2025 Market Project Candidates

Product and Project Management

June 12, 2024

This document represents potential 2025 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.

Table of Contents

Introduction

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Project Type	Description
Mandatory	Projects that are key to support Strategic Initiatives, comply with FERC Orders, maintain reliable operations, or sustain the operation of the NYISO business. These projects will be included in the budget.
Continuing	Approved in a prior year and have progressed to either Functional Requirements, Software Design, Development Complete, or Deployment. Additional projects may be classified as Continuing based on stakeholder feedback. These projects will be included in the budget. No Enterprise Projects will be Continuing.
Future	Consensus from stakeholder discussions of this project's 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. Market projects are included in the stakeholder survey

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 of scheduling interchange every five minutes with external control areas. This project will expand on 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 2025 project deliverable will be Market Design Complete.

1.3 Project Justification

This market improvement is expected to improve price convergence between RTC and RTD, and improve market efficiency by increasing the number 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. Advancing NYISO Transparency - Requested by DC Energy

2.1 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.

2.2 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 that can be shared based on its classification 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 2025 project deliverable will be Deployment.

2.3 Project Justification Provided by DC Energy

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, MPs 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, MPs 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.'"

3. Ancillary Services Shortage Pricing Update

3.1 Problem / Opportunity

With an increasing share of intermittent generation within the New York Control Area (NYCA), it is increasingly important to rely on Ancillary Services, such as reserves and regulation, for handling uncertainties arising from intermittent generation. While fuel prices continue to fluctuate, it is essential to review the existing Ancillary Services shortage pricing structures to ensure that they reflect the market dynamics. The evolving energy landscape demands a comprehensive reassessment of pricing mechanisms to accommodate the growing prominence of renewables and maintain grid reliability. Thus, there is an opportunity to analyze and potentially recalibrate existing pricing frameworks to better align with the evolving energy mix and mitigate potential disruptions.

3.2 Anticipated Project Deliverable (s)

The 2025 project deliverable will be a Study Complete.

3.3 Project Justification

This project would enhance the existing energy, reserves, and regulation pricing structures, especially with the expanding role of renewable energy sources and new market structures. By assessing current pricing mechanisms, the project aims to bolster grid reliability and align pricing strategies accordingly. After thorough analysis, potential shortage price adjustments could improve overall electricity pricing effectiveness, benefiting stakeholders and the broader energy ecosystem.

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 2024 effort was to complete the market design, the 2025 project will deploy Phase 1 of the software changes to support the approved market design.

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 (SOM) Recommendations 2021-1 and further evaluating 2017-2.

5. Billing Organization Portfolios for Reporting -*(previously SubAccounts)*

5.1 Problem / Opportunity

Current NYISO accounting and settlement processes do not allow a MP to partition billing components by the source or type of commercial activity. This creates certain difficulties for companies with diverse portfolios of businesses and market transactions. For example, under the current system, a company may have separate MPs for activity in generation, trading, and TCC activities.

The solution will be a modification to the NYISO's settlement and invoicing systems to allow the utilization of portfolios nested under the existing Billing Organization to group transactions for reporting purposes.

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

This project will modify invoice reporting in the NYISO settlement and invoicing systems to provide additional flexibility in a consolidated invoice query. The MP will be able to establish portfolios to separate market transactions on the invoice.

Portfolios for reporting will allow more detailed invoicing while keeping the overall settlement under a larger account. This project will implement the Market Design Complete deliverable determined by the 2024 project: ***SubAccounts for Reporting*** and include:

- A new user interface for the existing Invoice Detail Report to allow MPs to create portfolios for reporting purposes
- Reports based on various parameters within the existing NYISO data structure
- External and internal ability to label, save, and reuse report configurations
- External and internal ability to share custom reporting within the organization

This will be a reporting solution only. No changes are anticipated to credit rules, Billing Organization Banking Relationships, or to the existing Weekly and Monthly Invoicing by Billing Organization. The project deliverable for 2025 is Deployment.

5.3 Project Justification

This NYISO portfolio reporting project can reduce costs to MPs by reducing the need to maintain multiple MPs and will allow additional flexibility for MPs to compartmentalize larger accounts for better tracking of various market transactions. Other ISOs and RTOs have successfully implemented the utilization of portfolio reporting to the benefit of their MPs (*e.g.*, PJM and ISO-NE).

6. Capacity Market Structure Review

6.1 Problem / Opportunity

The objective of the capacity markets is to provide appropriate price signals to attract new resources and retain existing resources to meet resource adequacy criteria. Public policies also provide incentives and requirements for resource entry and exit to meet state and national requirements and objectives. Given these other drivers of resource entry and exit, it may be necessary to review the structure of the NYISO capacity markets to ensure the markets continue to provide for resource adequacy while incentivizing economically efficient resource entry and exit.

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

This project will investigate whether changes are needed to the structure of the capacity markets to ensure the markets continue to send accurate, transparent price signals that promote reliability and economic efficiency. The 2025 deliverable for this project would be an Issue Discovery.

6.3 Project Justification

The NYISO-administered capacity markets aim to maintain resource adequacy while incentivizing economically efficient resource entry and exit. However, the drivers for resource entry and exit have evolved in response to public policy, environmental, and other factors. Continued efficiency and efficacy may require changes to the structure and/or operation of the capacity markets in response to the ongoing evolution of the resource fleet.

7. Clean Hydrogen - Requested by NextEra and Constellation

7.1 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. The NYISO developed a Market Design Concept Proposed (MDCP) through collaboration with stakeholders to address this gap and seeks to further develop a Market Design Complete (MDC) to advance the project towards target deployment in 2028.

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

In 2024, the Clean Hydrogen Project investigated use cases proposed by MPs for loads co-located with non-emitting generation, including an electrolyzer producing clean hydrogen using energy from a co-located emissions-free generator. The NYISO worked with stakeholders to develop an MDCP in 2024. The 2025 effort will finalize the market design concept for approval by stakeholders, and will include development of any necessary tariff modifications to accommodate the 2024 MDCP.

7.3 Project Justification

Achieving New York's decarbonization goals will require a substantial amount of Dispatchable Emission Free Resources (DEFRs) 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."

