

2021 Market Projects

Capacity, DER, and Energy Market Design Teams

ICAPWG/MIWG

January 21, 2021

The Team

- The Market DesignTeam (led by Mike DeSocio) is composed of 3 focused teams, with Dr. Nicole Bouchez, PhD as Principal Economist
- Capacity Market Design (led by Zach T. Smith)
 - Emily Conway
 - Sarah Carkner
 - Ryan Patterson
 - Ethan Avallone
- Distributed Resource Integration (led by James Pigeon)
 - Michael Ferrari
 - Harris Eisenhardt
 - Francesco Biancardi
 - Christina Duong
- Energy Market Design (led by Zachary Stines)
 - Amanda Myott
 - Pallavi Jain
 - Ashley Ferrer
 - Kanchan Upadhyay



Purpose

- Our objective is to share the 2021 Capacity, DER, and Energy Market Design projects including anticipated schedule and deliverables with stakeholders.
- The following slides include the project description, schedule and deliverables of each project that was prioritized for 2021.



Capacity Market Design



Capacity Market Project Overview

2021 Capacity Market Design Projects	Q1	Q2	Q3	Q4	2021 Deliverable
Expanding Application of Peak Hour Forecasts	CD	CD	CP		Q3 Market Design Concept Proposal
Comprehensive Mitigation Review	CD	CD	CD	MDC	Q4 Market Design Complete
CRIS Expiration	CD	CD	CP		Q3 Market Design Concept Proposal
BSM Renewables Exemption Study	CD	DEP			Q2 Deployment
Demand Curve Reset		DEP			Q2 Deployment

Кеу					
CD	Continued Discussions	MDC	Market Design Complete		
ID	Issue Discovery	FR	Functional Requirements		
SD	Study Defined	SD	Software Design Specification		
sc	Study Complete	DC	Development Complete		
CP	Market Design Concept Proposed	DEP	Deployment		



Ethan Avallone, Technical Specialist



Background:

As part of the NYISO's proposed compliance revisions to its Services
Tariff to implement a "Renewables Exemption" under the BSM
Rules, the NYISO proposed that it would periodically review and
determine which renewable technologies should be an "Exempt
Renewable Technology", and do so during every ICAP Demand Curve
Reset Filing Year



- Deliverable: Q2 2021 Deployment
- Project Description:
 - In 2020, the NYISO commissioned Sargent and Lundy to produce a report detailing the total estimated costs for candidate intermittent renewable technologies.*
 - This report provides cost information the NYISO needs to complete the BSM Renewable Exemption Study.
 - The study will identify renewable technologies that have been shown to have high development costs and low capacity factors, and thus limited or no incentive or ability to suppress capacity prices
 - The NYISO will consider the cost of new entry and costs to operate, all potential market revenues, and potential cost savings to Loads due to capacity market price reductions resulting from new entry of each renewable technology evaluated



Stakeholder Engagement Plan:

- Q1 2021
 - Discussion with stakeholders.
 - Targeted period for the NYISO to provide the draft Exempt Renewable Technology study for review and comment by stakeholders and the MMU.
 - Per the Tariff, on or before the 60th day following the FERC acceptance of the ICAP Demand Curves, the ISO will file the results of its Exempt Renewable Technology periodic review and determination with FERC.
- Q2 2021
 - Proceed with appropriate treatment of identified Exempt Renewable Technologies.



Expanding Applicationof Peak Hour Forecasts

Ethan Avallone, Technical Specialist



Expanding Application of Peak Hour Forecasts

Background:

- Currently, the Load Serving Entities (LSEs) receive a capacity obligation based on the measured share of load consumed by each LSE during the NYCA peak load hour.
 - An assignment methodology using multiple peak and near-peak load hours may improve this process and create more appropriately defined and consistent LSE capacity obligations.
 - Additionally, the use of gross, rather than measured, load in whole or in part may be more appropriate as more Distributed Energy Resources (DERs) enter the system.



Expanding Application of Peak Hour Forecasts

- Deliverable: Q3 2021 Market Design Concept Proposal
- Project Description:
 - The NYISO will describe the current process to establish context for stakeholders, and lay the groundwork necessary to explore this market design enhancement.
 - The NYISO and its stakeholders will explore determining capacity obligations over multiple peak and near-peak load hours, utilizing gross load.
 - A market design concept proposal will be presented to stakeholders. The presentation will explore the viability of this market design enhancement.



