2024 Market Project Candidates

Product and Project Management

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This document represents potential 2024 Market project candidates. Market projects are associated with market rule(s), including market design and study projects as well as any projects implementing market rule changes. They are identified through (1) the State of the Market (SOM) Report; (2) internal NYISO discussions; and (3) discussions with Market Participants in the stakeholder process. These project candidates and their corresponding descriptions reflect information known about each of the project candidates as of the date of this document.

Introduction

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Project Type	Description
Mandatory	Projects that are key to support Strategic Initiatives, comply with FERC Orders, or sustain the operation of the NYISO business. These projects will be included in the budget
Continuing	Projects approved in a prior year and that have progressed to either Software Design, Development Complete, or Deploy will generally be proposed as Continuing. Additional projects may be classified as Continuing based on stakeholder feedback. These projects will be included in the budget
Future	Consensus from stakeholder discussions of this projects priority relative to other projects has resulted in these projects NOT being prioritized and initiated in the coming budget year. Resources, time constraints, stakeholder feedback, and other project dependencies have been taken into consideration
Prioritize	Projects to be prioritized and included in the budget based on a feasibility assessment taking into consideration resources, time constraints, stakeholder feedback, priority score, and other project dependencies

Prioritize

1. 5 Minute Transaction Scheduling

1.1. Problem / Opportunity

Currently, interchange with external control areas is achieved on either a 15-minute or an hourly basis using the NYISO's Real-Time Commitment (RTC) software. A significant portion of Internal Generation is scheduled every five minutes. More frequent interchange scheduling with external control areas could notably improve convergence between prices in RTC and Real-Time Dispatch (RTD) and provide additional balancing and/or ramping capabilities. With increased penetration of intermittent renewables, five-minute transactions would provide greater flexibility to RTD and would create more consistency between internal and external resource scheduling.

1.2. Project Objective(s) & Anticipated Deliverable(s)

The project builds upon the study completed in 2020 that evaluated the feasibility for scheduling every five minutes with external control areas. This project will expand upon the recommendation from the study by developing market rules and a mechanism to schedule interchange every five minutes using the RTD with Hydro-Québec (HQ). This will include evaluating the benefits of a transaction vs. generator model in greater detail.

The 2024 project deliverable will be Market Design Concept Proposed.

1.3. Project Justification

This market improvement is expected to improve price convergence between RTC and RTD, and improve market efficiency by increasing the amount of resources available to address real-time system changes and/or events. More frequent scheduling that aligns with internal generation scheduling frequencies will also help to alleviate top-of-hour and quarter-hour interchange discrepancies between RTC and RTD.

The added flexibility that more frequent interchange scheduling provides is particularly important with the State-mandated requirements for renewable generation and other clean energy resources to replace the use of fossil fuel generation. This effort will focus on incorporating five-minute scheduling with HQ, as this is the only neighboring Balancing Authority that has expressed interest in developing that capability.

2. Advanced Storage Modeling and Operation

2.1. Problem / Opportunity

Currently, when the NYISO is short on Energy or Capacity in a given hour, operators will commit additional resources or modify Energy Limited Resources (ELR) or Capacity Limited Resource (CLR) unit schedules to provide the remainder of the necessary Energy or Capacity. These

resources may include Distributed Energy Resources (DER), Energy Storage Resources (ESR), or any other generator that did not already have a commitment for that hour. However, as DER and ESR penetration increases, the process for operators to redispatch resources becomes more complex.

Due to their inherent energy duration limitations, dispatching an ESR in one hour will reduce its state of charge and subsequently impact how it can perform in future hours. Therefore, if NYISO operators redispatch an ESR to account for a shortage of Energy in a given hour, the ESR may not be able to meet its Energy schedule in the coming hours. This issue is especially significant when an ESR that was originally scheduled to inject Energy during hours in the peak load window is re-dispatched to provide Energy earlier in the day. The Advanced Storage Modeling and Operation project will address considerations for the redispatch of an ESR and whether the asset will have the necessary state of charge to continue to meet its Energy schedule.

2.2. Project Objective(s) & Anticipated Deliverable(s)

The market design concepts will seek to assess methods for enhancing the market modeling and operation of ESRs. The NYISO will coordinate with stakeholders to consider market design concepts governing the redispatch of an ESR throughout the day and the impacts of the redispatch on the resource's availability later in the day. The deliverable for this effort in 2024 will be to develop a concept proposal and deliver a Market Design Concept Proposal to market participants.

2.3. Project Justification

As more behind-the-meter resources enter the market, net load profiles may deviate from expectations, resulting in Real Time needs differing from projections. As such, the redispatch of resources may become more frequent, and Advanced Storage Modeling and Operation is expected to provide NYISO operators the necessary flexibility and tools to account for increased net load variability while providing market participants additional capabilities to manage limited energy resources availability throughout the day. This effort is also important in supporting feasible participation of limited duration resources as the NYISO considers expanding its Energy and Ancillary Service product offerings as described in the Balancing Intermittency and Dynamic Reserves efforts.

3. Advancing NYISO Transparency - Requested by DC Energy

3.1. Problem / Opportunity

Posting more information would aid in the transparency of wholesale market operations and market participation. The additional data requested below can be posted publicly or protected through CEII protocols, depending on the information classification.

3.2. Project Objective(s) & Anticipated Deliverable(s)

The following additional data should be posted by the NYISO:

1. State estimator modal and data including:
    a. Topology
    b. Branch characteristics
    c. Branch flows
2. Transmission line rating for all transmission lines/facilities monitored, including when they change and why
3. Day-Ahead Market (DAM) and Real-Time Market (RTM) contingencies. The NYISO has a separate list of contingencies for DAM/RTM relative to what the NYISO models in the Transmission Congestion Contracts (TCC) auctions, and the NYISO only publishes the TCC contingencies.

The project will review the information requested to determine its classification (public, CEII, confidential, etc.), develop software to automate extracting the data from the appropriate system, including working with vendors that support NYISO systems for modifications, and developing software to periodically post data in a manner that is designed to protect CEII and other Confidential Information.

The 2024 project deliverable will be Deployment.

3.3. Project Justification

Open, transparent, and competitive NYISO markets are essential to facilitate efficient solutions and provide benefits to consumers. The Federal Energy Regulatory Commission (FERC) has opined many times on the benefits that transparent and competitive markets deliver, for example:

- Commission's conclusions in AD14-14 that transparency plays a critical role in improving price formation.
- Without sufficient transparency, market participants may not have the tools necessary to critically analyze and discuss problems and identify potential solutions to market inefficiencies.
- Order No. 704 conclusion: "[Such] policies [i.e., the Commission's market-oriented policies for the wholesale natural gas industries] require that interested persons have broad confidence that reported market prices accurately reflect the interplay of legitimate market forces. Without confidence in the basic processes of price formation, market participants cannot have faith in the value of their transactions, the public cannot believe that the prices they see are fair, and it is more difficult for the Commission to ensure that jurisdictional prices are 'just and reasonable.'"

4. Balancing Intermittency

4.1. Problem / Opportunity

In a time of unprecedented change in the electricity sector, New York's competitive electricity markets must be positioned to unleash the innovation and flexible energy solutions necessary for a reliable transformation towards a zero-emissions power grid. A rapid transition is underway in New York State from a power grid where energy is largely produced by central-station fossil fuel generation, towards a grid with increased intermittent renewable resources and distributed generation.

The pace of this transition is driven primarily by state policy, notably the Climate Leadership and Community Protection Act (CLCPA). In addition, technological advancements are expanding the capabilities of new resources and lowering their costs, further driving broader industry changes.

The NYISO is actively working on market enhancements to meet these future challenges. A grid characterized by high levels of intermittent renewable resources, ESR, and DER will require new thinking to adequately balance intermittency on the system and the associated system ramps. 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.

The 2022 Grid in Transition Study identified the potential level of system flexibility that will be required with increases in intermittent resources and evaluate grid and/or resource attributes necessary to continue to reliably maintain system balance.

4.2. Project Objective(s) & Anticipated Deliverable(s)

Using the work completed to date across various NYISO studies and initiatives, including the Reliability and Market Considerations for a Grid in Transition work, Grid in Transition project work, and any relevant external studies on the ramp and flexibility needs of the future, this project will examine the existing NYISO market structures and market rules and will determine if there are any changes or additions needed to maintain reliability. While the 2023 effort proposed market concepts, the 2024 project will continue to more fully develop the market concepts from the 2023 effort with a deliverable of Market Design Complete.

4.3. Project Justification

The CLCPA includes the following goals:

- 100% of the state's electricity must be emissions free by 2040
- 9,000MW of offshore wind energy must supply NY by 2035
- 6,000MW of solar energy be installed in NY by 2025
- Statewide reduction of 185 trillion BTUs through energy efficiency
- 3,000MW of energy storage capacity must be installed to serve NY by 2030

Continuation of this project will help to identify the means to maintain system reliability while addressing the state's goals and mandates in a cost-effective way through the creation of proper market mechanisms. This project also supports State of the Market recommendations 2021-1 and further evaluating 2017-2.

5. Clean Hydrogen - Requested by NextEra and Constellation

5.1. Problem / Opportunity

Currently, NYISO's tariff does not clearly contemplate the co-location of an emissions-free generator and load arrangement, such as an electrolyzer producing clean hydrogen. This lack of an effective pathway will inhibit the development of clean hydrogen infrastructure, which will impede achievement of New York's decarbonization goals.

5.2. Project Objective(s) & Anticipated Deliverable(s)

The Clean Hydrogen Project would investigate use cases proposed by Market Participants for loads co-located with non-emitting generation, including an electrolyzer producing clean hydrogen using energy from a co-located emissions-free generator, and work with the NYISO to develop a market concept towards meeting a Market Design Concept Proposed milestone in 2024. Potential avenues may include a new participation model or modifications to the existing Co-located Resources, Hybrid Co-located Resource, and Behind the Meter Net Generator models.