8. Cost Recovery for NYISO-Designated IROL Critical Generators-Requested by Advanced Power

8.1 Problem / Opportunity

Under North American Electric Reliability Corporation (NERC) guidelines, it is the NYISO's responsibility to identify and designate generators critical to the derivation of Interconnection Reliability Operating Limits (IROL) ("IROL Critical Generators"). Once a unit is designated as an IROL Critical Generator, the generator is required to make NERC-mandated investments which correspond to its level of critical designation assigned by the NYISO.

These NERC-mandated upgrades for reliability and security are above and beyond the requirements in NYISO tariffs and Interconnection Agreements. The NYISO tariff does not have a mechanism to permit cost recovery for capital costs and ongoing operations and maintenance for the NERC-mandated investments made by these IROL Critical Generators.

For clarity, the cost recovery for generators will be forward-looking only. Cost recovery for capital investment already made by current IROL Critical Generators operating in the NYISO markets would not be considered.

8.2 Project Objective(s) & Anticipated Deliverable(s)

The objective of this project is an MDC that develops tariff revisions that will allow designated IROL Critical Generators to recover costs related to compliance with NERC guidelines for IROL Critical designated units. The project will also have scope for the NYISO to determine the resources required to perform necessary cost reviews and software upgrades as needed.

8.3 Project Justification

The project is needed to allow generators designated by the NYISO as IROL Critical Generators the opportunity to recover the costs associated with meeting the NERC guidelines for IROL Critical Generators. The NYISO tariff does not have any means for cost recovery for capital investment and ongoing O&M costs associated with the investments made to meet the NERC guidelines of IROL Critical Generators.

Other RTOs do allow cost recovery for these investments. PJM and ISO-NE have recently made updates to their tariffs to allow this cost recovery.

9. Demand Curve Reset Process Evaluation

9.1 Problem / Opportunity

Every four years, the NYISO, along with its stakeholder community, conducts a comprehensive review to determine the parameters used in establishing the Installed Capacity (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 capital and financial costs 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 which unit has the "lowest fixed costs and highest variable costs among all other units' technology that are economically viable." The unit that satisfies this requirement is then used to determine the underlying parameters for each ICAP Demand Curve over the next four Capability Years.

Public policies, such as the CLCPA, and other factors are driving a transition of the power grid to a clean energy system. To account for these changes, it may be necessary to structure the ICAP Demand Curves using a framework that differs from the current framework required to be studied in the DCR (e.g., utilizing the "lowest fixed costs and highest variable costs among all other units' technology that are economically viable" to determine the underlying parameters for each ICAP Demand Curve).

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

This project will investigate whether changes, and the drivers of those changes, are needed to the DCR study framework to continue to send accurate, transparent price signals that promote reliability and economic efficiency. The 2025 deliverable for this project would be an Issue Discovery.

9.3 Project Justification

The ICAP market aims to maintain resource adequacy while incentivizing economically efficient resource entry and exit. However, the drivers for resource entry and exit have evolved in response to policy, environmental and other factors. For the ICAP market to continue sending accurate and transparent price signals promoting reliability and economic efficiency, changes may be needed to the structure of the ICAP Demand Curves studied during each DCR to account for the ongoing evolution of the resource fleet.

10. Demand Curve WSR Revisions (SOM)

10.1 Problem / Opportunity

A winter-to-summer ratio (WSR) of available ICAP is used when determining the seasonal ICAP Demand Curves applicable for the Winter Capability Period. The WSR is utilized to account for expected seasonal differences in capacity availability when determining the winter reference point and maximum allowable clearing for each ICAP Demand Curve. Because the seasonal ICAP Demand Curves represent an apportionment of the annual gross and net cost of new entry values for the relevant hypothetical reference resource used to establish each curve, such seasonal curves are interrelated and must

account for the relative expectation of differences in capacity availability throughout the year to, in aggregate, provide revenue adequacy for such hypothetical reference resource used. The current procedures for calculating the WSR annually use data regarding capacity available to be sold in the ICAP Spot Market Auctions over a historical three-year period.

As noted in the 2023 SOM Report, capacity sales from Unforced Capacity Deliverability Rights (UDR) resources may result in material divergence between the capacity availability assumed in the WSR and actual capacity sales in the ICAP Spot Market Auctions. For example, actual capacity sales from UDR resources that are persistently and materially lower than assumed when calculating the WSR could result in pricing outcomes that do not properly reflect actual system conditions.

10.2 1.2 Project Objectives & Anticipated Deliverables

In its SOM Report, the MMU recommends consideration of alternative procedures for determining the WSR values to better account for actual capacity sales in the ICAP Spot Market Auctions rather than capacity available to be sold in such auctions. The SOM Report recommends implementing changes to these procedures on an expedited basis due to the near-term nature of the risk resulting from the expectation of significant new UDR resource capacity additions within the next few years. The project deliverable for 2025 will be a MDCP milestone.

10.3 1.3 Project Justification

Recommendation 2023-5 of the 2023 SOM Report.

11. Eliminate Offline GT Pricing

11.1 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 RTD model.

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

The scope of this project would involve eliminating the offline GT pricing logic, creating an information stream (that replaces the information provided by offline GT pricing) to help operators identify system

needs and effectively commit additional units, and developing proposed tariff changes to support this effort. The 2025 deliverable for this project would be FRS.

11.3 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 SOM Recommendation 2020-2.

12. Engaging the Demand Side

12.1 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 (DR) programs and DER and Aggregation participation model offer electric consumers the opportunity to "supply" energy to the wholesale markets.

The NYISO's current DER model requires DER to be fully dispatchable in real time with no commitment parameters such as start-up time. NYISO's current Special Case Resource (SCR) model has 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 MPs have provided feedback that design revisions may provide new and existing Resources the ability to participate more fully using the current NYISO DER, or SCR models. The NYISO remains interested in exploring opportunities to enhance the DER and/or SCR models.

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

The NYISO will advance the effort based on the 2024 MDCP. The 2025 project deliverable for this project will be an MDC.

12.3 Project Justification

Enhancements to the NYISO's DER and/or SCR models that further support robust participation of flexible demand in both DAM and RTM may provide another tool to balance the 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.

13. Engaging the Demand Side Phase 2

13.1 Problem / Opportunity

In 2024 the NYISO deployed the DER and Aggregation participation model expanding the opportunities for demand side resources to participate in NYISO administered markets. The NYISO remains

interested in exploring opportunities to enhance the DER and/or reliability programs for smaller DER, flexible loads, and an emergency load reduction program.

