New York ISO
Independent System Operator

Hybrid Aggregated Storage (HSR) Model – Tariff Modifications, Energy and Settlements

Francesco Biancardi and Katherine Zoellmer

New Resource Integration

MIWG/ICAPWG

September 12, 2022

Agenda

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Previous HSR Presentations (2022)

Date	Working Group	Topic/Links to Materials
March 25th, 2022	MIWG/ICAPWG	Hybrid Storage Model – Energy and Capacity Market Design Proposal
May 11th, 2022	MIWG/ICAPWG	NYISO Hybrid Aggregated Storage Resource (HSR) Model Use Case and Proposal Update
July 15th, 2022	MIWG/ICAPWG	Hybrid Aggregated Storage (HSR) Model – Energy and Ancillary Services Market Design Proposal Update
August 9th, 2022	MIWG/ICAPWG	Hybrid Aggregated Storage (HSR) Model – Energy and Capacity Market Design Proposal
August 24th, 2022	MIWG/ICAPWG	Hybrid Storage Model – CSR Market Design Proposal Updates

Project Background

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Project Background

- **An HSR consists of at least one Energy Storage Resource (ESR) and at least one Intermittent Power Resource (IPR) and/or Run-of-River (RoR) Hydro**
  - This model will support Wind, Solar, Landfill Gas, RoR Hydro, and ESR(s) that aggregate and share a POI operating as a single dispatchable resource
- **As part of the HSR project, the Co-located Storage Resource (CSR) model will be updated to allow for:**
  - An ESR + a Landfill Gas Generator
  - An ESR + a RoR Hydro Generator
  - An ESR + a Fast-Start Resource

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Overview of Tariff Changes

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Overview of Tariff Changes

- The following proposed modifications to the Market Administration and Control Area Services Tariff (MST) and the Open Access Transmission Tariff (OATT) address updates needed for Hybrid Storage Resource participation model and the Co-located Storage model regarding Energy, Operating Reserves, Voltage Support Service and related Settlements
- The rules for HSR generally parallel those for ESR or CSR. As such, the following sections include additions to rules currently in place to also account for HSR:
  - E.g., in MST 4.4.1.1, the following language is proposed: "RTC will treat Behind-the-Meter Net Generation Resources, Hybrid Storage Resources and Energy Storage Resources as already being committed and available to be scheduled."
  - ESR rules: MST 4.4.1.1, MST 4.4.3.1.1, MST 4.5.2.1, MST 15.3A.1.2, MST 15.3A.2, MST 15.4.2.1, MST 15.4.3.1, MST 17.1.3, MST 18.4.2, MST 18.5.2, MST 25.2.1, OATT 2.7.2.1.5, OATT 2.7.2.4.4
  - CSR rules: MST 8.2

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MST 2 – Definitions

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MST 2 – Definitions

- **The NYISO proposes changes to the following terms:**
  - MST 2.1 – Actual Energy Withdrawals
  - MST 2.3 – Capacity Limited Resource, Co-Located Storage Resources, Compensable Overgeneration, CSR Scheduling Limits
  - MST 2.5 – Energy Limited Resource
  - MST 2.12 – Lower Operating Limit
  - MST 2.14 – Normal Upper Operating Limit
  - MST 2.15 – Out-of-Merit
  - MST 2.18 – Resource
- **The NYISO proposes to introduce the following terms:**
  - MST 2.8 – Hybrid Storage Resource
  - MST 2.15 – Operating Reserve Limit

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MST 2.1 – Actual Energy Withdrawals

- **The update includes consideration for HSR**
- **The NYISO proposes the updating a portion of the definition of Actual Energy Withdrawals to read:**
  - Energy withdrawals which are either: (1) measured with a revenue-quality real-time meter; (2) assessed (in the case of Load Serving Entities ("LSEs") serving retail customers where withdrawals are not measured by revenue-quality real-time meters) on the basis provided for in a Transmission Owner's retail access program; or (3) calculated (in the case of wholesale customers where withdrawals are not measured by revenue-quality real-time meters), until such time as revenue-quality real-time metering is available on a basis agreed upon by the unmetered wholesale customers. For purposes of the allocation of the ISO annual budgeted costs and the annual FERC fee pursuant to Rate Schedule 1 of the ISO OATT, withdrawals shall also include the absolute value of negative withdrawals by Load for behind the meter generation. For purposes of assessing TSC and NTAC, Actual Energy Withdrawals shall include the absolute value of negative injections by Energy Storage Resources and Hybrid Storage Resources in accordance with Section 2.7 of the OATT.

