2024 Enterprise Project Candidates

Product and Project Management

May 22, 2023

This document represents potential 2024 Enterprise project candidates. Enterprise projects are internal-facing technology and back-office support projects that have no market rule changes. 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 2024 Enterprise project candidates. Enterprise projects include internal-facing technology and back-office support projects that have no market rule changes. The list includes projects that may be noticeable to Market Participants. 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	Projects that are key to support Strategic Initiatives, comply with FERC Orders, or sustain the operation of the NYISO business. These projects will be included in the budget
Continuing	Projects approved in a prior year and that have progressed to either Software Design, Development Complete, or Deploy will generally be proposed as Continuing. Additional projects may be classified as Continuing based on stakeholder feedback. These projects will be included in the budget
Future	Consensus from stakeholder discussions of this project's priority relative to other projects has resulted in these projects NOT being prioritized and initiated in the coming budget year. Resources, time constraints, stakeholder feedback, and other project dependencies have been taken into consideration
Prioritize	Projects to be prioritized and included in the budget based on a feasibility assessment taking into consideration resources, time constraints, stakeholder feedback, priority score, and other project dependencies. Market projects are included in the stakeholder survey

Enterprise projects are NOT included in the stakeholder survey. Enterprise projects that are Prioritize (not Mandatory, Continuing, or Future) are scored by the NYISO during the prioritization phase. These projects are included in the budget based on a feasibility assessment taking into consideration resources, time constraints, stakeholder feedback, priority score, and other project dependencies. The table that follows identifies project type for each of the projects included in this document.

Prioritize

1 3rd Floor Data Center Migration (Krey)

The 3rd floor data center was in existence when NYISO moved into the Krey Boulevard facility in 2006 and was used to house the vendor data services coming into the facility. Since it was an existing space already in service, the data center was never set up to meet current NYISO standards. There are air conditioning and power distribution issues that make this space less-than-ideal for data services.

In addition, the telemetry room on the 1st floor of the two-story addition to the Krey facility was built to ultimately house these services. All the supporting infrastructure, including power, cooling units, racks/cabinets, backbone fiber, and conduits are already in place in that room.

Rather than spending funds to address the current air conditioning and power issues in the 3rd floor data center, this project will move the vendor services to the telemetry room, which was explicitly designed and constructed to house these services.

2 Access Management Program Enhancements

The access management program is a portfolio of products supporting the North American Electric Reliability Corporation Critical Infrastructure Protection (NERC CIP) and System and Organization Controls (SOC) 1 audit requirements for controlling access within the NYISO organization ("Access Management"). Access Management services are critical to effectively managing and supporting NYISO's systems.

The further integration and expansion of these Access Management services continues to advance the capabilities available across NYISO environments for cloud, corporate, privilege, and physical access to ensure NERC CIP, SOC1, and internal process compliance. The proposed project would expand and strengthen the Access Management program capabilities by building and integrating the existing program to ensure security and compliance.

3 Air Handling Units Replacement (Krey)

There are four air handling units (AHUs) installed at the Krey facility that provide all the heating, ventilation, and air conditioning (HVAC) services to the four-story building. These four AHUs are original to the building, end of life, and will be 28 years old in 2025 when the replacement is planned to begin. Component failures within these units continue to increase, resulting in increased maintenance costs and reduced reliability.

Design and bidding is proposed for 2024. The funds in 2025 and 2026 will be used to procure and install two units in each year. The project scope has been reviewed and it is required to replace two units at the same time due to mechanical integration of the units.

4 Application Platform Upgrade

To keep the NYISO markets running smoothly and operate the electrical grid reliably, the underlying application platform infrastructure must be upgraded periodically to ensure the ongoing availability of security patches and vendor support for critical systems. Additionally, software vendors release new features in new application platform versions that the NYISO can often utilize to improve the overall performance, support, and maintenance of applications used in the running of the NYISO markets. This project is a continuation of a multi-year effort to replace aging application platform infrastructure and migrate to a new application platform standard. This technology lifecycle project is necessary to ensure the ongoing availability of security patches and vendor support for critical systems.

5 Automation of DMNC Validation

The NYISO's Market Mitigation and Analysis Department (MMA) currently performs the Dependable Maximum Net Capability (DMNC) validation process. This validation is a largely manual process that includes downloading data submitted by Market Participants (MP), formatting the data to be captured in a report, and reviewing the final report to see if further action is required. This project intends to automate steps of the DMNC validation process that are not required to be performed by an analyst. The objective of this project would be to review the workflow for the DMNC validation process, identify process improvements, and automate the process where possible.

