

Market Design Concepts to Prepare for Significant Renewable Generation

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Integrating Public Policy

NYS Clean Energy Standard Goals



	Carbon Pricing in the Wholesale Markets	Market Design Concepts to Prepare for Significant Renewable Generation
Forum	Integrating Public Policy Task Force (IPPTF)	Market Issues Working Group (MIWG)
Led by	NYISO + NY DPS + NYSERDA "Joint Staff"	NYISO
Objective	To further explore options to incorporate the cost of carbon dioxide into wholesale energy markets with the goal of contributing to achieving New York State's public policies, while providing the greatest benefits at the least cost to consumers and appropriate price signals to incentivize investment and maintain grid reliability.	To propose, analyze and develop new energy and capacity market products and/or rule changes that would incent the participation of resources that can enhance the availability, flexibility, predictability, and dispatchability of the NY Power System.
2018 Deliverables	Proposal and supporting rationale for how carbon could be priced in NY's wholesale electricity markets.	<ol style="list-style-type: none">1. Market Design Concept Proposals for viable near-term products and rule enhancements.2. 3-5 year vision for market design.



MASTER PLAN
Q2 2018

Agenda

- **2018 Project Plan – Market Design Concepts to Prepare for Significant Renewable Generation**
- **Review Initial Prioritization - Energy Market**
- **Review Initial Prioritization - Capacity Market**

2018 Project Plan - Market Design Concepts to Prepare for Significant Renewable Generation

2018 Working Group Meeting	Topic
January 10	Discuss report and 2018 project plan
January 25	Address requests for additional analysis
February 02 06	NYISO to propose prioritization of market design concepts
February 21, March 6, April 3	Analysis/ discussion of recommended market design concepts
April 24	Analysis/ discussion of recommended market design concepts
	Present draft outline of Master Plan
May 09	Analysis/ discussion of recommended market design concepts
	Present rough draft of Master Plan
May 23	Discuss rough draft and any proposed revisions to Master Plan
June 13	MDCP: Present Final Master Plan

Market Design Concept Prioritization

- **The NYISO conducted a preliminary review of the market design concepts proposed in the Market Assessment with 50% Renewables Report.**
- **Concepts were evaluated according to the following criteria:**
 - Whether the product or rule change would incentivize performance attributes such as availability, predictability, flexibility, and dispatchability.
 - Need demonstrated by the results of the NYISO's 2017 Market Assessment.
 - Anticipated future system need based on observations from other control areas or other NYISO studies.
- **The NYISO recommends that concepts which may offer benefits but are not yet well defined be prioritized as future studies or longer-term market design efforts.**

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Energy Market Design Concepts

- **The NYISO recommends that the following design concepts be developed during Q1 and Q2 2018:**
 1. Flexible ramping product to address forecast uncertainty
 2. Re-evaluate shortage pricing for Ancillary Services
 3. Review performance incentives for negative LBMP's
 4. More frequent transaction scheduling
- **Market Design Concept Proposals for these products or rule changes will be considered for inclusion in the Master Plan**

Flexible Ramping Product to Address Forecast Uncertainty

- **Volatility in load ramp net of renewable generation was observed in the Real-Time Market Study.**
 - As output from intermittent generators changed, the power system had to respond quickly to un-forecasted swings in net load ramp.
- **A ramping product would enable the NYISO to procure additional ramp-up and ramp-down capability by holding a portion of wholesale generating capability aside.**
 - Could be procured similarly to how the NYISO currently procures 10- and 30-minute Reserves.
 - Could be split into two distinct products: ramp-up and ramp-down.
 - The NYISO would review the implementation of ramping products by the MISO and CAISO as part of the market design concept development.

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Re-evaluate Shortage Pricing for Ancillary Services

- Shortage pricing could incent market participants to offer more flexibility and responsiveness in RT.
- Incremental Reserve value could be evaluated:
 - Operating reserves could be procured beyond the minimum requirements at lower price points.
 - This would assist in reflecting the incremental value the reserve requirement provides.
 - Potential design would also signal constrained NY Power System conditions more gradually.

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Review Performance Incentives for Negative LBMPs

- The Market Assessment demonstrated that a significant increase in renewable generation would be expected to cause LBMP's to clear below \$0/MWh more frequently.
- This effort could review incentives for resources to follow dispatch instructions.

More Frequent Transaction Scheduling

- Today, external transaction schedules can change once every quarter hour at interfaces where 15-minute transactions are enabled and once every hour where hourly transactions are enabled.
- The ability to schedule transactions more frequently in real-time could provide additional flexibility to the power system to respond to sudden changes in intermittent output like those observed in the Market Study.
- More frequent transaction scheduling could benefit neighboring control areas that also expect intermittent penetration to increase.

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Initial Prioritization – Energy Market

The following items could be considered over the longer term:

1. Separate Regulation Up and Regulation Down

- Today, only generators that can move symmetrically both up and down from their Base Points are eligible to provide Regulation.
- Separating Regulation into two products; Regulation-up and Regulation-down, could provide additional flexibility to the power system.

2. Re-evaluate Regulation Capacity Requirements

- Regulation shortages can result in reliability impacts if unresolved. The NYISO periodically reviews its requirements to ensure that adequate Regulation Capacity is procured.