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MST 2.3 – Capacity Limited Resource

- The proposed update precludes Capacity Limited Resources from participating as an ESR or HSR
- The NYISO proposes the following addition to the definition of Capacity Limited Resource:
  - Resources that meet the qualifications to be a Capacity Limited Resource, and choose to participate in the wholesale market as a Capacity Limited Resource, are not subject to the rules applicable to Energy Storage Resources or Hybrid Storage Resources.
- The proposed addition is consistent with the language for Energy Limited Resource. It indicates that CLR and HSR (and ESR) are mutually exclusive.

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MST 2.3 – Co-located Storage Resource

- **The proposed update incorporates landfill gas, Limited Control Run-of-River Hydro Resources, and Fast-Start Resources as eligible configurations for the CSR Participation Model**
- **The NYISO proposes the following updated definition for Co-located Storage Resource ("CSR"):**
  - A wind, ~~or~~ solar or landfill gas Intermittent Power Resource, or a Limited Control Run-of-River Hydro Resource, or a Fast-Start 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 Generators; and (c) share a set of CSR Scheduling Limits. Resources that serve a Host Load may not participate in the ISO-Administered Markets as a component of a CSR.

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MST 2.3 – CSR Scheduling Limit

- This proposed modification extends the application of the Wind and Solar Output Limit to landfill gas IPRs and Limited Control Run-of-River Hydro Resources that participate in a CSR
- A Wind and Solar Output Limit will only apply to a landfill gas IPR or a Limited Control Run-of-River Hydro Resource under the circumstances described below
- The NYISO proposes updating a portion of the definition for CSR Scheduling Limit to read:
  - To address the real-time variability of Energy deliveries from ~~wind and solar~~the Intermittent Power Resource~~s~~ or Limited Control Run-of-River Hydro Resource that participate as Co-located Storage Resources, when the participating Energy Storage Resource has a non-zero Regulation and/or Operating Reserves schedule or is dispatched to inject Energy, and the sum of the participating Energy Storage Resource's and the participating ~~wind or solar~~ Intermittent Power Resource's or Limited Control Run-of-River Hydro Resource's Energy, Regulation Service and Operating Reserves Schedules is greater than or equal to a specified percentage of the CSR injection Scheduling Limit, then the ISO will issue a Wind and Solar Output Limit to the Intermittent Power Resource or Limited Control Run-of-River Hydro Resource to not exceed its Base Point Signal. The specified percentage that is ordinarily used will be posted on the ISO's website.

New York ISO

MST 2.3 – Compensable Overgeneration

- **The proposed modifications to compensable overgeneration account for the incorporation of landfill gas IPRs and Limited Control Run-of-River Hydro Resources into the CSR Model**
- **The NYISO proposes updating a portion of definition for Compensable Overgeneration to read:**

For (i) Suppliers not covered by other provisions of this Section, and (ii) Intermittent Power Resources depending on wind or solar energy as their fuel for which the ISO has imposed a Wind and Solar Output Limit in the given RTD interval, and (iii) Intermittent Power Resources depending on landfill gas as their fuel or Limited Control Run-of-River Hydroelectric Resources that participate as CSR for which the ISO has imposed a Wind and Solar Output Limit in the given RTD interval, Compensable Overgeneration shall initially equal three percent (3%) of the Supplier's Normal Upper Operating Limit which may be modified by the ISO if necessary to maintain good Control Performance.

