UNITED STATES OF AMERICA BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

In Re Hybrid Resources) Docket No. AD20-9-000
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COMMENTS OF THE NEW YORK INDEPENDENT SYSTEM OPERATOR, INC.

In accordance with the Federal Energy Regulatory Commission's ("FERC" or "Commission") August 10, 2020 *Notice Inviting Post-Technical Conference Comments* ("Notice") in the above referenced proceeding,¹ the New York Independent System Operator, Inc. ("NYISO") hereby submits post-technical conference comments to update the Commission on its ongoing hybrid resource integration initiative and highlight important issues identified in that initiative.

The NYISO appreciates the opportunity to provide comments regarding the opportunities available to hybrid resources and its on-going efforts to integrate these resources into its energy, ancillary services, and capacity markets. The NYISO and its stakeholders have identified a number of motivating factors that support co-locating energy storage and renewable resources,² including improving the performance and flexibility of renewable resources, reducing development costs by sharing interconnection facilities, and providing access to financial incentives that are available when energy storage charges using renewable energy.³

¹ *Hybrid Resources*, Docket No. AD20-9-000 (Aug. 10, 2020) (Notice Inviting Post-Technical Conference Comments).

² The NYISO's 2020 market design effort focuses on co-location of Energy Storage Resources ("ESRs") and wind or solar powered Intermittent Power Resources. Future market design initiatives (starting in 2021) are expected to develop rules for co-location and aggregation of other resource types.

³ For example, the federal Investment Tax Credit ("ITC") and New York's Renewable Energy Credit ("REC") programs include incentives for co-located energy storage and renewable resources.

New York State's ambitious energy storage and renewable resource development mandates in the Climate Leadership and Community Protection Act ("CLCPA") also play an important role in hybrid resource development. The CLCPA requires that seventy percent (70%) of New York's electric load be served by renewable resources by 2030, and requires procurement of 6,000 MW of distributed solar resources, 3,000 MW of energy storage resources, and 9,000 MW of offshore wind resources. The CLCPA also requires that one-hundred percent (100%) of New York's electric load be zero-emission by 2040. Hybrid resource participation in the NYISO-administered markets will contribute to achieving New York State's aggressive goals.⁴

As discussed further below, the NYISO is currently developing a market participation model to accommodate Co-located Storage Resources ("CSRs"), and will begin development of a full Hybrid Storage Resource ("HSR") participation model in 2021. The NYISO's market design process has considered many of the issues raised in the Notice and discussed in the technical conference, and the NYISO appreciates the opportunity to share its experience with the Commission. If the Commission moves to develop regulations requiring Regional Transmission Operators ("RTOs") and Independent System Operators ("ISOs") to integrate hybrid resources, it should provide the RTOs and ISOs with the flexibility to implement those regulations in a manner that best fits its existing market design, regional needs, and regional and local reliability requirements.

⁴ The NYISO has roughly 700 MW of storage, wind, and solar in its interconnection queue today that could operate as hybrid resources.

I. COMMENTS

In 2019, the NYISO initiated a market design project to develop a participation model for hybrid resources that will enhance the participation opportunities for co-located resources.⁵ The NYISO and its stakeholders evaluated several different hybrid resource participation models before ultimately refining the market design into the CSR model and the HSR model.⁶ The CSR market design is expected to be completed this year,⁷ and development of the HSR model is expected to begin in 2021.

The NYISO's CSR proposal is being designed to permit an energy storage resource and an intermittent power resource that depends on wind or solar energy for its fuel to co-locate behind a common point of injection, and participate in the energy, ancillary services, and capacity markets as two separate generators.⁸ Because the individual generators behind a common point of injection will participate in the markets as distinct resources, the NYISO is able to utilize its existing market rules with certain enhancements. Building upon existing market rules will help streamline the integration of CSRs and result in quicker access by these resources to the wholesale markets.

The NYISO's CSR market design effort identified three areas that prompted more discussion and consideration: (i) interconnection processes, (ii) metering requirements, and (iii) the provision of reliability services (*e.g.*, operating reserves and regulation service) by non-

⁵ The NYISO's Tariffs permit multiple Generators to locate behind a common point of interconnection. The existing rules, however, do not include the type of efficiencies (both in the interconnection process and in the markets) of a participation model tailored to the co-location of energy storage assets and renewable assets.

⁶ The Notice sought industry input on a wide variety of questions relate to the integration of hybrid resources, many of which the NYISO discussed with its stakeholders over the last several months.

⁷ The NYISO anticipates implementing the CSR market design in 2021.

