

Hybrid Storage: Proposed Market design updates and energy market tariff revisions for Co-located Storage Resources (CSR)

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WebEx

Agenda

- **Project Background**
- **Market Design Overview**
- **Proposed updates for CSR Settlements**
- **Proposed tariff revisions to Market Administration and Control Area Services Tariff (MST)**
- **Next Steps**

Previous Presentations on Market Design Proposal and Tariff revisions

Date	Working Group	Discussion Points and Links to Materials
01-13-20	ICAPWG/MIWG	Hybrid Storage Model Project Kick-Off https://www.nyiso.com/documents/20142/10252714/Hybrid%20Storage%20Model_MIWG_Jan%2013%202019.pdf/caf29abe-a431-a2d1-358d-43326153824a
04-14-20	ICAPWG/MIWG	Hybrid Storage Model – Initial Market Design Concept Overview https://www.nyiso.com/documents/20142/11904936/Hybrid%20Storage%20Model%20MIWG%2004142020%20Final.pdf/08841944-5251-4497-c52b-105151f150ad
05-11-20	ICAPWG/MIWG	Hybrid Storage Interconnection Proposal https://www.nyiso.com/documents/20142/12465245/Hybrid%20Storage%20Interconnection_0511%20MIWG_ICAPWG_FINAL.pdf/0740db02-ac07-e7f4-42b4-0b17da0e82eb
06-30-20	ICAPWG/MIWG	Hybrid Storage: Proposal for participation options https://www.nyiso.com/documents/20142/13434223/Hybrid%20Storage%206.30.2020%20ICAPWG_MIWG%20draft%20v5_final.pdf/176a272a-cc21-08ef-749a-c4a157fe2bc3
07-22-20	ICAPWG/MIWG	Hybrid Storage: Energy Market Participation rules for Co-located Storage Resources https://www.nyiso.com/documents/20142/13960166/Hybrid%20Storage%20ICAPWG%20MIWG%2007.22.20%20Energy%20Market%20Rules%20%20final.pdf/89700275-108e-8002-1e44-aa ffe1712f0e
07-22-20	ICAPWG/MIWG	Hybrid Storage Model: Interconnection and Capacity https://www.nyiso.com/documents/20142/13960166/Hybrid%20Storage%20Interconnection%20and%20Capacity_07222020%20MIWG_FINAL.pdf/e3ba434d-a7ac-21d2-855d-c9cb249da614

Previous Presentations on Market Design Proposal and Tariff revisions(cont'd)

Date	Working Group	Discussion Points and Links to Materials
08-10-20	ICAPWG/MIWG	Hybrid Storage: Market Design for Co-located Storage Resources https://www.nyiso.com/documents/20142/14404876/Hybrid%20Storage%20ICAPWG%20MIWG%20081020%20final.pdf/f414f66a-eee0-3a3c-393d-6b075fe5a1ba
08-19-20	ICAPWG/MIWG	Hybrid Storage: Proposed Energy market tariff revisions for Co-located Storage Resources (CSR) https://www.nyiso.com/documents/20142/14617012/02_Hybrid%20Storage%20Energy%20tariff%20ICAPWG%20MIWG%2008.19.20%20draft%20final.pdf/a6b81cb1-fe9a-72cd-2a8f-75befefc4afa
08-19-20	ICAPWG/MIWG	Hybrid Storage: Proposed CRIS and Interconnections tariff revisions for Co-located Storage Resources (CSR) https://www.nyiso.com/documents/20142/14617012/03_Hybrid%20Storage%20Interconnection%20tariff%20ICAPWG%20MIWG%2008.19.20_FINAL.pdf/dbae9003-8314-e5c0-d0c3-55a7d6384cec
08-25-20	ICAPWG/MIWG	Hybrid Storage: Proposed Market design updates and energy market tariff revisions for Co-located Storage Resources (CSR) https://www.nyiso.com/documents/20142/14757023/Hybrid%20Storage_Market%20Design%20Updates%20%20Energy%20tariff%20ICAPWG%20MIWG%2008.25.20%20draft%20final.pdf/ffb01347-c4bd-24a1-6549-91cda42d8cb3
08-25-20	ICAPWG/MIWG	Hybrid Storage: Proposed Tariff Revisions for Co-located Storage Resources (CSR) https://www.nyiso.com/documents/20142/14757023/CSR%20ICAP%20Tariff%20Revisions.pdf/01796e6b-d1d8-ba86-9ab8-12c7bdf1d6f6

Project Background

A Grid in Transition – The Plan

- Carbon Pricing
- Comprehensive Mitigation Review
- DER Participation Model
- Energy Storage Participation Model
- Hybrid Storage Model

