

# 2018 Project Candidates

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## Product and Project Management

**8/18/2017**

This document represents potential 2018 project candidates identified through (1) the State of the Market (SOM) Report; (2) internal discussions within the NYISO; 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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# Business Intelligence Products

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## **Enterprise Information Management - Data Integration Phase III [Continuing]**

The Enterprise Information Management initiative is a multi-year strategic initiative focused on bringing together process, design, and technology to satisfy market and operations information needs at the NYISO. This phase of the project will continue the migration of the Decision Support System (DSS) system data processes to new data integration technology, which is intended to reduce support issues and improve maintainability.

## **Public Website Content Management Platform and Redesign [Continuing]**

This complete restructure of [www.nyiso.com](http://www.nyiso.com) implements a content management platform and a redesigned user interface. The content management platform technology provides the foundation to improve our ability to deliver long-term improvements to the website and integrations with other communication, data, and operational tool sets. In 2018, improvements to the website will include:

- Improved access to information and optimized navigation, search, and display capabilities
- Mobile-friendly design allowing the site to be viewed with ease on mobile devices
- Better access to NYISO data for Market Participants using web services

## **NAESB PKI Phase II [Continuing]**

The first phase of the NAESB Public Key Infrastructure (PKI) project served to prepare infrastructure and applications to accept NAESB compliant certificates and kick off the 10-month transition period. Phase II will continue to monitor the transition period while finishing up additional internal efforts to finalize the cutover to accepting only NAESB compliant certificates. This project will complete the efforts to fully migrate to NAESB certificates and will fully retire NYISO-provided certificates.

# Capacity Market Products

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## **Automate ICAP Import Rights [Continuing]**

Streamline and automate the process for obtaining ICAP import rights, which presently requires the gathering and processing of MP time-stamped faxes, and manually tracking MP requests for import MWs and return of allocated rights. This project will eliminate the fax process and many of the manual processes used to calculate import headroom, interface availability, and interface limits. It is a continuation of efforts started in 2016 to develop functional requirements, and in 2017 to complete software design.

### **RMR Cost Recovery Phase II [Mandatory]**

In order to comply with FERC’s mandate to have the ability to provide RMR contracts, software updates must be made to multiple NYISO systems which incorporate Bid to Bill functionality. This project is a continuation of 2017 efforts to develop functional requirements for system changes.

### **ICAP AMS Redesign & Test Improvements Phase II [Continuing]**

ICAP AMS is a NYISO application that supports a \$3B annual capacity market. Developed in house and launched in 2005, ICAP AMS is using multiple aging technologies. The application was built in a rapid succession of numerous market design projects under strict and aggressive implementation timelines, continually adding to its complexity. In 2016, the NYISO identified a multi-phase project for 2017 to start the process of redesigning the ICAP AMS in order to support future requirements. This project is a continuation of Phase I project efforts started in 2017 to re-write the ICAP AMS application over multiple phases to improve end-user experience (MPs, MMA, and IMO), increase code quality and maintainability, and automate and streamline testing.

### **Alternative Methods for LCRs (SOM) [Continuing]**

This project is a carryover from the 2017 effort to identify an alternative method for calculating the Locational Minimum Installed Capacity Requirements (LCRs). This project would evaluate any required tariff revisions and/or changes to methodology documentation and internal processes in order to seek to implement the alternative methodology developed in 2017.

### **CRIS for External-ROS Transmission Investments [Mandatory]**

This project is a continuation of the market design discussions conducted in 2015 and is the subject of FERC Docket ER17-505 in 2017. The 2015 design discussions presented the market design concepts available for allowing Market Participant-funded transmission projects for new transmission lines or upgrades to scheduled lines to obtain capacity rights to sell the incremental transfer capacity from a neighboring Control Area into the ROS region. Consistent with the NYISO filing in FERC Docket ER17-505, the NYISO will develop a market design concept to allow capacity rights be assigned to the financial sponsor of the transmission projects.

### **On Ramps and Off Ramps**

Evaluate a locational framework for creation (on ramps) and elimination (off ramps) of Localities that ensures that locational capacity prices would adjust to reflect changes in market conditions. The on ramp off ramp project will leverage prior stakeholder discussions on the elimination of capacity zones to develop a market design for the creation and elimination of zones based upon reliability principles.

