2023 Market Project Candidates

Product and Project Management

May 31, 2022

This document represents potential 2023 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.

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Introduction

This document represents potential 2023 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. Projects are classified as four project types.

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

Prioritize

1 5 Minute Transaction Scheduling

1.1 Problem / Opportunity

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

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

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

The 2023 project deliverable will be Market Design Concept Proposed.

1.3 Project Justification

This market design is expected improve price convergence between RTC and RTD, improve market efficiency by increasing the amount of available resources for dealing with real-time system changes and/or events. More frequent interchange 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.

2 Advancing NYISO Transparency

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 RTM contingencies. The NYISO has a separate list of contingencies for DAM/RTM relative to what the NYISO models in the TCC auctions, and the NYISO only publishes the TCC contingencies

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

The 2023 project deliverable will be Deployment.

2.3 Project Justification

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

- Commission's conclusions in AD14-14 that transparency plays a critical role in improving price formation
- Without sufficient transparency, market participants may not have the tools necessary to critically analyze and discuss problems and identify potential solutions to market inefficiencies.

- Order No. 704 conclusion: "[Such] policies [i.e., the Commission's market-oriented policies for the wholesale natural gas industries] require that interested persons have broad confidence that reported market prices accurately reflect the interplay of legitimate market forces. Without confidence in the basic processes of price formation, market participants cannot have faith in the value of their transactions, the public cannot believe that the prices they see are fair, and it is more difficult for the Commission to ensure that jurisdictional prices are 'just and reasonable.'"

3 Balancing Intermittency (SOM)

3.1 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, Energy Storage Resources (ESR), and Distributed Energy Resources (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 will identify 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. This project continues that work and supports State of the Market recommendations 2021-1.

3.2 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. The 2023 project deliverable will be Market Design Concept Proposed.

3.3 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.

4 Constraint Specific Transmission Shortage Pricing (SOM)

4.1 Problem / Opportunity

Transmission facility and line ratings limit the amount of energy that can flow from one location to the next on the bulk electric system. As transmission constraints arise, the NYISO's energy market software prices the quantity of energy that would be necessary to alleviate shortages. The existing transmission constraint pricing logic applies a single graduated shortage pricing mechanism to all facilities assigned a non-zero constraint reliability margin (CRM) value. Under the current pricing logic, some transmission constraints are relaxed without being resolved by the graduated mechanism.

The NYISO and its stakeholders completed a Market Design in 2021 to utilize a revised and more graduated transmission demand curve (TDC) mechanism that better accounts for the various non-zero CRM values assigned to facilities. Under this proposed construct, TDC prices will increase with the severity of transmission overloads. The design is intended to reduce occurrences of constraint relaxation by seeking to resolve constraints for internal facilities using a graduated TDC mechanism that includes pricing values for shortages that exceed applicable CRM values. In 2022, the NYISO, in collaboration with stakeholders developed techniques to address multiple active transmission constraints (MATC) for the same monitored element, in-series monitored elements, and parallel monitored elements.

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

Subject to acceptance by the FERC, in 2023, the NYISO will deploy enhancements to the TDC mechanism approved in the 2021 Market Design Complete as further enhanced to address the MATC issue. The 2023 project deliverable will be Deploy.

4.3 Project Justification

The transmission constraint pricing logic enables the NYISO's market software to re-dispatch resources efficiently in the short term to alleviate constraints and incentivizes long-term investment in locations where resources could provide the greatest benefits. This project also supports State of the Market recommendation 2015-17.

5 Coordinated Grid Planning Process (CGPP) Support - Requested by New York TOs

5.1 Problem / Opportunity

The New York Transmission Owners (TOs) are currently developing a Local Coordinated Grid Planning Process (CGPP) [see Feb 9 ESPWG Presentation on CGPP] to comply with a Public Service Commission (PSC) directive to develop an end-to-end planning process to identify and approval local transmission needed to achieve the state's CLCPA goals. A major part of the CGPP development needs to address the alignment between *the local utilities' planning process and the regional planning processes completed by the* NYISO, including but not limited to the utilization of databases developed by the NYISO to satisfy current regulatory requirements, the development of scenarios through the NYISO's System and Resource Outlook, and consideration of NYISO resource availability and additional resources necessary to complete studies to support the CGPP and align it with bulk system studies.

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

This project should entail a review of current NYISO procedures with a focus on *identifying areas where the CGPP and* the current set of NYISO processes and deliverables *can be better aligned*. The CGPP is envisioned to run on a two-year process cycle followed by Department of Public Service (DPS)/PSC review and approval of local project portfolio recommendations with the first CGPP cycle to start in 2023 or 2024. Utilization of and alignment with current NYISO deliverables related to the NYISO's planning processes would be beneficial to parties and stakeholders involved in both local and bulk transmission planning. Examples of work products that will be used in the CGPP include:

- Zonal Capacity Expansion Modeling Results

- New base cases in the FERC 715 Database
- Modification of cases for Zonal Capacity Expansion scenarios
- Performance of BPTF assessments of TO's proposed Local Transmission Solutions

As such a review of the current processes and deliverables is needed to identify potentially beneficial interactions, evaluate, and establish changes to existing or introduce new methods and procedures, and assess resourcing needs as compared to what exists today. The 2023 milestone will be Issue Discovery.

5.3 Project Justification

The PSC has directed the NYTOs to work with DPS Staff, the New York State Energy Research & Development Authority, and the NYISO to develop the CGPP – an effort to create a repeatable end-to-end planning process for local transmission needed to achieve the State's CLCPA goals. The NYISO has and continues to implement processes for bulk transmission identification and approval needed to achieve the same (e.g., the Public Policy Transmission Needs Process). It is imperative for the sake of consistency and transparency that the two planning processes are coordinated with regards to initiating assumptions used to develop scenarios guiding recommendations for approval of local transmission projects. The CGPP is meant to be complementary to the NYISO's bulk planning processes. Not having alignment between the two processes will risk the identification and approval of projects on the bulk and local level that may be incompatible with one another, reducing or negating the anticipated benefits of both and ultimately harming customers, developers, and other Market Participants.