Aligning Competitive Markets and New York State Clean Energy Objectives



- Enhancing Energy & Shortage Pricing
 - Ancillary Services Shortage Pricing
 - Constraint Specific Transmission Shortage Pricing
 - Enhanced Fast Start Pricing
- Review Energy & Ancillary Services Product Design
 - More Granular Operating Reserves
 - Reserve Enhancements for Constrained Areas
 - Reserves for Resource Flexibility

Valuing Resource & Grid Flexibility



- Enhancements to Resource Adequacy Models
- Revise Resource Capacity Ratings to Reflect Reliability Contribution
 - Expanding Capacity Eligibility
 - Tailored Availability Metric
- Capacity Demand Curve Adjustments

Improving Capacity Market Valuation



Project Background

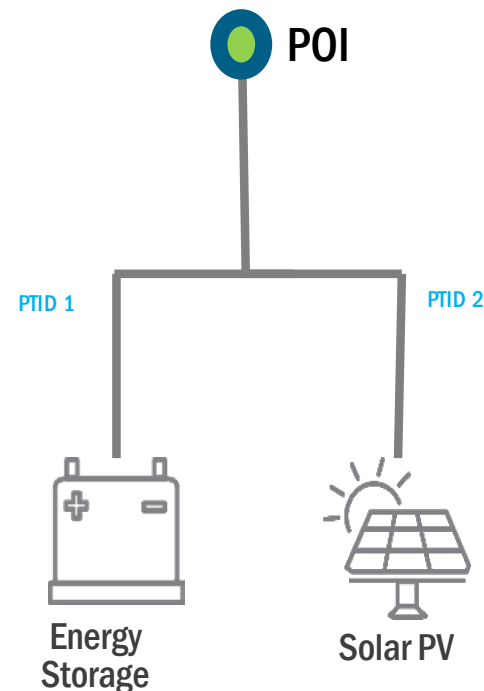
- **This project seeks to explore market participation option(s) for co-located front-of-the-meter generators and energy storage resources**
 - Incentives along with improvements in flexibility and availability are motivating developers to couple generation resources with storage resources
- **Modifications to existing market rules will be developed to accommodate Co-Located Storage Resources (CSR) by the end of 2020**

Market Design Overview for Co-Located Storage Resources (CSR)

CSR: Market Design Overview

- Each unit within a CSR will have a distinct PTID/bid/schedule/settlement
- The NYISO proposes to require a CSR to be represented by a single Billing Organization and to have a single bidding agent
- Units will participate under their own participation model. In the illustrative example shown here, Solar PV will participate as an Intermittent Power resource (IPR) and Energy Storage will participate under Energy Storage Resource (ESR) model
 - Only the ESR unit will be eligible to provide Reserves and Regulation
- The NYISO plans to utilize a CSR scheduling constraint to determine feasible energy and reserve schedule for units within the CSR
- All units within a CSR will be settled at the same LBMP at Point of Injection (POI)

The NYISO intends to walk through several examples on how this model would work at the September 22, 2020 Working Group meeting



Proposed Updates for CSR Settlements

CSR Settlements

- **At August 19,2020 ICAPWG/MIWG, the NYISO proposed that each CSR unit shall specify the CSR Scheduling Limits with its Day-Ahead and Real-Time bids**
 - The NYISO operators will be able to issue an Out of Merit (OOM) to change the CSR Scheduling Limits in Real-Time for ISO/TO reliability or at the Market Participant's request
- **The NYISO is proposing that when the ISO uses Out-of-Merit to reduce the CSR Scheduling Limit for NYCA or local reliability, the Out-of-Merit for NYCA or local reliability designation shall apply to each of the Generators that is subject to the affected CSR Scheduling Limit**

CSR Settlements

- **The NYISO is proposing that the ESR unit will be eligible for DAMAP when the CSR Scheduling Limit is OOM for reliability or the ESR unit is OOM for reliability**
 - This is consistent with the DAMAP rules for standalone ESRs, so no changes to DAMAP eligibility rules for ESR unit within the CSR are needed
 - ESRs are only eligible for DAMAP when they are OOM for reliability¹
 - This proposal is different from NYISO's proposal at August 10, 2020 ICAPWG/MIWG, where NYISO proposed that ESR unit within the CSR would not be eligible for DAMAP
 - Change in proposal is based on the feedback received on the proposal and subsequent internal discussions

1. For more discussion on DAMAP eligibility for ESRs, please refer to the presentation on "ESR Participation Model: Energy Market Design".
<https://www.nyiso.com/documents/20142/2686166/ESR%20Market%20Design%20MIWG%2009212018.pdf/ce0dccc8-f903-35b0-fbf9-74e8311a202e>