### **Performance Assurance**

This project is a carryover from the NYISO’s 2017 study efforts to evaluate whether additional Performance Assurance provisions are needed within the energy and/or capacity markets to maintain operational reliability.

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## **Competitive Entry Exemption for Increased CRIS**

Currently, Class Year projects requesting to increase their CRIS are not eligible to request a Competitive Entry Exemption from buyer-side mitigation. This project would be to discuss with stakeholders effective eligibility rules for a Competitive Entry Exemption for projects that request increased CRIS.

## **Winter CRIS Enhancements**

Currently, the NYISO manually enters a percentage in the AMS each Winter Capability Period for all partially-deliverable units, and the AMS applies that percentage to the unit's Winter DMNC. The NYISO proposes to improve this manual process by maintaining fixed values for Winter CRIS in the AMS. Revisions to Attachment S of the OATT necessary to implement this project are part of the 2017 project re: Interconnection Process Improvements. This project involves software modifications to (1) modify the ICAP AMS to add a field for a fixed Winter CRIS value while maintaining historical Winter CRIS % in AMS; and (2) modify calculations inside AMS to use a fixed Winter CRIS value.

## **BSM Repowering**

While there exists a competitive entry exemption to buyer-side mitigation, that exemption may not be adequate to facilitate the replacement of an existing generating unit with a new unit (sometimes referred to as "repowering"). A focused exemption may be appropriate in order to revise market rules so that they do not discourage or prevent replacements, while adequately protecting the integrity of the wholesale markets. This project would seek to evaluate and develop a proposal for a buyer-side mitigation exemption that specifically addresses the concerns with replacement (repowered) generation projects and encourages private investment. This exemption is intended to provide greater certainty and decrease the risk to generation developers/owners that pursue replacement projects. The exemption would be compatible with market-based principles and would not seek to support or encourage subsidized new entry.

## **DER Products**

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### **FERC Order No. 745 [Mandatory]**

In March 2011, FERC issued Order No. 745 establishing a set of rules related to the compensation of demand response resources participating in wholesale energy markets. Order No. 745 required, among other things, that all ISOs and RTOs implement a monthly Net Benefits Test to determine the price at which demand response was cost effective, identify an appropriate cost allocation methodology for the costs associated with paying demand response, and propose changes to measurement and verification procedures as necessary.

The NYISO made an initial compliance filing on August 19, 2011. On May 16, 2013 FERC accepted, in part, and rejected, in part, the NYISO's 2011 compliance filing and required

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additional justification for certain of the 2011 compliance proposals. The NYISO submitted a request for rehearing of the Commission’s rejection of NYISO’s cost allocation methodology on June 17, 2013, and a second compliance filing on August 14, 2013. On January 30, 2017, FERC granted the request for rehearing and accepted the NYISO’s justifications. The 2017 order accepted all tariff revisions in compliance with Order No. 745.

This project will implement the software and procedural changes necessary to implement the January 30, 2017 FERC order.

### **DER Participation Model [Mandatory]**

The NYISO released its Distributed Energy Resource (DER) Roadmap in February 2017, as a first step to enhancing its market rules for DER participation in the NYISO’s energy, ancillary services, and capacity markets. The NYISO is also currently evaluating potential modifications to its existing Demand Response programs as part of this effort. This project will continue developing the market design concepts outlined in the Roadmap, including developing an understanding of how to balance the simultaneous participation of DER in retail-level programs and in the NYISO administrated wholesale markets, consistent with the operational and reliability needs of both the transmission and local distribution systems.

This project will include the design of DER performance obligations, metering and telemetry requirements, baseline and performance measurement and verification rules, resource modeling, and the development of an understanding of how to balance the simultaneous participation of DER in retail -level programs, as well as the NYISO’s wholesale markets.

### **Granular Pricing & Market Price Delivery**

The NYISO has proposed to publish a set of 5-minute nodal load prices to assist developers in identifying the appropriate location of DER and REV resources. This project will identify and map a set of appropriate transmission nodes whose prices, when published, will assist in that effort.