Areas of interest for small DER include alternative telemetry methodologies and evaluating participation pathways for DER less than 10 kW. Price-Responsive Load Bids have historically constituted a small percentage of total bid Load by volume, but flexible loads that are price sensitive can be evaluated as a useful tool for operators to manage both sides of load and supply. The NYISO will explore participation pathways for flexible load to participate and provide value to the system. Expanding tools that allow the NYISO to alert the public of grid emergencies are an additional implement for operators to maintain system reliability and stability.

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

The NYISO will continue discussions with stakeholders based on the recommendations identified in the 2023 Engaging the Demand Side Report and the 2024 SCR market participant survey. The 2025 project deliverable for this project will be a Study Defined.

13.3 Project Justification

Enhancements to NYISO's DER and reliability-based models that further support robust participation of more resources in both DAM and RTM may provide another tool to balance the NYCA system, address resource intermittency, and support ancillary service providers.

14. Granular Capacity Market Pricing

14.1 Problem / Opportunity

The NYISO's capacity market has four pricing zones, which may not capture differences in the value of capacity in smaller regions within the existing pricing zones due to transmission constraints, both in the import and export direction. The NYISO's rules permit zone creation every four years, coinciding with the DCR. The NYISO is proposing to evaluate enhancements to the zone creation rules and the frequency with which new zones can be created to better align compensation to capacity suppliers with system needs.

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

The NYISO will advance the discussion with stakeholders on the recommendations identified in the 2024 Granular Capacity Market Pricing report. The project deliverable will be a Study Defined.

14.3 Project Justification

Adjusting capacity pricing zones to incent 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 SOM Recommendation 2022-4.

15. Improved Small Customer Enrollment in DRIS - Requested by OhmConnect

15.1 Problem/Opportunity

Aggregators with a high volume of small customers face many enrollment challenges under existing NYISO program requirements:

- Demand Response Information System (DRIS) software data inputs may be restrictive
    - Only whole numbers are accepted in DRIS for subscribed loads, effectively establishing one kW as the minimum value.
        - Customer loads may go above and below 1kW between summer and winter seasons
- Small Customer Aggregations (SCAs) were designed to accommodate thousands of small customers using alternative methodologies outside of the DRIS software to participate in the NYISO DR programs. This may not be sufficient for some resources that desire to participate as individual SCRs but cannot meet size requirements and cause additional workload for both the aggregator and NYISO by utilizing the SCA model
    - Require burdensome manual administration for both aggregators and the NYISO
    - Once a customer is enrolled into a SCR, they cannot become part of a SCA
    - Only customers with loads below 1kW can be included in an SCA
        - Once a customer is in a SCA they cannot become a SCR unless they sit out for 18 months; many customers are <1 kW in the winter and >1kW in the summer
    - Restrictive data integrity and precision requirements
        - Does not account for user churn.
        - No easily accessible and accurate database or API to provide aggregators with the information necessary from the Transmission Owner to register a premise in NYISO programs, in particular the zone and active status of the customer
- DER model does not offer an alternative for participation
    - Small customers do not meet the 10kW minimum size requirement
    - Six second telemetry may be cost prohibitive and infeasible

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

Develop a long-term solution to facilitate automated small customer enrollment in load flexibility programs that provides the NYISO with the desired level of visibility of demand response resources.

There are many potential solutions that could be considered:

- Modification of DRIS coding to accept subscribed loads with decimal values in tenths to more accurately reflect small customers' ACLs, with a minimum of 0.10kW.
- Development of an automated SCA.
- DER-like model for small resources.
- Proxy demand resource program.
- Modify SCA rules to allow subscribed loads greater than 1kW.

The project deliverable for 2025 will be MDC.

15.3 Project Justification

To support a reliable and resilient grid and help the state achieve its clean energy goals, the development of streamlined processes to accommodate tens of thousands of small customers providing load flexibility would facilitate additional resources to participate in the wholesale market while reducing administrative burden for aggregators and the NYISO.

16. Market Purchase Hub Transactions - Requested by LIPA

16.1 Problem / Opportunity

The ability for marketers to source energy from the wholesale market, (i.e., buy at Locational Based Marginal Pricing (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 MPs for other commercial purposes. The Netting of Bilaterals (Trading Hubs) initiative was first proposed in 2008, but was limited to balanced transactions. The proposed project 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.

16.2 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 in the same Load Zone as the Trading Hub. 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. The 2025 deliverable will be a FRS Complete.

16.3 Project Justification

The market design will propose modifying zonal trading hubs by allowing unbalanced transactions to provide additional flexibility in scheduling of hub transactions.

17. Mitigation Threshold Review

17.1 Problem / Opportunity

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

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

The objective of this project would be to evaluate all current mitigation thresholds, to improve the LPT methodology based on observations from the last several years, and to determine if any of the existing mitigation thresholds need to be modified.

This project will consider the following improvements:

1. Modifying the mitigation 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 tight constraints during summer peaks, but fewer constraints over the rest of the year.
2. Revising the method to determine the load pocket threshold. Currently, the formula uses a 12-month averaging of load-weighted and fuel-price-adjusted LBMPs to calculate the expected load-pocket LBMP in the coming month. 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. The proposal is focused on the yearly average. The NYISO wants to explore other options to replace the 12-month average with averages calculated over shorter, more relevant periods to better predict load-pocket LBMPs going forward, and hence create a more appropriate measure of the load pocket threshold.

3. The Market Services Tariff requires the NYISO to fuel-price-adjust LPTs, allowing the NYISO to specify the method of fuel price 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 fuel-price component of energy reference levels.
4. Automating the process of calculating LPTs, which currently consists of several manual steps that are time consuming and labor intensive. MMA proposes to work with Information Technology to create a fully-automated process with measures in place to validate results from each execution.

The project deliverable for 2025 will be Market Design Concept Proposed.

17.3 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.

18. Operating Reserves Performance

18.1 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, creates an inefficiency in the market, and has potential negative impacts to system reliability.

Based on NERC 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 the NYISO's direction, the 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.

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

Continuing the work from 2024, the deliverable for this project for 2025 is Software Design .

18.3 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.