5.3. Project Justification

Achieving New York's decarbonization goals will require a substantial amount of Dispatchable Emission Free Resources (DEFRs) in order to complement and balance intermittent generation sources. Clean hydrogen is widely understood to be a necessary fuel source for DEFRs, and the Clean Hydrogen Project is intended to develop market rules that will enable the development and deployment of clean hydrogen electrolyzers in New York State powered by co-located non-emitting generation.

Per New York State Energy Research and Development Authority (NYSERDA): "As New York transitions to a clean energy economy, we are seeking to understand and explore all resources that may be available as part of the State's comprehensive decarbonization strategy, including assessing the role of green hydrogen. Supporting innovation and studying all technologies will enable us to remain on the cutting edge of evolving solutions that will complement our existing decarbonization efforts in achieving the State's ambitious Climate Act goals." From the 2021-2040 Outlook: "As more wind, solar, and storage plants are added to the grid, DEFRs must be developed and added to the system at scale to reliably serve demand when intermittent generation is unavailable. The lead time necessary for research, development, permitting, and construction of DEFRs will require action well in advance of 2040 if state policy mandates under the CLCPA are to be achieved. Fossil generation will likely need to be retained past the 2040 mandates to keep the system reliable if DEFR technology is not in operation."

On April 7, 2023, NYSERDA, of behalf of the seven state Northeast Regional Clean Hydrogen Hub, applied to the U.S. Department of Energy (DOE) for a $1.25 billion share of $8 billion in federal hydrogen hub funding available as part of the Infrastructure Investment and Jobs Act. The proposal advances $3.62 billion of direct hydrogen investments advancing clean electrolytic hydrogen production, consumption, and infrastructure projects for hard to decarbonize sectors. As a result, clean electrolytic hydrogen projects and production will likely increase substantially.

6. Dynamic Reserves Phase 1

6.1. Problem / Opportunity

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 into the market in the coming years.

Based on New York State Reliability Council, L.L.C. (NYSRC) rules, the NYISO is required to procure sufficient reserves to account for the single largest source contingency at all times. However, the current static modeling approach does not account for the potential for the largest source contingency to change based on system conditions and system topology every market run. Dynamically determining the operating reserve requirements could enhance system reliability and market efficiency based on the system needs at any time.

The NYSRC rules also require the NYISO to ensure that transmission facilities are not loaded above their Long-Term Emergency (LTE) rating, post-contingency. In some cases within New York City, the NYISO is permitted to operate transmission facilities above LTE, using generating capacity not otherwise scheduled to provide energy and Phase Angle Regulator (PAR) actions to quickly secure the transmission facilities post-contingency. This operation offers opportunities to reduce production costs by relaxing the transmission limits of facilities that feed load pockets in New York City. Currently, operating reserve providers in these load pockets are not compensated for the avoided transmission congestion they enable by allowing certain facilities to be secured to a rating that is higher than LTE.

Therefore, Dynamic Reserves would enhance the current modeling by: (i) allowing the adjustment of the minimum operating reserve requirements based upon the single largest source contingency or risk for simultaneous loss of energy from similarly situated generation (e.g., offshore wind or natural gas), and (ii) accounting for transmission capability when determining reserve needs within a constrained area. These enhancements could allow the scheduling of energy above the minimum operating reserve requirements from individual suppliers when sufficient reserves are available and also the shifting of reserves to lower-cost regions when transmission capability exists. A dynamic reserve procurement methodology could improve

market efficiency through enhancing competition among suppliers, and better aligning market outcomes with how the power system is operated.

6.2. Objective(s) & Anticipated Deliverable(s)

The anticipated deliverable for 2024 will be Functional Requirements Specifications (FRS), based on the Market Design Complete from the 2023 Dynamic Reserves project.

6.3. Project Justification

As the markets and grid are expected to rapidly evolve in the coming years, the modeling of reserves will also need to evolve and become more flexible. The Market Monitoring Unit (MMU) has recommended that the NYISO "[d]ynamically adjust operating reserve requirements to account for factors that increase or decrease the amount of reserves that must be held on internal resources [SOM Recommendation 2015-16]." Dynamic Reserves would seek to ensure the reserve requirements and the procurement of reserves adequately reflect the conditions of the system. Specifically, the reserve modeling should dynamically account for the single largest source contingency and the loss of transmission capability into a region. This would improve market efficiency by allowing more energy to be produced from a single source if adequate reserves are available, and also allow reserves to be scheduled in less expensive regions when there is available transmission capability to import power into a constrained region post-contingency. Dynamic reserve requirements and procurements present opportunities to enhance grid resilience, encourage resource flexibility, lower total production costs, and increase efficiency in meeting applicable reserve requirements. This project also supports State of the Market recommendations 2015-16, 2021-2.

7. Eliminate Offline GT Pricing

7.1. Problem/Opportunity

The NYISO's RTM is based on a dispatch model that updates prices and generator schedules every five minutes. Currently, the dispatch model treats 10-minute gas turbines (i.e., units capable of starting up in ten minutes) as if they can follow a 5-minute signal. Offline GT pricing was developed to produce real-time prices that reflect the costs of actual resources that could be committed to address a constraint. The MMU has observed that this structure leads to inefficiencies, because 10-minute gas turbines are unable to respond in five minutes. This may lead to periods of under-generation, inconsistencies between scheduled transmission flows and actual flows, and inefficient prices that do not properly reflect the balance of supply and demand. The logic, however, provides useful information to grid operators regarding system needs and allows them to commit additional units based on evaluation by the Real time dispatch model.

7.2. Project Objective(s) & Anticipated Deliverable(s)

The scope of this project would involve eliminating the offline GT pricing logic and the development of tariff changes to support this change . The 2024 deliverable for this project would be to eliminate this feature through a software Deployment.

7.3. Project Justification

This project would enhance market efficiency by better aligning price signals and schedules with operational needs and resource capabilities. This project is also supported by the Market Monitoring Unit based on their State of the Market recommendation 2020-2.

8. Emissions Transparency (Requested by Stakeholders)

8.1. Problem/Opportunity

The emissions rates associated with the production of electricity in New York vary widely from hour to hour and location to location, but emissions rates are not transparent to the market. This project envisions that the NYISO would publish implied marginal emissions rates concurrent with the release of Locational Based Marginal Pricing (LBMP) results. Doing so would 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. In addition, providing such data to the market would enable consumers to evaluate the emissions associated with the energy they consume.

8.2. Project Objective(s) and Anticipated Deliverable(s)

This project will deploy a methodology to estimate real-time implied emissions rates for each load zone. The NYISO would aim to begin publishing emissions rates by 2025. They would be posted concurrently with LBMP results on its website.

Implied marginal emissions rates would be determined using a methodology comparable to LBMPc (see LBMPc Slides).

8.3. Project Justification

Publishing implied marginal emissions rates adds transparency of bulk power system related emissions, as requested by stakeholders.

9. Engaging the Demand Side

9.1. Problem / Opportunity

Engaging 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. The NYISO's demand response programs and DER participation model offer Load consumers the opportunity to "supply" energy to the wholesale markets.

NYISO's current DER model requires DER to be fully dispatchable in real time with no advanced notification or startup commitment. NYISO's current SCR model have a 21-hour advance notice and 2-hour in day notice. SCRs are required to be a 4 hour capacity provider with no other time duration options. NYISO Market Participants have raised concerns that these requirements are potentially leaving both current and new resources, unable to fully participate using the current NYISO DER, or SCR models. The NYISO remains interested in exploring opportunities to enhance the DER and/or SCR models.

9.2. Project Objective(s) & Anticipated Deliverable(s)

The NYISO will advance the discussion with stakeholders on the recommendations identified in the 2023 Engaging the Demand Side Report. The 2024 project deliverable for this project will be a Market Design Concept Proposed (MDCP) milestone that is reviewed in a presentation at MIWG.

9.3. Project Justification

Enhancements to NYISO's DER and/or SCR models that further support robust participation of more resources in both DAM and RTM may provide another tool to balance the New York Control Area (NYCA) system, address resource intermittency, and support ancillary service providers. The team will further evaluate recommendations identified in the 2023 Issue Discovery effort to determine their merit.

10. Evolving Resource Adequacy Models

10.1. Problem / Opportunity

Improving the resource adequacy tools and models is critical to efficiently meeting the reliability needs of the evolving grid. The Evolving Resource Adequacy Models project will evaluate enhancement of these tools and models, continuing work from the Improving Capacity Accreditation and Modeling Improvements for Capacity Accreditation projects.

10.2. Project Objective(s) & Anticipated Deliverable(s)

The Evolving Resource Adequacy Models project will research the need for potential changes to the assumptions, inputs, and modeling of winter months in the NYISO's current resource adequacy analysis software and investigate how unit size should be considered for calculating Capacity Accreditation Factors. Following the 2023 Modeling Improvements for Capacity Accreditation project, this project will also research the need for remaining enhancements, if any, related to accounting for correlated outages. The project deliverable for 2024 will be Study Complete. The completed study will be presented to the Installed Capacity Working Group and

New York State Reliability Council's Installed Capacity Subcommittee for consideration of any recommendations.

10.3. Project Justification

This project is a continuation of the work started with the Improving Capacity Accreditation and Modeling Improvements for Capacity Accreditation projects. This project will facilitate future work to establish Installed Capacity Market Reserve Margins reflecting reliability risks not currently modeled in the resource adequacy software and improved Capacity Accreditation Factors.