### **DER Pilot Framework**

In conjunction with the development of the DER Participation Model, the NYISO will establish pilot projects to test new energy technologies. These projects, utilizing the framework established in 2017, will allow developers of new or emergent technologies and the NYISO to test the ability of those technologies to provide value to the wholesale market and learn about the technology’s capabilities and uses. Pilot projects will also support REV demonstration efforts. The information learned through these pilot projects will ultimately allow the NYISO to develop DER market rules that appropriately incorporate new technology capabilities to meet grid needs.

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# Energy Market Products

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## **Energy Storage Integration and Optimization**

Continuation of the Energy Storage Integration and Optimization project aims to build upon concepts developed in 2017. The NYISO would more fully develop the energy storage participation model, associated market rules, and tariff language. Additionally, the NYISO would consider ways to improve the optimization of energy storage resources on a least cost basis by leveraging Energy Storage Resources' flexibility through more sophisticated energy constraint modeling.

## **RTC-RTD Convergence Improvements (SOM)**

The RTC-RTD Convergence Improvements Project seeks to better align RTC and RTD prices such that large deviations between the two corresponding market runs do not produce substantially diverging results. The inconsistencies between RTC and RTD may also contribute to transient shortage conditions and unnecessary price volatility. The NYISO seeks to eliminate unnecessary deviations between the two runs to ultimately result in better RTC-RTD price convergence.

## **Model 100+kV Transmission Constraints (SOM)**

Market incentives for investment in resources on the 115kV system in upstate New York may be inadequate, partly because these facilities are not reflected in the NYISO's energy and ancillary services markets. Currently, these constraints are managed through out-of-market actions, which may have contributed to the need for cost-of-service contracts to keep older capacity in service. Since these 115kV constraints are not reflected in the market scheduling process, real-time dispatch and day-ahead commitment decisions may sometimes be inefficient. This project will assess the implementation of a methodology for managing certain 115kV transmission constraints in the day-ahead and real-time markets, including mitigation measures for resources that are committed or dispatched to manage these constraints.

## **Constraint Specific Transmission Demand Curves (SOM)**

The NYISO uses a graduated transmission constraint pricing mechanism to set prices during certain transmission shortages. However, some transmission shortages are still resolved by relaxation instead of by setting prices through use of a transmission demand curve. This project would study replacing the NYISO's current transmission constraint pricing methodology with multiple transmission demand curves that can vary according to the importance, severity, and/or duration of the transmission constraint violation.

## **FERC Order 831: Offer Caps [Mandatory]**

Differences in offer caps between regions may interfere with economic and reliability driven interchange scheduling. On November 17, 2016, FERC issued Order 831 on Offer Caps, specifying a soft cap of \$1,000/MWh and a hard cap of \$2,000/MWh. Offers above \$1,000 are subject to cost verification. This project will modify the market software to incorporate the methodology and Offer Cap rule changes outlined in the compliance filing submitted by NYISO.



## **Large Solar Participation Model**

Large-scale solar installations are just beginning in the New York Control Area (NYCA). Solar technology can pose challenges to reliable grid operation due to its variable nature. The NYISO already contracts with solar forecasting entities to provide insight into the output from such resources. This project would examine how solar participation is modeled in the market and grid management software. As part of this endeavor, the NYISO will examine the need for solar forecasting by unit, similar to the current wind forecasting structure. Dispatchability requirements for large scale solar resources will also be considered.

## **Integrating Public Policy [Continuing]**

The State of New York Public Service Commission’s Clean Energy Standard increases the amount of renewable energy generation in New York State such that 50% of New York’s electricity is generated by renewable energy resources by 2030, while retaining upstate nuclear power plants as a bridge to the State’s decarbonization goals. To date, the NYISO has commissioned the Brattle Group to study potential market concepts for internalizing the cost of carbon into the wholesale market in order to complement New York’s efforts to reduce statewide greenhouse gas emissions. Its report is pending as of this time. In addition, FERC has initiated a new proceeding to address State public policy programs and their potential impacts on the wholesale competitive market (“State Public Policy Proceeding”). FERC held a two-day conference on May 1, 2017 and May 2, 2017, and has issued a notice seeking comments on these issues and may take action that could include a directive for the RTOs/ISOs to develop market design modifications and file associated tariff revisions.