3. 15-minute DAM Scheduling

- The DAM currently procures energy, reserves, and regulation on an hourly basis.
- Scheduling the DAM on a more granular basis, such as 15-minute, may improve the efficiency of the DAM commitment of resources when intermittent renewable schedules are constantly changing in RT.

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Initial Prioritization – Energy Market

The following items could be considered over the longer term:

4. Review Reserve Requirements

- The amount of 10-minute total reserve procured in the NYCA is equal to the most severe contingency under normal transfer conditions, defined today as the loss of the largest single generator (~1,000 MW).
- The future most severe contingency could be related to loss of intermittent generation.

5. Cycling Product

- More frequent cycling was observed in the NYISO's Energy Market Study.
- The energy market clearing price paid to generators today may not account for all of the costs that a generator would incur if required to cycle frequently.

6. Inertia, Primary Frequency Response, and Voltage Review

- Future reliability needs due to increased renewable energy production may necessitate a review of these products.

Initial Prioritization – Capacity Market

The following will be worked on in 2018:

1. Capacity Eligibility Requirements

- A further review of what is required in order to be eligible to offer capacity may be necessary, beyond that which is currently in process through DER efforts. That effort may need to be expanded to explore potential revisions to better accommodate an increase in renewable resources. This expanded review could include duration of output, metering, performance requirements, etc.

2. Obligations of Capacity Resources

- NYISO capacity suppliers that clear in the market have a number of obligations (e.g., bid, schedule, or notify requirement, GADS submissions, etc.) A review of these may be necessary to ensure obligations are aligned with the needs of the system.

Initial Prioritization – Capacity Market

The NYISO plans to enter the following concept into the project prioritization process for 2019:

Capacity Performance Measurement

- This project would evaluate potential enhancement of the measurement of capacity suppliers' performance (e.g., EFORd).

Initial Prioritization – Capacity Market

The following items may be considered over the longer term:

1. Performance Factors for New Entrant Renewable Resources

- The initial performance factors for Wind and Solar Resources entering the NYISO market are currently fixed values established in the ICAP Manual from a 2005 study.
- These values may need to be updated to better reflect expectations of performance of new entrants.
- May not have much additional benefit, as after entering the market for 1 year, performance is established using actual production data.

2. Retail (End Use) vs. Wholesale Solar Impacts on Capacity Requirements

- Evaluating the treatment of these resources could result in potential enhancements to the load forecasting and requirements setting processes.

3. Forward Capacity Market

- Though this topic has been evaluated a number of times with the determination that the current structure is preferable, the NYISO is open to pursuing this design should it be prioritized by stakeholders.

Next Steps

- We will continue to discuss Carbon Pricing in the Wholesale Markets at Integrating Public Policy Task Force (IPPTF) meetings
- Market Design Concepts to Prepare for Significant Renewable Generation will be discussed at future Market Issues Working Group (MIWG) meetings
 - Detailed timeline information is presented at slide 4

Appendix: Previous Presentations

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Previous Presentations

Date	Working Group	Discussion points and links to materials
9-12-16	Budget & Priorities Working Group (BPWG)	Presentation of stakeholder feedback, proposed scope of the project
10-19-16	Market Issues Working Group (MIWG)	Presentation providing more detail on the scope and timeline of the project
11-22-16	Market Issues Working Group (MIWG)	Presentation updating project status
1-31-17	Market Issues Working Group (MIWG)	Integrating Public Policy Update (Phases 1 and 2)
2-16-17	Market Issues Working Group (MIWG)	Phase 2: Study Description and Assumptions Review
3-28-17	Market Issues Working Group (MIWG)	Phase 2: Study Description and Assumption Update
4-24-17	Market Issues Working Group (MIWG)	Phase 2: Preliminary DAM Results
6-21-17	Market Issues Working Group (MIWG)	Phase 2: Real-time Study Description and Assumptions
7-13-17	ICAP Working Group (ICAP WG)	The ICAP Market - Preliminary Findings (Phase 2)
8-22-17	ICAP Working Group (ICAP WG)	IPP Phase 2 Capacity Market Results and background information
8-25-17	Market Issues Working Group (MIWG)	IPP Phase 2: Simulation Progress
9-25-17	Market Issues Working Group (MIWG)	IPP Phase 2: RT Energy Market Simulation Results
10-3-17	Market Issues Working Group (MIWG)	Presentation discussing market assessment paper
10-16-17	Market Issues Working Group (MIWG)	IPP Phase 3: Initial Concepts under Consideration
11-02-17	Market Issues Working Group (MIWG)	IPP Phase 3: Stakeholder Feedback Posted
12-5-17	Market Issues Working Group (MIWG)	IPP Phase 3: Review of Potential Market Product and/or Structure Enhancements
12-20-17	Market Issues Working Group (MIWG)	Market Assessment for Accommodating Public Policy
1-10-18	Market Issues Working Group (MIWG)	Market Assessment for Accommodating Public Policy: Stakeholder Feedback
1-25-18	Market Issues Working Group (MIWG)	Accommodating Public Policy: Initial Prioritization

Questions?

We are here to help. Let us know if we can add anything.

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits 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 policy makers, stakeholders and investors in the power system



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