11. Expanding Peak Hour Definition – Requested by DPS

11.1. Problem / Opportunity

The NYCA peak load hour is currently defined as the single hour within a Capability Year with the highest measured system load limited to weekdays during the months of July and August. The peak load is weather normalized, and a peak load forecast for the following year is generated by the NYISO in conjunction with the Transmission Owners (TOs). This peak load forecast is used for the Installed Reserve Margin study and the Installed Capacity (ICAP) market forecast, and determines the total load obligation for each Transmission District.

Current practice dictates that the TOs share out their capacity obligation to their Load Serving Entities (LSEs) based on the measured share of load consumed by each LSE during the NYCA peak load hour. Using multiple peak and near-peak load hours (*e.g.* the top five or top ten load hours) to share out obligations within a Transmission District may improve this process and create more robustly defined and consistent LSE shares. Likewise, in the distribution network, as LSEs use measures of peak period(s) usage to assign capacity cost to their customers, it becomes imperative that those measurements are representative of the customers' capacity needs. Basing a customer's capacity needs on demand during a single hour or day can leave too much to chance and not accurately measure the capacity need. Using the peaks from multiple high load days would be more stable and more reflective of long run cost causation.

Currently, the NYCA peak hour is determined using net hourly load as measured on the system. However, it is worth considering whether peak load should be based entirely or in part on gross load, which may become more important as demand response and distributed energy resource penetration increases.

11.2. Project Objective(s) & Anticipated Deliverable(s)

In 2020 this project was adopted by Market Participants. Over the course of 2021, NYISO Staff presented at the ICAPWG/MIWG (February 25, 2021, March25, 2021, May 4, 2021, June 3, 2021, June 30, 2021, and July 27, 2021). This resulted in a Market Design Concept Proposed, but the issue was not adopted for 2022. This project will continue from the Market Design Concept Proposed and determine what changes are needed in order to implement altering the way that

capacity obligations are allocated to LSEs. Findings and resulting suggestions will be reported and discussed with stakeholders. The project deliverable will be Market Design Complete and proposal for deployment.

11.3. Project Justification

Many other jurisdictions consider more than a single hour when determining peak obligations for demand and resources. Given the upcoming changes planned for New York's grid, ensuring the determination of peak load hours used for capacity allocations is robust will be important for maintaining reliability and fair and equitable allocation of costs.

As retail electric metering evolves across New York state, LSEs will be better able to track customer usage on an hourly basis. The Public Service Commission first required hourly pricing for large C&I customers in April 2006 in Case 03-E-0641 Order Adopting Mandatory Hourly Pricing (MHP), those MHP customers are billed for capacity on the basis of their usage during the peak hour. Over the years, the threshold for MHP has decreased. In the last seven years Utilities have proposed, approved, and installed AMI meters that provide hourly load data for all customers. This allows LSEs to allocate capacity cost more specifically to customers causing the need for capacity. As customers become responsible for the capacity cost they cause, they will seek to manage that cost. This helps to engage the demand side to manage peak hour demand.

12. Improve Duct-Firing Modeling

12.1. Problem/Opportunity

Providers of reserves and regulation are currently required to achieve their emergency response rate over the entire range of operation. This is problematic for combined-cycle gas turbines (CCGTs) with duct firing, because the response rate of the duct-firing portion is typically slower than the baseload portion of the plant. These resources cannot achieve the emergency response rate in the duct-firing portion of their range (typically the upper 10-20% of capability), which limits their availability to provide reserves and regulation.

This project would seek to develop a design that better utilizes the capability of each plant segment. The following solutions are considered, such as: (1) testing the static registration response rates for each MW block and not the emergency rate for the entire output of the plant and (2) allowing reserves and regulation to be provided for just the baseload output of the plant.

12.2. Project Objective(s) & Anticipated Deliverable(s)

The 2024 project deliverable will be to complete the FRS. The project would build upon the 2022 MDCP to enable market enhancements of using static registration ramp rates, that are currently used for energy dispatch, for reserve scheduling and limiting participation before the duct-firing range for reserves and regulation that would be required for a combined-cycle generator to reflect its operating characteristics in the duct-burning range as well as the benefits of this functionality.

12.3. Project Justification

There are currently many combined cycle generators in the New York Control Area and the majority of these combined cycle generators have duct-firing capacity. These resources currently represent a large source of dispatchable resources. Having access to these resources' full dispatchable capability will become increasingly important as generation from intermittent resources grows over the coming years. Enabling their participation will provide consumer benefits, as increased competition could result in lower market prices and greater availability of resource capability to provide various ancillary services. Thus, the project would seek to evaluate the enhancements to the scheduling of a generator's capacity that would provide more flexibility to participate in the reserves and regulation markets. This project also supports State of the Market recommendation 2020-1.

13. Integrating Champlain Hudson Power Express (CHPE)

13.1. Problem / Opportunity

The Champlain Hudson Power Express (CHPE) is a new high-voltage direct current (HVDC) line between HQ and NYISO that is expected to come in-service by summer 2026. The NYISO does not currently have an operating agreement for CHPE with HQ or the U.S. owner/operator of this HVDC line. Additionally, Tariff revisions may be required to incorporate the new device.

13.2. Project Objective(s) & Anticipated Deliverable(s)

The objective of this project is to develop an operating protocol with HQ and the U.S. owner/operator for the CHPE HVDC line, identify needed software enhancements, and to map out the timeline of changes needed to effectively integrate this facility into the market systems and reliability tools (EMS). The project deliverable for 2024 will be integration Study Complete and draft Operating Agreements.

13.3. Project Justification

With the addition of the new HVDC line between HQ and the NYISO that will be operated in the U.S. by a new, non-incumbent TO, operating agreements are necessary to guide the HDVC line control actions that reduce the overall cost of congestion and maintain reliability.

14. Internal Controllable Lines

14.1. Problem / Opportunity

There are no internal controllable lines in operation within the NYCA. Prior to the 2023 Market Design Complete, market rules for the scheduling and pricing of internal controllable lines within the Energy Market did not exist. The NYISO had high-level rules to allow Internal Unforced Capacity Deliverability Rights (UDRs) to participate within the ICAP Market. The internal rules had significant gaps that were addressed in 2023, including, but not limited to, the determination of

requirements for providing capacity on the Internal UDR and the determination of obligations for the Internal UDR that sells capacity.

The development of market rules for internal controllable lines to support outcomes in the best interests of all stakeholders is needed. This project began with developing market rules for the scheduling and pricing of internal controllable lines within the Energy Market. The NYISO also evaluated and revised the existing ICAP market rules for Internal UDRs to ensure compatibility with the expected operation of internal controllable lines in the Energy Market. These newly-developed rules account for how internal controllable lines may be used to support state and local programs.

14.2. Project Objective(s) & Anticipated Deliverable(s)

This project would build upon the 2023 Market Design Complete and develop the functional requirements that will be necessary to incorporate point-to-point internal controllable lines into NYISO markets. The 2024 milestone for this project will be FRS complete.

14.3. Project Justification

State initiatives such as Tier 4 Renewable Energy Credit (REC) procurements provide incentives for developers to deliver renewable generation into congested areas using HVDC lines or similarly controllable transmission resources. New York State has awarded one Tier 4 contract for an internal controllable line and additional projects have been proposed.

15. LCR Optimizer Enhancements

15.1. Problem/Opportunity

In 2017 and 2018, the NYISO worked with stakeholders to design and implement a proposal to set Locational Capacity Requirements (LCRs) based on both the Resource Adequacy criterion of maintaining a Loss of Load Expectation of no greater than one event-day in 10 years, as well as an economic cost minimization of those requirements based upon a set of Net Cost of New Entry (Net CONE) curves developed based upon the proxy technology underpinning the ICAP Demand Curve Reference Points. This effort, called the Alternative Methods for Determining LCRs, was intended to produce a robust, transparent, and intuitive process for maintaining reliability, while producing a lower cost solution in comparison to the previous method for developing LCRs, called the Tan 45 methodology.

Since the new methodology has been implemented, concerns have been raised about the methodology and the resulting LCRs, about 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.

15.2. Project Objective(s) & Anticipated Deliverable(s)

The objective of this project is to deploy any modifications and enhancements to the LCR process that were approved as part of the 2023 LCR Optimizer Enhancements project. The milestone for 2024 is Deployment.

15.3. Project Justification

This project will seek to further enhance the LCR methodology to improve stability and transparency of the LCRs.

16. Long Island Reserve Constraint Pricing

16.1. Problem/Opportunity

The DAM and RTM schedule resources to satisfy reserve requirements, including specific requirements for 10-minute spinning reserves, 10-minute total reserves, and 30-minute total reserves on Long Island. However, reserve providers on Long Island are currently paid based on the clearing prices for the larger Southeastern New York (SENY) reserve region (Load Zones G-K).

16.2. Project Objective(s) & Anticipated Deliverable(s)

The project scope would include conducting a study to further evaluate the current compensation rules for Long Island reserve providers and whether revisions thereto may be reasonable and provide for improved efficiency in pricing outcomes and performance incentives for Long Island reserve providers. The 2024 project deliverable will be a Market Design Concept Proposed.

16.3. Project Justification

The project would seek to evaluate whether revisions to the current compensation rules for Long Island reserve providers may better reflect the value of reserve capability on Long Island. This project also supports State of the Market recommendation 2019-1.

17. Market Purchase Hub Transactions - Requested by LIPA

17.1. Problem / Opportunity

The ability for marketers to source energy from the wholesale market, i.e. buy at LBMP for sale to load or other parties is important for municipalities to take advantage of Treasury Department regulations allowing for tax advantaged prepaid energy market purchases that serve retail load, and may be valuable to a broad range of Market Participants for other commercial purposes. The Netting of Bilaterals (Trading Hubs) initiative was first proposed in 2008, but was limited to balanced transactions. This initiative would expand the rules to allow market purchase hub transactions. To permit these unbalanced hub transactions, the project will need to address

market design, collateral requirements, and energy imbalances. The project will consider mechanisms to allow the transfer of responsibility for these requirements to the ultimate load recipient.