6 Bidding Upload Download Security Enhancements

The NYISO's Marketplace Bidding & Scheduling and Joint Energy Scheduling System upload and download capabilities are running on outdated software and must be replaced to provide better security for the data during transit. The Upload/Download functionality will be updated to deliver a new method for bulk submission of energy and transaction bids with a more secure authentication/authorization method.

7 Block Storage Refresh

The block storage environments at the NYISO provide corporate storage for all of the NYISO's Linux and Windows Servers as well as Oracle and SQL Server databases. Block storage is necessary for the NYISO to operate its markets smoothly and the electrical grid reliably. The NYISO's current block storage devices are end-of-life September 2025, and a current project to replace the corporate environment block storage in 2023 is ongoing. For 2024, this project will replace the Energy Management System/Business Management System (EMS/BMS) environment block storage. This project will ensure the NYISO's block storage environment is stable and supported by the

vendor. The project includes the purchase of the hardware, installation and freight charges, hardware maintenance, and consulting services.

8 Budgeting Tool

The NYISO currently builds its annual budget process through a manual process using Microsoft Excel that has low visibility to internal departments. Files are shared through email and network distribution methods, resulting in a manual workflow and process. The primary goal of this project would be to identify and procure a Budgeting Tool, which would increase efficiencies and visibility with the NYISO's budget development and management; as well as provide the following capabilities: capital project budgeting, full-time equivalent/salary budgeting, non-salary budgeting, automated workflow, approval process, reporting capabilities, and budget submission.

9 Building Management System Controls Upgrade

The NYISO started a multi-year project to replace the Facilities Building Management System at both the Krey Boulevard and Carman Road facilities in 2023. The Facilities BMS provides the monitoring of the electrical systems and the monitoring and control of the mechanical systems at both buildings. This system is the most important system to NYISO's Facilities staff as it provides the operational tools and situational awareness displays to effectively and efficiently monitor and control all critical and non-critical Building Systems.

The current Building Management System is 26 years old, is end of life, and needs replacement. In 2024, the NYISO proposes to complete migration of building equipment at Carman followed by completing the migration at Krey in 2025.

10 Capacity Analysis Commitment Tool

With the advent of distributed energy resources (DER) and more small resources (*e.g.*, 0.1 MW units), the Capacity Analysis Commitment Tool (CACT) is necessary give the NYISO operators the capability to respond to the needs on the grid in a timely manner and with economic merit. The CACT will provide NYISO operators the capability to manually schedule/re-schedule resources to meet an additional MW need in certain hours of a study period. This functionality will support NYISO operators in the evaluation of requests for local reliability submitted by the Transmission Operators or the Distribution System Operators through the applicable. This is a multi-year project with an initial deployment planned for 2024.

11 Cisco Server Refresh - Linux

Our current Corporate Cisco hardware is end of life in February 2024. The current Corporate Linux operating system is end of life June 30, 2024. It is critical that the NYISO hardware and software remain stable and vendor supported, so the NYISO cannot extend the use of the hardware and

software past their end-of-life dates. This project proposes to replace the current Cisco hardware and upgrade the operating system in corporate staging and production environments.

12 CMS and ConInvoice Data Integration

Finance manages several processes to manually update collateral, prepayments, and Market Participant transfers and refunds within the Credit Management System (CMS) and the Consolidated Invoice system (ConInvoice). This project will provide an automated solution to link CMS and ConInvoice, reducing or eliminating the need for manual data input by both the Accounting and Counterparty & Credit Risk Management teams.

Automating product integration will result in increased accuracy in both systems and a reduction in manual and redundant work efforts.

There are many processes such as payments, dividends, prepayments, and refunds/transfers that require the handing off of paper between departments. Because of this, regular reconciliation processes are performed to ensure systems are in sync. In addition, system rules in credit are triggered from dates, rather than receipt of funds, which could result in inaccurate adjustments to credit requirements in certain circumstances.

- This is a multi-year project that began in 2022 with requirements gathering and an FRS deliverable, as well as the further elaboration of use cases and detailed requirements.
- The 2023 project commitment requires the deployment of a portion of those requirements (the automation of Net Receivable credit instrument).
- The 2024 continuation would deliver the deployment of the remaining requirements which have been documented.

13 Conference Room Technology Upgrade

To support NYISO's shift to a hybrid workforce, Microsoft "Teams Room" technology has been established in NYISO conference rooms to provide video conferencing capabilities and improved audio to support meetings requiring on-site and remote participants. The initial roll-out of this technology was limited to conference rooms in private areas of the building and did not include the conference center and other rooms with existing specialized conference room technology. This project updates the technology in these additional rooms to provide consistent video conferencing capabilities in all NYISO meeting spaces and the ability to host hybrid meetings, The updates will include installation of multiple video cameras and upgrading audio system and TV displays.

