

June 27, 2019

**By Electronic Delivery**

Honorable Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, DC 20426

**Re: New York Independent System Operator, Inc., Proposed Tariff Revisions Regarding Establishment of Participation Model for Aggregations of Resources, Including Distributed Energy Resources, and Proposed Effective Dates; Docket No. ER19-\_\_\_\_-000**

Dear Ms. Bose:

Pursuant to Section 205 of the Federal Power Act,<sup>1</sup> the New York Independent System Operator, Inc. (“NYISO”) hereby submits proposed revisions to its Open Access Transmission Tariff (“OATT”) and its Market Administration and Control Area Services Tariff (“Services Tariff”) (collectively, the NYISO “Tariffs”) to establish a new “Aggregation” participation model and related requirements. The proposed revisions will enable a Market Participant to group individual facilities located on the transmission and/or distribution systems to form a single entity – an Aggregation – for the purpose of participating in the NYISO-administered Energy, Ancillary Services, and Installed Capacity markets.<sup>2</sup> The Aggregation may collectively satisfy the applicable eligibility and performance requirements necessary to participate in the NYISO-administered markets. The proposed revisions will significantly enhance opportunities for both existing and new facilities to participate in the NYISO-administered markets, including facilities that cannot currently participate or cannot fully participate in the markets due to, among other things, their size, physical or operational characteristics, or commitments to the local distribution system or host load.

Part II of this letter provides an overview of the NYISO’s proposed Aggregation participation model and the related revisions to the NYISO’s market, operating, and planning rules that are required to address the unique physical and operational characteristics of Aggregations. Parts IV through XI then describe in detail each of the components of the Aggregation participation model and related rules. These include: (1) requirements for the eligibility, composition, and participation of Aggregations, including the inclusion of distributed energy resources; (2) requirements for Aggregations’ participation in the NYISO-administered Energy and Ancillary Services markets; (3) rules for dual participation in the NYISO-administered markets and in programs or markets operated to meet the needs of distribution

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<sup>1</sup> 16 U.S.C. § 824d (2012).

<sup>2</sup> Capitalized terms that are not otherwise defined in this filing letter shall have the meaning specified in Section 1 of the OATT and Section 2 of the Services Tariff.

systems or host facilities; (4) revised metering and telemetry requirements, including the introduction of a new entity – a Meter Services Entity – that may qualify to provide third-party metering and meter data services; (5) settlement rules for Aggregations; (6) requirements for Aggregations’ participation in the NYISO-administered Installed Capacity market; (7) revised interconnection requirements; and (8) other tariff revisions required to account for the physical and operational characteristics of Aggregations and distributed energy resources.

This filing is the result of an extensive, multi-year initiative conducted among the NYISO and its stakeholders to evaluate opportunities to enhance the participation of distributed energy resources in the NYISO-administered markets and to develop a participation model to more fully integrate these resources. The resulting tariff language was approved by the NYISO’s stakeholder Management Committee and by its Board of Directors. The proposed revisions are just, reasonable, and not unduly discriminatory. They are also consistent with the Commission’s stated interest in “removing barriers in current RTO/ISO market rules that would prevent these new, smaller distributed energy resources that are technically capable of participating in the organized wholesale electric markets from doing so.”<sup>3</sup> The Commission should accept this filing without requiring any revisions or initiating any other proceedings.

As described in Part XII of this filing letter, the NYISO respectfully requests that the Commission issue an order within the standard notice period under Section 205, which is sixty (60) days of the date of this filing, *i.e.*, by Monday, August 26, 2019, accepting the proposed tariff revisions to the NYISO’s metering requirements with an effective date of November 1, 2019. The NYISO further requests staggered effective dates for the remaining tariff revisions to allow for an orderly implementation of the proposed tariff revisions. The requested staggered effective dates will allow the NYISO: (i) to permit dual participation of Energy Storage Resources upon their entry in the NYISO-administered markets in 2020; (ii) to begin the interconnection process for facilities participating in an Aggregation before the market rules become effective; (iii) to make certain revisions to the Installed Capacity market effective at the beginning of a Capability Year; and (iv) to implement the remaining tariff revisions once the NYISO has completed the software updates necessary to permit aggregations of facilities.