Proposed Energy Market Tariff revisions

Partial Set of Proposed Energy Market Tariff Revisions

- Redlined version of Tariff revisions to reflect market participation rules of CSR proposal are posted with today's meeting materials
- Tariff sheets with DER revisions have been used to draft the CSR rules
 - CSR rules are red lined
- Revisions include changes based on Stakeholder's feedback received on initial drafts at August 19, 2020 ICAPWG/MIWG
- Revised sections pertains to
 - MST 2 Definitions
 - MST 4 Market Services: Rights and Obligations
 - MST 15 Rate Schedules

MST 2 - Definitions

- **The NYISO proposes revisions to these sections**
 - 2.1; 2.3; 2.9; 2.15
- **New terms have been added:**
 - **Co-located Storage Resources (“CSR”):** A wind or solar Intermittent Power Resource and an Energy Storage Resource that: (a) are both located behind a single Point of Injection (as defined in Section 1.16 of the OATT); (b) participate in the ISO Administered Markets as two distinct resources; and (c) share a set of CSR Scheduling Limits. Resources that serve a Host Load may not participate in the ISO-Administered Markets as components of a CSR
 - **CSR Scheduling Limits:** The CSR injection Scheduling Limit sets the maximum, combined Regulation Capacity, Operating Reserve and Energy injection schedules for, and the maximum net injection by a CSR’s Generators. The CSR withdrawal Scheduling Limit sets the maximum, combined Regulation Capacity and Energy withdrawal schedules for, and the maximum net withdrawal by a CSR’s Generators
 - Each CSR Generator shall specify the CSR Scheduling Limits with its Day-Ahead and Real-Time Bids

MST Section 2 - Definitions

■ **Additions/revisions to existing defined terms (underlined)**

- **Out-of-Merit:** The designation of Resources committed and/or dispatched by the ISO at specified output limits for specified time periods to meet Load and/or reliability requirements that differ from or supplement the ISO's security constrained economic commitment and/or dispatch. The ISO may also use Out-of-Merit to reduce the CSR injection Scheduling Limit and/or the CSR withdrawal Scheduling Limit to protect NYCA or local reliability. When the ISO does so the Out-of-Merit for NYCA or local reliability designation shall apply to each of the Generators that is subject to the affected CSR Scheduling Limit

MST 4 Market Services: Rights and Obligations

- The NYISO proposes revisions to these sections
 - 4.1.6; 4.2.1.3; 4.2.1.7; 4.4.1.2; 4.4.2.1
- Proposed changes include:
 - A Generator with a real time physical operating problem that makes it impossible for the Generator (a) to operate in the bidding mode in which it was scheduled, or (b) to provide all of the Energy or Ancillary Services offered in its Bids , or (c) to achieve or comply with applicable operating parameters or other requirements, shall notify the NYISO
 - NYISO Operations should be informed if a CSR Scheduling Limit needs to be reduced in real-time
 - Co-located Storage Resources can each offer all of their available capability into the Day-Ahead and Real-Time Markets. The ISO will account for the CSR Scheduling Limits in the schedules and dispatch it issues to CSR Generators
 - Each CSR Generator shall specify the CSR Scheduling Limits with its Day-Ahead and Real-Time bids
 - An Energy Storage Resource's bus can be the Point of Injection for a Bilateral Transaction, but it cannot be the Point of Withdrawal for a Bilateral Transaction

MST 15 Rate Schedules

- **The NYISO proposes revisions to these sections**
 - 15.4.2; 15.4.3
- **Proposed changes include:**
 - The sum of the amount of Energy each CSR Generator is scheduled to provide, the amount of Regulation Service the Energy Storage Resource is scheduled to provide, and the amount of each Operating Reserves product the Energy Storage Resource is scheduled to provide, shall not exceed the CSR injection Scheduling Limit
 - The net of the CSR Generators' Energy Schedules and the amount of Regulation Service the Energy Storage Resource is scheduled to provide shall not exceed the CSR withdrawal Scheduling Limit

Next Steps

Next Steps

- **The NYISO will continue working on addressing questions and concerns raised by stakeholders at the previous ICAPWG/MIWG, and address them at future working group meetings. Some previous questions/concerns that have been addressed include:**
 - Proposal addressing Application of Wind and Solar Output Limit to IPR Generator when CSR Schedule approaches the Scheduling Limit
 - Additional explanation and more examples were presented to stakeholders at 8/25 ICAPWG/MIWG.
 - Proposal on CSR Settlements
 - Questions raised by stakeholders on DAMAP proposal for CSR were addressed in today's 9/8 ICAPWG/MIWG presentation
- **The NYISO is working on developing examples for CSR participation option and intends to discuss them at the September 22, 2020 ICAPWG/MIWG**
- **The NYISO will continue to review its proposed Energy and Ancillary Services Market Tariff revisions with stakeholders as they are developed**
- **NYISO will return to future working groups to discuss Tariff revisions to other sections**

Questions?

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