For a Generator: (i) which is operating in Start-Up or Shutdown Periods, or Testing Periods; or (ii) which is a Limited Control Run of River Hydro Resource that has offered its Energy to the ISO in a given interval not using the ISO-committed Flexible or Self-Committed Flexible bid mode (except as provided above); or (iii) which is an Intermittent Power Resource that depends on landfill gas for its fuel and has offered its Energy to the ISO in a given interval not using the ISO-committed Flexible or Self-Committed Flexible bid mode (except as provided above); or (iv) which is an Intermittent Power Resource that depends on wind or solar energy for its fuel (except as provided above), Compensable Overgeneration shall mean all Energy actually injected by the Generator that exceeds the Real-Time Scheduled Energy Injection established by the ISO for that Generator~~; provided however, this definition of Compensable Overgeneration shall not apply to an Intermittent Power Resource depending on wind or solar energy as its fuel for any interval for which the ISO has imposed a Wind and Solar Output Limit.~~

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MST 2.5 – Energy Limited Resource

- **The proposed language modifies the Energy Limited Resource Definition to preclude participation as (part of) a Hybrid Storage Resource**
- **The NYISO proposes the following updated definition for Energy Limited Resource to read:**
  - Capacity resources, not including BTM:NG Resources, that, due to environmental restrictions on operations, cyclical requirements, such as the need to recharge or refill, or other non-economic reasons, are unable to operate continuously on a daily basis, but are able to operate for at least four consecutive hours each day. Energy Limited Resources must register their Energy limiting characteristics with, and justify them to, the ISO consistent with ISO Procedures. Resources that meet the qualifications to be an Energy Limited Resource, and choose to participate in the wholesale market as an Energy Limited Resource, are not subject to the rules applicable to Energy Storage Resources or Hybrid Storage Resources.

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MST 2.8 – Hybrid Storage Resource

- **The NYISO proposes to add the following new definition for Hybrid Storage Resource ("HSR") to MST Section 2.8:**

  Hybrid Storage Resource ("HSR"): At least one Intermittent Power Resource (wind, solar or landfill gas) or Limited Control Run-of-River Hydro Resource and at least one Energy Storage Resource (at least two Generators) that: (a) are all located behind a single Point of Injection (as defined in Section 1.16 of the OATT) that is capable of injecting more than 20 MW; and (b) participate in the ISO Administered Markets together as a single Resource that is expected to be capable of following the ISO's dispatch instructions. A HSR is not permitted to share metering or telemetry with Load, other than its own station service load.

  Where there are not HSR-specific rules or exceptions, a HSR follows the rules that apply to Generators. A HSR can register to be, but is not required to be eligible to withdraw Energy. Energy withdrawals by HSRs follow the rules for self-managed Energy Storage Resources. The ISO will not consider a HSR's State of Charge when it develops dispatch instructions for, or issues Energy or Ancillary Service schedules to, the HSR.

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MST 2.12 – Lower Operating Limit

- The proposed modification prevents HSRs from using modifications to their Lower Operating Limit to self-schedule to inject Energy. HSRs may self-schedule by submitting appropriate DA or RT Bids.
- The NYISO proposes the following updated definition for Lower Operating Limit to read:
  - For an Energy Storage Resource or a Hybrid Storage Resource, the maximum amount of megawatts the Resource can consume from the grid, if it is bidding to withdraw Energy, or the minimum amount of MW the Resource can supply the grid if it is not bidding to withdraw Energy. The Lower Operating Limit of an ISO-Managed Energy Storage Resource that is not bidding to withdraw Energy shall not be set to less than 0 MW. The Lower Operating Limit of a Hybrid Storage Resource shall not be set to greater than 0 MW.

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MST 2.14 – Normal Upper Operating Limit

- **The proposed modification requires that an HSR's UOL_N be not less than 0 MW**
  - Prevents modification of UOLn to be used to self-scheduling to charge. HSRs may self-schedule by submitting appropriate DA or RT Bids.
- **The NYISO proposes the following updated definition for Normal Upper Operating Limit ("UOL_N") to read:**
  - The upper operating limit that a Generator, except for the Generator of a BTM:NG Resource, indicates it expects to be able to reach, or the upper operating limit a BTM:NG Resource indicates it expects to be able to inject into the grid after serving its Host Load and subject to its Injection Limit, or the maximum amount of demand that a Demand Side Resource expects to be able to reduce, during normal conditions. Each Resource will specify its UOL_N in its Bids which shall be reduced when the Resource requests that the ISO derate its Capacity or the ISO derates the Resource's Capacity. A Normal Upper Operating Limit may be submitted as a function depending on one or more variables, such as temperature or pondage levels, in which case the Normal Upper Operating Limit applicable at any time shall be determined by reference to that schedule. Bids for Self-Managed Energy Storage Resources may include a negative UOL_N when the Resource bids to withdraw Energy from the grid. The UOL_N for ISO-Managed Energy Storage Resources or a Hybrid Storage Resource shall not be lower than 0 MW.