19. Pivotal Supplier Calculation Enhancement

19.1 Problem / Opportunity

Each month the NYISO identifies Pivotal Suppliers that are subject to a must offer requirement and an offer cap in the monthly spot auction as part of administering the NYISO's Supply-Side Mitigation rules. The thresholds to identify Pivotal Suppliers are based on whether a Market Party controls an amount of UCAP, and some portion of that UCAP is necessary to meet the applicable Locality requirement of the Mitigated Capacity Zone. The identification of a Pivotal Supplier 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. This project will attempt to align the Pivotal Supplier evaluation with the incentive of a Market Party to withhold capacity to influence prices.

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

This project will evaluate, and, if necessary, propose changes to UCAP thresholds that subject Market Parties to mitigation within each mitigated capacity zone. Exceeding such thresholds 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 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 2025 will be MDCP.

19.3 Project Justification

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

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

20.1 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.

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

This project is intended to build on the efforts undertaken in 2020 and 2021 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 2025 will be Software Design.

20.3 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:

1. 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
2. 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.

21. Review of Control Area System Resources

21.1 Problem / Opportunity

A Control Area System Resource is a set of Resources owned or controlled by an entity within a Control Area that also is the operator of such Control Area. Entities supplying UCAP using Control Area System Resources do not designate specific Resources, and therefore cannot be evaluated like External Resources and ICAP Suppliers located within the NYCA.

21.2 Project Objectives & Anticipated Deliverables

The NYISO will evaluate the ability of Control Area System Resources to provide Unforced Capacity to determine whether they are functionally equivalent to other External Resources, and whether Control Area System Resources are being properly valued for their contribution to resource adequacy. The project deliverable for 2025 is MDCP.

21.3 Project Justification

As part of its efforts to improve modeling for capacity accreditation, the NYISO is in the process of evaluating ICAP Supplier availability and performance. This project will evaluate whether Control Area System Resources are properly accredited and propose changes if necessary.

22. Review of Real-Time Market Structure

22.1 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.

22.2 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 2025 project deliverable would be Issue Discovery.

22.3 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 SOM Recommendation 2012-13.

23. Storage as Transmission

23.1 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 as 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 considered with traditional transmission resources to be eligible for cost-of-service rate recovery.

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

This project will continue the work recommended in the Issue Discovery and MDCP phases of this effort and may consider 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 market impacts into consideration. These components are related and may depend on one another.

The 2025 project deliverable will be MDC, where the NYISO will build on the 2024 MDCP to develop a market design and accompanying tariff modifications to be presented for approval by MPs.

23.3 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.

24. Time Differentiated TCCs

24.1 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 that 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.

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

The 2025 project deliverable will be MDC, building upon the 2021 project efforts to develop a MDCP 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 and the market design proposed in 2021.

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.

24.3 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 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.

25. Valuing Transmission Security

25.1 Problem / Opportunity

The ICAP Market incorporates transmission security limits (TSLs) in its process to establish Locational Capacity Requirements (LCRs). When a TSL binds during the process to establish an LCR, the result indicates 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 and transmission security. Due to the potential differing reliability values, the ICAP market may not accurately value capacity when requirements are set by transmission limitations rather than strictly resource adequacy needs.

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

Building off the 2024 Issue Discovery work, this project will propose the necessary ICAP market design changes to provide for efficient capacity market compensation when ICAP Market requirements are set by transmission limitations. The project deliverable for 2025 will be MDC.

25.3 Project Justification

Transmission security margins are declining in southeast New York as noted by the 2023-2032 Comprehensive Reliability Plan. The declining transmission security margins will make it more likely for TSLs to set the LCRs in southeast New York, as was the case all Localities for the 2024/2025 Capability Year. This project supports Recommendation No. 2022-1 from the 2022 SOM Report.

26. Voltage Support Service for Inverter Based Resources (VSS-IBR)

26.1 Problem / Opportunity

The NYSRC issued **Reliability Rule #151 - Reliability Rule B.5: Establishing New York Control Area (NYCA) Interconnection Standards for Large IBR Generating Facilities**, which adopts all normative mandatory requirements specified in IEEE 2800-2022. The new rule necessitates updated testing requirements and settlement mechanisms for inverter-based resources (IBRs). IEEE 2800-2022 requires that new large IBR generating facilities have the capability to produce and absorb MVArs at zero active power output. However, the mandates of the new rule may not be required by the NYISO under its existing Voltage Support Service program. This requires the NYISO to revisit the existing payment structure and revise existing protocols to accurately assess IBR performance and facilitate appropriate compensation for reactive support provision.

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

The Voltage Support Service for Inverter Based Resources (VSS-IBR) project will deliver updated testing requirements and settlement mechanisms to align with the new rule set forth by the NYSRC. The 2025 project deliverable would be MDCP.

26.3 Project Justification

This project is crucial for compliance with the latest NYSRC reliability rules regarding reactive power capability for IBRs. This project will explore providing an incentive to existing IBRs to upgrade their equipment to provide reactive power support at zero MW output. Procuring this service greatly enhances grid reliability and will alleviate the need to Supplemental Resource Evaluation (SRE) fossil fuel-based generators for voltage support only. Being able to rely on this service might even contribute to efficient/economic solutions to the voltage issues identified during reliability planning process. By aligning testing requirements and settlement mechanisms with the new rule, the project facilitates accurate assessment of IBR performance and fair compensation for reactive support provision. This enhances grid stability and reliability while promoting the efficient utilization of IBRs in the NYCA. Through optimized operations and adherence to regulatory standards, the project contributes to the sustainability and resilience of the state's energy infrastructure.

27. Winter Reliability Capacity Enhancements

27.1 Problem / Opportunity

The NYISO's planning analyses indicate that the New York State electric system is evolving from a summer peaking/summer risk system to a winter peaking/winter risk 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 ICAP Market will continue to be effective in a winter peaking system.

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

The Winter Reliability Capacity Enhancements project will address issues identified in the 2024 Winter Reliability Capacity Enhancements report. In 2025, NYISO will explore specific market enhancements and propose design changes to support a winter peaking/winter risk system. The project deliverable for 2025 will be MDC.

27.3 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 SOM Recommendation 2022-2.