14 ConInvoice Testability Improvements

ConInvoice is a core Market application that provides critical functionality and is often in scope for market design projects, resulting in the frequent need to perform testing of the application. Currently there are multiple challenges when testing the application:

1. Setup is time consuming and often requires extensive lead time
2. There is no easy way to "re-do" testing or reset the test data if needed
3. The invoice creation is tightly coupled with the downstream Decision Support System processes. This creates dependencies that can block our ability to conduct testing.
4. There is limited flexibility if there is a need to do concurrent testing of the invoice for multiple projects at the same time

The goal is to automate the processing of invoices in the quality assurance environments.

15 Control Room Logging Replacement

The NYISO is proposing a project to replace the Control Room Logging (CRL) application. CRL is a web application created over 15 years ago for the NYISO Control Room to record system conditions and Control Room activity in a consistent manner. These events, or log entries, are recorded and published manually in a daily report at the close of the energy day.

Grid Operations needs the ability to efficiently make entries in a log of events on the power system, log actions taken by the control room to manage these events, and quickly change and manipulate logging menus, drop downs and fields/event types in the CRL. The current software is not capable of performing these actions because it has limited search options, and it is difficult to make necessary changes in real time when new entry types are required to keep the CRL up to date.

In addition, Grid Operations would like to pursue new features in the replacement CRL, including the ability to integrate into existing systems (such as the EMS or the outage system) to capture log events automatically. This is a multi-year project.

16 Demand Forecasting Operational Reporting Enhancements

The current process for the demand forecasting daily operations is limited due to its complexity, inefficiency, and lack of reporting capabilities. The current process for creating daily (*e.g.*, day-ahead and real-time forecast verification) and monthly (*e.g.*, annual energy budget tracking, weather/DER data validation) forecasting reports entails the manual updating of SAS programs, access databases, and Excel workbooks. Efficiencies could be gained by introducing additional automation into the current extract-transform-load and data visualization processes. This automation would enable the Demand Forecasting and Analysis department to better serve the internal and external stakeholders who rely on these reports and post-processed data sets to inform operational, financial, and comprehensive system planning processes.

17 EMS/BMS Operational Enhancements

The NYISO completed a multi-year project in 2020 to upgrade both the EMS and the BMS. The EMS encompasses the core reliability functions used by the system operators such as load flow and contingency analysis. The BMS encompasses the day ahead and real time energy market functionality. This is a continuation of the multi-year project to implement additional functional enhancements to the EMS/BMS systems to support the changing needs of the business.

18 EMS/BMS Technologies Upgrade

The NYISO's current hardware and operating system that the EMS/BMS platform runs on will be end of life in 2024. It is critical that the hardware and operating system the EMS/BMS platform runs on be upgraded so they remain stable and vendor-supported. Therefore, the NYISO cannot extend the use of the hardware and operating system past their extended support end-of-life dates. For the NYISO to move forward with an upgrade to a vendor-supported operating system version, the NYISO must make modifications to the existing Network Manager platform. This project is a multi-year effort.

19 Enhanced Exterior Security Profile (Carman)

With the recent renovations to the Carman Road Control Room, and the desire to make the Carman Road and Krey facilities very similar in functionality, it is important to maintain a similar security profile at the Carman Road and Krey facilities. This project would enhance physical security at the Carmen Road facility.

In addition, there are several necessary security repairs and upgrades, such as guard shack improvements, refurbishment of the guard shack swing gates, new sidewalks, and handrails from the main entrance door down to both parking lots and improved site lighting.

20 Enterprise Project Collaboration

Opportunities exist in the Product and Project Management department to utilize and embrace new technologies to reduce manual process, drive increased enterprise collaboration, and increase transparency. The goal is to foster collaboration across departments utilizing new technologies, update processes, and enhance Product and Project Management reporting for greater visibility into key performance metrics. Reducing manual processes will lessen the risk of manual errors and allow the organization to focus on additional value-add project tasks. Automated tasks, early detection and prevention of risks, and greater collaboration has to potential to speed up project completions while maintaining NYISO's high quality standards. This project will evaluate these new technologies and make recommendations for improvements.

21 Fence Vibration System Replacement (Krey)

The security fence and fence vibration system at Krey is a critical piece of NYISO's Security Program and needs to be maintained at the highest level. The vibration system notifies NYISO Security guards if there is significant vibration of the security fence, indicating a possible intruder attempting to come on NYISO property. The fence vibration system is now over fifteen years old. This project will replace the fence vibration system at Krey.