17.2. Project Objective(s) & Anticipated Deliverable(s)

This project will; modify zonal trading hubs in the NYISO energy market systems to provide additional flexibility in scheduling of hub transactions. Using the NYISO and scheduling system, a Market Participant will be able to establish unbalanced transactions to purchase power from the NYISO market for ultimate delivery to a load. The Market Participant will be able to establish separate transactions to sell the power it purchases from the trading hub to a portfolio of load service entities that may be at different electrical locations. The purpose is to allow service to load, not virtual transactions. This project will identify tariff, software, and procedural changes needed to bring about these changes.

17.3. Project Justification

This market enhancement project can reduce costs to load by allowing financed prepayments of energy purchases, and will allow additional transactional flexibility for Market Participants.

18. MDIWG Support

18.1. Problem / Opportunity

The NYISO will contribute to ongoing discussions with NY Department of Public Service (DPS) staff in the Market Design and Integration Working Group (MDIWG). DPS states that the MDIWG's purpose is: (1) to establish market coordination between utilities, DER operators, and the NYISO; (2) to determine technical and economic requirements for efficient planning, dispatch, measurement, and compensation of DER; and (3) to identify necessary industry roles, responsibilities, and interactions to achieve the State's energy deployment goals.

18.2. Project Objective(s) & Anticipated Deliverable(s)

NYISO staff will engage with DPS staff and other stakeholders to further the work undertaken by the Design Team for the MDIWG. This effort will be tracked as an issue discovery.

18.3. Project Justification

Throughout the multi-year DER effort, the NYISO has worked closely with the New York DPS Staff to discuss and identify challenges that will facilitate DER participation in New York State. The NYISO recognizes the New York state goals for the future of bulk and distribution system frameworks will need to be informed by the NYISO's expertise in the operation of the Bulk Electric System and wholesale markets. It is necessary for the NYISO to continue to work with the New York DPS and other stakeholders as part of the MDIWG effort to support the development of coordination and transaction frameworks for DER.

19. Mitigation Threshold Review

19.1. Problem / Opportunity

This project will perform a comprehensive review of and solicit stakeholder feedback on all mitigation behavioral thresholds. This project will review all thresholds used for conduct and impact for mitigation, including the current Load Pocket Threshold (LPT) process.

19.2. Project Objective(s) & Anticipated Deliverable(s)

The objective of this project would be to evaluate all current mitigation thresholds and to improve upon the LPT methodology based on observations from the last several years and to determine if there is a need to modify any of the other current existing mitigation thresholds.

This project will consider the following improvements:

1. Modifying the measure that predicts potential market power for each load pocket in the coming month, based on the number of transmission-constrained hours in the previous 12 months. The existing measure may not accurately forecast upcoming tightness of load pockets by neglecting the systematic tendency for strong summer peaks in constrained hours, but fewer such constraints over the rest of the year.
2. Revising the measure of "lowest allowable LPT." This measure uses a 12-month averaging of load-weighted and fuel-price-adjusted LBMPs to calculate the expected load-pocket LBMP in the coming month and takes 2% of that figure to generate a "lowest allowable LPT." The formula that calculates a weighted average of past load-pocket LBMPs could be revised to better predict load-pocket LBMP in the upcoming month, and hence create a more appropriate measure of lowest allowable LPT.
3. Changing the frequency of fuel-adjusting LPTs. The Tariff requires the NYISO to fuel-price-adjust LPTs, allowing the NYISO to specify the method of fuel adjustment. Currently, the Market Mitigation and Analysis Department (MMA) implements this requirement by fuel-adjusting the LBMP term on a monthly basis. MMA proposes to change the frequency of fuel-adjusting LPTs from monthly to daily, so that each day LPTs maintain consistency with the daily-evolving fuel-price component of energy reference levels.
4. Automating the process of calculating LPTs. This process currently consists of several manual steps, some of which are time consuming and labor intensive. MMA proposes to work with IT to create a fully automated process with measures in place to validate results from each execution.

The project deliverable for 2024 will be Market Design Concept Proposed.

19.3. Project Justification

This project would allow for a comprehensive review of all mitigation thresholds, as well as the LPT methodology and process, to identify ways to improve the accuracy of and verification process for LPT calculations.

20. Operating Reserves Performance

20.1. Problem / Opportunity

Assessing an operating reserves provider's stated capabilities or performance is becoming a growing concern as the grid becomes more dependent on intermittent renewable generators and limited duration or limited energy resources. It is important that the NYISO can count on resources' stated capabilities when they are instructed to convert reserves to energy in response to grid reliability needs, such as load balancing or contingency response. Additionally, under current market rules, operating reserves receive the same compensation regardless of their actual performance. This compensation structure may not provide adequate incentive to perform, create an inefficiency in the market, and has potential negative impacts to system reliability.

Based on North American Electric Reliability Corporation and Northeast Power Coordinating Council rules, if the NYISO fails to procure sufficient reserves to recover from a Disturbance Control Standard event, the NYISO may be required to procure additional reserves and may be subject to financial penalties. Additionally, if a supplier cannot fully convert operating reserves to energy at NYISO's direction, NYISO must dispatch other, often more costly, resources to provide the needed energy, or be forced to take out-of-market actions that cause uplift and reduce efficiency. The Operating Reserves Performance project seeks to improve market efficiency and help maintain system reliability.

20.2. Project Objective(s) & Anticipated Deliverable(s)

This project will seek to assess methods for evaluating the performance of an operating reserves provider and confirming its actual capabilities match its stated reserves capabilities. Additionally, the NYISO will work with stakeholders to develop a proposal for improving the market rules to create financial consequences for resources that misstate operating reserve capability and/or perform poorly when called upon to convert operating reserves to energy. The deliverable for this effort in 2024 will be Market Design Complete, where NYISO will develop a market design, including a presentation and accompanying tariff modifications, to be presented for approval by Market Participants.

20.3. Project Justification

As the markets and grid are expected to rapidly evolve in the coming years and reliance on grid reliability services such as reserves increases, enhancements to the methods for both assessing the performance of operating reserves providers and ensuring that compensation appropriately reflects performance will be of growing importance. The MMU has previously recommended that the NYISO "[c]onsider means to allow reserve market compensation to reflect actual and/or expected performance [SOM Recommendation 2016-2]." The Operating Reserves Performance project seeks to improve incentives for a resource to accurately reflect the operating reserves that it is capable of providing. Ensuring that operating reserves capabilities are accurately stated

will aid NYISO in procuring the necessary levels of operating reserves for reliable operation and reduce the need for potentially less efficient and/or costly actions to ensure access to adequate production capability.

21. Participation Opportunities for Small DER

21.1. Problem / Opportunity

NYISO's current DER and Aggregation model has a minimum capability threshold of 10kW per DER. NYISO Market Participants have raised concerns that this requirement is potentially leaving small and residential resources, unable to participate using the NYISO DER model. The NYISO is concerned with its ability to support large quantities of small DER (<10kW) using the current DER model rules due to anticipated administrative and procedural challenges. The NYISO remains interested in exploring use cases that market participants believe small DER can be leveraged in the wholesale markets and believes robust participation of flexible, small DER may provide another tool to balance the NYCA system.

21.2. Project Objective(s) & Anticipated Deliverable(s)

The NYISO intends to use the recommendation(s) identified in the 2023 Engaging the Demand Side Report (which will be based on discussions with stakeholders and engagement with end use customers) to develop a concept proposal. The 2024 project deliverable for this project will be to develop a concept proposal and deliver a Market Design Concept Proposal to Market Participants.

21.3. Project Justification

Technological advancements and public policy support are encouraging greater adoption of new technologies, including small DERs to meet consumer energy needs and possibly supporting larger system needs. Small DERs offer the potential to make load more dynamic and responsive to market signals, potentially improving overall system efficiencies. If small DER are incorporated into wholesale market operation efficiently, they could benefit the NYISO's operations while improving alignment with New York State policy goals such as those described in the Reforming the Energy Vision.

22. Pivotal Supplier Calculation Change

22.1. Problem / Opportunity

As part of the NYISO's Supply-side Mitigation rules, each month the NYISO identifies Pivotal Suppliers that are subject to a must-offer requirement and an offer cap in the monthly Capacity spot auction. Currently, the thresholds to identify Pivotal Suppliers are based on whether a Market Party controls an amount of Unforced Capacity (UCAP) of which some portion is necessary to meet the Locality requirement of the Mitigated Capacity Zone. Specifically, the

Market Party is a "Pivotal Supplier" because without some portion of its UCAP, the minimum requirements would not be met. However, this designation does not always correlate with the Market Party having a minimum portfolio size for which withholding capacity to increase prices would result in greater revenue for the portfolio. Therefore, the current thresholds do not always align with the incentive of a Market Party to withhold capacity to influence prices.

22.2. Project Objective(s) & Anticipated Deliverable(s)

This project would propose changes to UCAP thresholds that subject Market Parties to mitigation within each mitigated capacity zone. Exceeding such thresholds would create a rebuttable presumption that the Market Party has a financial incentive to withhold UCAP.

This project will consider the following improvements:

1. Revise the supply-side mitigation thresholds for each Mitigated Capacity Zone to more closely align exemptions from the must-offer requirement and offer cap with whether a supplier has a financial incentive to withhold UCAP.
    a. This threshold can be calculated using the demand curve parameters and the amount of UCAP available.
2. Identify a lower bound in which the price impact due to withholding can be considered *de minimis.*
3. Review whether enhancements are needed to the threshold calculation to account for the effects of nested localities.