6 CRIS Expiration Evaluation

6.1 Problem/Opportunity

As part of the Class Year Redesign project, the NYISO identified proposals providing for more stringent Capacity Resource Interconnection Service (CRIS) expiration rules. Some of those proposals were implemented as part of that initiative, while others were deferred for later consideration. Although the new CRIS rules are expected to prevent retention of CRIS by certain facilities not participating in the Installed Capacity (ICAP) market and increase deliverability "headroom," the rules, as accepted by FERC and implemented by the NYISO, do not significantly address circumstances under which facilities can retain their CRIS beyond the effective date of their retirement for up to three years and retain unused CRIS with minimal participation in the ICAP market under Section 25.9.3 of the NYISO Open Access Transmission Tariff (OATT).

The current tariff provisions may allow facilities to retain CRIS that, if terminated, could eliminate the need for deliverability upgrades or require less costly deliverability upgrades, thereby

facilitating new entry. For example, the existing rules allow a facility to retain its full CRIS by offering as little as 1 MW into the capacity market. Additionally, a facility is able to retain all CRIS obtained for up to three years after it retires, rather than immediately making its unused CRIS available to other new entrants.

Modifying the current tariff language with respect to CRIS transfers may allow for more flexibility as more public policy resources come on to the system. Modifications could include exploring options to include same-location transfers to better facilitate these new entrants.

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

Continuing the work from the 2022, the objective of this project is to develop software requirements to implement the CRIS Expiration rules as well as the rules surrounding CRIS Transfers. The project deliverable for 2023 will be Functional Requirements.

6.3 Project Justification

This project will seek to further enhance and provide additional clarification to the CRIS expiration rules. Further enhancements to the CRIS expiration rules will more appropriately address the retention of CRIS by retired facilities and facilities no longer fully participating in the ICAP market.

Finally, this project will seek to increase the capacity deliverability headroom and potentially lower the cost of market entry to future facilities seeking to participate in the ICAP market.

7 Dispatchability and Fast Response Product - Requested by NYPA

7.1 Problem / Opportunity

The purpose of this project is to study the need for market products to address system needs given the changing resource mix, electrification of the grid, and evolving load profiles as we transform New York's electric grid as mandated by the Climate Leadership and Community Protection Act (CLCPA). Given the mandate for the State to achieve a 70% renewable energy supply mix by 2030; and a 100% clean electricity supply mix by 2040 the available technologies to meet these goals are primarily non-dispatchable, weather-dependent, intermittent resources, challenging the reliable operation of the grid with their inherent variability and uncertainty of output. This project will help the NYISO and stakeholders' study, identify and implement market products necessary to sustain and incent generator attributes necessary to maintain reliability while promoting the achievement of reaching the State's policy goals codified in the CLCPA.

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

This project will be to perform a study to assess the need for new products to provide economic incentives to sustain or attract generation attributes including but not limited to: generator dispatchability; ramping reserves; a fast (near-immediate) ramping product; a premium fast ramping product for generators capable of large (>500MW) inertial response capable of addressing natural events, e.g. wind-lull and cloud events, fast and slow responding reserves; and, other products as identified in the study to provide operational capabilities, safety margins and overall system reliability and appropriate compensation mechanisms that appropriately value such attributes. If demonstrated to be valuable, a market product(s) would be promoted as the next phase of this project for implementation.

7.3 Project Justification

With the State's codified CLCPA goals, intermittent resources will soon be the pre-eminent generating resource powering New York's electric grid. New York's power grid was developed with large central-station fossil generation where dispatchability, quick ramping, frequency regulation, long-duration output, and near-immediate inertial response and other capabilities were available to maintain reliability and in quick response to a signal from the TO/NYISO Control Room. As the grid transforms into becoming the cleaner and greener energy form of energy New Yorkers value, the high penetrations of non-dispatchable weather-dependent resources raise the issue of exactly how to balance intermittency on the system.

Numerous recent studies conducted by the NYISO and others conclude that we will need to replace the fossil generation mandated by public policy to retire. Currently these studies state that this fossil generation will be replaced in large part by dispatchable emissions-free resources (DEFRs). What technology will be employed by these new DEFRs, and therefore what generator attributes they will have that are capable of addressing high levels of intermittency is not known. This means that in the near-term it is likely that the NYISO will increasingly rely upon the existing DEFRs on the system, specifically NYPA's large hydro resources, to balance increasing intermittency on the system to maintain reliability. The only alternative to NYPA's large hydro resources for large flexible emissions-free power-on-demand- are the upstate nuclear units, which are not designed to ramp up or down – and in fact have very little variability in their operational output in order to avoid expensive damage to their facilities.

Current NYISO market products, reimbursement mechanisms and market rules do not fully consider the excessive wear and tear (which significantly reduces unit life-expectancy) that these large expensive units already endure, and will likely increase. The current practice to go on indefinitely. NYPA's large hydro resources, which are relied upon by the NYISO operationally, and

consumers for its DEFR status and low-cost energy must be valued appropriately for their essential electrical and economic attributes.

The NYISO has proposed addressing the need to balance intermittency by developing Operating Reserve products. This study would distinguish the important differences between operating reserves, which enables the ISO to respond to unanticipated outages, and ramping reserves, which serve a separate and distinct purpose of managing generation variability and uncertainty in net load. This distinction is drawn in the NYISO Grid in Transition (GIT)report, which explained that the quantity of a ramping product that is needed would "depend[] on the magnitude of the potential variations in intermittent resource output … rather than on the size of potential generation or transmission contingencies.

