### UNITED STATES OF AMERICA BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

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Hybrid Resources

Docket No. AD20-9-000

## COMMENTS OF THE NEW YORK INDEPENDENT SYSTEM OPERATOR, INC.

Pursuant to Rule 213 of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission ("Commission"),<sup>1</sup> the New York Independent System Operator, Inc. ("NYISO")<sup>2</sup> respectfully submits these comments in response to issues raised by commentators in this docket. The NYISO continues to share the Commission's desire to integrate hybrid resources into the wholesale energy, ancillary services, and capacity markets. The NYISO and its stakeholders have identified a number of motivating factors that support the co-location of energy storage and renewable resources, 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 Resources charge using renewable energy.

The NYISO's responses address terminology, interconnection procedures, market participation rules, and metering and settlement requirements.<sup>3</sup> While the NYISO understands and appreciates the perspective of hybrid resource developers, it is important that the

<sup>&</sup>lt;sup>1</sup> 18 C.F.R. § 385.213(d)(2) (2021).

<sup>&</sup>lt;sup>2</sup> Capitalized terms not defined in these Comments shall have the meaning set forth in Section 1 of the NYISO Open Access Transmission Tariff ("OATT") and Section 2 of the Market Administration and Control Area Services Tariff ("Services Tariff").

<sup>&</sup>lt;sup>3</sup> In the interest of limiting the scope of these Comments, the NYISO does not address all issues raised in comments submitted in this docket. The fact that the NYISO is not responding to all issues raised by parties should not be construed as agreement therewith.

Commission evaluate the impact of proposed changes on the reliability of the bulk power system, the efficiency of wholesale markets, and the costs to consumers.

### I. Regional Transmission Organizations ("RTO") and Independent System Operators ("ISO") are best positioned to schedule and dispatch resources to maintain bulk power system reliability and wholesale market efficiency.

The Hybrid Resources Coalition ("HRC") argues that a key benefit of integrated hybrid resources (as opposed to co-located hybrid resources), "is the possibility that the market participant can optimize the output of the resources together."<sup>4</sup> The NYISO agrees that a hybrid resource that includes (for example) both intermittent renewable resources and energy storage resources can provide more predictable output and may be able to follow ISO or RTO dispatch instructions. However, allowing ISOs and RTOs to direct the operation of the component resources may be the most efficient and effective way to utilize those resources to meet bulk power system needs.

Part of the rationale for creating ISOs and RTOs was to improve efficiency by scheduling resources through competitive wholesale markets in a least-cost manner, resulting in reduced production costs for consumers. The ISOs and RTOs can schedule and dispatch resources efficiently because they have information about the power grid and the availability and price of interconnected resources that market participants cannot have due to the need for confidentiality and to prevent the potential exercise of market power. This information asymmetry places the ISOs and RTOs in the best position to determine the most efficient and effective resources to schedule in order to meet the reliability needs of the grid and to serve all consumers at least production cost. Consumers receive necessary reliability services at the lowest cost available if the ISO and RTO markets procure the products and characteristics that are needed, and if the

<sup>&</sup>lt;sup>4</sup> Hybrid Resources Coalition September 20, 2021 Comments, Docket No. AD20-9-000, at 19 ("HRC Comments").

rules for new resource types allow them to participate in a manner that is consistent with maintaining reliability.

The tools that ISOs and RTOs rely on to make scheduling decisions are extremely sophisticated and optimize the schedules of hundreds of resources<sup>5</sup> and considers thousands of constraints. The NYISO's tools are designed to capture and reflect the operating characteristics of each resource and resource type to the fullest extent practical while ensuring market solutions meet stringent reliability criteria established by North American Electric Reliability Corporation, Northeast Power Coordinating Council, and the New York State Reliability Council twenty-four hours a day, every day.

The NYISO is working with its stakeholders to incorporate new resource capabilities including co-located storage and integrated hybrid resources. The NYISO believes that resources can most effectively provide flexibility to the system by having each asset available for dispatch by the ISO or RTO independently, rather than in aggregate. The NYISO's existing rules are designed to accommodate intermittent renewable resource output largely<sup>6</sup> without penalty and to provide Energy Storage Resources full access to revenues from its energy, ancillary service, and capacity markets.