The project deliverable for 2024 will be Market Design Concept Proposed.

22.3. Project Justification

This project is proposed in response to stakeholder feedback to make enhancements that would create mitigation thresholds that more closely align with the ability and incentive of the Market Party to influence capacity prices.

23. Reference Level Software Cleanup

23.1. Problem / Opportunity

The Reference Level Software (RLS) was originally released in 2010. Since that time, many NYISO projects and initiatives have impacted the development of reference levels and the software. Following the release and subsequent enhancements, numerous RLS improvements have been identified. This project intends to implement the list of identified improvements and prepare the RLS for future enhancements.

23.2. Project Objective(s) & Anticipated Deliverable(s)

The first step of this project would be to review the current set of identified RLS improvements, properly document the list, and determine the priority order of improvements. The ultimate objective for this project would be the development and release of improvements in the RLS.

23.3. Project Justification

The current state of the RLS could introduce a risk that reference level development and mitigation consultations might not remain compliant with the NYISO's Market Services Tariff in the near future. MMA is required by the Market Service Tariff to develop reference levels using specific methodologies and the most current available data and conduct mitigation consultations in a specific manner. Without improvements, the RLS could increase the risk of both a potential process error or human error when reviewing reports and data that could lead to a tariff violation.

The RLS remains a critical piece of software to support the Energy Markets. Making the identified improvements would position the software well for enhancements that will be needed to support future projects.

24. Reserving Capacity for TCC Balance-of-Period (BoP) Auctions

24.1. Problem / Opportunity

The NYISO currently conducts Centralized TCC Auctions twice each year. In each of those auctions, longer-duration TCCs (six-month, one-year, and/or two-year) are available for purchase. However, TCCs covering periods shorter than six months are not available in those auctions. Instead, MPs wishing to purchase shorter-term TCCs must do so in the Reconfiguration Auctions, which are held each month. Reconfiguration Auctions may be conducted as either single month auctions or Balance-of-Period (BoP) Auctions. BoP Auctions encompass all remaining months of the applicable Capability Period.

Currently, the NYISO's tariffs require that all transmission capacity not associated with Existing Transmission Agreements or outstanding TCCs and not reserved through conversion of Existing Transmission Capacity for Native Load (ETCNL) to ETCNL TCCs or Residual Capacity Reservation Rights (RCRR) to RCRR TCCs be made available for sale in the Centralized TCC Auctions. As a result, the opportunity for MPs to acquire shorter-term TCCs in BoP Auctions may be significantly limited. Other ISO/RTOs reserve some transmission capacity for sale in their monthly Financial Transmission Right auctions.

Consequently, this proposal seeks to build upon the 2020 and 2021 project efforts related to the development of software and rule/procedure revisions to permit the NYISO to reserve a portion of available system transfer capability, which it would then release into the BoP Auctions. Such functionality would permit auction participants to purchase additional shorter-term TCCs in the BoP Auctions.

24.2. Project Objective(s) & Anticipated Deliverable(s)

This project is intended to build on the efforts undertaken previously to develop market rule changes to accommodate the potential for reserving a portion of otherwise available transmission capacity for release in the BoP Auctions. The project deliverable for 2024 will be Software Design.

24.3. Project Justification

Today the TCC Automated Market System and other supporting systems do not support the reservation of transmission Capacity for sale in BoP Auctions.

The proposed solution is intended to:

- Address stakeholder requests for such enhancements to the current TCC auction design, as auction participants have consistently indicated interest in reserving transfer capability for release in BoP Auctions; and
- Provide additional opportunities for interested parties to obtain shorter-duration TCCs because it would remove a constraint that limits the availability of shorter-term TCCs in the BoP Auctions.

25. Storage as Transmission

25.1. Problem / Opportunity

The unique characteristics of energy storage allow these assets to provide many potential services to grid operators. During normal operation, storage can have positive impacts on transmission systems by shifting demand, supporting ancillary services, and managing transmission congestion. Currently, the NYISO tariffs treat storage as a resource that is capable of injecting and withdrawing to shift demand and/or manage transmission congestion and provide ancillary services. In some instances, storage used exclusively as a regulated transmission asset, instead of a market resource, could provide an alternative option for providing the same services as traditional transmission solutions. Because storage requires scheduling of power to consume or supply, the current market rules do not contemplate evaluating storage as a regulated transmission asset in the planning process. Additionally, the market rules consider storage to be a market-based resource that competes and is scheduled in parallel with other suppliers; the current rules do not contemplate allowing assets that are suppliers such as generators, pumped hydro, or energy storage to be eligible for cost of service rate recovery.

25.2. Project Objective(s) & Anticipated Deliverable(s)

This project will continue the work recommended in the Issue Discovery phase of this effort, which considered two components. The first component would allow a storage project to be considered and evaluated as a regulated solution (including options for cost recovery) in the

planning process, and assessed in the applicable interconnection process as necessary. The second component would consider methods for operating the storage as a transmission asset, taking multi-use and double payment issues into consideration. These components are related and may depend on one another.

The NYISO intends to leverage the recommendation(s) identified in the 2023 Storage as Transmission Report, which were based on discussions with stakeholders to more fully understand the issues and opportunities. The 2024 project deliverable for this project will be to develop a concept proposal and deliver a Market Design Concept Proposal to Market Participants.

25.3. Project Justification

Transmission upgrades may be necessary to deliver more clean energy across New York's electric grid. However, transmission development is often difficult, expensive, and on very extended development time frames. Utilizing storage as regulated transmission assets may provide an alternative for providing or enhancing these services on a shorter timescale and potentially at lower cost, while preserving valuable optionality in the process. However, storage does not create transfer capability on the grid and thus it may not be the appropriate solution in many cases. Without fully vetting the opportunities and risks for considering whether storage can offer viable and reliable alternatives to traditional transmission, the marketplace will not have certainty on whether there is value to these potential projects, and market rules changes would not be pursued that could unlock these benefits.

26. Supply-Side Mitigation for Internal Controlled Lines

26.1. Problem / Opportunity

There are currently no internal controllable lines in operation within NYCA. However, NYSERDA's Tier 4 REC initiative has driven the prioritization to develop market participation rules for internal controllable lines. The NYISO's existing supply-side mitigation rules, which primarily address generators, might be insufficient for internal controllable lines. As the design of the market rules for internal controllable lines progresses, the NYISO and stakeholders will need to assess what Tariff and procedure changes will be necessary to incorporate internal controllable lines into the capacity market supply-side mitigation measures.

26.2. Project Objective(s) & Anticipated Deliverable(s)

The objective of this project would be to evaluate the current Tariff-prescribed supply-side mitigation measures and determine the required enhancements to the supply-side mitigation measures in consideration of the entry of internal controllable lines into the capacity market.

The Q4 2024 deliverable will be Market Design Complete.

26.3. Project Justification

The purpose of supplier-side mitigation is to prevent physical or economic withholding by ICAP Suppliers that may have an economic incentive to raise prices. The current rules were written prior to the consideration of internal controllable lines. Therefore, enhancements to the supply-side mitigation rules will be needed to ensure mitigation is applied to internal controllable lines in the manner that is consistent to all other suppliers located in Mitigated Capacity Zones.

27. Time Differentiated TCCs

27.1. Problem / Opportunity

The project seeks to disaggregate the TCC product from its current 24-hour time span to include additional, more granular products covering shorter timeframes. This enhancement, which is a feature requested by certain MPs, is intended to improve the commercial function and forward congestion price transparency. Currently, the availability of only a 24-hour product may limit the effectiveness in serving as an efficient forward hedging mechanism against congestion for certain MPs' interests because it does not provide forward congestion price signals from TCC auctions that distinguish between the congestion patterns than can occur during different periods of the day or week. MPs could utilize more granular TCC products to tailor portfolios to better hedge congestion costs during different periods of the day or week. This additional flexibility could benefit MPs under current grid conditions, as well as future grid topologies with increased levels of intermittent resources, which have notable variations in output in daytime hours versus nighttime hours. Additionally, defining more granular TCCs may make other market design improvements possible.

27.2. Project Objective(s) & Anticipated Deliverable(s)

The 2024 project deliverable will be Market Design Complete, building upon previous project efforts to develop a Market Design Concept Proposed and would include working with stakeholders to finalize market rule changes needed to facilitate the creation of TCC products that apply to different periods of time.

Due to the potential increased complexity of multi-period granular TCC auctions, the implementation of more granular TCC products may depend on the automation of the Existing Transmission Capacity for Native Load (ETCNL) feasibility analysis process and the automation of an inventory system to calculate the remaining feasible ETCNL and Original Residual TCCs.

27.3. Project Justification

Breaking out the TCC product into time differentiated products may: (1) improve the commercial functionality of TCCs to provide tailored congestion hedges for all MPs, including intermittent generation; (2) reduce the cost of congestion hedging for MPs; (3) improve forward congestion price signals from TCC auctions to distinguish between time periods where congestion patterns can vary; and (4) permit other market design improvements.

28. Valuing Transmission Security

28.1. Problem / Opportunity

The ICAP Market incorporates transmission security limits (TSLs) in its process to establish LCRs. When a TSL binds during the process to establish LCRs, the market is indicating that the transmission limitations are driving the need for ICAP in that Locality rather than strictly resource adequacy needs. A resource can have different contributions to resource adequacy transmission security. Due to the potential differing reliability values, the ICAP Market may not provide efficient compensation when requirements are set by transmission limitations rather than strictly resource adequacy needs.