As an example of the need to expand the NYISOs focus beyond operating reserve products, in a recent Brattle paper[1] Dr's Spee and Newell suggest setting demand curves for ramping capability "to account for the declining probability of lost load due to lack of ramping at each level of reserve, times the value of lost load," which is similar to the NYISO MMU's proposal for determining the maximum price the ISO should be willing to pay for 30-minute reserve. In contrast, the GIT Report asserts, "The energy market cost of resources providing ramp capability would ideally be taken into account in scheduling additional ramp capability, as resources scheduled to provide additional ramp capability would be dispatched for energy much more often than spinning reserves will be activated following contingencies." Taken together these

[1] Dr. Kathleen Spees and Dr Samuel Newell, Principals of the Brattle Group, "Modernizing Electricity Market Design Efficiently Managing Net Load Variability in High-Renewable Systems: Designing Ramping Products to Attract and Leverage Flexible Resources" submitted by NYSERDA as an attachment to their "Post-Technical Conference Comments on Modernizing Electricity Market Design, held by the Federal Energy Regulatory Commission (FERC) (Docket No. AD21-10-000).

conclusions highlight the fact that the price at which energy is offered is much more important for a provider of ramping reserve than for a provider of operating reserve underscores the desirability of separating the need for operating reserve from the need for ramping capability.

This project seeks to perform a study to assess the need for new products to provide economic incentives to sustain or attract generation attributes including but not limited to: generator dispatchability; ramping reserves; a fast (near-immediate) ramping product; a premium fast ramping product for generators capable of large (>500MW) inertial response capable of addressing natural events, e.g. wind-lull and cloud events, fast and slow responding reserves; and, other products as identified in the study to provide operational capabilities, safety margins and overall system reliability and appropriate compensation mechanisms that appropriately value such attributes. If demonstrated to be valuable, a market product(s) would be promoted as the next phase of this project for implementation.

8 Dynamic Reserves (SOM)

8.1 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 changing 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 NYC, the NYISO is permitted to operate transmission facilities above LTE, using generating capacity not otherwise scheduled to provide energy and phase angle regulator actions to quickly secure the transmission facilities, post-contingency. This offers opportunities to reduce production costs by relaxing the transmission limits of facilities that feed New York City load pockets. Currently, operating reserve providers in these NYC 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 and/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.

8.2 Objective(s) & Anticipated Deliverable(s)

The market design will seek to leverage the recommendations from the study conducted in 2021 and the 2022 Market Design Concept Proposed and develop potential changes to the NYISO's market software and market rules to facilitate more efficient scheduling of operating reserves based on system conditions. The project deliverable for this effort in 2023 will be Market Design Complete.

8.3 Project Justification

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

This project also considers an additional recommendation made by the MMU in past State of the Market Reports. The MMU has recommended that the NYISO "[c]onsider rules for efficient pricing and settlement when operating reserve providers provide congestion relief [Recommendation 2016-1]."

9 Emissions Transparency - Requested by Stakeholders

9.1 Problem/Opportunity

The emissions rates associated with the production of electricity in New York vary widely from hour to hour and location to location, but specific emissions rates are not transparent to the market. This project envisions that the NYISO would publish marginal and average emissions rates concurrent with the release of Locational Based Marginal Pricing (LBMP) results. Doing so would inform end users, load-serving entities, generators, energy service companies, marketers, aggregators, and other Market Participants seeking to optimize their use, production, storage, or purchase of electricity based on emissions. In addition, providing such data to the market would enable consumers to evaluate the emissions associated with the energy they consume and could inform decision-making related to implementation of State policies and environmental initiatives.

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

This project will deliver Functional Requirements including a methodology to determine real-time emissions rates for each transmission node and load zone.

The NYISO would aim to begin publishing emissions rates by 2024. Published rates would include indicative day-ahead and real-time emissions rates (both average and marginal) for each transmission node and load zone. They would be posted as an additional column when the NYISO posts LBMP results on its website.

Marginal emissions rates would be determined based on the characteristics and operations of each marginal generator in a manner similar to that used by PJM (see PJM Primer) or using a methodology comparable to LBMPc (see LBMPc Slides).

Average emissions rates for each transmission node and load zone would be determined using a methodology to be developed and documented (e.g., in a manual) by the NYISO in consultation with its stakeholders.

9.3 Project Justification

The project could provide several benefits: 1) it would support use of load management and storage operations to reduce emissions, 2) it would enhance the market for sustainable electricity products, and 3) it would provide data that could be used to support planning and implementation of State policies and environmental initiatives. The project would enhance the NYISO's reputation as a leader in market design, would provide more effective planning in the context of state and local environmental goals, and would facilitate the development of more robust markets for green energy products. Without a transparent and reliable flow of detailed

information to the marketplace, decisions intended to reduce greenhouse gas emissions and enhance environmental quality may not be made in the most efficient manner.

10 Engaging the Demand Side

10.1 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 is zero emission and climate action policies. The NYISO's demand response programs and DER participation model offer Load consumers the opportunity to "supply" energy to the wholesale markets. The NYISO also currently offers Load Serving Entities the opportunity to offer Price-Responsive Load in the DAM. Historically, Price-Responsive Load Bids have constituted a few percent of total bid Load by volume.

As part of the NYISO's mission to improve market efficiencies, the NYISO believes there may be opportunities to enhance market signals for Load Serving Entities to modulate Load in response to price on the buyer side of the equation. Load flexibility is at the intersection of the retail and wholesale markets. While demand response is a reduction of planned or expected consumption, Load flexibility includes other actions such as shifting or modulating demand in response to price signals. Robust participation of flexible, price–responsive Load in both DAM and Real-Time Markets (RTM) may provide another tool to balance the NYCA system, address resource intermittency, and support ancillary service providers.

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

The NYISO will work with both internal and external stakeholders to identify opportunities ripe for enhancing Load participation in the wholesale markets. The 2023 project deliverable for this project will be Issue Discovery.

10.3 Project Justification

Further engaging Load participation could allow for more robust price formation that reflects customers' willingness to pay, consistent with the marginal benefit of consuming energy. Engaged end-use customers that understand their Load consumption patterns and have access to incentivized price signals are enabled to modify behaviors to take advantage of enhanced customer rate design. Once established, end-use customer consumption patterns can allow Load Serving Entities to bid price sensitivity in the wholesale markets. Incenting Loads to modify behavior and bid responsively would benefit the NYISO's market design and operations and aligns with New York State policy goals to encourage end-use customer engagement in their energy

usage through Reforming the Energy Vision. Opportunities identified in this effort can then be further evaluated to determine their merit.

