q4 Market Design Concept Proposed
Engaging the Demand Side	CD	Q4 Issue Discovery
Storage as Transmission	CD	Q4 Issue Discovery

2023 NRI Ongoing and Implementation Projects	Q1	2023 Deliverable
Internal Controllable Lines	CD	Q4 Market Design Complete

Key			
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FERC Order 2222 Compliance

FERC Order 2222 Compliance

- **Background:**
  - The requirements to implement NYISO's FERC Order No. 2222-compliant market rules are not fully included in the 2023 deployment scope.
  - The NYISO is awaiting a final ruling from the Commission of its Order No. 2222 compliance proposals, while continuing to scope necessary enhancements.
  - This project's expected benefits are to allow the NYISO to cultivate a market that is accessible and competitive for DER, aligning with federal regulatory compliance requirements and New York State policy goals.

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FERC Order 2222 Compliance

- **Deliverable: Q4 Market Design Concept Proposed**
- **Project Description:**
  - The NYISO continues to develop its DER Participation Model software requirements, which began in 2020. The software infrastructure needed to implement the DER program was originally scoped based on the 2020 FERC-accepted market design.
    - FERC's issuance of Order No. 2222 presented additional scope and challenges to the NYISO's previously approved market design. The NYISO continues to work with the stakeholder community to achieve consensus on any new requirements as a result of FERC's Order on NYISO's Order No. 2222 compliance filing.
  - This will build on the efforts and momentum of the 2022 NYISO manual and tariff updates initiative, and the previous discussions between NYISO and stakeholders on Order No. 2222 requirements. This project will enable NYISO to review and incorporate market design features required by Order No. 2222 that were not previously included in the initial deployment of DER due to resource constraints and a lack of final ruling from the Commission.
  - The 2023 effort will enable NYISO's DER Participation Model to be fully compliant with the requirements of FERC Order No. 2222, while building on the participation model to be deployed in 2023 to support the 2020 FERC-accepted market design.

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FERC Order 2222 Compliance

- **Stakeholder Engagement Plan:**
  - Q1 2023
    - NYISO to continue updating manuals, guides, and technical bulletins to support the deployment of the 2019 DER participation model
    - NYISO to present and seek approval at BIC and MC of FPA 205 filing tariff updates
    - With time remaining, NYISO to begin review of Order 2222 design features
  - Q2 – Q4 2023
    - NYISO to continue review of key market design concepts, including ancillary services for heterogenous Aggregations of DER as accepted by FERC in 2022, reaching a conclusive market design concept proposed presentation by end of Q4

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Engaging the Demand Side

Engaging the Demand Side

- **Background:**
  - The NYISO's demand response programs and DER participation model offer Load consumers the opportunity to "supply" energy to the wholesale markets. The NYISO also currently offers Load Serving Entities the opportunity to offer Price-Responsive Load in the DAM. Historically, Price-Responsive Load Bids have constituted a few percent of total bid Load by volume.
  - As part of the NYISO's mission to improve market efficiencies, the NYISO believes there may be opportunities to enhance market signals for Load Serving Entities to modulate Load in response to price on the buyer side of the equation. Load flexibility is at the intersection of the retail and wholesale markets. While demand response is a reduction of planned or expected consumption, Load flexibility includes other actions such as shifting or modulating demand in response to price signals. Robust participation of flexible, price–responsive Load in both DAM and Real-Time Markets (RTM) may provide another tool to balance the NYCA system, address resource intermittency, and support ancillary service providers.
  - This project ultimately seeks to identify and investigate new ways that the aforementioned programs can be improved/modified to increase consumer engagement in the NYISO – administered wholesale markets. Enabling consumers to assume greater control of their energy use will help to balance increasing penetration of intermittent and variable generation supporting New York State's zero emission and climate action policies.

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Engaging the Demand Side

- **Deliverables:**
  - Q4 Issue Discovery
- **Project Description:**
  - Engaging the Demand Side is intended to be a highly collaborative project. The NYISO seeks to leverage both external and internal stakeholders in identifying potential issues/gaps in the NYISO's existing DR/Load-based programs – solicited feedback will be gathered via two external roundtable discussions, to be held at the end of March 2023. Information gathered at these external roundtable discussions will inform a final report to be released in Q4 of 2023, which will recommend next steps regarding future Market Design projects/efforts to address solicited feedback.

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Engaging the Demand Side

- **Stakeholder Engagement Plan:**
  - February 2023
    - NYISO will share a finalized roundtable schedule with stakeholders at various Working Groups
  - March 2023
    - The NYISO will hold two off-site roundtable discussions with stakeholders
      - The dates for these roundtable discussions will be finalized over the course of January 2023, shared with stakeholders in early February
  - April -> August 2023
    - Monthly project updates at Working Groups
  - Q4 2023
    - NYISO will share a final report with stakeholders that will recommend next steps regarding Market Design projects/efforts to address solicited feedback

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Storage as Transmission

Storage as Transmission

- **Background:**
  - The unique characteristics of energy storage allow these assets to provide many potential services to the grid, including the relief of peak demand through injections and reducing congestion through off-peak charging to provide power when it will be needed later
  - In some instances, storage used exclusively as a regulated transmission asset may represent an efficient option for providing the same or similar services as traditional regulated alternatives, while providing valuable optionality to scale or augment project size or operation in the future
  - Currently, the NYISO tariffs treat storage as a Generator, and there is no pathway by which a storage project could be evaluated through the interconnection process as a regulated transmission asset, and no methods by which to operate a storage asset as transmission.

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Storage as Transmission

- **Deliverable: Q4 Issue Discovery**
- **Project Description:**
  - This project will assess the current NYISO process and whether a process for considering and evaluating a storage project as a regulated transmission asset, including options for cost recovery, is needed
  - Additionally, the project will consider rules and methods for operating the storage as a regulated transmission asset to address identified reliability issues, if appropriate

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Storage as Transmission

- **Stakeholder Engagement Plan:**
  - Q1 2023
    - Discussions on the current NYISO planning processes
    - Review of how other ISOs are considering Storage as Transmission
  - Q2 2023
    - Discussions on incorporating Storage as Transmission into NYISO planning processes, as well as consideration for market participation and operating rules for these assets

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Ongoing & Implementation Efforts

Ongoing & Implementation Efforts

- **Internal Controllable Lines**
  - Deliverable: Q4 2023 – Market Design Complete
  - Project Description:
    - Building upon the 2022 Market Design Concept Proposed (MDCP)*, the 2023 effort will develop potential changes to the NYISO's market software and market rules to integrate Internal Controllable Lines into NYISO markets.
  - Stakeholder Engagement Plan:
    - Q1
      - Project kick-off
        - » Overview of project plan and items to address in 2023

*ICL MDCP Presentation: Slide 1 (nyiso.com)

New York ISO

Our Mission & Vision

Mission

Ensure power system reliability and competitive markets for New York in a clean energy future

Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation

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Questions?