28.2. Project Objective(s) & Anticipated Deliverable(s)

This project will investigate the potential for inefficient compensation when ICAP Market requirements are set by transmission limitations. The project deliverable for 2024 will be Issue Discovery.

28.3. Project Justification

Transmission security margins are declining in southeast New York as noted by the 2022 Reliability Needs Assessment. The declining transmission security margins will make it more likely for TSLs to set the LCRs in southeast New York, as was the case in the New York City and G-J Localities for the 2023/2024 Capability Year. This project also supports State of the Market recommendation 2022-1.

29. Winter Reliability Capacity Enhancements

29.1. Problem / Opportunity

As identified in the NYISO's planning analyses, the New York State electric system is evolving from a summer peaking system to a winter peaking system. Ahead of this change, the NYISO's ICAP Market structure will need to be reviewed to assess whether price signals, obligations, and incentives provided by the Installed Capacity Market will continue to be effective in a winter peaking system.

29.2. Project Objective(s) & Anticipated Deliverable(s)

The Winter Reliability Capacity Enhancements project will review the need for potential changes to the ICAP Market structure ahead of moving to a winter peaking system. This review will include evaluating the ICAP Load Forecasts, the requirement setting process, the establishment of ICAP Demand Curves, and participation rules for ICAP Suppliers. The project deliverable for 2024 will be Issue Discovery.

29.3. Project Justification

The existing structure of the ICAP Market is based on New York being a summer peaking electric system. As New York moves from a summer peaking system to a winter peaking system, changes to the Installed Capacity Market may be needed to ensure the market continues to efficiently provide for New York's resource adequacy needs. This project also supports State of the Market recommendation 2022-2.

Mandatory

30. Ambient Adjusted Transmission Lines Ratings

30.1. Problem / Opportunity

FERC recently issued Order 881 to improve the accuracy and transparency of the transmission line ratings. This order results in both Tos and regional transmission organizations (RTOs) needing to implement a methodology to determine transmission line ratings that are ambiently adjusted on an hourly basis for all near term evaluations such as the DAM, RTM and Real-Time Security. This effort will require coordinated work by the Tos and NYISO, as the Tos, who are the rating authorities, will need to calculate the hourly ratings for their own use and then transmit them to the NYISO for use in the Energy Management System and Business Management System software and posted to the NYISO's public website.

30.2. Project Objective(s) & Anticipated Deliverable(s)

This project is a continuation of the 2022 FERC Ruling assessment effort and compliance filing and the 2023 project deliverable of a Functional Requirements Specification. The 2024 deliverable will be Development Complete.

30.3. Project Justification

This project is a FERC mandate and therefore completion is required to comply with Order 881 by mid-2025.

31. CRIS Expiration Evaluation

31.1. Problem/Opportunity

As part of the 2022 and 2023 CRIS Expiration Evaluation project, stakeholders approved market rule changes to (1) allow deactivated facilities with unexpired CRIS to voluntarily relinquish their CRIS, (2) limit the extent to which facilities using only part of their CRIS can retain unused CRIS

(i.e., partial CRIS expiration), and (3) provide additional CRIS transfer options. These changes aim to increase capacity deliverability headroom and potentially lower the cost of market entry to future facilities seeking to participate in the ICAP market. To effectuate the partial CRIS expiration rules, the NYISO must work towards developing the necessary software.

31.2. Project Objective(s) & Anticipated Deliverable(s)

Continuing the work from 2023, the objective of this project is to complete the development of the software requirements to implement the partial CRIS expiration rules.

The project deliverable for 2024 will be Development Complete.

31.3. Project Justification

This project seeks to automate the tracking of utilization of CRIS to maintain compliance with the Tariff.

32. Demand Curve Reset

32.1. Problem / Opportunity

Every four years, the NYISO, along with its stakeholder community, conducts a comprehensive review to determine the parameters used in establishing the ICAP Demand Curves. This process is referred to as the demand curve reset (DCR). As required by the tariff, the study includes an examination of potential peaking unit technologies and the financial parameters assumed in the construction and operation of that unit, along with an estimate of the projected profit earned in the Energy and Ancillary Service markets, to determine unit with the "lowest fixed costs and highest variable costs among all other units' technology that are economically viable" that serves in establishing values for each of the ICAP Demand Curves.

32.2. Project Objective(s) & Anticipated Deliverable(s)

This periodic review of the ICAP Demand Curves seeks to ensure that the capacity market continues to efficiently support reliability and send accurate, transparent price signals. The review is performed by engaging an independent consultant to lead the DCR process. In addition to providing recommendations for the parameters and assumptions used in establishing the ICAP Demand Curves, the consultant's efforts include evaluating the shape, slope, and zero crossing point for each ICAP Demand Curve.

The 2024 project deliverables will be Study Complete, which will include reports by the independent DCR consultant and the NYISO providing recommendations addressing the ICAP Demand Curves for the 2025/2026 Capability Year, as well as the parameters and assumptions to be used in conducting the subsequent annual updates to derive the ICAP Demand Curves for the 2026/2027, 2027/2028, and 2028/2029 Capability Years.

The DCR process culminates in a filing on or before November 30, 2024 of the proposed curves for the first year of the reset period (i.e., the 2025/2026 Capability Year), along with the assumptions and methodology to be used to set demand curves for the subsequent three Capability Years of the reset period (i.e., the 2026/2027, 2027/2028 and 2028/2029 Capability Years).

32.3. Project Justification

The quadrennial DCR is mandated by the tariff. The DCR is a resource intensive process for both the NYISO and stakeholders that has a significant impact on the market as a whole.

33. FERC Order 2222 Compliance

33.1. Problem / Opportunity

FERC's issuance of Order No. 2222 presents additional scope to NYISO's previously-approved DER market design. In 2021 and 2022, the NYISO developed and filed market rules in compliance with Order No. 2222. Additional work is necessary to design market rules for heterogeneous Aggregations supplying Ancillary Services. In 2023, NYISO will complete the Market Design Concept for Order No. 2222 Compliance requirements. The additional Order No. 2222 scope requires the NYISO to develop a final Market Design to be in compliance with the order and support deployment of Order No. 2222 compliant software by 2026. The final FERC Order on NYISO's compliance filing may require modifications and additions to the scope of this project.

33.2. Project Objective(s) & Anticipated Deliverable(s)

Using the 2023 Market Design Concept Proposed as a basis, NYISO will first develop a Market Design Complete presentation and tariff to be presented for discussion with stakeholders. The MDC will support the design of ancillary service rules for heterogenous Aggregations of DER. NYISO will then develop a Functional Requirements Specification to reflect requirements of Order No. 2222 compliance that were previously not in scope for the 2023 deployment, including the new market rules from the Market Design Complete. The FRS will guide the remaining software development necessary to prepare NYISO systems for compliance with Order No. 2222. The 2024 deliverable for this project is FRS.

This effort may also include steps to address any additional Order No. 2222 compliance requirements established by a new FERC order.

33.3. Project Justification

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 2024 effort will enable NYISO's DER Participation Model and software to be fully compliant with the requirements of FERC Order No. 2222, while building on the 2020 FERC-accepted market design deployed in 2023.

34. Interconnection Process Enhancements

34.1. Problem / Opportunity

With the implementation of the CLCPA, New York State's power grid is rapidly transitioning with the incorporation of new intermittent renewable resources, ESRs, and DERs. It is estimated that an additional 26,000 MW of new resources will need to come online by 2030 in order to achieve the codified goals of the CLCPA. Most of these new resources will be required to go through the NYISO's interconnection process. While the NYISO has taken important steps to improve the interconnection process in recent years, additional steps are needed to promote further efficiencies, develop study and other process enhancements, and to reform the overall structure of the interconnection study process. Such reforms are critical to ensuring the NYISO's interconnection process keeps pace with the dramatic influx of renewable resources proposing to interconnect in New York.

34.2. Project Objective(s) & Anticipated Deliverable(s)

For 2024, this continuing project will aim to file tariff revisions and implement interconnection process and Salesforce portal changes according to the Market Design that is being completed in 2023.

34.3. Project Justification

In addition to the evolving climate policies in in New York, FERC has also recognized the need for reforms to interconnection queues generally and issued a Notice of Proposed Rulemaking in 2022 (Interconnection NOPR). The Interconnection NOPR proposes significant revisions to pro forma Large Generator Interconnection Procedures. As of April 19, 2023, FERC has not yet issued a final order; however, upon such an order, the NYISO and other ISOs/RTOs will likely have a compliance directive to make significant interconnection-related tariff revisions. While recent interconnection-related process improvements and tariff revisions from 2019-2022 have addressed some of the issues of concern in the Interconnection NOPR, the NYISO is committed to pursuing additional reforms with stakeholder collaboration in advance of a FERC order on the Interconnection NOPR. As the volume of new resources seeking to interconnect to the system rapidly grows, it is paramount that the NYISO continues to enhance the interconnection process to balance the large influx of new resources and maintain the reliability of the electric grid.

35. Modeling Improvements for Capacity Accreditation

35.1. Problem / Opportunity

As part of the Improving Capacity Accreditation project discussed in 2021 and 2022, limitations in the NYISO's current resource adequacy analysis software were identified on modeling and accounting for attributes, such as correlated fuel unavailability for non-renewable resources or resources with long start up notifications. Resolving these limitations would enable more accurate calculations of the Resource Adequacy requirements needed to maintain reliability as well as the value of resources in meeting Resource Adequacy requirements.

35.2. Project Objective(s) & Anticipated Deliverable(s)

The 2024 effort will work to deploy the enhancements approved as part of the 2023 Modeling Improvements for Capacity Accreditation project to the resource adequacy software and, if necessary, internal reports.