11 Enhancing Fuel and Energy Security

11.1 Problem / Opportunity

The 2023 Enhancing Fuel and Energy Security project would refresh the assumptions developed in the 2019 Enhancing Fuel and Energy Security project in recognition of the ongoing transformation of the bulk power system to assess emerging operational and grid reliability concerns. The NYISO also appreciates stakeholder concerns related to a wide range of potential grid resilience risks, including extreme weather scenarios and climate change impacts. Future changes to New York's fuel supply mix as well as the expected increases in winter peak loads due to electrification may challenge the ability to meet electric system demands under stressed system conditions, such as a prolonged cold weather event and/or natural gas supply/transportation disruptions. NERC, NPCC and NYSRC are all currently considering new mandatory standards in this area. The 2023 Enhancing Fuel and Energy Security project should examine potential new reliability standards and the changing nature of the supply mix and load patterns and quantify the amount of resources that will be required based on a wide array of study assumptions. Depending on the results of the study, the NYISO would, in collaboration with stakeholder, assess the subsequent development of potential operational and/or capacity and energy market enhancements to achieve recommended improvements in grid resilience as related to fuel and energy security.

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

The 2023 project deliverable for this project will be Study Complete.

11.3 Project Justification

Future changes to New York's resource mix as well as the expected increases in winter peak loads due to electrification may challenge the ability to meet electric system demands under stressed system conditions, such as a prolonged cold weather event and/or natural gas supply/transportation disruptions. Additionally, NERC, NPCC and NYSRC are all currently considering new mandatory standards in this area.

12 Evolving Financial Transaction Capabilities: Bilateral Transactions - Requested by NY-Best and Bayonne Energy Center

12.1 Problem/Opportunity

Current NYISO software capabilities facilitate internal bilateral transactions, however the range of source and sink locations do not encompass the full range of use cases. For example, while ESRs can currently be the source in bilateral contracts, they cannot currently be a sink.

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

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

This project will enhance bilateral transaction functionality by increasing the range of bilateral contracting opportunities (i.e., source and sink locations), including creating the opportunity for bilateral contracts in which an ESR could be a sink. This project would assess and commence designing the software changes necessary to achieve this objective. The 2023 project deliverable for this project will be Software Design.

12.3 Project Justification

The ability for an ESR to procure charging energy from specific generators, particularly renewable generators, would enhance the ability to provide customers with energy that is sourced from certain resources. Additionally, New York State has adopted aggressive energy storage goals (6000 MW by 2030) as a step towards achieving the requirements of the CLCPA. The software revisions that would be pursued under this project would enable developers of ESRs to represent to potential customers that the energy stored in their facilities is sourced from renewable and emission-free generators. This is especially important in Zone J, where much of the generation operates using fossil fuels. Allowing developers to enter into bilateral contracts to charge their energy storage projects will facilitate financing and development, as it will allow ESR operators to meet the needs of customers who prefer acquiring emission free energy. Similarly, owners of renewable and emission-free generators may want the ability to store their energy in downstate energy storage facilities during periods of low-demand for use during higher-demand periods.

13 Hybrid Aggregation Model

13.1 Problem / Opportunity

The 2022 Hybrid Aggregation Model project created the market rules and Functional Requirements for an ESR and another Generator to be co-located at a single point of interconnection and share the same point identifier (PTID). To effectuate these rules, the NYISO must work towards developing and implementing the necessary software changes.

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

This project is a continuation of the 2022 Hybrid Aggregation Model project. The 2023 project deliverable will be Software Design based on the 2022 Functional Requirements.

13.3 Project Justification

State and Federal initiatives such as Renewable Energy Credit (REC) procurements provide incentives for developers to couple storage and intermittent renewable assets. Such programs are aimed at reducing the output volatility and improving the availability of intermittent resources. The NYISO has implemented a Co-Located Storage (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 2023 project deliverable will continue the work necessary to implement the new participation model.

14 Improve Duct-Firing Modeling (SOM)

14.1 Problem/Opportunity

Providers of reserves and regulation are currently required to achieve their emergency response rate over the entire range of operation. This is problematic for combined-cycle gas turbines (CCGTs) with duct firing because the response rate of the duct-firing portion is typically slower than the baseload portion of the plant. These plants 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. Simpler alternatives may also be considered, such as: (1) testing response rates for each MW block and not the emergency rate for the entire output of the plant or (2) allowing reserves and regulation to be provided for just the baseload output of the plant.

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

The 2023 project deliverable will be Market Design Complete. The project would propose the 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 benefits of this functionality.

14.3 Project Justification

There are currently many combined cycle generators in the New York Control Area and the majority of these combined cycle generators have duct-firing capacity. These resources currently represent a large source of dispatchable resources. Having access to these resources' full dispatchable capability will become increasingly important as generation from intermittent resources grows over the coming years. Enabling their participation will provide consumer benefits, as increased competition could result in lower market prices and greater availability of resource capability to provide various ancillary services. Thus, the project would seek to evaluate the enhancements to the scheduling of a generator's capacity that would provide more flexibility to participate in the reserves and regulation markets. This project also supports State of the Market recommendation 2021-1.

15 Interconnection Process Enhancements - Requested by ACE-NY

15.1 Problem / Opportunity

With the advent of the CLCPA, New York State's power grid is rapidly transitioning with the incorporation of new intermittent renewable resources, energy storage resources, and distributed energy resources. It is estimated that an additional 26,000 MW of new resources will need to come online by 2030 in order to achieve the codified goals of the CLCPA. All of these new resources will be required to go through the NYISO's interconnection process. While the NYISO has taken important steps in ensuring the competitive markets and reliability are maintained through initiatives like Grid in Transition, additional steps are needed to be taken to develop new enhancements and reforms to the interconnection process to ensure that is remains sustainable and reflects the unique characteristics of the resources that will be interconnecting.

The NYISO's Interconnection process was last enhanced and reformed back in 2019 with the Class Year Redesign, and a 2022 project will seek to better coordinate the interconnection process with expected transmission expansion. Additionally, FERC has initiated an Advance Notice of Proposed Rulemaking with regards to Transmission Planning and Interconnection. It is expected that FERC will issue a final Notice of Proposed Rulemaking (NOPR) by the end of 2022 resulting in a compliance directive for the RTO/ISOs. While these initiatives have and are expected to result in increased efficiencies, there are additional opportunities for reforms and enhancements that

build upon these initiatives (i.e., 2019 Class-year redesign, 2022 project, and expected FERC NOPR).