22 Generator Data Reporting System

NYISO's Installed Capacity Market (ICAP) Operations team manages, tracks, and develops reports based upon generator availability data that is submitted by NYISO ICAP suppliers for purposes of capacity accreditation, generator modeling for resource adequacy, planning, and operations reliability assessments. The current Generator Availability Data Operating System (GADS) must be re-platformed and/or re-designed in the coming years due to a loss of expertise and vendor support. The 2024 project will perform the necessary analysis to determine the path forward.

23 ICAP AMS Improved System Integrations, Customer Transitions, & Offers Project

NYISO's ICAP Automated Market System (AMS) exchanges data with the NYISO Market Information System (MIS) and CMS, accepts load forecast, load shift, and true-up data from Transmission Owners, and allows MPs to bid and offer capacity in the Strip, Monthly, and Spot auctions.

This project is expected to address the following issues:

i. Billing and credit problems can result due to a mismatch between the methods used by the NYISO MIS and ICAP AMS in determining effective dates for a) Financially Responsible Party (FRP); and b) generator ownership, and which must be corrected via manual billing adjustments, or which require MPs to settle outside of the NYISO settlement process.

ii. When a Load Serving Entity (LSE) involuntarily exits the market, their load must be transferred to the Provider of Last Resort (POLR). There is no mechanism for automatic transfer of load to the POLR, nor does the AMS automatically reject/identify future load forecast data for terminated/withdrawn LSEs.

iii. When MPs become non-market qualified, the ICAP AMS does not automatically identify or remove existing ICAP AMS Strip and Monthly bids and offers from non-market qualified MPs prior to auction runs.

iv. If an MP is deemed non-market qualified, the NYISO prohibits it from accessing the ICAP AMS, which prevents the MP from reviewing current and past billing details and prevents It from offering any unoffered resources or long capacity into the Spot Auction. This can result in additional financial loss to the MP, as well as to other MPs, who can pay a higher MCP due to the unoffered MWs.

v. MPs are occasionally awarded bid MWs in nested locations outside of itsbid location. If an MP inadvertently fails to offer this resale capacity in the Spot auction, the capacity will go unmonetized.

vi. MPs are currently unable to offer internal specific-Point Identifier capacity in the Strip and Monthly auctions.

24 ICAP Auction Simulator Enhancements

The NYISO's Installed Capacity Market Operations (IMO) team administers two Strip auctions, twelve Monthly auctions, and twelve Spot auctions each capability year. As the market rules and business rules to implement market design initiatives become increasingly complex to administer, the NYISO will need to develop the ability to prototype new auction structures and rule sets to assess feasibility and ensure market evolutions can be seamlessly integrated into market operations. The expansion of the existing Auction Simulator will provide the ICAP Analysts and Engineers with the ability to test various business rules and different constraints and pricing logic in parallel with market design initiatives and will speed up the implementation process as the auction and market rules continue to evolve and gain complexity.

25 ICAP Supplier Status Enhancements

NYISO's IMO team currently manages ICAP Supplier statuses manually. ICAP Supplier statuses include ICAP Ineligible Forced Outage, Mothball, and Retirement. These statuses are maintained manually within the AMS through the "Derating Factor" value as a proxy for all inactive states. As a result, this manual tracking and accounting process requires careful attention and leads to redundant or unnecessary ICAP Supplier data in the AMS, because of the binary logic employed to track multifaceted ICAP Supplier statuses which all adhere to unique timelines. Automatically tracking ICAP Supplier status will result in more efficient utilization of NYISO resources and reduce the potential for error.

26 IT Development and Control of Compliance Reports

The NYISO's MMA Department currently uses several reports, dashboards, and screens to comply with Services Tariff Attachment H provisions. MMA has identified areas for improvement to certain existing reports and tools, which are maintained within the MMA Department, and the need for new reports. This project would have the Information Technology Department take over and maintain controlled versions of preexisting reports, dashboards, and screens and develop new screening tools.

This restructuring will both enhance the consistency and maintainability of current reports, as well as provide new reporting mechanisms to assist MMA in compliance with Attachment H. This effort will help to reduce the risks of non-compliance, maintainability issues, and performance issues.

27 IT Infrastructure Automation

The focus of this continuing, multi-year effort is on increasing automation of various IT management activities. By enhancing the NYISO infrastructure, with supporting processes and current and prospective tools, the NYISO will be increasingly responsive in supporting the frequency of change required by the business. Automation of activities, such as patching and upgrade processes, will also serve to improve the NYISO's security posture while reducing business impact of services.