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MST 2.15 – Operating Reserve Limit

- **The NYISO proposes the addition of a new definition for Operating Reserve Limit to MST Section 2.15:**
  - The upper limit (in MW) of the injection capability of a Hybrid Storage Resource to provide Operating Reserves that are sustainable for one hour. The ability of a Hybrid Storage Resource to provide Operating Reserves shall be based on the capabilities of the participating Energy Storage Resource.

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MST 2.15 – Out-of-Merit

- The update includes consideration for HSR in the definition
- The NYISO proposes updating a portion of the definition for Out-of-Merit to read:
  - The ISO may also use Out-of-Merit to reduce the CSR injection Scheduling Limit and/or the CSR withdrawal Scheduling Limit, and/or a Hybrid Storage Resource's Upper Operating Limit or its Lower Operating 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 the Hybrid Storage Resource, or to each of the Generators that is subject to the affected CSR Scheduling Limit.

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MST 2.18 – Resource

- **The proposed update incorporates HSRs into the existing definition of Resource:**
  - An Energy Limited Resource, Energy Storage Resource, Limited Energy Storage Resource, Generator, Hybrid Storage Resource, Installed Capacity Marketer, Special Case Resource, Intermittent Power Resource, Limited Control Run of River Hydro Resource, municipally-owned generation, System Resource, BTM:NG Resource, Demand Side Resource or Control Area System Resource.

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MST 4 – Market Services: Rights and Obligations

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MST 4 – Market Services: Rights and Obligations

- **The NYISO proposes changes to the following sections:**
  - MST 4.2.1.3.1 – General Rules
  - MST 4.2.1.3.2 – Bid Parameters
  - MST 4.2.1.7 – Bilateral Transactions
  - MST 4.2.3 – Security Constrained Unit Commitment ("SCUC")
  - MST 4.2.3.1 – Reliability Forecast for the Dispatch Day
  - MST 4.4.1.1 – Real-Time Commitment ("RTC") – Overview
  - MST 4.4.1.2 – Bids and Other Requests
  - MST 4.4.1.2.1 – Real-Time Bids to Supply or Withdraw Energy and Supply Ancillary Services, other than External Transactions
  - MST 4.4.3.1.1 – Reserve Pickup
  - MST 4.5.2.1 – General Rules for Suppliers
- **The NYISO proposes to introduce the following new sections:**
  - MST 4.2.1.3.5 – Additional Parameters for Hybrid Storage Resources

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MST 4.2.1.3.1 – General Rules

- The proposed updates to MST 4.2.1.3.1 discuss HSR bidding in the Day-Ahead Market, including the new bidding parameter: Operating Reserve Limit
- Proposed new language:
  - A Supplier's Day-Ahead Bids for a Hybrid Storage Resource to withdraw Energy and to inject Energy shall be submitted as a single, continuous, bid curve representing the Capacity, in MW, available for commitment in the Day-Ahead Market for each hour of the Dispatch Day. A Hybrid Storage Resource may not submit a LOL that exceeds zero MW, or a UOL that is less than zero MW.
- Proposed updated language:
  - If a Supplier that is eligible to provide Operating Reserves does not submit a Day-Ahead Availability Bid for Operating Reserves, its Day-Ahead Bid shall be rejected in its entirety. A Hybrid Storage Resource must submit an Operating Reserve Limit with each of its hourly Bids. A Behind-the-Meter Net Generation Resource that is comprised of more than one generating unit that is dispatched as a single aggregate unit at a single PTID is not qualified to provide Regulation Service or Spinning Reserves.