35.3. Project Justification

This project is a continuation of the 2023 Modeling Improvements for Capacity Accreditation project and will facilitate both the establishment of ICAP Market Reserve Margins reflecting reliability risks not currently modeled by the resource adequacy software, as well as improved Capacity Accreditation Factors for resources with these operating characteristics. This project also supports State of the Market recommendation 2021-4.

Continuing

36. Evolving Financial Transactions Capabilities – Bilateral Transactions

36.1. Problem / Opportunity

Current NYISO software capabilities facilitate internal bilateral transactions. While withdrawal-eligible generators, such as ESRs, can currently be the source in bilateral contracts, however, they cannot currently be a sink.

To the extent there is increasing demand to use bilateral transactions to serve load by contracting output from specific resources, an opportunity exists for NYISO to enhance its bilateral transaction functionality to meet this demand.

36.2. Project Objective(s) & Anticipated Deliverable(s)

This project will enhance the existing financial bilateral transaction functionality by creating the opportunity for bilateral contracts in which a withdrawal-eligible generators could be a sink. The 2024 project deliverable for this project will be Deployment based on the 2023 Software Design Specifications.

36.3. Project Justification

The ability for withdrawal-eligible generators to procure charging energy from specific generators, particularly renewable generators, would enhance the ability to provide customers with energy that is sourced from certain resources. Additionally, New York State has adopted aggressive energy storage goals (6,000 MW by 2030) as a step towards achieving the requirements of the CLCPA. The software revisions that would be pursued under this project would enable developers of withdrawal-eligible generators to represent to potential customers that the energy stored in their facilities is sourced from renewable and emission-free generators. This is especially important in Zone J, where much of the generation operates using fossil fuels. Allowing developers to enter bilateral contracts to charge their energy storage projects will facilitate financing and development, as it will allow withdrawal-eligible generator operators to meet the needs of customers who prefer acquiring emission-free energy. Similarly, owners of renewable and emission-free generators may want the ability to store their energy in downstate energy storage facilities during periods of low-demand for use during higher-demand periods.

37. Hybrid Aggregation Model

37.1. Problem / Opportunity

As part of the 2022 Hybrid Aggregation Model project, the NYISO developed the market rules and Functional Requirements to permit an ESR and a Landfill Gas, Run-of River Hydro Resource, or a Fast-Start Resource to be co-located at a single point of interconnection and share the same point identifier (PTID). To effectuate these rules, in 2023, the NYISO completed the Software Design Specifications document. In 2024, the NYISO must now work towards developing and implementing the necessary software changes.

37.2. Project Objective(s) & Anticipated Deliverable(s)

This project is a continuation of the 2023 Hybrid Aggregation Model project. The 2024 project will deploy the CSR Enhancements described above and begin development of the HSR participation model functionality, which is targeted for deployment in 2025.

37.3. Project Justification

State and federal initiatives such as REC procurements provide incentives for developers to couple storage and intermittent renewable assets. Such programs are aimed at reducing the output volatility and improving the availability of intermittent resources. The NYISO has

implemented a CSR model for front-of-the-meter generators plus storage acting as two distinct resources with a shared injection limit that better align the NYISO's market procurement with state and federal efforts to integrate more clean energy into the grid. The NYISO will broaden the range of resources that can use its existing CSR participation model. The 2024 project deliverable will continue the work necessary to implement the new participation model.

Future

38. Capacity Transfer Rights for Internal Transmission Upgrades

38.1. Problem / Opportunity

Granting internal capacity deliverability rights for transmission between zones would incentivize merchant investment in supply resources, demand resources, and transmission facilities, since right-holders would not be limited to a cost-of-service rate.

38.2. Project Objective(s) & Anticipated Deliverable(s)

This project would create a new process for granting capacity transfer rights based on internal transmission upgrades that increase transfer capability into areas with Locational Minimum Installed Capacity Requirements that can be offered into the NYISO's ICAP market. The project deliverable would be Market Design Concept Proposed.

38.3. Project Justification

Deliverability constraints create substantial barriers to entry for competitive new suppliers and imports, which reduces competition in the market. Transfer rights would increase market efficiency by creating a dynamic framework for incorporating system upgrade needs into capacity price signals. This project also supports State of the Market Recommendation 2012-1c.

39. Dynamic Reserves Phase 2

39.1. Problem / Opportunity

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 into the market in the coming years.

Based on New York State Reliability Council, L.L.C. (NYSRC) rules, the NYISO is required to procure sufficient reserves to account for the single largest source contingency at all times. However, the current static modeling approach does not account for the potential for the correlated outages (and correlated forecast error) for intermittment resources. As the penetration of such intermittent resources grows, the correlated, cumulative, effect of potential forecast error can increase materially.

The NYISO envisions that the Dynamic Reserves Phase 2 effort will build on both Dynamic Reserves Phase 1 project and the Balancing Intermittency project.

Dynamically determining reserve requirements based on intermittent resource forecast errors could enhance system reliability and market efficiency.

39.2. Objective(s) & Anticipated Deliverable(s)

The deliverable for Dynamic Reserves Phase 2 will be a Market Design Complete.

39.3. Project Justification

As the markets and grid are expected to rapidly evolve in the coming years, the modeling of reserves will also need to evolve and become more flexible. The Market Monitoring Unit (MMU) has recommended that the NYISO "[d]ynamically adjust operating reserve requirements to account for factors that increase or decrease the amount of reserves that must be held on internal resources [SOM Recommendation 2015-16]." Dynamic Reserves would seek to ensure the reserve requirements and procurement of the reserves adequately reflect the conditions of the system. Specifically, reserveneeds could be enhanced to account for correlated forecast errors . Dynamic reserve procurements present opportunities to enhance grid resilience, incentivize resource flexibility, lower total production costs, and increase efficiency in meeting applicable reserve requirements.

40. Eliminate Fees for CTS Transactions with PJM

40.1. Problem / Opportunity

Coordinated Transaction Scheduling (CTS) was introduced as a market design concept to allow wholesale market operators the ability to schedule efficient transactions based on close to real-time price information. The 2017 SOM report notes that overall performance of CTS improved significantly between 2016 and 2017, but that participation is still much stronger at the ISO-NE interface (where it is required) than the PJM interface (where it is optional). The lower utilization of CTS with PJM can partially be attributed to the relatively large fees that are charged to transactions between NYISO and PJM, while no substantial transmission charges or uplift charges on transactions are charged between New York and New England. The fees and uplift charges present an economic barrier to achieving potential benefits from CTS process at the PJM border. The cost of these fees are paid by load, regardless of whether it is charged to transactions

because Market Participants facilitating transactions must increase their bids to account for the fees.

40.2. Project Objective(s) & Anticipated Deliverable(s)

This effort would seek to eliminate fees on CTS transactions at the NYISO and PJM interface, or alternatively minimize the fees applied by NY on CTS transactions. The project deliverable for this effort would be Market Design Concept Proposed.

40.3. Project Justification

Charging fees for transactions introduces an unnecessary cost into the marketplace. Eliminating or minimizing transaction fees with PJM would provide a market efficiency gain by setting a LBMP at the border that better reflects the actual marginal cost of energy. This project also supports State of the Market recommendation 2015-9.

41. Granular Capacity Market Pricing

41.1. Problem / Opportunity

The NYISO's capacity market has four pricing zones, which may not capture differences in value of capacity in smaller regions inside these zones due to transmission constraints, both in the import and export direction. Additionally, today's rules only allow for zone creation every four years, coinciding with the Demand Curve Reset. Enhancements to the rules for creating zones and the frequency of establishing zones could better align compensation to capacity suppliers with system needs.

41.2. Project Objective(s) & Anticipated Deliverable(s)

This project would create a new process for evaluating what capacity zones are needed, and explore the frequency that zones should be re-examined. Additionally, this project would evaluate what demand curves may be needed for export constrained regions. The project deliverable would be Issue Discovery.

41.3. Project Justification

Establishing appropriate capacity pricing zones to incent needed reliability and recognize the value of capacity suppliers located in different zones could facilitate efficient retention and investment of capacity in regions that provide the highest value while minimizing consumer costs. This project also supports State of the Market Recommendation 2022-4.

42. Locational Marginal Pricing of Capacity

42.1. Problem / Opportunity

An opportunity exists to better align capacity market clearing prices with the marginal reliability value of capacity in each Locality. Achieving this alignment could lower overall costs of satisfying capacity needs.

42.2. Project Objective(s) & Anticipated Deliverable(s)

The objective for this project would be to devise a capacity pricing framework where the clearing price at each location is set in accordance with the marginal reliability value of capacity at the location. The project deliverable for would be Market Design Concept Proposed.

42.3. Project Justification

This proposal could reduce the costs of satisfying resource adequacy needs, facilitate more efficient investment and retirement decisions, and be more adaptable to changes in resource mix (*i.e.*, increasing penetration of wind, solar, and energy storage). It may also lead to capacity pricing outcomes that are difficult to anticipate and a market that is administratively complex. The project also supports State of the Market recommendation 2013-1c.

43. Long Island PAR Optimization and Financial Rights

43.1. Problem / Opportunity

Scheduling of Phase Angle Regulator (PAR)-controlled lines between New York City and Long Island (*i.e.*, the 901 and 903 lines) is not currently optimized in the NYISO's market software. These lines are scheduled according to the terms of long-standing contracts that predate open access transmission tariffs and the NYISO's markets, which can result in inefficient power flows. Significant efficiency gains may be achieved by improving the operation of these lines.

43.2. Project Objective(s) & Anticipated Deliverable(s)

The NYISO will investigate the creation of a financial settlement mechanism to compensate the party that would be giving up some of the benefits from the current operation. Completion of this study will necessitate discussions with PSEG-Long Island and Con Edison. The NYISO should work with these parties to explore potential changes to wheeling agreements or to identify how the agreements can be accommodated within the markets more efficiently. The project deliverable for this effort would be Study Complete.