Due to a large influx of new projects to the Interconnection Queue, the complete study process has become overly lengthy, with high numbers of withdrawals from the queue. Longer timelines create queue churn, wherein potential generators will submit a large number of projects in the hopes of seeing 2 or 3 make it through the process. This leads to longer study timelines. And a feedback loop is created.

As the volume of new resources seeking to interconnect to the system rapidly grows, it is paramount that the NYISO seeks to continue to enhance the interconnection process to be the most efficient and sustainable possible.

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

The project will first study and identify opportunities for improvement to the interconnection process by working with key stakeholders (i.e., Interconnecting Developers, Transmission Owners, and NYISO Planning department). As part of this initial phase of the project, it will be important to identify aspects that are included as part of the expected FERC NOPR. This will help the project avoid any duplicative work and ensure it is operating in coordination with other interconnection initiatives. These identified opportunities will then be prioritized to create a plan that identifies a timeline for their implementation. The project will culminate in a final proposal for the enhancement of the interconnection process. The 2023 project deliverable for this project will be Issue Discovery.

The areas identified for improvement would range from simple process improvements, to updating study procedures, to tariff modifications.

Areas to be addressed should include but not be limited to the following:

- Evaluate current COD requirements to accommodate longer development timeframes (e.g., Off-shore wind)
- Stakeholder Communications
    - Portal Improvement
    - Improved response time to inquiries
- Study process improvements
    - Determine how to speed up SRIS process
    - Determine the need for SRIS Cluster analysis
    - Improve cost estimate accuracy
    - Determine how Developers and NYISO can use consultants to expedite SRIS process

- Standardize agreements and milestone templates across all TOs
- Improve facilitation of LGIA process

The proposed enhancements would result in an interconnection process that is sustainable, efficient, and designed to support the state of New York's energy transition goals. The 2023 project milestone would be a Market Design Complete.

15.3 Project Justification

Enhancements to the NYISO Interconnection process result in efficiencies that reduce time, decrease uncertainty, and reduce the risk that the interconnection process imposes upon new resources. This risk creates uncertainty for entrants, which is most often reflected in costs, and a need to overcompensate with additional projects. By reducing this risk, a positive feedback loop could be created, fewer interconnection requests would be required, timelines would shrink, and the process would become more efficient. Additionally, the NYISO is facing an unprecedented challenge associated with the drastic increase in workload due to the volume of projects needing to interconnect while also experiencing staffing challenges. Therefore, any increase in efficiency would support the NYISO in their essential function of the reliable interconnection of new resources.

16 LCR Optimizer Enhancements

16.1 Problem/Opportunity

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

Since the new methodology has been implemented, multiple concerns have been raised about the methodology and the resulting LCRs about the stability of the LCRs and the transparency of the optimization function. Re-examining this process and the methodology could lead to improvements in the stability and transparency of the LCRs.

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

The objective of this project is to examine the process used today to optimize the setting of Location Capacity Requirements and develop any necessary modifications and enhancements to the process. The milestone for 2023 is a Market Design Complete.

16.3 Project Justification

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

17 M2M West PARs

17.1 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 Phase Angle Regulator (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 OATT and other applicable documentation/procedures and make software updates to allow for future PARs to be included in the M2M PAR coordination program.

17.2 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 2023 project deliverable will be Market Design Concept Proposed. Implementation is expected to be completed in 2024.

17.3 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.

18 Meter Data Management Modernization

18.1 Problem / Opportunity

The DER project provided the opportunity to modernize the upload and download of generator and tie meter data with the introduction of an API, which is a computer-to-computer communication protocol. This project seeks to continue with this modernization and include

additional API functionality for upload and download for the remaining data in SDX. This will allow for the eventual retirement of the existing SDX application.

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

The 2023 project deliverable will be Deploy.

This 2023 effort will include the gathering of functional requirements, detailed requirements, software design, development, testing, and production deployment of API functionality to replace the current file upload and download processing currently utilized through the SDX application.

This project will also include discussions with stakeholders regarding the timing of the sunsetting and eventual retirement of the SDX application.

18.3 Project Justification

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

19 Mitigation Threshold Review

19.1 Problem / Opportunity

This project intends to 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.

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

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

This project will consider the following improvements:

1. Modifying the measure that predicts potential market power for each load pocket in the coming month, based on the number of transmission constrained hours in the previous 12 months. The existing measure may not accurately forecast upcoming tightness of load pockets by neglecting the systematic tendency for strong summer peaks in constrained hours, but fewer such constraints over the rest of the year.
2. Revising the measure of “lowest allowable LPT.” That measure uses 12-month averaging of load-weighted and fuel-price-adjusted LBMPs to calculate the expected load-pocket

LBMP in the coming month and takes 2% of that figure to generate a "lowest allowable LPT." The formula that calculates a weighted average of past load-pocket LBMPs could be revised to better predict load-pocket LBMP in the upcoming month, and hence create a more appropriate measure of lowest allowable LPT.

3. The Tariff requires the NYISO to fuel-price-adjust the LPTs, allowing the NYISO to specify the method of fuel adjustment. Currently, the Market Mitigation and Analysis Department (MMA) implements this requirement by fuel-adjusting the LBMP term in on a monthly basis. However, MMA proposes to change the frequency of fuel-adjusting LPTs from monthly to daily, so that each day LPTs maintain consistency with the daily-evolving fuel-price component of energy reference levels.
4. Automating the process of calculating LPTs, which currently consists of several steps, some of which are time consuming and labor intensive and hence prone to error. MMA proposes to work with IT to create a fully automated process with measures in place to validate results from each execution.

The project deliverable for 2023 will be Market Design Concept Proposed.

19.3 Project Justification

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

20 Multi-Level References

20.1 Problem / Opportunity

This project supports gas electric system coordination by providing more sophisticated and efficient methods for Market Participants (MPs) and the NYISO to model generator fuel availability, fuel costs, and operational situations.