⁸ The proposal will require modifications to the NYISO's markets software to permit evaluation of any constraints imposed by the interconnection facilities at the point of injection.

traditional generator configurations. None of the three concepts has proved unworkable; to the contrary, the NYISO has been able to identify reasonable rule enhancements that will benefit developers seeking to build CSR projects, and allow the NYISO to meet its core reliability obligations and applicable reliability standards. The rule changes for each area, however, highlight the need for the Commission to provide flexibility to RTOs and ISOs in developing their hybrid resource participation models.

A. Streamlining Interconnection Processes

The NYISO's tariffs currently permit multiple Generators to co-locate behind a common point of injection. When they do so, each generator must individually go through the NYISO's interconnection processes and obtain Energy Resource Interconnection Service ("ERIS") and Capacity Resource Interconnection Service ("CRIS") (if desired). While various generators in the New York Control Area ("NYCA") have utilized this process, the NYISO believes rule enhancements that permit co-located and hybrid generators to simultaneously engage in the interconnection processes as a single project will decrease costs borne by developers and improve the efficiency of the required studies.

The NYISO has worked with stakeholders to develop an interconnection rule proposal for hybrid resources that will provide additional flexibility for resources co-located behind the same point of interconnection by (i) allowing all units behind a common point of injection to be studied as part of a single interconnection request, (ii) require a single interconnection agreement for all units behind the shared point of injection, and (iii) clarify how ERIS and CRIS are allocated to the participating generators, taking into account any constraints at the point of injection.

Under the NYISO's CSR market design, individual generators behind a common point of injection will each have a distinct Point Identifier ("PTID"), and will each be allocated separate

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ERIS, and if requested and eligible, CRIS. The NYISO's proposal will set the maximum ERIS allocation for the energy storage resource of the CSR as the maximum injection capability of the resource.⁹ The proposal modifies the existing ERIS allocation rules for the wind and solar intermittent power resource of the CSR to allow for a maximum allocation of ERIS equal to the resource's maximum injection capability plus the full withdrawal capability of the energy storage resource. For example, consider a CSR that has a 100 MW intermittent power resource and a 20 MW energy storage resource behind a common point of injection. In this example, the intermittent power resource will have a maximum allowable ERIS of 120 MW.

CSR interconnection studies will also evaluate the capability to inject (and withdraw) energy at the point of injection. In certain circumstances, the total ERIS allocated to the two units may exceed the injection capability of the point of injection.

The NYISO is also considering energy and ancillary services scheduling and dispatch rules (and corresponding software logic) that will limit the total energy and ancillary services schedules to the maximum injection capability of the shared point of injection. Together, these rule enhancements will allow the CSR to request an ERIS allocation of the maximum capability of the two units, but also respects the limits of the point of injection in order to maintain reliability.

Unlike ERIS, CRIS values will be limited to the injection capability of each unit, and the sum of CRIS among all units behind the point of injection may not exceed the injection limit for the entire CSR.¹⁰ These rules are similar to NYISO's rules that apply to existing installed

⁹ A generator may request and be allocated less ERIS than its maximum injection capability in order to avoid upgrading the interconnection facilities at the point of injection, provided that appropriate control technologies are in place. *See* NYISO Open Access Transmission Tariff Secs. 30.3.2.3 and 32.4.11.3.

¹⁰ Unlike ERIS, the withdrawal capabilities of the Energy Storage Resource will not result in an increase to the CRIS allocation for the renewable resource.

capacity suppliers. Extending the CRIS allocation rules to CSRs will help maintain reliability, and provide confidence that the capacity is available to the NYCA when needed.

The NYISO is confident that appropriately tailored revisions to its interconnection rules will improve the efficiency of interconnection studies for hybrid resources, reduce costs to developers, allow the NYISO to meet its obligation to maintain reliability. The reasonable reforms under development in its CSR market design are the result of a collaborative process with stakeholders and have been well received.

B. <u>Identifying Hybrid Resource Metering Configurations that Enable Transmission</u> of Accurate Real-Time Operational Data and Revenue-Quality Data for Financial <u>Settlements</u>

Over the last several years, the NYISO has completed market design initiatives that addressed non-traditional resource types (*e.g.*, Behind-the-Meter Net Generation Resources, Energy Storage Resources, and Distributed Energy Resources).¹¹ In addition to identifying the appropriate market rules for these resource types, the NYISO undertook a close examination of its metering requirements and practices to better understand what metering configurations would provide accurate and complete real-time operational data used by system operators, and after-the-fact revenue-quality metering data used in financial settlements. The NYISO worked with its stakeholders to establish metering requirements that meet the NYISO's needs as a grid operator and market administrator, without being overly burdensome to Market Participants. In each case, the NYISO and its stakeholders developed acceptable metering requirements that addressed

¹¹ See New York Independent System Operator, Inc., Proposed Amendments to the NYISO Open Access Transmission Tariff and Market Administration and Control Area Services Tariff to Incorporate Behind-the-Meter Net Generation Resources into the NYISO's Energy, Ancillary Services and Capacity Markets, Docket No. ER16-1213-000 (Mar. 17, 2016); New York Independent System Operator, Inc., Compliance Filing and Request for Extension of Time of Effective Date, Docket No. ER19-467-000 (Dec. 3, 2018); New York Independent System Operator, Inc., Proposed Tariff Revisions Regarding Establishment of Participation Model for Aggregations of Resources, Including Distributed Energy Resources, Docket No. ER19-2276-000 (Jun. 27, 2019).

the parties' respective needs. Hybrid resource integration need not be any more complex than other non-traditional resource configurations. The NYISO's CSR and HSR proposals will establish metering requirements that reflect market administration and grid operational needs and the needs of its stakeholders.