28. Winter Fuel Constraint Study

28.0 Problem / Opportunity

The NYISO's Resource Adequacy studies model constraints on natural gas and secondary fuel during the winter season. Natural gas and secondary fuel constraints are correlated with various weather conditions, including extreme conditions. The current natural gas and secondary fuel constraint modeling assumptions are based on available data that only covers normal weather conditions and does not contain sufficient detail to analyze conditions that are beyond normal conditions that contribute to the fuel constraints.

28.1 Project Objective(s) & Anticipated Deliverable(s)

The NYISO will perform the fuel constraint study for the entire NYCA system. The study is expected to answer the following questions:

- What is the amount of natural gas available to electricity generators during winter under various weather conditions, considering gas pipeline limitations, Local Distribution Company limitations, economic limitations due to natural gas price, as well as impact from Liquefied Natural Gas?
- What is the dependable storage level of secondary fuel of electricity generators during winter under various weather conditions, considering on-site storage size, replenishment of on-site storage, and lead time for on-site fuel switching if needed?
- How are these fuel constraints expected to change in the next 10 years?

The 2025 milestone will be Study Complete.

28.2 Project Justification

The winter fuel constraint study will help refine the assumptions made in the Resource Adequacy study, leading to more accurate representation of the Resource Adequacy risk during the winter

season. The refined assumptions will benefit both the annual Installed Reserve Margin study and the bi-annual Reliability Needs Assessment study.

Mandatory

29. Ambient Adjusted Transmission Lines Ratings

29.1 Problem / Opportunity

FERC issued Order 881 to improve the accuracy and transparency of the transmission line ratings. This order requires both TOs and regional transmission organizations (RTOs) 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 because 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 posting to the NYISO's public website.

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

This project is a continuation of the 2022 FERC Ruling assessment effort and compliance filing. The goal of this project will be work with Transmission Owners to determine requirements, specifically the mechanics of a data exchange and communication, with a 2025 deliverable of Study Complete.

29.3 Project Justification

This project is a FERC mandate. Completion by 2028 is required to comply with Order 881.

30. Coordinated Grid Planning Process (CGPP)

30.1 Problem / Opportunity

In its August 2023 order, the New York State Public Service Commission (NYPSC) approved the Utilities' proposal for a Coordinated Grid Planning Process with certain modifications. One of the modifications was to coordinate with the NYISO to leverage the NYISO's planning work as inputs into the CGPP. Additionally, the NYPSC directed the utilities to collaborate with DPS, NYSERDA, and the NYISO to reduce each cycle of the CGPP from three years to two years to achieve efficiency and to better align with the NYISO's two-year planning cycle. The NYISO's coordination with the utilities is a multi-year project that began in 2023. If the NYSPSC takes additional action to modify the currently approved CGPP, this project will account for any modifications to the current timeline for study work in 2025.

30.2 Objective(s) & Anticipated Deliverable(s)

In addition to the NYPSC's decision on the two-year study cycle, the NYISO recognizes the need for a greater alignment between the System and Resource Outlook findings and the Reliability Planning

Process. Particularly, with increased variable energy resources (wind, solar, batteries) there is a need to align the output of production cost simulations more closely with transmission security analysis evaluated for reliability studies.

This project objective would be to complete a study that reviews software capabilities for producing transmission security power flow case representations from hourly production cost simulations. This work would also add value to the CGPP in stages 2-4 for the development and identification of system conditions that should be evaluated. Modifications of these deliverables may be required after any NYPSC decision on the current three-year study cycle. The deliverable for this project will be a Study Complete.

30.3 Project Justification

This project is needed to ensure alignment between the System and Resource Outlook findings and the Reliability Planning process. Additionally, it may be necessary for regulatory compliance based on the potential for rulings from the NYPSC that impact the NYISO's current two-year planning cycle.

31. Demand Curve Reset

31.1 Problem / Opportunity

Every four years, the NYISO, along with its stakeholder community, conducts the DCR study. As required by the tariff, the study includes an examination of potential peaking unit technologies and the capital and financial costs 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 which unit has the "lowest fixed costs and highest variable costs among all other units' technology that are economically viable." The unit that satisfies this requirement is then used to determine the underlying parameters for each ICAP Demand Curve over the next four Capability Years.

31.2 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.

On or before November 30, 2024, the NYISO will file 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).

For 2025, the project would complete the DCR study by supporting any required regulatory activities related to the NYISO's filing to address the results of the DCR, as well as preparation for the 2025/2026

Capability Year and Locational Minimum Installed Capacity Requirement (LCR) study, ICAP auctions and subsequent annual updates that will utilize the new parameters determined by the DCR.

31.3 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.

32. FERC Order 2222 Compliance

32.1 Problem / Opportunity

FERC's issuance of Order No. 2222 presents additional scope to the NYISO's previously approved DER and Aggregation market design. In 2021 and 2022, the NYISO developed and filed market rules in compliance with Order No. 2222. In 2024, NYISO completed the FRS for all functionality remaining to support the filed tariff language for compliance with the Order. In 2025, the NYISO will complete the Software Design for Order No. 2222 Compliance requirements based on the 2024 FRS. The project scope requires the NYISO to complete software development in alignment with accepted tariff language to support deployment of Order No. 2222 compliant software by the end of 2026.

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

Using the 2024 FRS as a basis, the NYISO will complete the Software Design in 2025. The NYISO will then begin development of software based on the use cases and specifications identified to reflect requirements of Order No. 2222 compliance that were not in scope for previous DER project deployments and releases, including the new market rules from the 2024 FRS.

32.3 Project Justification

This project will enable the NYISO to incorporate software specifications to support market design features required by Order No. 2222 that were not included in the initial deployment of DER.

The 2025 effort will enable NYISO's DER Participation Model and software to be fully compliant with the requirements of FERC Order No. 2222 by the end of 2026, while building on the 2020 FERC-accepted market design deployed in 2024.