28 LDAP Upgrade

LDAP (Lightweight Directory Access Protocol) is a communication protocol used to access and manage information stored in a directory service. The directory service stores information about network resources such as users, computers, and printers, and LDAP allows users to search, retrieve, and modify this information. The NYISO uses LDAP for authentication and authorization purposes, allowing management of user and system accounts across multiple applications, such as Outage Scheduler, Marketplace, Webform, BSS, and CMS, and devices in a centralized and standardized way.

The various software that supports the NYISO's use of LDAP is on sustaining support (search database for fixes and apply – cannot open tickets for support). This project proposes a multi-year effort to upgrade software to current and supported versions.

29 LFDR Upgrade and Enhancements

The Load Forecasting Data Repository (LFDR) is currently the real-time "flight recorder" for the NYISO's operational load forecasting system. It serves as the data warehouse for real-time (*i.e*., 5-min) and day-ahead (*i.e*., hourly) demand forecast information and as the long-term archive for weather, and behind-the-meter (BTM) solar forecasts and estimated generation. The LFDR base system is no longer supported by the vendor as of 2021. As part of B736, the current LFDR has begun migration to a new platform in 2023. This project will complete that migration effort and expand the LFDR's capabilities to include archiving of select economic, demographic, and end-use data sets, and samples of BTM distributed energy resource profiles (*e.g*. fuel-cells, energy storage, and others).

30 Market Validation, Reporting, and Penalty Tracking Enhancements

NYISO's IMO team administers several manual market validation and reporting processes as well as ICAP Supplier penalty calculations that are achievable only through the use of SQL queries, VBA macros, or Excel templates that are developed and tested within IMO and outside of NYISO's software development lifecycle process. These tools and processes include (i) the Spot Market Validation tool to independently recalculate the Spot Auction clearing price and analyze MP behavior, (ii) the ICAP Market Report to post recent and historic market data publicly and which

replaces the annual ICAP Market report to FERC, and (iii) DMNC penalty calculations authorized by the Market Services Tariff. The ICAP Automated Market System (AMS) will be enhanced to include functionality that automates each of these important tools and processes.

31 Micro-Segmentation

NYISO currently employs a defense-in-depth (DID) approach to cybersecurity by placing multiple layers of protection between critical assets and external threat actors. The next generation security architecture is an evolution in cybersecurity that builds upon the DID through the adoption of zero-trust principles to remove inherent trust found in many systems, applications, and capabilities to better detect and isolate threats that can evade internal security protections.

Micro-segmentation is a continuing multi-year effort to implement a technology-driven approach that redefines security boundaries from broad network segmentation to isolated, minimized attack surfaces by applying security controls closer to the asset they are protecting. Micro-segmentation technology provides greater visibility and control over NYISO's data center/cloud infrastructure traffic and mitigates unauthorized access and lateral movement between different parts of the network. This approach can limit the spread of ransomware or other threats to reduce the potential and impact of security breaches.

In 2024, the project aims to expand micro-segmentation beyond the pilot performed in 2023.

32 Microsoft 365

This project is part of a strategic focus on implementing a hybrid infrastructure model that will leverage cloud solutions, where appropriate, to increase service delivery flexibility, agility, and efficiency. The project will expand NYISO's adoption of a virtual desktop and files services; pilot a security service; pilot an endpoint configuration manager as an on-premises Windows management solution; and modernize Windows endpoint management practices to ensure efficient and effective software and policy distribution.

33 Midrange and Storage Upgrade

As part of the 2022 NetBackup Appliance Refresh project, the NYISO purchased software that provides storage reporting solutions for consolidated visibility into complex, multi-vendor storage environments, enabling the NYISO to increase data reliability and reduce costs with unified reporting and automated alerts. The software will allow the NYISO to drill down and identify the root cause of performance issues, identify re-tiering opportunities, and streamline compliance requirements. This project proposes installing and configuring the software for the NYISO environment, and creating customized reports. Additionally, the operating system for the NYISO's server infrastructure that hosts market databases is in extended support starting in 2023.

This project will upgrade the current version of the operating system in all environments so that it remains supported by the vendor.

34 Modernizing ASIS

The Automated Suspect Identification System (ASIS) is the rule engine used to validate market outcomes, including prices, generated by Network Manager application. ASIS performs a critical function for the Market Validation department. It helps ensure that NYISO can thoroughly validate the market outcomes, to the extent possible, which helps provide reasonable assurance that prices are reflective of system conditions. The ASIS application has grown considerably over the years and is expected for more rules to be added as NYISO continues to support DER initiatives and future energy market changes.