Because the NYISO has access to far more system and market information than any participant in its markets,<sup>7</sup> resource operator decisions about how best to operate a fully

<sup>&</sup>lt;sup>5</sup> The quantity of participating resources, and the number of offers that the NYISO will need to evaluate in order to produce a solution, are expected to grow significantly as distributed energy resources, co-located resources and hybrid resources are deployed in New York.

<sup>&</sup>lt;sup>6</sup> The NYISO may apply a Wind or Solar Output Limit when intermittent renewable resource output is causing congestion on the transmission system.

<sup>&</sup>lt;sup>7</sup> In real-time operations the NYISO has up-to-the minute (or second) information about resource and transmission availability, resource schedules—including day-ahead schedules and advisory real-time schedules for the next 2.5 hours, transmission constraints (including Generator and Phase Angle Regulator shift factors for each constraint), loop flows, and all resource offers to supply energy and bids to withdraw energy (where applicable). Market participants have access to just a small fraction of this information.

integrated hybrid resource aggregation, especially a large-scale aggregation, are not likely to make the most efficient possible use of the available resources. A resource owner will have expectations about Locational Based Market Prices at its location and access to some pertinent information but cannot fully understand the reasons for actions the NYISO is taking to preserve grid reliability, or how other resources have been instructed to respond. Self-optimization of integrated hybrid resources by resource owners that lack the NYISO's access to grid data and the market offers submitted by other resources may result in less efficient scheduling of resources and higher costs for consumers.

For example, an integrated hybrid resource that is comprised of wind or solar intermittent power resources and energy storage (batteries) will not want to receive a schedule that it cannot achieve in real-time operation. To address that risk, it would submit offers that incorporate a margin of error with regard to anticipated intermittent resource output. The market participant's decision to submit conservative offers that it expects will result in achievable schedules may be entirely reasonable in light of the information available to the market participant, but those offers may not make the most efficient use of the market participant's resources. If the same set of resources are each, independently, offered to the ISO or RTO in a co-located configuration, the ISO or RTO may be able to achieve additional efficiencies and better protect system reliability.<sup>8</sup>

The impacts of inefficient scheduling may include increased consumer costs, or even exacerbate reliability issues if sub-optimal scheduling decisions result in resources not being available to address upcoming grid issues. For example, forecasted storm watches in New York require significant re-dispatch of generation when the transmission lines to New York City are at

<sup>&</sup>lt;sup>8</sup> In order to achieve the described efficiencies, the ISO or RTO must know the capabilities of each resource and the Point of Injection scheduling limit and be able to make scheduling and dispatch decisions. Offering a set of resources as a "black box," where the ISO or RTO does not know which resources are operating, will limit the ability of an ISO or RTO to make the most efficient decision.

risk due to possible lightning strikes.<sup>9</sup> The NYISO operates the bulk power system to specific reliability rules that require it to increase energy production in New York City and make corresponding reductions to upstate resource schedules (and some imports) to reduce loadings on the at-risk transmission lines. If the NYISO has access to the state-of-charge for all (upstate and New York City) Energy Storage Resources and the ability to instruct their operation, it will enhance the NYISO's ability to pre-position the system to prepare for a storm watch event.<sup>10</sup>

### II. The Commission should carefully evaluate the bulk power system and wholesale market benefits provided by various asset combinations proposed to participate as integrated hybrid facilities.

The NYISO does not support allowing participation models to be overly broad, especially when considering the pairing of technologies that will be offered as a single market resource (*e.g.*, an integrated hybrid resource). For example, offering the combination of a Limited Energy Storage Resource (LESR), an intermittent renewable resource and a demand response resource as a hybrid aggregation could result in situations where the NYISO expects energy from the integrated hybrid resource based on its hourly offer that cannot be delivered because the LESR is only designed to provide regulation service, the variable resource is unable to follow a dispatch signal, and the demand response is not eligible to be paid for reducing its output under Order No. 745.