Expanding Application of Peak Hour Forecasts

- Stakeholder Engagement Plan:
 - Q1 2021
 - Initial stakeholder discussions.
 - Present information regarding the current design.
 - Begin exploring alternative designs.
 - Q2 2021
 - Continue stakeholder engagement.
 - Conduct analysis as necessary.
 - Continue exploring alternative designs.
 - Q3 2021
 - Continue stakeholder engagement.
 - Present MDCP.



Sarah Carkner, Market Design Specialist



Background:

- In consideration of the recently signed Climate Leadership and Community Protection Act (CLCPA), the NYISO is reevaluating Buyer's Side Mitigation (BSM) rules to ensure that they promote competitive markets, support minimizing consumer cost, and harmonize with state energy policy targets that are now New York State law
- In 2020, the NYISO completed proposals for the Renewable Exemption Limits and BSM Enhancements
 - The Renewable Exemption Limits proposal has since been accepted by FERC
 - Note that the NYISO's BSM Enhancements' proposal for the Part A Exemption Test
 has since been denied at FERC, and that the NYISO has filed a request for rehearing
 on FERC's order



- Deliverable: Q4 2021 Market Design Complete
- Project Description:
 - Continue a comprehensive review to modify its Installed Capacity market framework in a balanced manner that (i) preserves competitive price signals and economically efficient market outcomes required to maintain system reliability, and (ii) enables the Climate Leadership and Community Protection Act (CLCPA) goals



Stakeholder Engagement Plan:

- Q1 2021
 - Continue to solicit and share feedback from stakeholders
 - Consider concepts based on feedback provided
- Q2 2021
 - Initial stakeholder discussions
- Q3 2021
 - Continue stakeholder engagement
- Q4 2021
 - Present MDC



Emily Conway, Associate Market Design Specialist



Background:

- As a part of the 2019 Class Year/Interconnection Queue Redesign initiative, the NYISO identified proposals providing for more stringent CRIS expiration rules. Some of those were implemented as part of that initiative, while others were ultimately deferred for later consideration. For example, the rules that were accepted by FERC as part of the 2019 initiative do not address partial CRIS utilization or the retention of CRIS by retired facilities.
 - Current rules allow a facility to retain its full CRIS for 3 years after deactivation
 - Current rules also allow a facility to retain its full CRIS regardless of how much of that CRIS it is using. As a result, a facility that offers only 0.1 MW into the capacity market once in a 3 year period may maintain its full MW level of CRIS
- This project will discuss the extent to which facilities can retain their CRIS beyond the
 effective date of their retirement and the extent to which facilities using only part of
 their CRIS can retain unused CRIS.



- Deliverable: Q3 2021 Market Design Concept Proposal
- Project Description:
 - The NYISO will investigate opportunities to make the rules addressing CRIS retention more stringent where CRIS is not fully utilized and propose changes to the rules where necessary
 - Enhancements to these rules will address the retention of CRIS by retired facilities and facilities that have minimal participation in the ICAP market, whose retention potentially decreases capacity deliverability headroom that could potentially increase the cost of market entry to future facilities



Stakeholder Engagement Plan:

- Q1 Q3 2021:
 - Discussions with stakeholders
 - Conduct analysis as necessary
- Q3 2021:
 - Market Design Concept Proposal



2021-2025 ICAP Demand Curve Reset

Ryan Patterson, Market Design Specialist



ICAP Demand Curve Reset

Background:

 Every four years, the NYISO and its stakeholders undertake a comprehensive review, referred to as the ICAP Demand Curve reset (DCR), to determine the necessary inputs and assumptions for developing the ICAP Demand Curves for the four-year period covered by the reset. Each ICAP Demand Curve is based on the estimated cost to construct and operate a hypothetical new capacity supply resource in various locations throughout New York.



Demand Curve Reset

- Deliverable: Q2 2021 Deployment
- Project Description:
 - During 2019 and 2020, the Independent Consultant led discussions with stakeholders and the NYISO to develop recommendations for the assumptions, methodologies, variables and inputs used to establish the ICAP Demand Curves for the 2021-2025 reset period.
 - On November 30, 2020, the NYISO filed with FERC its proposed ICAP Demand Curves for the 2021-2022 Capability Year, along with the methodologies and inputs for use in conducting annual updates to determine the ICAP Demand Curves for the 2022/2023, 2023/2024, and 2024/2025 Capability Years.