ASIS uses several outdated technologies and depends on multiple databases and external interfaces. In 2023, a multi-year effort began to remove these outdated technologies and transfer the applications to a modern technology stack. This multi-year project will also include consolidating dependencies on external interfaces and development of automated tests to reduce the testing effort for future changes. The NYISO proposes to continue this effort for 2024.

35 Network Infrastructure Upgrade

The NYISO network infrastructure includes many different components that are critical to delivering networking services to NYISO end-users, business units, and external customers. This includes key infrastructure such as switches, routers, firewalls, and other network devices that interconnect and protect NYISO systems. All these components require active vendor support to provide 24x7 assistance and to receive necessary updates to protect from vulnerabilities. Several NYISO network infrastructure components are entering the vendor-mandated end-of-life state. As a result, the NYISO will no longer receive necessary security patches to mitigate new cyber risks and/or software bugs once that threshold has been passed.

Given the critical importance of this infrastructure, it is necessary to keep these key components under vendor support to receive updates, patches, and on-going maintenance. This project is a continuation of a multi-year effort to continue replacing outdated hardware with the objective of providing secure service delivery while modernizing and streamlining the NYISO's data centers in accordance with current industry best practices and vendor recommendations.

36 New Ties and Gens Management

Generator and tie line management is currently a lengthy manual process that spans multiple years and involves the coordination and sharing of information from multiple NYISO departments including Planning, Operations, Customer Registration, Customer Settlements, as well as MPs. Coordination and on-going communication are necessary to ensure that all impacted systems for end users have the correct information. This current process requires settlements to retrieve

data from multiple sources to ensure adequate time is allowed for system set-up within the NYISO and at the Meter Authority. This information is also necessary for the validation of data which can only occur in production when data is entered by the Transmission Owner for the new tie line. This project would consolidate the manual processes into a single system, streamlining the current process.

37 OASIS Reliability Upgrade

The current OASIS application runs on out-of-date technology, which causes regular disruptions in the ability of the application to publish postings. The underlying technology used by the OASIS application to publish critical business documents to mis.nyiso.com must be replaced for more efficient and reliable OASIS publishing process, and a multi-year project to do so began in 2023.

In 2023, the NYISO is piloting new storage technology for select OASIS posting(s). The new solution will be compared to the current solution to gauge success before expanding to other postings. Upon meeting the success criteria, the project will start to migrate the remaining posting to the new design in 2024. This migration will include a transition and retirement plan for the old framework.

38 Office Mechanical Systems Replacement (Krey)

The cooling towers and chillers at Krey provide the cooling capacity for the entire four-story building at Krey. These units are original to the building are EOL and will be 27 years old when they are replaced in 2024. This project will replace the current cooling towers and chillers with air-cooled chiller technology.

The NYISO is developing the design in 2023 and expects to install the first unit in Fall 2024, followed by second unit in the beginning of 2025.

39 On-Boarding of New Resources

Improving the current process for on-boarding new resources is required to facilitate the rapidly increased volume of resources using battery storage, solar, and wind technologies that are seeking to participate under the multiple participation models (*e.g.*, ESR, Solar, Wind, Co-Located Storage, DER/Aggregations, and Hybrid Aggregated Storage Resource, and to mitigate the significant strain on many NYISO departments. This project aims to continue to streamline processes and provide educational materials that focus specifically on the on-boarding process. The educational materials are expected to be targeted by technology type and/or participation model and cover a broad range of information that spans the various stages of the on-boarding process, *e.g.*, early stage interested entities who are trying to assess the NY market, developers working towards market participation and MPs with project specific technical questions.

The project will document the current on-boarding processes, identify opportunities to streamline those processes, and create easily accessible self-serve on-boarding educational

material that include, but are not limited to FAQs, checklists, knowledge articles, info graphics and training videos.

40 Operations - NERC Audit Preparation

As part of a planned triennial cycle, the NYISO's Operations and Planning programs will be formally audited by Northeast Power Coordination Council (NPCC), the regional entity responsible for monitoring NYISO compliance with the NERC standards, in Q4 of 2024. This project will provide resources and funding for audit preparation, including an internal controls review, to ensure preparedness.

41 Optimization Solver Upgrade

The mathematical problem for solving the unit commitment and dispatch optimization is formulated using a Mixed-Integer Programming (MIP) technique. The NYISO utilizes a commercial product solution engine in its software to solve this problem. Major new releases of this optimization solver that include performance improvements and resiliency features occur every two to three years. To take full advantage of the new features, the NYISO must upgrade the hardware the optimization solver software runs on. Additionally, the NYISO must upgrade the software versions periodically to maintain support from the vendor. In 2024 the NYISO plans to upgrade the optimization solver hardware and software.