This project will continue the vetting of wholesale market concepts with stakeholders to harmonize the State’s decarbonization goals with the wholesale energy and capacity market design. The effort will include consideration of market design changes as well as market products for energy and capacity markets that support viable and efficient wholesale markets for maintaining needed existing and incenting new resources necessary to sustain reliable grid operations over the long run. As part of the evaluation, a comprehensive review of the impacts that may result from a major incremental influx of renewable energy resources and associated market design changes to account for these impacts will be studied. This effort will also include, as necessary, responding to actions taken by FERC in its State Public Policy Proceeding.

## **Enterprise Products**

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### **Database Platform Upgrades Phase II [Continuing]**

This is a continuation of a multi-year effort to upgrade the NYISO’s database systems and implement changes to improve the overall performance of critical databases. This technology lifecycle project is necessary to ensure the ongoing availability of security patches and vendor support for critical systems.

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### **Telephony System Upgrade [Continuing]**

This is the final phase of a multi-year project intended to reduce the total cost of ownership of telephony systems, improve network resiliency and redundancy, utilize best-in-class technology, and maintain or enhance current levels of service and support. This phase will implement vendor technology solutions selected for voice / data equipment and services, network connectivity, and unified communications.

### **Application Platform Upgrade Phase V [NYISO Scored]**

This is a multi-year effort to replace aging server infrastructure and migrate to a new application platform standard. This phase includes hardware/operating system migrations and middleware upgrades.

### **Identity and Access Management (IAM) – 2018 [NYISO Scored]**

This is a multi-year project to improve identity and access management (IAM) controls for cyber systems and physical facilities. The IAM 2018 project builds upon the completed deliverables from earlier IAM project phases. This phase seeks to further extend automated provisioning capabilities and implement infrastructure upgrades for enhanced security and improved system availability.

### **Application Testing Improvements Phase II [NYISO Scored]**

This project is a multi-year effort to reduce the cycle time and resources required to take ideas from concept to production release by increasing automation of the software build, deploy, test, and release processes. Bringing together process and technology enhancements will enable the NYISO to speed up and increase regression test coverage; reduce the time and effort required for data setup, and remove bottlenecks in the software delivery process. This phase will focus on enhancements to the application infrastructure to enable scaling of the solution delivery platform.

### **Software AG Upgrade [ NYISO Scored]**

This is the final phase of a multi-year effort to build upon and enhance the Ranger Messaging Integration Platform to handle the more stringent performance and availability requirements of the reliability applications. Enhancements to the platform include improving the integration of existing market applications, as well as ensuring the platform resides on a vendor-supported version that is capable of handling future market and reliability application integration needs.

### **Corporate Workstation Replacement [NYISO Scored]**

This is a project to replace aging workstation infrastructure and to upgrade to the current operating system standard. This technology lifecycle project is necessary to maintain system performance and availability, as well as ensure ongoing vendor support for critical systems.

### **Laptop Refresh and Upgrade [NYISO Scored]**

This project completes the replacement of NYISO aging laptops, and includes the upgrade to the current operating system and Microsoft Office standards. This technology lifecycle project

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is necessary to maintain system performance and availability, as well as ensure ongoing vendor support for critical systems.

### **Microsoft Systems Upgrade [NYISO Scored]**

This project is a multi-year effort to upgrade NYISO's aging Microsoft Systems infrastructure. This technology lifecycle project is necessary to maintain system performance and availability, as well as ensure ongoing vendor support for critical systems.

### **Network Infrastructure Upgrade [NYISO Scored]**

This is a multi-year project to replace and/or upgrade network infrastructure components. This technology lifecycle project is necessary to maintain system performance and availability, as well as ensure ongoing vendor support for critical systems.

### **Planning High Performance Computing (HPC) Platform Upgrade [NYISO Scored]**

This is a project to replace aging HPC hardware and to upgrade to the current operating system standard. This technology lifecycle project is necessary to maintain system performance and availability, as well as ensure ongoing vendor support for critical systems.