33. FERC Transmission Planning Order Implementation

33.1 Problem / Opportunity

FERC issued a final rule on Long-Term Regional Transmission Planning and Cost Allocation on May 13, 2024. The final rule requires the NYISO to reform its current regional transmission planning process

(*i.e.*, the Comprehensive System Planning Process [CSPP]) to, among other things, establish a process to identify and address long-term transmission needs over a 20-year time horizon, improve coordination of its CSPP and generator interconnection procedures, require consideration of alternative transmission technologies, improve transparency and coordination of local transmission planning processes, and require the establishment of a right of first refusal for right-sized replacement transmission facilities selected to meet an identified long-term transmission need. NYISO staff has immediately started working to comply with the final rule. This project will continue work started in 2024, which is expected to result in a compliance filing by the final rule's deadline in mid-2025. The 2025 deliverable for this project is Issue Discovery. This deliverable is contingent upon the NYISO receiving timely FERC acceptance of its anticipated compliance filing.

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

For 2025, the objectives are to complete a compliance filing, including necessary tariff revisions, and an Issue Discovery, outlining the necessary business process changes required to meet the final rule.

33.3 Project Justification

The project is required to comply with a FERC final rule.

34. Interconnection Cluster Study Process Implementation

34.1 Problem / Opportunity

On July 28, 2023, FERC issued Order No. 2023 addressing Improvements to Generator Interconnection Procedures and Agreements. Among the order's goals are addressing long interconnection queue backlogs across the country due to increasingly large numbers of new resources seeking to interconnection to the transmission system. On March 21, 2024, FERC issued an order on rehearing – Order No. 2023-A – broadly upholding its initial rulings and offering additional clarifications.

The NYISO presented a comprehensive compliance proposal to the Operating Committee in December 2023, and has held numerous stakeholder meetings to review components of the compliance plan and related tariff revisions. On May 1, 2024, the NYISO submitted its compliance filing with a requested effective date of May 2, 2024 and immediately began implementation of the new procedures.

Most significant among the reforms NYISO included in its May 1, 2024 compliance filing were tariff revisions that propose to:

- Shorten the timeframe for the NYISO's interconnection process in line with the timeframe established in Order No. 2023 by establishing a two-phase Cluster Study Process.

- Establish a framework to improve transparency and accountability in the performance of the interconnection process.

- Establish a pre-application process and provide a heatmap to provide developers with the opportunity to obtain additional information prior to the submission of their Interconnection Requests.

- Provide physical infeasibility screening early in the Cluster Study Process to identify physically infeasible interconnections and permit penalty free withdrawals due to physical infeasibility.

- Retain or otherwise incorporate into the Cluster Study Process technological advancement requirements identified in Order No. 2023.

- Align the treatment of incorporate generating facilities 20 MW or smaller with the Cluster Study Process, incorporating all generation facilities into a single, standardized process.

- Address requirements for affected systems located in the NYCA and neighboring systems.

- Establish a Transition Cluster Study Process available to all developers that satisfy the process entry requirements to enable developers to immediately make use of the new study process without prerequisite studies.

- These compliance reforms will collectively drive substantial efficiencies and improvements in the NYISO's interconnection process and are directly targeted at enabling the increasing number of projects seeking to interconnect in New York to do so in a reliable, efficient, transparent, and timely manner. The proposed reforms will assist New York State in satisfying its ambitious climate goals.

- This project is a multi-year project focused on the implementation of the new cluster study process, new and revised process changes, and tools needed to support the FERC Interconnection study process. These enhancements will allow collaboration and communication with the Interconnection customers, connecting Transmission Owners (CTOs), and NYISO

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

- This is a continuing project to focus on the implementation of the new Cluster Study process changes and tools to support the interconnection study process. These enhancements allow collaboration and communication with the Interconnection Customers, CTOs, and NYISO. The NYISO's goal is to develop an Interconnection Portal to serve as the source of information for the NYISO and Interconnection Customers regarding interconnection projects and to replace the manual processes that the NYISO currently uses. 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.

- The project will involve software changes within SalesForce to implement an Interconnection Portal and other changes that would increase the transparency and efficiency of the interconnection process. Additionally, to meet the FERC Order requirement for a HeatMap, the project will include the selection and implementation of a vendor solution. The chosen vendor solution will look to include providing a Queue map to replace the existing queue list process. The project goal for 2025 is to reach the Deployment milestone.

34.3 Project Justification

This project is required to meet compliance obligations related to Order Nos. 2023 and 2023-A

35. Long Mountain PAR Operating Protocol with ISO-NE

35.1 Problem / Opportunity

There is a planned Phase Angle Regulator (PAR) installation on the Long Mountain-Cricket Valley 345kV (#398) intertie between the NYISO and ISO-NE by Q4 2025, which is an upgrade from the AC Public Policy Segment B project. The NYISO does not currently have an operating agreement with ISO-NE for this PAR. Tariff revisions will be required to incorporate the new device.

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

The objective of this project is to develop an operating protocol with ISO-NE for the new Long Mountain PAR. The project deliverable for 2025 will be Market Design Complete.

35.3 Project Justification

With the addition of a PAR on the NYISO/ISO-NE seam, an operating agreement is necessary to guide PAR control actions that reduce the overall cost of congestion and maintain reliability.

36. New York City Public Policy Transmission Need

36.1 Problem / Opportunity

In the NYPSC order designating a New York City Public Policy Transmission Need (NYC PPTN) issued in June 2023, the NYPSC directed the NYISO to proceed with a solicitation for a transmission project to connect at least 4,770 MW of offshore wind to New York City. The NYISO began work on this project in 2023 with the identification of the Determination of Transmission Need. In 2024, the NYISO continued this effort, working through the solicitation of solutions and performing the Viability & Sufficiency Assessment. The NYISO anticipates that the evaluation and selection of the more efficient or cost-effective solution, if any, will occur in 2025 (full project completion). NYISO staff will produce a detailed report on the analyses and evaluation of the proposed projects and will recommend the more efficient or cost-effective solution to the Board to address the NYC PPTN, if any.

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

For 2025, this project's deliverable will be a Study Complete, with a recommendation to the Board of Directors based on the outcome of NYISO's evaluation of the proposed solutions.

36.3 Project Justification

With the NYPSC's order identifying a PPTN, the project is required to comply with the requirements of the Public Policy Transmission Planning Process set forth in the NYISO's tariff.

Continuing

37. CRIS Expiration Evaluation

37.1 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.

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

Continuing the work from 2024, the objective of this project is to test and deploy the software that was developed as part of the 2024 project.

The project deliverable for 2025 will be Deployment.

37.3 Project Justification

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

38. Dynamic Reserves Phase 1

38.1 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.