42 Outage States Portal Dashboard

NYISO's IMO team administers ICAP Supplier outages states procedures in coordination with the NYISO's ICAP MMA and Scheduling departments. This process requires frequent email communication with ICAP Suppliers and careful and consistent tracking of internal and external communication regarding ICAP Supplier outages over long periods of time, on the order of 6-12 months, or longer.

To support this process, an "Outage States" portal will be developed and include the following functionality: track forced outage duration, monitor tariff-defined milestones, allow for multi-user approval, draft and send pro-forma communications, and a viewable dashboard for current and historical awareness.

43 Price Correction Report Modifications

The Market Administration and Control Area Services Tariff Attachment E prescribes NYISO's reporting requirements pertaining to price corrections. The NYISO's Market Validation (MV) team currently uses software built in 2014 to produce a Price Correction Report following the processing of price corrections to inform MPs about the details of those price corrections as prescribed by the Tariff. The MV team has proposed enhancements to the software used to produce these reports to streamline and improve the efficiency of the process, including removal

of extraneous fields from the user interface and improving the searchability of past correction details. Part of the current report technology will be reaching end of life in 2025, and a software upgrade will be required to make any user-interface changes.

44 Procurement and Implementation of EMT Modeling Software

The rapid growth of inverter technology has created a need to go beyond the conventional planning tools to conduct more detailed studies using electromagnetic transient (EMT) models for issues related to inverter-based resource integration. With the growing penetration of Inverter Based Resources (IBRs) in New York State, such as solar and wind, there is a need for EMT studies. This type of modeling is complex and requires new software. Several relevant NERC standards are under revision, including but not limited to NERC Facility Interconnection Studies standard FAC-002, Modeling Standard MOD-032, MOD-026 and Transmission Planning TPL-001, add to the requirement for EMT modeling and studies.

The project goal is to purchase two new off the shelf software applications and procure training for the subject matter experts.

45 Production Cost Software Upgrade Project

Due to the expected large volume of rapid changes in the resource buildup in the New York Control Area (NYCA) system to comply with aggressive climate goals as outlined in the NY Climate Leadership and Community Protection Act (CLCPA), the NYISO must update its production cost model and related software tools to more accurately simulate future scenarios and new resource types (*e.g.*, increased amounts of renewables and energy storage). The existing production cost model and software tools cannot account for a large number of these new resources in future scenarios or capture the effects of transmission outages and new inverter-based resources on reserves.

The NYISO will work with a vendor to design the new production cost model and validate the required software features and tools. This work will provide the NYISO with the foundation for production cost analysis required for future System and Resource Outlook studies.

46 Reliability Compliance Tools Enhancements

As the NYISO markets continue to evolve, it is imperative that the tools NYISO Grid Operations uses to administer the markets evolve to support these changes. This project will enhance NYISO Grid Operations situational awareness of critical functions by implementing enhancements to the tools used by the Operators to administer the grid. This is a multi-year project with an initial deployment planned for 2024.

47 Renewable Energy Forecast Integration and Reporting Enhancements

The NYISO currently supports two distinct systems to meet its front-of-the-meter (FTM, grid connected) and BTM (distributed) renewable energy forecasting requirements. The current data systems separately provide data processing, real-time alerting, and reporting infrastructure for NYISO and have developed over the last 20 years in response to the growing number of wind and solar installations across the NYCA. Launched in 2006 and 2017 respectively, both the FTM and BTM renewable forecast integrations have successfully incorporated renewable generation into the NYISO markets (*e.g.*, FTM resources) and have advanced the load forecasting system (*e.g.*, estimating and forecasting the impact of BTM photovoltaic generation on bulk power system loads). The demand for robust renewable forecast performance information and capacity/attribute tracking will continue to grow with the large number of renewable projects in the interconnection queues along with the potential new forecasting data streams (*e.g.*, probabilistic wind and solar forecasts to support dynamic reserve market products).

The renewable energy (both FTM and BTM), weather forecasting, and reporting/tracking processes at the NYISO are not currently integrated in a cohesive and consistent manner. Managing the current systems is complex due to specialized vendor data integrations coupled with the maintenance associated with multiple supporting software applications. The technologies used in select supporting applications is also outdated. These factors currently limit the NYISO's ability to rapidly evaluate and assimilate new renewable forecasting providers and data elements into the load forecasting and energy market systems. This project aims to design and implement an updated renewable energy and weather forecasting data integration and reporting framework. This framework and its supporting technical infrastructure will allow the NYISO to more effectively evaluate, track, and adapt to the forecasting challenges associated with the rapidly growing number of renewable generation assets in the NYCA.