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MST 4.2.1.3.2 – Bid Parameters

- **The proposed modification to MST 4.2.1.3.2 requires that an ESR and a Generator, including Fast-Start Resources, within a CSR cannot submit bids greater than the CSR Scheduling Limits**
- **Proposed language:**
  - Co-located Storage Resources must each submit a CSR injection Scheduling Limit and a CSR withdrawal Scheduling Limit for each hour of the Day-Ahead Market to indicate the expected capability of the relevant facilities. ~~An Energy Storage~~ Resources that participate~~s in~~ as CSR shall not submit Day-Ahead Market Bids that would Self-Commit either of the Generators, or both of the Generators together, to inject or to withdraw a quantity of Energy that exceeds an applicable CSR Scheduling Limit. An Energy Storage Resource that participates as Co-located Storage Resources with a Fast-Start Resource shall not submit Real-Time Market Bids that would Self-Commit the Energy Storage Resource to inject Energy such that the Fast-Start Resource's Minimum Generation (which is equal to the full output of a Fixed Block Unit), plus the Energy Storage Resource's Self Schedule, exceeds the CSR injection Scheduling Limit.

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MST 4.2.1.3.5 – Additional Parameters for Hybrid Storage Resources

- The new proposed language describes the Operating Reserve Limit, which is a new bidding parameter developed for HSR
- Proposed new language:
  - In addition to the parameters that Suppliers submit for Generators, Hybrid Storage Resources must also submit an Operating Reserve Limit for each hour of the Day-Ahead Market to indicate the Operating Reserves that the Hybrid Storage Resource reasonably expects to be capable of sustaining for one hour.

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MST 4.2.1.7 – Bilateral Transactions

- **The proposed modification to MST 4.2.1.7 allows for an HSR to be eligible to be a Point of Injection for a Bilateral Transaction**
- **Proposed language:**
  - Transmission Customers requesting Bilateral Transaction schedules shall identify hourly Transaction quantities (in MW) by Point of Injection and Point of Withdrawal, minimum run times associated with Firm Point-to-Point Transmission Service, if any, and shall provide other information (as described in ISO Procedures). Like other Generators, an Energy Storage Resource's or a Hybrid 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.

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MST 4.2.3 – Security Constrained Unit Commitment ("SCUC")

- **The proposed modification to MST 4.2.3 specifies that an HSR is a dispatchable resource, and the ISO will consider the Operating Reserve Limit for an HSR when determining its schedule**
- **Proposed language updates:**
  - The schedule will include commitment of sufficient Generators and/or Demand Side Resources to provide for the safe and reliable operation of the NYS Power System. SCUC will treat a Behind-the-Meter Net Generation Resources, Hybrid Storage Resources and Energy Storage Resources as already being committed and available to be scheduled. Pursuant to ISO Procedures, the ISO may schedule any Resource to run above its UOLn up to the level of its UOLe.
  - In the development of its SCUC schedule, the ISO may commit and de-commit Generators and Demand Side Resources, based upon any flexible Bids, including Minimum Generation Bids, Start-Up Bids, Curtailment Initiation Cost Bids, Energy, and Incremental Energy Bids and Decremental Bids received by the ISO provided however that: (a) the ISO shall commit zero megawatts of Energy for Demand Side Resources committed to provide Operating Reserves and Regulation Service; ~~and~~ (b) for Behind-the-Meter Net Generation Resources, the ISO will consider for dispatch only those segments of the Resource's Incremental Energy Bids above the forecasted Host Load and subject to the Injection Limit; and (c) the ISO shall account for the Operating Reserve Limit a Hybrid Storage Resource submits in determining its SCUC schedule.

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MST 4.2.3.1 – Reliability Forecast for the Dispatch Day

- **The proposed modification to MST 4.2.3.1 discusses the use of the NYISO's electronic portal that is in development as part of the DER project (GOCP) by a Transmission Owner to submit a request for HSR availability**
- **Proposed language:**
  - A Transmission Owner may request commitment of additional Generators for a Dispatch Day following the close of the Day-Ahead Market to meet changed or local system conditions for the Dispatch Day that may cause the Day-Ahead schedules for the Dispatch Day to be inadequate to ensure the reliability of its local system. A Transmission Owner will use the ISO's electronic portal to request the availability of an additional Hybrid Storage Resource. The ISO will use SRE to fulfill a Transmission Owner's request for additional units.