In later project phases, the creation of a new financial product to allow the owner of the PARs to benefit from PAR optimization will include an internal determination of the necessary modification/ creation of NYISO credit, settlement, and other processes to facilitate a new financial right and the Long Island PAR optimization. The market software/ processes will also need to be modified to optimize the Long Island PARs and create the new financial product.

43.3. Project Justification

This solution will explore mechanisms to minimize total production cost by ensuring power flows in the economic direction most of the time in the DAM. Optimizing the Long Island PARs and creating a financial right to compensate the affected TO has been cited by the MMU as a recommendation for improvement. This project also supports State of the Market Recommendation 2012-8.

44. M2M West PARs

44.1. Problem / Opportunity

Market to Market (M2M) provides the capability for the NYISO to request assistance from a neighbor or provide assistance to a neighbor through re-dispatch and PAR control actions to solve constraints at a lower cost, thereby reducing the overall cost of congestion. PARs are scheduled to be installed on the East Towanda-Hillside line and the Dunkirk-South Ripley line. With these planned installations, the NYISO seeks to update the Open Access Transmission Tariff and other applicable documentation/procedures and make software updates to allow for future PARs to be included in the M2M PAR coordination program.

44.2. Project Objective(s) & Anticipated Deliverable(s)

The objective of this project is to identify and capture the necessary software and tariff updates required to include new PARs that straddle the NY-PJM border. The project deliverable would be Market Design Concept Proposed.

44.3. Project Justification

With the addition of PARs at the NY-PJM seam, it is important to continue the coordination of PAR control actions across all the border PARs to reduce the overall cost of congestion.

44.4. Project Justification

This is a continuation of the modernization effort to introduce significant efficiencies by retiring older technology.

45.More Granular Operating Reserves

45.1. Problem/Opportunity

In 2020, the NYISO proposed enhancements to implement reserve requirements for certain load pockets within New York City and Long Island to provide location-specific market signals consistent with reliability needs. In 2021, as part of the Reserve Enhancements for Constrained Areas study, the NYISO investigated the feasibility of modeling local reserve requirements in New York City load pockets based on available transmission capability. These new requirements

would account for the flexibility of the grid to respond to system needs by utilizing the transmission system to import capacity into generation-constrained regions. Additionally, load pocket reserves could provide further incentives for resources to locate in important, supply constrained areas of the NYCA.

As the potential implementation of load pocket reserve requirements is considered, a dynamic reserve procurement methodology that does not exist today is an important pre-requisite to improve market efficiency, better align market outcomes with how the power system is operated, and avoid the potential for unnecessary price volatility.

45.2. Project Objective(s) & Anticipated Deliverable(s)

The project deliverable would be Market Design Concept Proposed. The More Granular Operation Reserves design and implementation would be dependent on the market design for Dynamic Reserves.

45.3. Project Justification

The MMU has recommended that the NYISO "[m]odel local reserve requirements in New York City load pockets [Recommendation 2017-1]." This effort has also been identified as beneficial in both the 2018 Performance Assurance Management Response and the 2017 Integrating Public Policy Market Assessment Report. Additionally, this effort will reflect the locational reliability value provided by resources in certain load pockets within New York City. This project also supports State of the Market recommendation 2021-3.

46. Reserves for Congestion Management (SOM)

46.1. Problem/Opportunity

The NYISO is responsible for the reliable operation of the electricity grid in New York State. One way the NYISO maintains reliability is by procuring operating reserves – extra power capability that can quickly be dispatched to address sudden changes in demand or unexpected outages. Additionally, the availability of reserves in certain locations allows NYISO operators to increase transmission flows on certain facilities, thereby increasing the utilization of the transmission system.

The current system does not reflect the location-specific benefits of operating reserves when they relieve congestion on the transmission grid. As a result, all providers of operating reserves receive the applicable market clearing price regardless of whether they enable NYISO operators to increase transmission system flows on certain facilities.

There is an opportunity to improve NYISO's wholesale electricity markets by developing rules for efficient pricing and settlement when operating reserve suppliers provide congestion relief. Such rules could compensate operating reserve suppliers for the cost of providing those reserves, including any location-specific costs or benefits associated with relieving congestion on the

transmission grid. Furthermore, promoting competition among operating reserve suppliers will help to drive down the cost of providing those reserves and reduce the cost to consumers. Encouraging investment in new operating reserve capacity will also help maintain the reliability of the electricity grid.

46.2. Project Objective(s) & Anticipated Deliverable(s)

The objective of this project is to consider and develop new rules and mechanisms for efficient pricing and settlement when operating reserve suppliers provide congestion relief. The anticipated deliverable is a Study Complete identifying the proposed rules and mechanisms.

46.1. Project Justification

Improving the rules and mechanisms for efficient pricing and settlement of operating reserves in NYISO's wholesale electricity markets will lead to a more efficient and reliable electricity grid. By more accurately reflecting the true cost of providing operating reserves and the location-specific benefits of relieving congestion, the new rules and mechanisms will promote competition among operating reserve suppliers, produce efficient costs for consumers, and encourage investment in new operating reserve capability.

The project will address the need for improved pricing and settlement mechanisms for operating reserves that provide congestion relief. The goal is for the NYISO's wholesale electricity markets to promote competition, efficiency, and investment in new operating reserves to maintain the reliability of the electricity grid.

47. Review of Real-Time Market Structure

47.1. Problem / Opportunity

In a time of unprecedented change in the electricity sector, New York's competitive electricity markets must be positioned to unleash the innovation and flexible energy solutions necessary for a reliable transformation towards a zero-emissions power grid. A rapid transition is underway in New York State from a power grid where energy is largely produced by central-station fossil fuel generation, towards a grid with increased intermittent renewable resources and distributed generation.

The pace of this transition is driven primarily by state policy, notably the CLCPA. In addition, technological advancements are expanding the capabilities of new resources and lowering their costs, further driving broader industry changes.

The NYISO is actively working on market enhancements to meet these future challenges. A grid characterized by high levels of intermittent renewable resources, ESR, and DER may require different RTM structures and rules to efficiently balance intermittency and uncertainty while continuing to efficiently schedule energy transactions and commit short lead time resources.

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.

47.2. Project Objective(s) & Anticipated Deliverable(s)

This project will review the existing RTM structure and settlements and determine if changes are needed to maintain reliable operation in real time. The project will review the current RTM and settlement structure, the risks associated with a grid characterized with high levels of intermittent renewable resources, ESR and DER and will review potential alternative structures. The project deliverable would be Issue Discovery.

47.3. Project Justification

The CLCPA includes the following goals:

- 100% of the state's electricity must be emissions free by 2040
- 9,000MW of offshore wind energy must supply NY by 2035
- 6,000MW of solar energy be installed in NY by 2025
- Statewide reduction of 185 trillion BTUs through energy efficiency
- 6,000MW of energy storage capacity must be installed to serve NY by 2030

This project will help to identify the means to maintain real-time system reliability while addressing the state's goals and mandates in a cost-effective way through the creation of proper market mechanisms. This project also supports State of the Market Recommendation 2012-13.

48. Separating Regulation Up and Regulation Down

48.1. Problem / Opportunity

Currently, Regulation Service providers are required to be able to move both up and down at the instruction of the NYISO in order to balance the system.

The Reliability Gap Analysis in the 2019 *Reliability and Market Considerations for a Grid in Transition* report identified that bifurcation of the reserve by separating regulation "up" and regulation "down" products would be a benefit in maintaining the ability to balance load and generation.

The 2021 Grid Services from Renewable Generators report reported that bifurcation of Regulation Service into "up" and "down" products would lead to a variety of impacts on markets, grid operations, and consumers. It expected to:

- Expand the participation by renewable resources by allowing participation in regulation down without having the impact on generation that participating in regulation up would have, and
- Expand participation by generation when they encounter limitations in scheduling capability due to an inability to regulate up or down. For example, generators that are scheduled at either their minimum generation (mingen) or Upper Operating Limit (UOL) and are not currently eligible to provide the current symmetric Regulation Service because they are not able to move in both directions.

Additionally, this effort could include reassessing the Regulation Capacity and Movement structure to determine if there might be opportunities for increased market efficiency.

The bifurcation of the regulation market will require substantial software revisions. Discussions with other ISOs and RTOs that procure distinct Regulation "up" and Regulation "down" products indicated that procurement of separate regulation products has led to software run-time increases due to the added complexity of the solution.

48.2. Project Objective(s) & Anticipated Deliverable(s)

The project deliverable would be Market Design Concept Proposed. The project would propose the market enhancements that would be required for regulation providers to separate their up and down regulation offers as well as for the NYISO to accept, optimize, price, and dispatch resources using separate up and down regulation offers.

48.3. Project Justification

Bifurcation of the Regulation Service market would be expected to reduce consumer costs, as it would expand the pool of eligible suppliers. This increase in supply may include some renewable generators, but it is likely that the majority will consist of generators that were previously precluded from providing Regulation Service due to the constraint of either being scheduled at mingen or UOL. The NYISO conducted a consumer impact analysis for this project in 2021. Costs to consumers would be expected to decline overall as a result of this market change, since the shift in supply would likely drive a reduction in high-priced intervals, including shortage price intervals, and reduce price impacts from tradeoffs with producing energy. The current Regulation Service market is small in relation to the energy market, on the order of $15-$20M annual cost compared to annual energy market costs that have ranged from roughly $4B to $7B in recent years. Thus, while this effort would be expected to reduce consumer costs, the benefits are expected to be minimal in the context of total NYISO market costs.