ICAP Demand Curve Reset

Next Steps:

- Q1 Q2 2021:
 - Communication with FERC on the DCR filing, as necessary
- Q2 2021
 - Deploy accepted ICAP Demand Curves for the 2021-2022 Capability Year



Distributed Resource Integration



DER Projects Overview

2021 DER Market Design Projects	Q1	Q2	Q3	Q4	2021 Deliverable
Climate Change & Grid In Transition	CD	CD	CD	ID	Q4 Issue Discovery
Hybrid Aggregation Model	CD	CD	CD	MDC	Q4 Market Design Complete
Engaging the Demand Side	CD	CD	CD	ID	Q4 Issue Discovery
Ongoing TSO & DSO Coordination	CD	CD	CD	ID	Q4 Issue Discovery

Кеу					
CD	Continued Discussions	MDC	Market Design Complete		
ID	Issue Discovery	FR	Functional Requirements		
SD	Study Defined	SD	Software Design Specification		
SC	Study Complete	DC	Development Complete		
СР	Market Design Concept Proposed	DEP	Deployment		



Harris Eisenhardt, Associate Market Design Specialist



Background:

- 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.
- A grid characterized by high levels of intermittent renewable resources and distributed generation will require new thinking. We approach potential market enhancement efforts 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.
- Additionally, the study will inform the NYISO's planning, forecasting, and operations, as well as the development of wholesale market mechanisms to enhance grid resilience.



- Deliverable: Q4 Issue Discovery
- Project Description:
 - Continue to study, investigate, discuss, and develop concepts described in the Reliability and Market Considerations for a Grid in Transition report.
 - This project will also examine identified impacts to the bulk power system under the conditions modeled in Phase I and II of the Climate Change and Impact Resilience (CCIR) study. If wholesale market design changes are necessary to address specific impacts/issues, then the NYISO would propose concepts to address those impacts/issues.
 - This project will position the wholesale markets to continue to support grid reliability as the mix of resources and system needs continues to evolve in New York.



Stakeholder Engagement Plan:

- Q1 Q3 2021:
 - Discussions with stakeholders
 - Discuss potential market and/or process improvements as necessary
 - Conduct and discuss analysis that can assist with understanding market inefficiencies and inform necessary market design improvements
- Q4 2021:
 - Present findings



Christina Duong, Market Design Specialist



Background:

- The NYISO's market rules do not currently allow an ESR and another Generator to be co-located at a single point of interconnection and share the same point identifier (PTID). Instead, where an ESR and another Generator are co-located behind the same point of interconnection, each resource type must be separately metered and have its own PTID.
- State and Federal initiatives such as REC procurements provide incentives for developers to couple storage and intermittent renewable assets. Such programs are aimed at improving the availability of intermittent resources and firming their output.
- In 2020, the NYISO developed a market participation model for Intermittent Power Resources plus storage acting as two distinct resources with a shared injection limit to better align the NYISO's market rules with state and federal efforts to integrate more clean energy. The 2021 deliverable will create a new market participation model to improve grid flexibility and resilience by enabling new resource types to provide their full capabilities.



- Deliverable: Q4 Market Design Complete
- Project Description:
 - This project is distinct from the DER and ESR Integration initiatives, but it will build on work completed as part of those initiatives. This project is a continuation of the 2020 Hybrid Storage model effort and will develop market rules that allow at least one ESR and other Generator(s) to be co-located behind the same point of interconnection, share a single PTID, and act as a single market resource. The 2021 project deliverable is a Market Design Complete.



Stakeholder Engagement Plan:

- Q1 2021
 - Initial stakeholder discussions
- Q2 & Q3 2021
 - Continue to solicit and share feedback from stakeholders
 - Consider concepts based on feedback provided
 - Develop and discuss tariff revisions
- Q4 2021
 - Present Market Design Complete to Stakeholders at BIC



Engaging the Demand Side

Francesco Biancardi, Associate Market Design Specialist



Engaging the Demand Side

Background:

- The NYISO-administered markets currently feature demand side participation opportunities through the SCR program, EDRP, DSASP, DADRP, price responsive load bids by Load Serving Entities in the Day-Ahead Market, and in the future also through the DER participation model. Eventually, controllable and flexible load may be desirable to balance inflexible/intermittent supply and provide ancillary services.
- Animating load in the NYISO-administered markets will require close coordination with the Member Systems and the New York State Department of Public Service.
 - Improvements to consumer metering, communication platforms, and access to retail
 real-time rates will be necessary to improve load flexibility, and should be a focus of these
 efforts moving forward. These enhancements will provide consumers with visibility of
 real-time prices which offers the ability to make more informed decisions about when and
 how to consume energy.