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MST 4.4 – Real-Time Markets and Schedules

- The NYISO proposes updates to the following sections to address Real-Time Commitment, Bidding, and Reserve Pickups for HSRs/CSRs, and an explanation of the Operating Reserve Limit for HSRs:
  - MST 4.4.1.1
  - MST 4.4.1.2
  - MST 4.4.1.2.1
  - MST 4.4.3.1.1
- See MST 4.4 in the attached meeting materials for the complete proposed language

New York ISO

MST 8 – Eligibility for ISO Services

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MST 8.2 – Additional Requirements Applicable to Suppliers

- **The updates include HSR in the CSR bidding entity requirements**
- **Proposed language:**
  - Generators that participate in the ISO Administered Markets together as Hybrid Storage Resources or Co-located Storage Resources must share the same bidding entity and the same billing organization. Market Participants and owners of Hybrid Storage Resources or Co-located Storage Resources must provide the ISO at least 60 days advance written notice in order to change the bidding entity or the billing organization for a set of Hybrid Storage Resources or Co-located Storage Resources, and a change of billing organization will only be effectuated on the first day of a month.

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MST 15 – ISO Market Administration and Control Area Service Tariff Rate Schedules

MST 15 – ISO Market Administration and Control Area Service Tariff Rate Schedules

- **The NYISO proposes changes to the following sections:**
  - MST 15.2.2.1 – Annual Payment for Voltage Support Service
  - MST 15.3A.1.1 – Overgeneration Charges
  - MST 15.3A.1.2 – Persistent Over-Withdrawal Charges
  - MST 15.3A.2 – Exemptions
  - MST 15.4.1.3 – Other Supplier Requirements
  - MST 15.4.2.1 – Bidding and Bid Selection
  - MST 15.4.3.1 – Bid Selection
  - MST 15.4.3.5 – Performance Tracking and Supplier Disqualifications

New York ISO

MST 15.2.2.1 – Annual Payment for VSS

- The updates address HSR and CSR compensation for Voltage Support Service
- Proposed language:
  - For VSS Suppliers that are ~~CSR~~ Generators that participate in a CSR, compensation for each VSS Supplier shall be limited to the lesser of its Reactive Power capability, demonstrated in accordance with ISO procedures, or the total Reactive Power capability at the CSR's Point of Injection/Point of Withdrawal. For a Hybrid Storage Resource, VSS compensation shall be limited to the lesser of the Reactive Power capability of the participating Generators, demonstrated in accordance with ISO procedures, or the total Reactive Power capability at the Hybrid Storage Resource's Point of Injection. Otherwise, Generators that participate in a CSR and Hybrid Storage Resources follow the rules for Generators.

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MST 15.3A – Rate Schedule "3-A" – Charges Applicable to Suppliers That Are Not Providing Regulation Service

- The proposed language in the following sections provide updates to Overgeneration Charges, Persistent Over-Withdrawal Charges, and Exemptions for CSRs and HSRs:
  - MST 15.3A.1.1 – Overgeneration Charges
  - MST 15.3A.1.2 – Persistent Over-Withdrawal Charges
  - MST 15.3A.2 – Exemptions
- See MST 15.3A in the attached meeting materials for the complete proposed language

New York ISO

MST 15.4 – Rate Schedule 4 – Payments for Supplying Operating Reserves

- The proposed updates in the following sections address supplier requirements for HSRs, bidding and bid selection, and performance tracking:
  - MST 15.4.1.3 – Other Supplier Requirements
  - MST 15.4.2.1 – Bidding and Bid Selection
  - MST 15.4.3.1 – Bid Selection
  - MST 15.4.3.5 – Performance Tracking and Supplier Disqualifications
- See MST 15.4 in the attached meeting materials for the complete proposed language

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MST 17 – Attachment B

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MST 17.1 – LBMP Calculation

- **The NYISO proposes changes to the following sections:**
  - MST 17.1.1.2 – Incremental Dispatch Costs for Pricing Fast-Start Resources
  - MST 17.1.2.1.2.1 – The First Pass
  - MST 17.1.2.1.2.2 – The Second Pass
  - MST 17.1.3 – Day-Ahead LBMP Calculation Procedures

New York ISO

MST 17.1.1.2 – Incremental Dispatch Costs for Pricing Fast-Start Resources

- The update explains that the NYISO Fast-Start pricing will account for CSR Scheduling Limits when a Fast-Start Resource participates as part of a CSR
- Proposed language:
  - For the purpose of calculating LBMPs for the Day-Ahead and Real-Time Markets, all Fast-Start Resources that Bid ISO-Committed Flexible are treated as flexible and able to be dispatched anywhere between zero (0) MW and their UOLN or UOLE (whichever is applicable). The dispatch for Fast-Start Resources, including Fixed Block Units, that participate as Co-located Storage Resources will consider CSR Scheduling Limits.

