

Hybrid Storage: Tariff Revisions for Co-located Storage Resources (CSR)

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Energy Market Design

ICAPWG/MIWG

October 16, 2020

WebEx

Agenda

- **Project Background**
- **CSR Market Design Overview**
- **Continued discussion on CSR Settlements**
 - Market participation charges on injection/withdrawals from CSR units
- **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-aaffe1712f0e |
| 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 |

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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-75befec4afa |
| 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 |
| 09-08-20 | ICAPWG/MIWG | Hybrid Storage: Proposed Market design updates and energy market tariff revisions for Co-located Storage Resources (CSR) https://www.nyiso.com/documents/20142/15078529/Hybrid%20Storage_Market%20Design%20Updates%20%20Energy%20tariff%20ICAPWG%20MIWG%2009.08.20%20final.pdf/fcbb65d6-71d1-c1ac-52e9-8ecb6efb20f7 |

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

| Date | Working Group | Discussion Points and Links to Materials |
|----------|------------------|---|
| 09-22-20 | ICAPWG/MIWG | Hybrid Storage: Participation Examples and Energy Market Tariff Revisions for Co-located Storage Resources (CSR) https://www.nyiso.com/documents/20142/15473217/Hybrid%20Storage_CSR%20examples_%20%20Energy%20tariff%20ICAPWG%20MIWG%2009.22.20%20draft%20final.pdf/944fc9aa-edfb-a77a-3d77-b94c82e74b2c |
| 10-02-20 | ICAPWG/MIWG | Hybrid Storage: Market Design Updates and Tariff Revisions for Co-located Storage Resources (CSR) https://www.nyiso.com/documents/20142/15773723/4%20Hybrid%20Storage_Energy%20tariff%20ICAPWG%20MIWG%2010.02.20%20final.pdf/856b5bb8-175c-cd27-e972-b72c34e58a19 |
| 10-06-20 | ICAPWG/MIWG/TPAS | Hybrid Storage Model: Interconnection Tariff Changes https://www.nyiso.com/documents/20142/15824617/2%20Hybrid%20Storage%20Incremental%20Interconnection%20Tariff%20Changes_100620_FINAL.pdf/f5fd38fc-20fb-b669-66ef-6c9a8d0d15ef |
| 10-06-20 | ICAPWG/MIWG | Hybrid Storage Model: MST Attachment H Tariff Changes https://www.nyiso.com/documents/20142/15824617/3%20Hybrid%20Storage%20Attachment%20H%20Tariff%20Changes_100620_FINAL.pdf/e5a54b2-d8f8-16cb-3aab-31622215a08f |

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



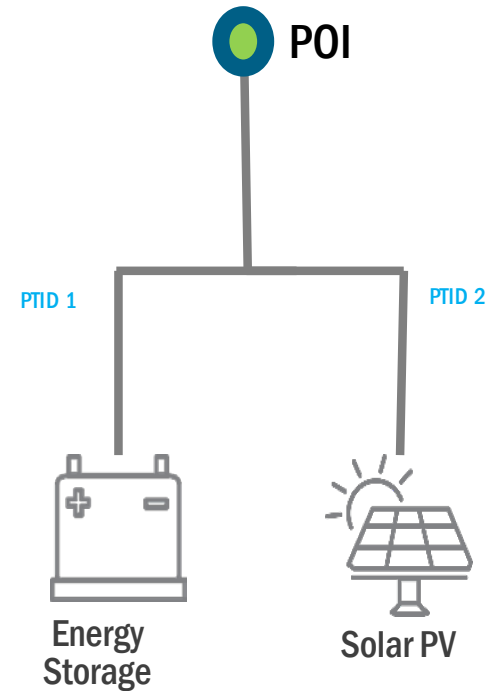
Project Background

- **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 CSR by the end of 2020**

CSR Market Design Overview

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 schedules for units within the CSR
- All units within a CSR will be settled at the same LBMP at the Point of Injection (POI)



Continued discussion on CSR Settlements

Market Participation Charges for CSR Generators

- **ISO annual budget charges and annual FERC fees will be assessed on the total MWh injections and withdrawals by CSR units**
 - For the purposes of these charges/fees, withdrawals from ESR are considered negative injections and counted as Injection Billing Units¹
 - This treatment is consistent with the proposal that the two units in the CSR participation option participate as distinct resources in the wholesale market

1. Please refer to OATT 6.1 Rate Schedule 1 for more details on these charges/fees

Proposed Tariff Revisions

Proposed Tariff Revisions

- **Redlined version of Tariff revisions to reflect market participation rules of CSR proposal are posted with today's meeting materials**
- **Revised sections pertains to**
 - MST 2.1 Definitions
 - MST 15 Rate Schedules
 - MST 23.3 Att H - ISO Market Power Mitigation Measures
- **With regard to new or revised definitions included in the Services Tariff (MST), NYISO will make conforming changes to OATT definitions, or will add a cross-reference in the OATT to the term defined in the MST**

MST 2 Definitions

- **The NYISO proposes revisions to Section 2.1**
- **Proposed changes expand the definition of “Actual Energy Withdrawal” to:**
 - Conform the MST definition to the currently effective OATT definition
 - For purposes of the allocation of the ISO annual budgeted costs and the annual FERC fee pursuant to Rate Schedule 1 of this ISO OATT, withdrawals shall also include the absolute value of negative withdrawals by Load for behind the meter generation.
 - Make clarifying changes to the definition for assessing TSC and NTAC
 - For purposes of assessing TSC and NTAC, Actual Energy Withdrawals shall include the absolute value of negative injections by Energy Storage Resources in accordance with Section 2.7 of the OATT.

MST 15 Rate Schedules

- **Minor revision to MST 15.2 based on Stakeholder's feedback at 10/02/2020 ICAPWG/MIWG. The change is highlighted in yellow in the posted tariff sheet.**

MST 23 Att H - ISO Market Power Mitigation Measures

- **The NYISO proposes revisions to Section 23.3.1.1 and 23.3.3.3.2.1.6**
- **Proposed changes to 23.3.1.1 to include CSR Scheduling Limit under the existing Energy market physical withholding rules**
- **Propose change to 23.3.3.3.2.1.6 to clarify that the demonstrated opportunity costs only need to differ from (not necessarily exceed) the opportunity cost used in the reference level**
 - This recognizes that an ESRs opportunity costs can be impacted if the ESR must incur a higher cost to charge (withdraw) in order to respond to a SRE or OOM commitment/dispatch

Next Steps

Next Steps

- **NYISO will return to future working groups to discuss Tariff revisions to other sections**
- **BIC vote**
 - Target date is November 11, 2020
- **MC vote**
 - Target date is November 18, 2020
- **FERC filing**
 - Q1 2021
- **Deployment**
 - Q4 2021

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