Engaging the Demand Side

- Deliverable: Q4 Issue Discovery
- Project Description:
 - The NYISO will work with both internal and external stakeholders to identify opportunities to enable more demand side participation in the wholesale markets through issue discovery, such as including flexible load as supply in the price formation in the Installed Capacity and Energy markets. Further engaging load participation could allow for more robust price formation that reflects consumer willingness to pay, consistent with the marginal benefit of consuming energy. Potential changes to SCR program to better align with the operational needs may also be considered. Any opportunities identified to further engage demand side participation can be used to develop future market design enhancements.



Engaging the Demand Side

- Q1 Q3 2021:
 - Discussions with stakeholders
 - Conduct analysis as necessary
- Q4 2021:
 - Present findings



Michael Ferrari, Market Design Specialist



Background:

- Throughout the multi-year DER effort, the NYISO has worked closely with the Joint Utilities (JU) of New York to develop processes that will facilitate DER participation in the wholesale markets. The NYISO recognizes that bulk system and distribution system operational coordination and situational awareness are necessary to successfully integrate DER. The NYISO must continue working with the JU as well as Long Island Power Authority (LIPA) and New York Power Authority (NYPA) to finalize coordination details in preparation for DER participation in Q4 2022.
- This project will ensure that the NYISO and the New York transmission operators will have the proper tools, communication protocols, and procedures in place to maintain reliability as the penetration of DER on the grid increases.



- Deliverable: Q4 Issue Discovery
- Project Description:
 - In 2021 the NYISO, the Joint Utilities, LIPA, and NYPA will continue
 to coordinate in support of DER participation model topics, including
 but not limited to Transmission Nodes, Dual Participation, and
 operational tools. The NYISO will review the results of those efforts
 with its stakeholders via NYISO market and operational working
 groups as an issue discovery effort.



- Q1 Q4 2021:
 - Discussions with NYISO Joint Utilities Task Force
- Q4 2021:
 - Discuss Updates



Ongoing & Implementation Efforts

Harris Eisenhardt, Associate Market Design Specialist



Ongoing & Implementation

DER Participation Model – 2021

- Software-Defined Wide Area Network manuals updates to be published and presented
- FERC Order 2222 compliance

Co-located Storage Resource – 2021

- Tariff revisions filed at FERC
- Energy & Capacity market design manuals updates to be published and presented



Energy Market Design



Energy Market Projects Overview

2021 Energy Market Design Projects	Q1	Q2	QЗ	Q4	2021 Deliverable
Constraint Specific Transmission Shortage Pricing		CD	CD	MDC	Q4 Market Design Complete
Time-Differentiated TCCs	CD	CD	CD	CP	Q4 Market Design Concept Proposed
Grid Services from Renewables	CD	CD	sc		Q3 Study Complete
Reserve Enhancements for Constrained Areas	CD	CD	CD	SC	Q4 Study Complete

Кеу						
CD	Continued Discussions	MDC	Market Design Complete			
ID	Issue Discovery	FR	Functional Requirements			
SD	Study Defined	SD	Software Design Specification			
SC	Study Complete	DC	Development Complete			
СР	Market Design Concept Proposed	DEP	Deployment			



Kanchan Upadhyay, Market Design Specialist



Project Background:

- 2017 State of the Market report included a recommendation to utilize constraint specific demand curves to set transmission constraint Shadow Prices during transmission shortages.
 - The subsequent State of the Market reports in 2018 and 2019 continue to recommend this effort under "Energy Market Enhancements - Pricing and Performance Incentives" category.
- The NYISO completed a study of the current transmission constraint pricing logic in September 2018.¹
 - The study included a number of recommended considerations with respect to potential enhancements to the current Transmission Constraints Pricing logic
- The NYISO presented a Market Design Concept Proposal in February 2019.²
- Link to the Constraint Specific Transmission Shortage Pricing study: https://www.nyiso.com/documents/20142/2549789/Constraint%20Specific%20Transmission%20Shortage%20Pricing%20-%20Paper_Final.pdf/7f69227a-7ca8-656e-b895-0f8147635319
- Link to the Constraint Specific Transmission Shortage Pricing Market Design Concept Proposal:

 https://www.nyiso.com/documents/20142/5020603/Constraint%20Specific%20Transmission%20Shortage%20Pricing%20_MDCP_021519.pdf/d7d80189-e48e-a893-a860-6e4b9636b8bf



- Deliverable: Q4 2021 Market Design Complete
- Project Description:
 - This project seeks to develop a revised and more graduated Transmission Constraint Pricing logic to better align the transmission demand curves with severity of the constraints.