The enhanced functionality will also allow MMA and the MMU to more effectively implement tariff requirements, allow greater flexibility in creation of references in response to market conditions, and provide additional transparency to MPs. This will allow for more accurate reference levels for non-traditional generation (*e.g.*, DER, CSR, Hybrid Storage resources).

20.2 Objective(s) & Anticipated Deliverable(s)

This project will implement several functional enhancements to the Reference Level Software (RLS) web application as well as the Reference Calculation Engine. Some functional

enhancements include allowing multiple fuels for a single reference and cost adjustment reports. The project deliverable for 2023 will be Software Design.

20.3 Project Justification

The functional enhancements will improve MMA analysts' ability to quickly and accurately identify potential problems with reference levels, which could subsequently improve application of mitigation.

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

21.1 Problem / Opportunity

The NYISO currently conducts Centralized Transmission Congestion Contracts (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.

21.2 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 2023 will be Software Design.

21.3 Project Justification

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

The proposed solution is intended to:

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

22 Review of Real-Time Market Structure (SOM)

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 Real-Time market 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 Project Objective(s) & Anticipated Deliverable(s)

This project will review the existing real-time market structure and settlements and determine if changes are needed to maintain reliable operation in real time. The project will review the current real-time market 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 2023 project deliverable will 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 State of the Market Recommendation 2012-13.

23 Storage as Transmission – Requested by Stakeholders

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 often has very positive impacts on transmission systems by relieving peak demand through injections and reducing congestion through off-peak charging to bring power where it will be needed later. Currently, the NYISO tariffs treat storage as a Generator. In some instances, storage used exclusively as a transmission asset could provide a faster and cheaper option for providing the same or similar services as traditional alternatives, while providing valuable optionality to scale or augment project size or operation in the future. There is currently no pathway by which a storage project could be evaluated through the interconnection process as a transmission asset, and no methods by which to operate a storage asset as transmission. Furthermore, market rules for such projects would need to consider what impact market participation may have to avoid double payment while allowing for flexibility and reduced revenue requirements through traditional rate-basing mechanisms. Finally, the project should consider options for cost recovery for storage as transmission, while evaluating participation of storage in various transmission use cases.

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

This project has two primary components. The first component would have the NYISO develop a process by which a storage project could progress through the interconnection queue while being considered and evaluated as a transmission asset, including options for cost recovery. The second component would have the NYISO develop rules and methods for operating the storage as a transmission asset, taking multi-use and double payment issues into consideration, as well as the various use cases. These components are related and may depend on one another.

This process should include discussions with developers in this space, review of the literature from FERC on the issue, and consideration of similar projects in other jurisdictions. The 2023 project deliverable will be Market Design Concept Proposed, covering market rules for evaluating, interconnecting, and operation storage as a transmission asset.

23.3 Project Justification

Transmission upgrades may be necessary to ensure delivery of clean energy across New York's electric grid. However, transmission development is often difficult, expensive, and on very extended time frames. Utilizing storage as transmission provides another alternative for providing or enhancing these services on a shorter timescale and potentially at lower cost, while preserving valuable optionality in the process. Without a path forward and market rules, these projects are unlikely to be proposed or move forward, despite the significant potential 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 than can occur during different periods of the day or week. MPs could utilize more granular TCC products to tailor portfolios to better hedge congestion costs during different periods of the day or week. This additional flexibility could benefit MPs under current grid conditions, as well as future grid topologies with increased levels of intermittent resources, which have notable variations in output in daytime hours versus nighttime hours. Additionally, defining more granular TCCs may make other market design improvements possible.

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

The 2023 project deliverable will be Market Design Complete, building upon the 2021 project efforts to develop a Market Design Concept Proposed and would include working with stakeholders to finalize market rule changes needed to facilitate the creation of TCC products that apply to different periods of time 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 all MPs, including intermittent generation; (2) reduce the cost of congestion hedging for MPs; (3) improve forward congestion price signals from TCC auctions to distinguish between time periods where congestion patterns can vary; and (4) permit other market design improvements.

Mandatory

25 Ambient Adjusted Transmission Lines Ratings

25.1 Problem / Opportunity

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

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

This project is a continuation of the 2022 FERC Ruling assessment effort and compliance filing. The 2023 project deliverable for this project will be Functional Requirements.

25.3 Project Justification

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

26 Demand Curve Reset

26.1 Problem / Opportunity

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

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

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

The 2023 project deliverables will be Study Defined, which will include selecting an independent DCR consultant and posting the project schedule for completing the DCR.

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

26.3 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.

27 DER Participation Model

27.1 Problem / Opportunity

Technological advancements and public policy support are encouraging greater adoption of DERs to meet consumer energy needs as well as system needs. DERs offer the potential to make load more dynamic and responsive to wholesale market price signals, potentially improving overall system efficiencies.

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

In 2022, the NYISO is working on delivering software and infrastructure changes required to enable the participation of DER Aggregations in the NYISO Market. While most of the software changes are on track to be delivered in 2022, work on one to two key systems is likely to continue into 2023 and will require software deployment.

27.3 Project Justification

The 2023 software deployment will enable full participation of DERs in the NYISO Capacity, Energy, and Ancillary Services Markets.

28 FERC Order 2222 Compliance

28.1 Problem / Opportunity

NYISO's Q4 2022 DER Participation Model deployment scope includes only those features needed to operationalize the 2019 filed, 2020 FERC-approved market design. As a result, the requirements to implement NYISO's FERC Order No. 2222-compliant market rules were not included in the 2022 deployment scope. A FERC Order on NYISO's compliance filing will require modifications and additions to, the deployed DER Participation Model.

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

Throughout 2020, 2021, and 2022, the NYISO completed software design consistent with the 2020 FERC-accepted tariff. NYISO also dedicated resources to drafting and filing market rules in compliance with Order No. 2222, including several engagements with MPs. In 2021, the NYISO submitted its compliance filing, responses to Comments submitted in response to the compliance filing, and a response to a request for additional data from the Commission.