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MST 17.1.2.1.2.1 – The First Pass

- **The updated language specifies that the Offline GT Pricing logic will not apply to a Fixed Block Unit that participates as part of a CSR**
- **Proposed language:**
  - Fixed Block Units that do not participate in a Co-located Storage Resource, are capable of being started and meeting Minimum Generation Levels ~~and capable of being started~~ in ten minutes or less, and that have not been committed by RTC, are treated as flexible (i.e. able to be dispatched anywhere between zero (0) MW and their UOLN or UOLE, whichever is applicable).

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MST 17.1.2.1.2.2 – The Second Pass

- **The proposed revisions to MST 17.1.2.1.2.2 are similar to the prior two slides.**
- **Proposed language:**
  - The second RTD pass consists of a least bid cost, multi-period, co-optimized dispatch for Energy, Regulation Service, and Operating Reserves that treats: (i) all Fast-Start Resources that are committed by RTC; (ii) ~~all~~ Fixed Block Units that do not participate in a Co-located Storage Resource, are capable of starting and meeting Minimum Generation Levels ~~and capable of starting~~ in ten minutes, ~~that~~ and have not been committed by RTC; and (iii) all Fixed Block Units otherwise instructed to be online or remain online by the ISO, as flexible (i.e., able to be dispatched anywhere between zero (0) MW and their UOLN or UOLE, whichever is applicable), regardless of their minimum run-time status. The dispatch of Fast-Start Resources, including Fixed Block Units, that participate as Co-located Storage Resources will consider CSR Scheduling Limits. The second pass calculates real-time Energy prices and real-time Shadow Prices for Regulation Service and Operating Reserves that the ISO shall use for settlement purposes pursuant to Section 4, Rate Schedule 15.3, and Rate Schedule 15.4 of this ISO Services Tariff respectively. The ISO will not use schedules for Energy, Regulation Service and Operating Reserves established in the second pass to dispatch Resources.

New York ISO

MST 17.1.3 – Day-Ahead LBMP Calculation Procedures

- **The following proposed language explains that the NYISO will account for CSR Scheduling Limits when a Fast-Start Resource participates as part of a CSR:**
  - The dispatch for Fast-Start Resources that participate as Co-located Storage Resources will consider CSR Scheduling Limits.
- **The following proposed update is also included in MST 17.1.3 to address the dispatch of HSRs:**
  - All Energy Storage Resources and Hybrid Storage Resources dispatched in the final step of Pass 1 (which could be either Step 1A, 1B, or 1C depending on activation of the AMP) are blocked on at the dispatch that was determined in Pass 1 in Passes 2 through 4. The resources required to meet local system reliability are determined in Pass 1.

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MST 18 – Attachment C – Formulas For Determining BPCG Payments

New York ISO

MST 18 – Attachment C – Formulas for Determining BPCG

- **The NYISO proposes changes to the following sections:**
  - MST 18.4.2 – Formula for Determining Real-Time BPCG for Generators in RTD Intervals Other Than Supplemental Event Intervals
  - MST 18.5.2 – Formula for Determining BPCG for Generators in Supplemental Event Intervals
- **The proposed modifications treat HSRs very similar to Energy Storage Resources**

New York ISO

OATT 2.7 – Billing and Payment

New York ISO

OATT 2.7– Billing and Payment

- **The NYISO proposes changes to the following sections:**
  - OATT 2.7.2.1.5 – Payable by Energy Storage Resources or Hybrid Storage Resources (Transmission Service Charge)
  - OATT 2.7.2.4.4 – Payable by Energy Storage Resources or Hybrid Storage Resources (NYPA Transmission Adjustment Charge)
- **The proposed language applies the rules regarding Transmission Service Charges and NYPA Transmission Adjustment Charges for ESRs to HSRs**

New York ISO

Next Steps

- HSR Metering and Telemetry
- Additional tariff updates

New York ISO

Our Mission & Vision

Mission

Ensure power system reliability and competitive markets for New York in a clean energy future

Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation

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Questions?

New York ISO