Accurate and timely real-time operational data is necessary to maintain reliable system operations. The NYISO determined that real-time operational data must be provided at the shared point of injection for each CSR, so that the data reflects the CSR's actual energy injections to and withdrawals from the grid. The NYISO will also require real-time operating data to be telemetered in six-second intervals for each of the generators that participates in a CSR.¹²

The NYISO proposes to measure energy injections and withdrawals with a revenuequality meter at the point of injection.¹³ All resources participating in the NYISO-administered markets are required to have a revenue-quality meter for the purpose of financial settlements. The primary question for CSRs is whether the revenue-quality meter should be located at the point of injection, or at each participating generator.

Because many co-located storage resources anticipate using DC-coupled generation, and in an effort to reduce the burden on developers and operators, the NYISO determined that a single revenue-quality meter for settlement and a single non-revenue grade meter for telemetry located at the point of injection should be sufficient so long as additional telemetry (that does not

¹² The NYISO has had many discussions with its stakeholders regarding the need for six-second telemetry, and the potential financial burden of the metering and data infrastructure needed to support data exchange at that frequency. The NYISO continues to believe six-second data is necessary to maintain reliable system operations, and does not believe any changes to telemetry rules are required to integrate hybrid resources.

¹³ Like its proposal for Energy Storage Resources, the NYISO will propose that the revenue-quality meter used at the CSR point of injection be a dual channel meter. Dual channel meters are able to record injections independent of withdrawals, providing for more accurate settlements.

need to be revenue-quality) measures the output of the individual generators in a CSR. The NYISO expects to propose that financial settlements for the individual generators in a CSR be based on the revenue-quality data at the point of injection, proportionally allocated to each Generator based on its telemetered contribution.

The NYISO is working to understand the complexities of converting DC-coupled Generator meter data to AC at the point of injection. Depending on the technology used by the generators, a CSR will need to account for variance between the output of the participating generators and injections or withdrawals at the CSR's shared point of injection. For example, a DC-coupled system may connect the energy storage resource to the point of injection via a DC-DC converter, a DC-AC inverter, and a step-up transformer. The CSR's intermittent power resource, on the other hand, may be connected to the point of injection through a DC-AC inverter and step-up transformer. There will be some losses between each CSR generator and the point of injection, and possible conversion losses at the point of injection. The NYISO is working with its stakeholders to establish any processes or procedures necessary to address these complexities.¹⁴

The details of the NYISO's metering and telemetry requirements are contained in its business practice manuals and operating procedures.¹⁵ Inclusion of those details in the manuals and procedures provides flexibility to the NYISO and its market participants to address changing circumstances and meet market participant reliability needs. Like in its previous tariff

¹⁴ See, e.g., Hybrid Storage: Participation Examples and Energy Market Tariff Revisions for Co-Located Storage Resources (CSR) Presentation, Joint Installed Capacity and Market Issues Working Group (Sept. 22, 2020); available at:

 $https://www.nyiso.com/documents/20142/15473217/Hybrid\%20Storage_CSR\%20examples_\%20\%20Energy\%20ta riff\%20ICAPWG\%20MIWG\%2009.22.20\%20draft\%20final.pdf.$

¹⁵ See, e.g., NYISO Manual No. 25 - Revenue Metering Requirements Manual; *available at*: https://www.nyiso.com/documents/20142/2923231/M-25-rev_mtr_req_mnl.pdf/.

enhancements for Behind-the-Meter Net Generation Resources, Energy Storage Resources, and Distributed Energy Resources, the NYISO believes it is appropriate to include much of the detailed requirements necessary to implement specific metering configurations in its business practice manuals and procedures. The Commission should not require RTOs and ISOs to spell out each permissible metering configuration in its tariffs, but rather to identify only those metering rules that specifically affect the rates, terms, and conditions of service (the "rule of reason" policy).