In 2022, the NYISO will deploy the DER Participation Model. The NYISO is awaiting a final ruling from the Commission of its Order No. 2222 compliance proposals, while continuing to scope necessary enhancements. The project deliverable for this project for 2023 will be Functional Requirements to reflect requirements of Order No. 2222 compliance that were previously not in scope for the 2022 deployment.

This project's expected benefits are to allow the NYISO to cultivate a market that is accessible and competitive for DER, aligning with federal regulatory compliance requirements and New York State policy goals.

28.3 Project Justification

The NYISO has developed its DER Participation Model software requirements since 2020. The software infrastructure needed to implement the DER program was scoped based on the 2020 FERC-accepted market design. FERC's additional issuance of Order No. 2222 presents additional scope and challenges to the NYISO's previously approved market design.

The NYISO will continue to work with the Joint Utilities, New York Power Authority (NYPA), Long Island Power Authority (LIPA), municipal representatives, and the broader stakeholder community to achieve consensus on any new requirements as a result of FERC's Order on NYISO's Order No. 2222 compliance filing. This will build on the efforts and momentum of the 2022 NYISO manual and tariff updates initiative, and the previous discussions between NYISO and stakeholders on Order No. 2222 requirements.

This project will enable NYISO to review and incorporate market design features required by Order No. 2222 that were not previously included in the initial deployment of DER due to resource constraints and a lack of final ruling from the Commission.

The 2023 effort will enable NYISO's DER Participation Model to be fully compliant with the requirements of FERC Order No. 2222, while building on the participation model deployed in 2022 to support the 2020 FERC-accepted market design.

29 Long Mountain PAR Operating Protocol with ISO-NE

29.1 Problem / Opportunity

There is a planned PAR installation on the Long Mountain-Cricket Valley 345kV (#398) intertie between NYISO and ISO-NE by Q4 2023, 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. Longer-term operational plans for this PAR could include setting up a market-to-market PAR coordination program with ISO-NE.

29.2 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 2023 will be Market Design Complete.

29.3 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.

30 Modeling Improvements for Capacity Accreditation (SOM)

30.1 Problem / Opportunity

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

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

Working with stakeholders and the NYSRC, the 2023 effort will examine methodologies and enhancements to GE MARS and the inputs to the Installed Reserve Margin and LCR database to model additional risk factors in the Resource Adequacy assessments and Capacity Accreditation calculations. The project deliverable for 2023 will be Functional Requirements.

30.3 Project Justification

This is a continuation of the work started with the Improving Capacity Accreditation project and will facilitate both the establishment of Installed Capacity Market Reserve Margins reflecting reliability risks not currently modeled by GE MARS as well as improved Capacity Market Accreditation Factors for resources with these operating characteristics.

Continuing

31 CRIS Tracking

31.1 Problem / Opportunity

The NYISO tariff indicates that CRIS expires if a project has been CRIS-inactive for three years. Recently, as part of the 2019 Class Year Redesign project, the NYISO proposed certain refinements to the CRIS expiration rules that have now been accepted by FERC. These new rules, for example, address the application of CRIS-inactive status to new projects and load modifiers. The new rules create the need for additional CRIS tracking and monitoring capabilities for the NYISO. The NYISO may also identify opportunities to enhance its current method of tracking CRIS, and CRIS-inactive status, for all projects.

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

The 2023 project deliverable will be Deploy.

31.3 Project Justification

FERC acceptance of these enhanced CRIS rules makes this a required project to meet the new tariff obligation.

Increased administrative efficiency will be realized by the implementation of automated tracking of resource participation, in the Installed Capacity (ICAP) market, on a rolling historic basis. Automated tracking will reduce the risk of inappropriate market outcomes due to errors or delays that could arise via a manual tracking process.

32 Improving Capacity Accreditation (SOM)

32.1 Problem / Opportunity

The resource mix is evolving and the NYISO's markets need to continue to accurately value resources for the attributes they provide in meeting system reliability. Specifically for the Installed Capacity market, a review of resource adequacy concepts including the determination of capacity requirements as well as resources' contribution to reliability is needed.

As the resource mix transitions to one more dependent on resources that rely on the sun or wind to produce energy and/or resources with energy limitations, each resources' contribution to

reliability also evolves. For example, as more solar generation is added to the grid the peak load shifts to non-daylight hours therefore making it less valuable to resource adequacy.

The resource adequacy contribution of all resources must be reviewed as the diversity and performance of the resource mix changes and must be accurately reflected in the Installed Capacity market and its processes.

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

The objective for this project would be to expand on the principles established with the Expanding Capacity Eligibility, Tailored Availability Metric, and Capacity Valuation projects to apply to all resources. The project deliverable for 2023 will be Deploy.

32.3 Project Justification

Properly valuing resources' contribution to maintaining grid reliability, known as capacity accreditation, will provide the signals necessary to maintain a diverse resource mix. Enhancing these capacity accreditation measures will allows the Installed Capacity market to continue to support grid reliability as the transition of the resource mix unfolds.

33 Internal Controllable Lines

33.1 Problem / Opportunity

As of April 2022, there are no internal controllable lines in operation within the NYCA. Although the NYISO has high-level rules to allow Internal Unforced Capacity Deliverability Rights (UDRs) to participate within the ICAP Market, these rules also have gaps 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.

Additionally, market rules for the scheduling and pricing of internal controllable lines within the Energy Market do not exist.

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

The development of market rules for internal controllable lines that will support outcomes in the best interests of all stakeholders is needed. This project would begin with developing market rules for the scheduling and pricing of internal controllable lines within the Energy Market. Based on these newly developed rules, the NYISO would evaluate and, if necessary, revise 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 must also consider how internal controllable lines could be used to support state and local programs.

This project would build upon the 2022 Market Design Concept Proposed and develop the market rule changes that would be necessary to incorporate point-to-point internal controllable lines into NYISO markets. This project will proceed to a Market Design Complete and at a minimum present the full set of market rules to the Business Issues Committee in 2023.

33.3 Project Justification

State and local initiatives such as Tier 4 REC procurements and NYC Local Law 97 provide incentives for developers to deliver renewable generation into congested areas using HVDC lines.