38.2 Objective(s) & Anticipated Deliverable(s)

The anticipated deliverable for 2025 will be Software Design Specification~~Development Complete~~, based on the Functional Requirements Specifications from the 2024 Dynamic Reserves project.

38.3 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 SOM Recommendations 2015-16, 2021-2.

39. Hybrid Aggregation Model

39.1 Problem / Opportunity

As part of the 2022 Hybrid Aggregation Model project, the NYISO developed the market rules and FRS 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. In 2024, the NYISO is working on developing and implementing the necessary software changes to broaden the range of resources that can use existing Co-located Storage Resource (CSR) participation model to include Dispatchable Generators, while starting development for the new Hybrid Aggregated Storage (HSR) participation model, which will be implemented in 2025.

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

This project is a continuation of the 2023 Hybrid Aggregation Model project. The 2025 deliverable will be to deploy the HSR participation model functionality.

39.3 Project Justification

State and federal initiatives such as renewable energy credit 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 add a HSR participation model that gives MPs greater authority to decide how to employ their resources to comply with the NYISO's dispatch signal.

40. Improve Duct-Firing Modeling

40.1 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. It is also expected to be a problem for resources with a mix of technologies, such

as Aggregations. 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 being considered in 2024, but the list is not exclusive: (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.

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

The 2025 project deliverable will be to deploy software changes to support the approved 2024 market design. The project would enable market enhancements that would be required for a combined-cycle generator to reflect its operating characteristics in the duct-burning range as well as the capturing the benefits of this functionality.

40.3 Project Justification

There are currently many combined cycle generators in the NYCA, and the majority of these combined cycle generators have duct-firing capacity. These resources currently represent a large source of dispatchable energy, reserves, and regulation. 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 enhancements to the scheduling of a generator's capacity that would provide more flexibility in the reserves and regulation markets. This project also supports SOM Recommendation 2020-1.

41. Integrating Champlain Hudson Power Express (CHPE)

41.1 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.

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

The objectives of this project are to develop an operating protocol with HQ and the U.S. owner/operator for the CHPE HVDC line, identify needed tariff revisions and 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 2025 will be Q4 Development Complete.

41.3 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. New software and tariff changes are also necessary to manage advanced reservations.

42. Internal Controllable Lines

42.1 Problem / Opportunity

There are no internal controllable lines in operation within the NYCA. Prior to the 2023 project MDC, 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.

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

This is a continuing project to incorporate point-to-point internal controllable lines into NYISO markets. Continuing the work from 2024, the deliverable for the project for 2025 is Software Design .

42.3 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.

43. LCR Optimizer Enhancements

43.0 Problem/Opportunity

In 2017 and 2018, the NYISO worked with stakeholders to design and implement a proposal to set Locational Minimum Installed 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 (CONE) curves developed based upon the peaking plant used in establishing each ICAP Demand Curve. 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, commonly referred to as the "Tan 45" methodology.

Since implementation of the revised methodology, concerns have been raised about the methodology and the resulting LCRs, including 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.

43.1 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 and 2024 "LCR Optimizer Enhancements" project efforts. The milestone for 2025 is a Deployment.

43.2 Project Justification

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

44. Dynamic Reserves - Review Operating Reserve Supplier Cost Recovery

44.1 Problem / Opportunity:

Currently, the NYISO charges Load Serving Entities (LSEs) for the cost of providing all Operating Reserves based on load-ratio share, distributing costs throughout the NYCA. However, with the impending implementation of Dynamic Reserves, which tailor reserve requirements to specific grid conditions, including localized constraints, this project will explore ~~mechanisms~~ alternatives to ~~implement~~ the current procedures for recovering the cost of reserves that the NYISO procures in order to manage these locational constraints. In particular, this project ~~also~~ will ~~assess~~explore if adjustments are necessary to ~~cost allocation procedures due to specific components of Dynamic Reserves Phase~~ : (1~~: (1)~~) the funding source for the locational component of locational Operating Reserve compensation; (2) the allocation of Forecast Reserve Charge revenues, (3) the procedure for determining transmission facility ratings used in the TCC auction, which affects the number of TCCs available, as well as any changes to the procedures for allocating TCC auction revenues and ~~(2)~~ day-ahead congestion rent residuals among the TOs that may become necessary if the procedure for determining these ratings is changed; and (4) settlements for generators that are the first and second largest ~~generator.~~contingencies.

The implementation of the Dynamic Reserves project will decrease congestion rent collections whenever flows on constrained facilities are reduced below the limits that apply to those facilities in lieu of maintaining locational reserves to manage those constraints. In the absence of any other changes, this will lead to congestion rent shortfalls in the DAM. Using congestion rents to fund the locational component of those reserves would also increase DAM congestion rent shortfalls. By reducing the number of TCCs available, changes to the TCC auction assumptions could reduce these shortfalls. Similarly, the allocation of the Forecast Reserve Charge that will result from the implementation of Dynamic Reserves can also affect the shortfall. Finally, when Dynamic Reserves is implemented, the ISO's decision to schedule generators that are one of the two largest contingencies to produce additional energy will consider the impact that such a decision has on operating reserve requirements.

As demonstrated in the Dynamic Reserves project, 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. Upon the completion of Dynamic Reserves, the NYISO will implement a nodal reserve market, which provides locational signals to value and identify the need for reserves in specific locations.

44.2 Objective(s) & Anticipated Deliverable(s):

The primary objective of this project is to develop market rules and mechanisms to allocate the cost of procuring Operating Reserves on a locational basis~~.~~, consistent with and necessary to implement the Dynamic Reserves project. Additionally, the project will investigate the allocation of Forecast Reserve Charge revenues and settlements for generators that are the first and second largest ~~generator.~~contingencies. Also, the project will assess changes in procedures used to determine transmission facility ratings used in the TCC auction, and any changes to the procedures for allocating TCC auction revenues and day-ahead congestion rent residuals among the TOs that may become necessary if the procedure for determining these ratings is changed. The anticipated deliverable for 2025 is MDCP.

44.3 Project Justification

Stakeholders have expressed interest in exploring alternative operating reserve cost recovery structures, particularly emphasizing alignment between locational reserve procurement and cost recovery, as discussed during the Dynamic Reserves market design.