C. Application of Reliability Requirements to Non-Traditional Resource Types

1. NYISO's Application of Reliability Rules to Resource Aggregations

In 2016, the NYISO developed a participation model for Behind-the-Meter Net Generation Resources.¹⁶ The NYISO's goal was to allow a facility that had one or more Generators and host load behind a common point of interconnection to provide energy, ancillary services, and capacity in the NYISO-administered markets. In order to comply with the reliability rules applicable to the provision of operating reserves and regulation service,¹⁷ the NYISO took a "least common denominator" approach whereby the Behind-the-Meter Net Generation Resource, as a whole, may only provide those services that each generating asset within the resource group is eligible to provide. For example, if there are three generation assets behind a common point of interconnection and two of those assets can provide 10-Minute Non-Synchronous Reserve and the third is only eligible to provide 30-Minute Reserve, then the entire set of resources is only permitted to provide 30-Minute Reserve. The NYISO intends to apply

¹⁶ New York Independent System Operator, Inc., Order Accepting Proposed Tariff Revisions Subject to Condition, 155 FERC ¶ 61,166 (2016).

¹⁷ See, e.g., Northeast Power Coordinating Council, *Directory 05 – Reserve, available at:* https://www.npcc.org/content/docs/public/program-areas/standards-and-criteria/regionalcriteria/directories/directory-5-reserve-20200426.pdf.

the same approach to CSRs and HSRs. The NYISO's approach is appropriate under the current reliability rules.¹⁸

The NYISO continues to work with the applicable reliability organizations, its stakeholders, and developers to consider how advanced technologies can offer services consistent with existing reliability standards. The reliability rules have developed with a focus on learning from past events to maintain future grid reliability. The NYISO manages reliability by requiring resources that provide reliability services to meet minimum standards, and incenting resources to follow dispatch instructions. For example, the Northeast Power Coordinating Council ("NPCC") requires operating reserves suppliers be able to sustain their energy injection for at least one continuous hour. The NYISO incents resources to follow dispatch signals by penalizing resources that deviate from those instructions and protecting resource compensation when resources follow dispatch instructions.¹⁹

2. Reliability Standards May Be Tailored to Reflect the Capabilities of Aggregated Resources, but Should Not Be Relaxed for these Resources

As renewable resources and energy storage take on a greater role in supplying the bulk power system, as required by New York State's CLCPA, aggregations that include these resources will be increasingly important to providing essential reliability services. As such, the NYISO favors a market design approach that will hold hybrid and co-located resources to the same dispatch and reliability expectations that other supply resources must satisfy. The NYISO supports maintaining grid reliability by removing ambiguity regarding the obligation of all resources to satisfy reliability requirements.

¹⁸ The NYISO must comply with reliability rules enforced by the North American Reliability Corporation, the Northeast Power Coordinating Council, and the New York State Reliability Council.

¹⁹ For example, the NYISO protects a resource's day-ahead margin through a Day-Ahead Margin Assurance Payment in order to incent a resource to follow the ISO's instruction and not to deviate from its day-ahead schedule.

3. ISOs and RTOs are in the Best Position to Issue Commitment and Dispatch Instructions to Co-located Resources for the Benefit of all Electric Consumers

The NYISO, as the wholesale market administrator and Reliability Coordinator, has comprehensive information about resource costs and capabilities and therefore can issue dispatch instructions that maximize benefits to reliability while minimizing overall production cost to the benefit of all New York electricity consumers. For example, ISOs and RTOs know when a particular resource is coming off-line and that other resources will be necessary to dispatch to maintain reliability. In contrast, market participants do not and cannot have access to this information, and therefore cannot individually maximize benefits to consumers.²⁰ ISOs and RTOs are able to evaluate data from all resources participating in its market and make efficient dispatch decisions. Individual resource compliance with dispatch instructions supports reliable system operations and maximizes consumer benefits.

II. COMMUNICATIONS AND CORRESPONDENCE

All communications and correspondence concerning these Comments should be served as follows:

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²⁰ Permitting individual resources to deviate from the ISO's dispatch signals would be inefficient and an ineffective manner in which to maintain reliability, and may lead to unnecessary make-whole payments and provide inappropriate mid to long-term investment signals.

III. CONCLUSION

WHEREFORE, the NYISO respectfully requests that the Commission consider these comments in its continued evaluation of the participation of hybrid resources in the wholesale electric markets. A well-structured hybrid resource participation model will be an important component of the NYISO's wholesale market enhancements that support reliability and benefit consumers as New York State advances its clean energy plans under the CLCPA.

Respectfully submitted,

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Dated: September 24, 2020

cc: Jignasa Gadani Jette Gebhart Kurt Longo John C. Miller David Morenoff Larry Parkinson Douglas Roe Frank Swigonski Eric Vandenberg Gary Will

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding in accordance with the requirements of Rule 2010 of the Rules of Practice and Procedure, 18 C.F.R. §385.2010.

Dated at Rensselaer, NY this 24th day of September 2020.

By: <u>/s/ John C. Cutting</u>

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