Future

34 Capacity Transfer Rights for Internal Transmission Upgrades (SOM)

34.1 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.

34.2 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 for 2023 will be Market Design Concept Proposed.

34.3 Project Justification

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

35 Carbon Pricing

35.1 Problem / Opportunity

New York State public policy in recent years has been to promote carbon-free resources through the Clean Energy Standard. However, the wholesale electricity markets operated by the NYISO do not fully align with these policy objectives. As a result, the wholesale markets are restricted in their ability to signal cost-effective carbon dioxide ("carbon") abatement options and send effective price signals to retain needed units to sustain the reliable operation of the grid.

In 2017, the Brattle Group published a report detailing how pricing carbon into the NYISO's wholesale markets could help to harmonize wholesale markets and New York State's public policies. After the report was published, a NYISO, New York State Energy Research and Development Authority, and Department of Public Service team worked with the Integrating Public Policy Task Force (IPPTF) to analyze the mechanics and benefits of incorporating carbon pricing into NYISO's wholesale markets. These efforts culminated in the NYISO's publication of a Carbon Pricing Proposal at the end of 2018. In 2019, a complete Market Design proposal was vetted through the NYISO's working group process. The NYISO will seek agreement from the State, as well as approval from stakeholders, the NYISO Board, and FERC on the NYISO carbon pricing proposal.

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

The next phase of this project is anticipated to be software development and implementation. If New York State supports moving forward with carbon pricing, the NYISO will seek stakeholder and Board approval to submit the proposed carbon pricing tariff revisions to FERC under Section 205 of the Federal Power Act. Upon FERC acceptance of the tariff revisions, NYISO intends to begin software development.

35.3 Project Justification

Harmonizing state policies and wholesale market design will provide more efficient ways to achieve public policy goals at the lowest possible cost. This project will improve market signals, which increases locational and temporal efficiency. Carbon pricing will also support the orderly entry and exit of resources consistent with state policy objectives and maintaining grid reliability.

36 Eliminate Fees for CTS Transactions with PJM (SOM)

36.1 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 is paid by load, regardless of whether it is charged to transactions because MPs facilitating transactions must increase their bids to account for the fees.

36.2 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 2023 project deliverable for this effort will be Market Design Concept Proposed.

36.3 Project Justification

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

37 Eliminate Offline GT Pricing (SOM)

37.1 Problem/Opportunity

The NYISO's RTM runs 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. The MMU has observed that this structure leads to inefficiencies since 10-minute gas turbines are unable to respond in five minutes. As a result, units may receive schedules they are incapable of following. This leads 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.

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

The 2023 project deliverable for this project would be a Market Design Concept Proposed. The scope of this project would involve examining the implications of eliminating the currently existing offline GT pricing logic and presenting potential revisions to market rules to stakeholders.

37.3 Project Justification

This project could enhance market efficiency by better aligning price signals and schedules with operational needs and resource capabilities. This project also supports State of the Market recommendation 2020-2.

38 Locational Marginal Pricing of Capacity (SOM)

38.1 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.

38.2 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 2023 will be a Market Design Concept Proposed.

38.3 Project Justification

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

39 Long Island PAR Optimization and Financial Rights (SOM)

39.1 Problem / Opportunity

Scheduling of 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.

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

The NYISO will investigate the creation of a financial settlement mechanism to compensate the party that would be giving up some of the benefits from the current operation. Completion of this study will necessitate discussions with PSEG-Long Island and Con Edison. The NYISO should work with these parties to explore potential changes to wheeling agreements or to identify how the agreements can be accommodated within the markets more efficiently. The 2023 project deliverable for this effort will 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.

39.3 Project Justification

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

40 Long Island Reserve Constraint Pricing (SOM)

40.1 Problem/Opportunity

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

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

The project scope would include conduct of a study to further evaluate the current compensation rules for Long Island reserve providers, and whether revisions thereto may be reasonable and

provide for improved efficiency in pricing outcomes and performance incentives for Long Island reserve providers. The 2023 project deliverable will be a Market Design Complete.

40.3 Project Justification

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

41 Monthly Demand Curves (SOM)

41.1 Problem / Opportunity

The capacity market is divided into summer and winter Capability Periods of six months. Within each Capability Period, the capacity requirements and Demand Curves remain constant, although the reliability value of resources is much greater in high-demand months (e.g., July) than in low-demand months (e.g., October). The constant Demand Curves ensures that resource owners have an incentive to coordinate their planned outages through the NYISO outage scheduling process throughout the year; however, it may lead to inefficient incentives for resources that are not consistently available during all 12 months of the year. There may be value in setting the Demand Curves in a manner that allocates the annual net cost of new entry value in proportion to the marginal reliability value of capacity across the 12 months of the year.

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

This project will evaluate the implications of translating the annual net cost of new entry value into monthly capacity Demand Curves. Findings and resulting suggestions will be reported and discussed with stakeholders. The project deliverable for 2023 will be Issue Discovery.

41.3 Project Justification

This effort would concentrate incentives for resources to sell capacity into New York during the months when the reliability value of capacity is greatest. This change would also enable flexibility in the ability to allocate incentives to different months, as the evolution of the New York generating fleet may drive changes in which months carry the peak demand. This project also supports State of the Market recommendation 2019-4.

42 More Granular Operating Reserves (SOM)

42.1 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 aligning market outcomes with how the power system is operated and avoiding the potential for unnecessary price volatility.

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

The 2023 project deliverable will be Market Design Concept Proposed. The More Granular Operation Reserves design and implementation would be dependent on the market design for Dynamic Reserves in 2023.

42.3 Project Justification

The MMU has recommended that the NYISO "[m]odel local reserve requirements in New York City load pockets [Recommendation 2017-1]." This effort has also been identified as beneficial in both the 2018 Performance Assurance Management Response and the 2017 Integrating Public Policy Market Assessment Report. Additionally, this effort will reflect the locational reliability value provided by resources in certain load pockets within New York City. This project also supports State of the Market recommendation 2021-2.

43 Separating Regulation Up and Regulation Down

43.1 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.

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

The 2023 project deliverable will 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.

43.3 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.