<sup>&</sup>lt;sup>9</sup> New York City suffered a significant blackout in 1977 when lightning strikes caused the simultaneous forced outage of several transmission lines that bring power from upstate New York into the city.

<sup>&</sup>lt;sup>10</sup> If the NYISO has timely information, its Real-Time Commitment ("RTC") and Real-Time Dispatch ("RTD") look-ahead capabilities can pre-position the system to address potential transmission system issues. For example, the NYISO's RTC and RTD could charge energy storage resources in New York City in advance of a storm so that the in-city resources are available to supplement generation when transmission constraints prevent upstate energy from being delivered to meet New York City demand.

Additionally, some integrated hybrid resource combinations are more viable than others (not all pairings are of equal value to the system). For example, it might be reasonable to expect a 10MW/30 MWh battery paired with a 40 MW wind facility to follow the NYISO's dispatch signals, since the battery has a substantial energy storage capability and its instantaneous output is significant compared to the combined set of assets (*e.g.*, the energy storage resource has one quarter of the capability of the maximum wind output, and the storage asset can sustain its output for up to three hours).<sup>11</sup>

Pairing a 5 MW/5 MWh battery with a 50 MW wind facility, however, would not provide the same control capabilities. In this case, the NYISO has concerns that the integrated hybrid resource would not be able to follow the NYISO-issued dispatch signals unless the dispatch was based solely on (and matched closely to) the wind availability. The NYISO already has market participation rules that accommodate the intermittent output of wind and solar resources and is designing hybrid resource rules that expect the aggregate resource to follow dispatch signals in real-time. The NYISO's existing Intermittent Power Resource, Energy Storage Resource, and Co-located Storage Resources<sup>12</sup> market designs are better suited to handle this type of arrangement because they treat each participating resource independently and recognize that intermittent resources are not always able to follow the NYISO's dispatch. Using the Intermittent Power Resource + Energy Storage Resource, or the Co-located Storage Resource model would allow the wind to be dispatched based on the wind availability and maximize the

<sup>&</sup>lt;sup>11</sup> The battery's stored energy can be used until the Market Participant is able to incorporate more conservative expectations about wind production into its real-time Bids.

<sup>&</sup>lt;sup>12</sup> The NYISO's Co-located Storage Resources market rules, which are expected to be in place by the end of 2021, allow a wind or solar Intermittent Power Resource and an Energy Storage Resource to share a common point of interconnection, but to operate as two distinct resources. The wind or solar resource in Co-located Storage Resources is not expected to conform its operation to the NYISO's dispatch signals (except when its output causes reliability concerns).

use of the battery to provide energy, operating reserves and/or regulation service, which would benefit all New Yorkers.

# **III.** A Final Rule on Hybrid Resources should accommodate regional variation of interconnection procedures.

HRC comments that the lack of rules governing the interconnection of hybrid resources is an impediment to the integration of those resources. To help reduce barriers to entry, HRC recommends that RTOs and ISOs establish interconnection procedures for integration of (i) new hybrid resources, (ii) existing stand-alone renewable projects that seek to add storage, and (iii) stand-alone projects in the RTO/ISO interconnection queues that want to modify their interconnection requests to add storage. The NYISO agrees with HRC that interconnection procedures specifically applicable to hybrid resources will reduce barriers to entry and has already developed interconnection procedures for Co-located Storage Resources that address the three situations identified by HRC.

As explained in its Report on Hybrid Resources,<sup>13</sup> the NYISO proposed,<sup>14</sup> and the Commission accepted,<sup>15</sup> new interconnection rules applicable to Co-located Storage Resources. These rules permit multiple Generators behind a single Point of Interconnection to submit a single Interconnection Request<sup>16</sup> and permits certain Projects<sup>17</sup> with separate queue positions<sup>18</sup> to combine to become proposed Co-located Storage Resources upon satisfaction of specific

<sup>&</sup>lt;sup>13</sup> New York Indep. Sys. Operator, Inc. July 19, 2021 Report on Hybrid Resources, Docket No. AD20-9 ("Hybrid Report").