## **Finance Products**

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### **North Subzone Redistricting [Continuing]**

This is a continuation of a 2017 Software Design Project (SDS). In 2008, NYPA and National Grid requested new sub-zonal boundaries in the North Zone in order to reduce Unaccounted For Energy (UFE). The NYISO worked with NYPA and National Grid to provide a solution, which was effective 12/1/2008. The current solution is a manual process administered by NYPA and National Grid. In 2017, the NYISO is completing a software design which will allow for changing the boundaries of subzones within zones systematically. The project will implement and deploy the subzone redistricting capability.

### **Expense Reports Automation [Continuing]**

This project would automate the process for submitting, approving, and processing expense reports for all NYISO employees. An automated user interface would be integrated with the Oracle E-Business Suite Financials and replace the existing form and manual processes that are in use today.

### **Rate Schedule 12 Settlement [Continuing]**

This project would implement settlements for Rate Schedule 12. It would allow for the NYISO's settlements systems to provide for cost recovery, consistent with Attachment S to the OATT, for the portion of a Highway System Deliverability Upgrade (SDU) not funded by contributing Class Year Developers.

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## **CMS Projected True-up Exposure Enhancement**

The NYISO modified its credit policy in 2015, to account for significant differences between a Market Participant’s initial settlement and four-month true-up, which were primarily caused by Market Participants under forecasting load. These changes were made to the CMS in February 2015. In 2017, the NYISO performed additional analysis to identify potential areas of improvement whereby the credit requirement better aligns to market risk. This project would implement those enhancements and revise the tariff accordingly.

## **FERC Form1 Redesign [NYISO Scored]**

This project will procure and install or will create a utility to enter and submit data in a new electronic format as being prescribed by FERC and NAESB. This financial data is currently provided to FERC using FERC’s online Form 1 and is supplied quarterly and annually.

## **Vendor Management Tool [NYISO Scored]**

The NYISO’s Procurement Department manually maintains data on procurement activity for over 1,000 vendors and several thousand contracts, agreements, and tax documents that are used to support approximately 800 annual procurement events. The primary goal of this project is the creation of a single database, with query/ reporting capabilities, to house all vendor and contract information. This database would facilitate vendor management, minimize errors, and increase organizational efficiency. Successful implementation would further enable the Procurement Department to replace several manual processes, and to better support current initiatives such as tactical vendor management and strategic sourcing.

## **Electric Quarterly Report (EQR) DSS Report Update**

FERC has updated the required information and format for EQR reports that are filed with FERC by NYISO’s customers. For many years, NYISO Market Participants have benefited from a report generated out of DSS in helping to fill out their EQR filings. Market Participants have requested that NYISO update the existing DSS report with additional information and formatting to further assist them in satisfying their FERC EQR requirements.

# **Operations & Reliability Products**

## **EMS/BMS System Upgrade [Continuing]**

This is a multi-year project to upgrade both the Energy Management System (EMS) and the Business Management System (BMS), which can also be referred to as the Market Management System (MMS). The EMS encompasses the core reliability functions used by the system operators such as load flow and contingency analysis. The BMS/MMS encompasses the day ahead and real time energy market functionality. This project is a continuation of prior year efforts.

### **TOA Platform Upgrade Phase II [Continuing]**

This project continues the efforts started in 2016 to upgrade the NYISO's outage scheduling application, classic TOA. Currently, the NYISO is one of the few remaining customers on the classic TOA platform, which reduces our ability to implement new functionality and increases concern of supportability. Classic TOA is being upgraded in multiple phases as the current platform is nearing end-of-life and the vendor is migrating its customers to its new platform, iTOA.

### **PI System Upgrade [Continuing]**

The PI Server currently in production is not compatible with the new version of EMS/BMS software that the NYISO is implementing as part of the multi-year EMS/BMS Upgrade Project. The PI System Upgrade project will update PI Server to a version compatible with the new EMS/BMS platform, and will be performed in conjunction with the EMS/BMS Upgrade testing and deployment. In addition, the new version of PI Server will result in decreased database licensing costs and improved maintainability and reliability.