48 SDX Replacement

Currently, the Settlement Data Exchange (SDX) is the system that is used for MP reporting and reconciliation of hourly meter data for generators, tie lines, subzones, and load buses. Through SDX, meter data is uploaded and downloaded using CSV files. The transition of this functionality to an Application Programming Interface has already begun in conjunction with the DER project.

This project will transition the remaining SDX upload and download template to an API technology.

49 Secure Communication Channel with MPs

MMA and MPs currently exchange information primarily via email. This project would either leverage existing platforms used by the NYISO or implement a new platform that would allow MMA and MPs to exchange information in a more efficient and secure manner.

50 Telemetry Tone Gear Upgrade

The NYISO telemetry includes many different components that are critical to delivering required telemetry data to NYISO Operations and MPs. This includes key infrastructure that interconnects NYISO systems to external services. These components require active vendor support to provide 24x7 assistance and to receive necessary updates to protect from vulnerabilities. Many of the NYISO's telemetry infrastructure components are entering the vendor-mandated end-of-life state.

Given the critical importance of this infrastructure, it is necessary to keep these key components under vendor support to receive updates, patches, and on-going maintenance. This project is a continuation of a multi-year effort to replacing outdated hardware with the objective of providing secure service delivery while modernizing and streamlining the NYISO's telemetry services in accordance with current industry best practices and vendor recommendations.

51 Thunderstorm Alert

During a thunderstorm alert, all transmission into New York City is shut off and all cost allocation is diverted back to New York City. This project seeks the development of an automated system for settlement of thunderstorm alerts. The current manual process to ensure appropriate settlement during thunderstorm alerts leverages a system for calculations that requires acquisition of data files from multiple sources for processing and calculations. In addition, data files contain dynamic transmission flows from Network Manager, making settlements more difficult.

52 Watchlist for Rest of State Units

Currently in the Rest of State (ROS) locale, a method to automatically mitigate generators which can impact prices in their locations does not exist. ROS units are subject to mitigation for guaranteed payments and prospective mitigation in response to Locational Based Marginal Price impacts. On occasion, new facilities are added to the network model, which could present opportunities for generators to exercise market power. These new facilities change the topology in a manner which makes certain existing facilities the only option to relieve constraints, thus putting them in a position to exercise market power. To effectively monitor these units for potential mitigation, MMA requires an automated method to gather information needed to evaluate conduct. There is currently no automated report that gathers the information needed to determine if market power is triggered by existing units. The 2024 deliverable for this project would be to develop requirements and deploy an automated report which would trigger a review of units which could potentially exercise market power in a ROS location.

53 Windows Server Hardware Upgrade

This project is a multi-year effort to upgrade NYISO's aging Windows Systems. For 2024 the impacted systems include are:

1. NYISO's Control Room Chart Workstations: used to display Phase 1 data to the Operators, which is required to maintain grid reliability,
2. Windows Corporate servers: support all of the premises corporate services and applications offered by the Windows team in the NYISO datacenters (replacing all these systems is a two-year project itself),
3. Windows Server operating systems: with Windows server 2016 reaching end of life by January 2027, this effort will upgrade an estimated 700+ servers starting in 2024 and completing in 2025, and
4. NYISO's Simulation Room Video Wall Server: replace end-of-life server with a display controller appliance that will be simpler to maintain and provide more consistent output to the Simulation Room wall. This project will serve as a proof of concept to determine if the NYISO can port this same solution to the Krey and Carman Control Room video walls.

This technology lifecycle project is necessary to maintain system reliability, performance, and availability, as well as ensure ongoing vendor support for critical systems.

54 Transmission Project Developer Billing Access

As part of efforts to meet the CLCPA, the NYS Public Service Commission (PSC) approved the development of 62 local transmission upgrades. (https://dps.ny.gov/system/files/documents/2023/02/pr23015.pdf)

Currently, Regulated Transmission Cost Recovery is only used for *statewide* transmission projects; supported by internal NYISO Planning and Finance Settlement users through software functionality within ConInvoice. Upcoming tariff changes will extend Regulated Transmission Cost Recovery to include *local* transmission projects, requiring updates to the existing software functionality. These updates include incorporating local projects into the existing software and enabling Developer/Transmission Owner access to complete tasks and processes associated with both local and statewide projects.

The project objective is to update the existing Transmission Cost Recovery software functionality within Con Invoice.