- Q1-Q3 2021:
 - Conduct analysis as necessary and continue discussing transmission constraint pricing logic enhancements with stakeholders
 - Develop and discuss tariff revisions
 - Conduct and present Consumer Impact Analysis
- Q4 2021:
 - Present Market Design Complete to Stakeholders at BIC



Grid Services from Renewable Generators

Amanda Myott, Market Design Specialist



Grid Services from Renewable Generators

Background:

- This project was proposed by NYSERDA
- Recent industry studies in California suggest that wind and solar resources could be capable of providing grid services such as regulation, voltage control, frequency response, and ramping
- Enabling wind and solar resources to supply ancillary services in New York could reduce consumer costs for maintaining reliability and support the transition to a low-emitting fleet



Grid Services from Renewable Generators

- Deliverable: Q3 Study Complete
- Project Description:
 - The NYISO will:
 - Explore and describe the current obstacles to enabling wind and solar generators to provide grid services
 - Work with renewable generators to determine any necessary equipment upgrades to enable wind and solar generators to provide grid services
 - Evaluate possible market design changes that would allow renewable generators to provide grid services
 - Present study report to stakeholders discussing the findings of the study



Grid Services from Renewable Generators

- Q1 2021
 - Initial market participant discussions
 - Stakeholder presentations pertaining to the current market design and obstacles
 - Discuss study assumptions with stakeholders
- Q2 2021
 - Conduct research and analysis as necessary
 - Discuss preliminary findings and draft study report with stakeholders
 - Conduct consumer impact analysis
- Q3 2021
 - Present consumer impact analysis to stakeholders
 - Finalize study report and discuss with stakeholders



Time-Differentiated **Transmission Congestion Contracts** (TCCs)

Ashley Ferrer, Market Design Specialist



Time-Differentiated TCCs

Project Background:

- Currently, TCCs are awarded for all hours of an effective period (*i.e.*, 24 hours day, 7 days week)
- This project was requested by Calpine and Vitol
- Market Participants have requested a feature to include more granular TCC products covering shorter timeframes
 - This could improve commercial function and forward congestion price transparency by providing TCC products that distinguish between congestion patterns that can vary during different periods of the day or week



Time-Differentiated TCCs

- Deliverable: Q4 2021 Market Design Concept Proposed
- Project Description:
 - This project would develop market rule changes needed to facilitate the creation of TCC products that apply to different periods of time to supplement the current 24-hour product



Time-Differentiated TCCs

- Q1 Q3 2021:
 - Discussions with stakeholders
 - Conduct analysis as necessary
- Q3 2021:
 - Present consumer impact analysis
- Q4 2021:
 - Present Market Design Concept proposal to stakeholders



Pallavi Jain, Market Design Specialist



Project Background:

- Currently, 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 does not reflect the flexibility of the grid to respond to system needs by utilizing the transmission system to import capacity into generation-constrained regions.
 - As reserve regions become smaller, this static modeling can potentially lead to market inefficiencies and unnecessary price volatility.
 - In June 2019, the NYISO implemented a new reserve region and associated requirements for New York City (Load Zone J)*.
- As the potential implementation of load pocket reserve requirements is considered, a dynamic reserve
 procurement methodology that does not exist today could be useful to improve market efficiency, better
 align market outcomes with how the power system is operated, and avoid the potential for unnecessary
 price volatility.
 - With this project, the NYISO is exploring the potential implementation of more granular reserve requirements within certain New York City load pockets that would better represent the value of short-notice resources in desirable locations.

*Link to Load Zone J reserve region presentation:

https://www.nyiso.com/documents/20142/5410485/5%20Zone%20J%20Reserves%20BIC%20031319.pdf/c671b044-5c6c-8ce5-9c7c-580a2dfc65e6



- Deliverable: Q4 2021 Study Complete
- Project Description:
 - The study will seek to identify and evaluate potential changes to the NYISO's market rules and software to facilitate dynamic scheduling of operating reserves based on system conditions. The study will also explore how to most efficiently incorporate potential reserve requirements within certain load pockets in New York City into the market software.



- Q1 Q3 2021:
 - Discussions with stakeholders
 - Conduct research and analysis as necessary
- Q3 2021:
 - Present consumer impact analysis
- Q4 2021:
 - Publish study report



Implementation Efforts

Pallavi Jain, Market Design Specialist



Implementation Efforts

- Ancillary Services Shortage Pricing 2021
 - Stakeholder Engagement Plan:
 - Q1-Q2 2021:
 - File proposal with FERC
 - Discuss associated manual updates with stakeholders
- Reserves for Resource Flexibility 2021
 - Stakeholder Engagement Plan:
 - Q1-Q2 2021:
 - Proposal filed with FERC on December 11, 2020
 - Discuss associated manual updates with stakeholders



Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system