### **EMS/BMS Workstation Upgrade [Continuing]**

As part of the EMS/BMS upgrade project, NYISO must deploy new operator workstations that host the Network Manager (NM) platform in the control room and to run the Day-Ahead Market. The new workstations are being setup to support parallel execution of the markets in the NM-R and NM environments until we switch over to the NM platform. The scope of this project is to add new NM workstations and update the ESX cluster in place, which will run both Ranger and NM virtual workstations. This upgrade is required to be completed before the NM deployment, but purchasing, system builds, and configuration will take place in 2018.

### **Gurobi (MIP) Hardware Refresh [Continuing]**

The Ranger performance project procured a cluster of x86 servers in 2012 to run the Gurobi compute engine for MIP. That hardware will reach end of life in Q1 of 2020. A refresh of that hardware needs to occur before then. With a new Linux environment being introduced into production as part of the EMS BMS project, there is a potential to reduce hardware and software costs by leveraging the new platform. The deployment of new servers should coincide with the rollout of the EMS BMS production hardware in Q1 2019.

### **Gurobi (MIP) Software Upgrade [Continuing]**

The math engine responsible for solving the unit commitment and dispatch optimization for Ranger and the EMS BMS upgrade is a commercial product called Gurobi. Major releases of this product occur every two years and mainline support rolls off for a particular release after about four years. The version currently used in production is Gurobi 5.6 and it is on extended support, resulting in higher maintenance fees to the vendor. Gurobi 7.0 is the current version and offers improved performance and resiliency features. This project is to upgrade to the current version of Gurobi in production and in the new NM environment.

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## **Load Forecaster Upgrade & Buildout [NYISO Scored]**

The NYISO's current Load Forecaster application, MetrixIDR Version 5.3.2.268, and its computational engine, MetrixND Version 4.5.68, are supplied by Itron, Inc. Itron notified the NYISO in October 2016 that they will be releasing a new version of MetrixIDR, expected in October 2017. The newest version of MetrixND, 4.7, was released in October 2016. The current version of IDR in operation at the NYISO will no longer be supported by Itron after December 2018. To put these two related products in context, MetrixND contains the statistical software that is used to estimate all forecast models used in production. MetrixIDR is the dynamic system that receives data inputs and generates forecasts in real time for Grid Operations and Market Operation.

Itron has a dedicated software development team working on enhancing MetrixIDR to meet the requirements of a global customer community. In order to mitigate risk and enhance the NYISO's load forecasting capabilities, this project would upgrade the NYISO's current version with the new release of MetrixIDR.

In addition, this project will build out the QA Integration 1 environment, which currently lacks the ability to perform testing on MetrixIDR. An additional client license for MetrixIDR will most likely be needed for INT-1.

The objective of this project is threefold: to upgrade MetrixIDR and MetrixND, and to build out the INT-1 environment.

## **EPG PMU Enhancements [NYISO Scored]**

One of the main challenges hindering the use of real-time synchrophasor data is the quality of the data. This project will address some of the challenges in assuring that synchrophasor data is usable and trustworthy for use in operations and grid analytics. This will help facilitate the goal of using synchrophasor data to detect real-time disturbances in the grid, and take action to enhance reliability.

## **Planning Products**

### **Interconnection Project Queue (or Portal) Automation**

The NYISO's Interconnection Projects team currently uses a manual process to manage both the receipt of Interconnection Project requests and management of the Interconnection Projects queue. Due to recent changes in energy markets and the business environment, the NYISO is experiencing a sustained increase in the number of Interconnection Project requests received.

Other ISOs/RTOs are currently using interconnection portals to manage their interconnection processes. The NYISO's Planning department would like to implement similar processes in order to alleviate work load on internal resources and improve customer service for Market Participants that request interconnection services.

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## **Comprehensive System Planning Process Review**

The purpose of this project is to review the NYISO's separate comprehensive system planning processes and consider whether it may be beneficial to revise and/or further integrate the reliability, economic, and public policy planning processes.

## **Model-on-Demand Upgrade and Build-Out**

Siemens PTI Model-on-Demand (MOD) and associated Web Portal are used by the NYISO and the NY TOs to update and maintain the network model. MOD was last updated in 2013 and in order to maintain support and take advantage of new capabilities, the NYISO would like to upgrade the application to a newer version. As part of this effort, NYISO would build out an additional environment to test the upgrade prior to going into our staging and production environments.

## **TCC Products**

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None.