<sup>&</sup>lt;sup>14</sup> New York Indep. Sys. Operator, Inc. January 29, 2021 Filing Proposing Tariff Revisions to Implement Co-located Storage Resources, Docket No. ER21-1001-000 at 28-39.

<sup>&</sup>lt;sup>15</sup> New York Indep. Sys. Operator, Inc., 174 FERC ¶ 61,242 (Mar. 30, 2021).

<sup>&</sup>lt;sup>16</sup> Hybrid Report at 5.

<sup>&</sup>lt;sup>17</sup> The NYISO defined a "Project" as "[t]he proposed facility as described in a single Interconnection Request, to the extent permitted by [the Large Facility Interconnection Procedures] or [Small Generator Interconnection Procedures]." OATT Sec. 25.1.2 (at definition of "Project").

<sup>&</sup>lt;sup>18</sup> Each Project must have been in the NYISO Interconnection Queue as of March 31, 2021.

transition rule requirements. These Commission-accepted rules join the interconnection procedures applicable to Energy Storage Resources, Intermittent Power Resources, and Distributed Energy Resources to form a suite of procedures that are intended to reduce barriers to entry for new, innovative technologies, and meet the NYISO's needs to maintain reliability and safety.

HRC recommends that transmission providers follow certain "best practices" to model hybrid resources in the RTO/ISO interconnection processes.<sup>19</sup> The NYISO does not agree with the proposed "best practice" of modeling a facility to match the developer's planned operational parameters, instead of performing studies based on the proposed resource's actual minimum and maximum capabilities, so that the system will continue to operate reliably when the resource's actual real-time operation exceeds the planned operational parameters the developer submitted.

The NYISO is concerned with the reliability and market impacts of HRC's proposed requirements. Consider an integrated hybrid resource comprising a set of wind turbines and energy storage capability. Under the NYISO's interconnection procedures, the system impact of the facility's injection and withdrawal capability would be studied across the entire day, including during system peaks. The studies would identify if any upgrades are needed to accommodate dispatch of the resource—both injecting and withdrawing—across the operating day. Under HRC's proposal, the hybrid resource (by design) would not be fully available to be dispatched in response to extreme system conditions. HRC's proposal would limit the resources available to system operators to address system needs and could result in spilling solar energy that cannot be injected on-peak or result in the NYISO directing the operation (or curtailment) of

<sup>&</sup>lt;sup>19</sup> HRC Comments at 11-13.

other generators out of economic merit (perhaps resulting in uplift payments) because the transmission system is not sufficiently robust.

HRC also recommends that the Commission require RTOs and ISOs to have processes for surplus interconnection service, or another fast-tracked process outside the normal interconnection queue.<sup>20</sup> The NYISO notes in response that the Commission required in Order No. 845 for transmission providers to establish an expedited interconnection process to allow for transfers of surplus interconnection service.<sup>21</sup> The NYISO sought an independent entity variation in its Order No. 845 Compliance Filing from this requirement on the basis that the unique interconnection standard rules established in New York are incompatible with surplus interconnection service.<sup>22</sup> The Commission granted the NYISO's request for an independent entity variation, stating that the "premise for surplus interconnection service is not applicable to NYISO's interconnection process because, under the NYISO Minimum Interconnection Standard, [Energy Resource Interconnection Service] customers are subject to re-dispatch of a facility (both the studied project and existing generators in the queue) in interconnection studies at less than the facility's full capacity to mitigate reliability impacts."<sup>23</sup> "As a result," the Commission continued, "there is no unused [Energy Resource Interconnection Service] when a generation facility injects less than its full output onto NYISO's system, which means that there is no surplus interconnection service available on NYISO's system."<sup>24</sup> The Commission

<sup>&</sup>lt;sup>20</sup> HRC Comments at 14.

<sup>&</sup>lt;sup>21</sup> Reform of Generator Interconnection Procedures and Agreements, Order No. 845, 83 Fed. Reg. 21342 (May 9, 2018), 163 FERC ¶ 61,043, at P 467 (2018) ("Order No. 845"), order on clarification and reh'g, Order No. 845-A, 166 FERC ¶ 61,137 (2019) ("Order No. 845-A").

