New York ISO
Independent System Operator

Hybrid Storage: Proposed CRIS and Interconnections tariff revisions for Co-located Storage Resources (CSR)

Amanda Myott

Capacity Market Design

ICAPWG/MIWG

August 19, 2020

WebEx

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

Agenda

- Project Background
- Market Design Overview
- Overview of Proposed CRIS and Interconnection Rules for CSRs (substantive changes from those presented previously are noted in red)
- Proposed revisions to Open Access Transmission Tariff (OATT)
- Next Steps

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

Previous Presentations on Market Design Proposal

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

k ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

Previous Presentations on Market Design Proposal (cont'd)

Date	Working Group	Discussion Points and Links to Materials
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
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

Red text denotes substantive changes from those presented previously

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

Project Background

New York ISO

© COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED.

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

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

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**

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

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

New York ISO

© COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED.

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 LBMP at Point of Injection to the transmission or distribution system (POI)

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

Overview of CRIS and Interconnection Rules for CSRs

New York ISO

© COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED.

CRIS and Interconnection Rules for CSRs

- For any facility proposing to interconnect as a multi-unit facility behind the same Point of Injection, all units within the multi-unit facility may be included in a single Interconnection Request (IR)
- Each CSR may be studied in the interconnection process as a single facility with a single CSR ERIS and CRIS value, allocated to each unit (such that each unit, with its own PTID, will have its own ERIS and CRIS value)
- Maximum Permissible Requested ERIS and CRIS
  - ERIS and CRIS values may not exceed the injection capability of each unit
  - ERIS for the Intermittent Power Resource cannot exceed the CSR Injection Capability Resource plus the full withdrawal capability of the Energy Storage Resource
  - The sum of CRIS among all units may not exceed the injection limit for the total facility
  - While the sum of ERIS among all units may exceed the CSR injection limit, energy injection at the POI may not exceed the CSR injection, as described in the examples on subsequent slides
  - Units within the CSR may request ERIS below the nameplate for the unit in order to avoid upgrading injection capability, provided proper control technologies are in place

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

CRIS and Interconnection Rules for CSRs

- Proposed transition rules enable projects that currently have separate positions in the Interconnection Queue to combine and proceed under a single Interconnection Request as a CSR if:
  - Both projects propose to be behind the same Point of Injection,
  - Both projects are in the queue as of the effective date of the tariff revisions, and
  - A single individual or entity submits a revised Interconnection Request for the combined project
- The CSR (and any other multi-unit facility evaluated as a single project) will have a single Interconnection Agreement (IA); however projects that propose a configuration or which there are no market rules will require language limiting the facility to operating under current market rules
  - For example, a proposed combined cycle plus energy storage may proceed under a single IR and single IA, but may not operate in the market as a hybrid resource without market rules allowing for such participation

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

Interconnection Examples

- The scenarios below illustrate the amount of ERIS and CRIS that units within a CSR would be eligible to receive based on whether injection capability is limited by unit-level equipment (such as PV inverter) and/or facility-level equipment (shared inverter, GSU, etc.)
  - In the examples on this slide, unit-level injection capability is sized to unit nameplate

	Example 1: CSR IL=150 MW	Example 2 : CSR IL=100 MW	Example 3 : CSR IL = 70 MW
Eligible ERIS (MW)	PV <= 100 ESR <= 50	PV <= 100 ESR <= 50	PV <= 100* ESR <= 50
Eligible CRIS (MW)	PV + ESR <=150 PV <= 100 ESR <= 50	PV + ESR <=100 PV <= 100 ESR <= 50	PV + ESR <=70 PV <= 70 ESR <= 50

*ERIS may only exceed the CSR IL in the case where both CSR units are in the same Interconnection Request

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

Interconnection Examples

- **The scenarios below illustrate the amount of ERIS and CRIS that units within a CSR would be eligible to receive based on whether injection capability is limited by unit-level equipment (such as PV inverter) and/or facility-level equipment (shared inverter, GSU, etc.)**
  - In the examples on this slide, PV injection capability is undersized compared to unit nameplate

	Example 1: CSR IL=130MW	Example 2 : CSR IL=80 MW	Example 3 : CSR IL = 70 MW
Eligible ERIS (MW)	PV <= 80 ESR <= 50	PV <= 80 ESR <= 50	PV <= 80* ESR <= 50
Eligible CRIS (MW)	PV + ESR <= 130 PV <= 80 ESR <= 50	PV + ESR <= 80 PV <= 80 ESR <= 50	PV + ESR <= 70 PV <= 70 ESR <= 50

* ERIS may only exceed the CSR IL in the case where both CSR units are in the same Interconnection Request

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

Proposed CRIS and Interconnection Tariff revisions for CSR

New York ISO

© COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED.