This project would also address two components of Dynamic Reserves: (1) The application of the Forecast Reserve Charge revenues and (2) ~~Settlements~~settlements for generators that are the ~~First~~first and ~~Second Largest Generators~~second largest contingencies. The Forecast Reserve Charge will charge the Forecast Reserve price to real-time Loads that do not schedule in the Day-Ahead Market to provide the appropriate incentive to schedule load Day-Ahead and recover the cost of scheduling reserves up to Forecast Load. As proposed under Dynamic Reserves, the revenues from this charge would offset the total reserve charges to LSEs (i.e., offset Rate Schedule 5). This project will investigate if it is warranted

to allow Day-Ahead Loads to collect a credit when their RTM schedule is less than their DAM schedule, and where Forecast Reserve Charge revenues are offset.

Additionally, since the implementation of Dynamic Reserves will increase day-ahead congestion rent shortfalls if there are no modifications to the procedures currently used to determine the total quantity of TCCs that can be outstanding at any point in time, the project will assess whether the procedures used to determine transmission facility ratings used in the TCC auction should change. It will also consider changes to the procedures for allocating TCC auction revenues and day-ahead congestion rent residuals among the TOs that may become necessary if the procedure for determining these ratings is changed.

Future

45. Balancing Intermittency Phase 2: Long Lead Time Reserves

45.1 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 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 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.

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, the 2023 Balancing

Intermittency project Market Design Concept Proposed recommended the introduction of a longer lead time reserve product (*i.e.*, 1 hr notification time Operating Reserve product). The 2024 project, currently underway, will build on the 2023 MDCP and deliver a Market Design Complete.

45.2 Anticipated Project Deliverable(s)

The deliverable for this project will be Functional Requirement Specifications (FRS) based on the findings and recommendations of the 2024 Market Design Complete.

45.3 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

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 (SOM) Recommendations 2021-1 and further evaluating 2017-2.

46. Balancing Intermittency Phase 3: Evaluation of Efficient Operating Reserve Scheduling Practices and Designs

46.1 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 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 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.

As Operating Reserve needs grow to provide the flexibility needed to manage increasing uncertainty and variability, the efficient scheduling of such Operating Reserves will become increasingly important. Currently, Operating Reserves are scheduled strictly based on the supplier's offer to provide Operating Reserves. Alternate designs may enable broader consideration of Operating Reserve supplier costs, such as the cost of energy if the Operating Reserve supplier is converted from reserves to energy.

46.2 Anticipated Project 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 to evaluate efficient methods to schedule Operating Reserves, including consideration of the energy costs of those resources scheduled for Operating Reserves. The deliverable for this project will be Study Complete

46.3 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.

47. Capacity Transfer Rights for Internal Transmission Upgrades

47.1 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.

47.2 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 MDCP.

47.3 Project Justification

Deliverability constraints can create barriers to entry for competitive new suppliers and imports, which may reduce 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 SOM Recommendation 2012-1c.

48. Uncertainty Adjustment Review

48.1 Problem / Opportunity

The NYISO market design is advancing rapidly to consider (a) dynamic scheduling of reserves based on the varying needs of the grid to respond to changes in system conditions (i.e., the Dynamic Reserves Project) and (b) the uncertainty introduced by intermittent and behind the meter resources (i.e., the Balancing Intermittency project).

These designs will enable more efficient reserve requirements and facilitate efficient operations. At the same time, they will build a foundation for further improvements (e.g., More Granular Operating Reserves). One such potential enhancement would be to transition the Uncertainty Reserve Requirements calculation process from one based on measured historic errors to one that incorporate probabilistic forecasts of next-day uncertainty.

This study will also serve as an opportunity to review the performance and parameters of the Uncertainty Reserve Requirement more broadly to ensure that it is performing its intended function of procuring additional reserves to ensure sufficient Real-Time energy is available to serve Load.

48.2 Objective(s) & Anticipated Deliverable(s)

The deliverable for the Uncertainty Reserve Requirement Refresh Study will be Study Complete.

48.3 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

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 (SOM) Recommendations 2021-1 and further evaluating 2017-2.

49. Eliminate Fees for CTS Transactions with PJM

49.1 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 MPs facilitating transactions must increase their bids to account for the fees.

49.2 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 MDCP.

49.3 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 SOM Recommendation 2015-9.

50. Improve Duct-Firing Modeling: Multiple Ramp Rates

50.1 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. It is also expected to be a problem for resources with a mix of technologies, such as Aggregations. Some CCGTs equipped with duct-burners 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.

This project would seek to develop a design that better utilizes the capability of each plant segment. The project would involve testing of the static registration response rates for each MW block and not the emergency rate for the entire output of the plant.

50.2 Project Objective(s) & Anticipated Deliverable(s)

The deliverable for this project will be a Study Complete (SC) to study the feasibility of a production level Multiple Ramp Rate model built upon the prototype from the 2022 Improve Duct-Firing Modeling project.

50.3 Project Justification

There are currently many combined cycle generators in the NYCA, and the majority of these combined cycle generators have duct-firing capacity. These resources currently represent a large source of dispatchable energy, reserves, and regulation. 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 enhancements to the scheduling of a generator's capacity that would provide more flexibility in the reserves and regulation markets. This project also supports SOM Recommendation 2020-1.

51. Locational Marginal Pricing of Capacity

51.1 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.

51.2 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 MDCP.

51.3 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 SOM Recommendation 2013-1c.

52. Long Island PAR Optimization and Financial Rights

52.1 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.

52.2 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 would 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.

52.3 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 SOM Recommendation 2012-8.

53. M2M West PARs

53.1 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 Tariff and other applicable documentation/procedures and make software updates to allow for future PARs to be included in the M2M PAR coordination program.

53.2 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 MDCP.

53.3 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.

54. More Granular Operating Reserves

54.1 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.

54.2 Project Objective(s) & Anticipated Deliverable(s)

The project deliverable would be MDCP. The More Granular Operation Reserves design and implementation would be dependent on the market design for Dynamic Reserves.

54.3 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 SOM Recommendation 2021-3.

55. Reserves for Congestion Management (SOM)

55.1 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 the 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.

55.2 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.

55.3 Project Justification

Improving the rules and mechanisms for efficient pricing and settlement of operating reserves in the 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.

56. Separating Regulation Up and Regulation Down

56.1 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.

56.2 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.

56.3 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.