<sup>&</sup>lt;sup>22</sup> New York Indep. Sys. Operator, Inc. May 22, 2019 Compliance Filing at 23-24.

<sup>&</sup>lt;sup>23</sup> New York Indep. Sys. Operator, Inc., 170 FERC ¶ 61,117, at P 98 (2020).

<sup>&</sup>lt;sup>24</sup> Id.

concluded that the NYISO's existing interconnection process "accomplishes the stated purposes of Order No. 845's surplus interconnection service proposal by reducing costs for interconnection customers and improving wholesale market competition by increasing the utilization of existing interconnection facilities and network upgrades rather than requiring new ones."<sup>25</sup> Considering that the Commission addressed this issue in the Order No. 845 proceedings, the NYISO respectfully submits that the Commission should reject HRC's request that RTOs and ISOs adopt supplemental interconnection service to the extent that the request conflicts with established Commission-accepted interconnection procedures.

# **IV.** Robust metering and telemetry requirements are necessary to maintain situational awareness and enable accurate settlement.

HRC comments that "[m]etering requirements for settlement of integrated and co-located hybrid resources should provide the information necessary to properly settle market transactions, without burdening integrated and co-located hybrid resources with any unnecessary metering."<sup>26</sup> The NYISO agrees with HRC that metering requirements should permit RTOs and ISOs to accurately settle transactions, however, the NYISO disagrees with HRC as to the particular requirements necessary to achieve that goal.

HRC argues, for example, that an integrated hybrid resource needs only a single meter at the interconnection point to measure energy injections and settle energy and installed capacity market transactions.<sup>27</sup> This proposal will not work for all integrated hybrid configurations. For example, HRC proposed that market participants should be permitted to include controllable load as a component of an integrated hybrid resource so long as the operator is willing to manage the

<sup>&</sup>lt;sup>25</sup> Id.

<sup>&</sup>lt;sup>26</sup> HRC Comments at 22.

<sup>&</sup>lt;sup>27</sup> *Id.* at 23.

resource through a single bid and settlement.<sup>28</sup> To the extent that the Commission views this type of controllable load as demand response that is subject to the requirements of Order No. 745, a single meter measuring injections and withdrawals at the interconnection point would not provide enough information for an RTO/ISO to settle those demand reductions consistent with Order No. 745. The controllable load resource would need to provide the ISO or RTO with distinct meter data so that demand reductions could be identified and measured. Fluctuations in the load that are not a direct response to a dispatch signal from the ISO or RTO should not be eligible for compensation.

A final rule on Hybrid Resources should provide the RTOs and ISOs flexibility to develop robust metering and telemetry schemes that account for the type of hybrid (integrated or co-located), the characteristics of the resources that will participate, and the needs of the particular region. In Order No. 2222 the Commission stated that it understood "the need to balance, on one hand, the RTO's/ISO's need for metering and telemetry data for settlement and operational purposes, and, on the other hand, not imposing unnecessary burdens on distributed energy resource aggregators," and therefore declined to "prescribe the specific metering and telemetry requirements that each RTO/ISO must adopt."<sup>29</sup> The Commission permitted each RTO and ISO establish the metering and telemetry requirements for its region.<sup>30</sup> The approach taken in Order No. 2222 should guide the Commission's direction on hybrid resources.

<sup>&</sup>lt;sup>28</sup> *Id.* at 10.

<sup>&</sup>lt;sup>29</sup> Order No. 2222 at P 263.

<sup>&</sup>lt;sup>30</sup> Id.

### V. Conclusion

WHEREFORE, the NYISO respectfully requests that the Commission consider these comments in its evaluation of hybrid resource participation in the organized markets and provide RTOs and ISOs with the flexibility necessary to implement any future Commission directives on these issues in a manner that is appropriate and tailored to the markets they administer.

Respectfully submitted,

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cc: Janel Burdick Matthew Christiansen Jignasa Gadani Jette Gebhart Leanne Khammal Kurt Longo John C. Miller David Morenoff 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 20<sup>th</sup> day of October 2021.

/s/ Mitchell W. Lucas

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