Proposed CRIS and Interconnection Tariff Revisions

- Tariff revisions to reflect the CRIS and interconnection segments of CSR proposal are posted with today's meeting materials
- Revised sections:
  - OATT Section 25 (Attachment S)
  - OATT Section 30 (Attachment X)
  - OATT Section 32 (Attachment Z)

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

OATT Section 25 (Attachment S)

- **Proposed revisions to OATT 25 Attachment S, include changes to following sections (additional sections include ministerial edits or edits to use new defined terms):**
  - 25.1 (Purpose of Rules and Definitions)
  - 25.3.1 (CRIS increases)
  - 25.6.2.3.1 (Regulatory Milestone Requirements)
  - 25.7.6 (CRIS values)
  - 25.8.1 (Maximum Requested CRIS)
  - 25.9.3 and 25.9.4 (CRIS Retention and CRIS Transfers)
  - 25.11 (Expedited Deliverability Study Agreement data form)

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

OATT Section 25 (Attachment S)

- **Primary changes covered in the proposed revisions include - max permissible CRIS requests, allocation of CRIS among multiple units, and CRIS transfers provisions**
  - New defined term "Project" to avoid confusion with the term "facility," particularly in the context of multi-unit facilities like CSRs
  - CRIS request cannot exceed the maximum injection capability in MW for the full facility as described in the Interconnection Request
  - The MW level of CRIS for a Project comprised of multiple units (*e.g.*, Co-located Storage Resource) will be determined at the Project level but will be allocated among the multiple units, as requested by Developer in the Class Year Interconnection Facilities Study Agreement or Expedited Deliverability Study Agreement, as applicable.

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

OATT Section 25 (Attachment S)

- The final CRIS allocation for the Project and each individual unit will be set forth in the Operating Committee-approved Class Year Deliverability Study Report or Expedited Deliverability Study Report, as applicable
- CRIS can only be transferred at the same electrical location if all units in the facility deactivate
- The 2 MW CRIS increase not subject to deliverability is available only for the total facility (i.e., the Intermittent Power Resource and ESR within a single "facility" for interconnection purposes cannot obtain this 2 MW increase for each unit in the CSR)
- For facilities 2 MW and smaller that are not subject to deliverability, the 2 MW is calculated based on total facility size (i.e., a CSR with a 2 MW ESR and a 2 MW solar cannot obtain any CRIS without being subject to deliverability)
- Regulatory milestone requirements for a project apply to all units in the CSR (or other multi-unit facility)

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

OATT Section 30 Attachment X and OATT Section 32 Attachment Z

- **Proposed revisions to OATT Section 30 (Attachment X) and OATT Section 32 (Attachment Z), include changes to following sections:**
  - 30.1 and 32.1 (Definitions)
  - 30.3 and 32.4 (General provisions and Interconnection Request requirements)
  - 30.4.3, 30.4.4, 32.1.4.1 (Transition Rule)
  - 30.14 and 32.5 (Interconnection Request forms, study agreement data forms)

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

OATT Section 30 Attachment X and OATT Section 32 Attachment Z

- **Primary changes covered in the proposed revisions include – updates to data forms for interconnection requests, and transition rules for projects in the interconnection queue**
  - New defined term "Project" to avoid confusion with the term "facility," particularly in the context of multi-unit facilities like CSRs
  - Revisions to definitions to "Interconnection Request" and other provisions to encompass multi-unit facilities in the Large Facility Interconnection Procedures (already permitted in the Small Generator Interconnection Procedures)
  - Revisions to data forms to collect additional information relevant to multi-unit facilities and to streamline the data forms across the interconnection procedures

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

OATT Section 30 Attachment X and OATT Section 32 Attachment Z

- Revisions to Interconnection Request requirements:
  - A facility comprised of multiple co-located units behind the same Point of Injection will be considered a single Large Generating Facility, provided the Interconnection Request identifies a single Developer for purposes of the Project
- Transition Rule: For a Project in the Interconnection Queue, the Developer may modify the Project by combining it with another Project in the Interconnection Queue, even if the Projects are different technologies; provided the following requirements are met:
  - The Projects must share a single Point of Injection
  - A single Developer must submit a revised Interconnection Request reflecting the modification as well as identifying the Developer of record for purposes of the interconnection process
  - Developer of record must demonstrate the manner in which such Developer maintains site control for the Projects it seeks to combine

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

Next Steps

New York ISO

© COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED.

Next Steps

- Return to future working groups to review and discuss Tariff revisions to other sections

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED

Questions?

New York ISO

© COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED.

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

New York ISO

©COPYRIGHT NYISO 2020. ALL RIGHTS RESERVED