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<sup>3</sup> See *Notice of Proposed Rulemaking, Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 157 FERC ¶ 61,121 (2016) (Nov. 17, 2016) (“November 2016 NOPR”).

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## I. Background

### A. Existing Participation Opportunities for Distributed Energy Resources in the NYISO-Administered Markets

Distributed energy resources presently have limited opportunities to participate in the NYISO-administered markets. Many of these facilities are not individually able to meet the eligibility or performance requirements under an existing participation model to participate or to fully participate in the markets.

Distributed energy resources currently have the opportunity to participate in the NYISO's reliability-based demand response programs: the Emergency Demand Response Program ("EDRP") or the Special Case Resource ("SCR") program.<sup>4</sup> The EDRP offers eligible resources the opportunity to voluntarily curtail load in response to NYISO requests for load reduction to address specific system conditions such as forecasted operating reserve shortages.<sup>5</sup> EDRP resources can reduce load in response to a NYISO activation via curtailment, deployment of a Local Generator, or both, and will receive Energy payments for verified load reductions. The SCR program is similar to EDRP in that the NYISO activates SCRs in response to specific reliability-related system conditions. However, in exchange for receiving capacity payments (and Energy payments for real-time performance), SCRs must have the capability, and are obligated, to reduce load for a minimum of four (4) consecutive hours when called on by the NYISO.<sup>6</sup> SCRs that fail to respond to appropriate SCR activation notifications can be subject to financial penalties.

Distributed energy resources also currently have the opportunity to participate in the NYISO's economic demand response programs: the Day-Ahead Demand Response Program ("DADRP") or the Demand Side Ancillary Services Program ("DSASP").<sup>7</sup> The DADRP provides eligible resources the opportunity to offer load reduction in response to Day-Ahead Market price signals. DADRP resources offer into the Day-Ahead Market the amount of load reduction they are willing to provide at a particular price (or along a curve). If the bid is accepted, the resource performs by simply reducing consumption or by self-supplying a portion of its load during the intervals in which it receives a Day-Ahead schedule. A DADRP resource receives Day-Ahead energy payments for scheduled load reduction as if it was generation, subject to the NYISO's requirements adopted to comply with Order No. 745.<sup>8</sup> An eligible

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<sup>4</sup> Under the NYISO's existing requirements, Demand Side Resources may participate in either the SCR program *or* the EDRP.

<sup>5</sup> As of May 2019, the EDRP has 5.3 MW of capability throughout the state. This value includes capability of Special Case Resources that did not sell their full available capacity.

<sup>6</sup> As of May 2019, the SCR program had 1219.5 MW of capability throughout the state.

<sup>7</sup> Under the NYISO's existing requirements, a dispatchable Demand Side Resource may participate in either the Day-Ahead Demand Response Program *or* the Demand Side Ancillary Service Program.

<sup>8</sup> *Demand Response Compensation in Organized Wholesale Energy Markets*, Order No. 745, FERC Stats. & Regs. ¶ 31,322 ("Order No. 745"), *order on reh'g and clarification*, Order No. 745-A, 137 FERC ¶ 61,215 (2011), *reh'g denied*, Order 745-B, 138 FERC ¶ 61,148 (2012), *vacated sub nom. Elec. Power Supply Ass'n v.*



demand response resource may instead submit bids for Ancillary Services through the NYISO's DSASP. Demand response resources that are capable of modulating their load in response to Base Point Signals from the NYISO are eligible to supply, and be paid for, Operating Reserves and Regulation Service.<sup>9</sup> Demand Side Resources may not simultaneously participate in the DADRP and DSASP.

A distributed energy resource that can inject at least 1 MW into the grid can also participate in the NYISO-administered markets as a Behind-the-Meter Net Generation ("BTM:NG") Resource. The BTM:NG Resource requirements were designed for large facilities that have on-site generation capability routinely serving a local, on-site Load (*i.e.*, the facility's Host Load), and that have excess generation capability after serving that Host Load.<sup>10</sup> Eligible BTM:NG Resources can sell Energy, Ancillary Services, and Installed Capacity to the wholesale markets and participate in a manner similar to traditional Generators.

Finally, a distributed energy resource that is not directly participating in the wholesale markets may be used by Load Serving Entities ("LSEs") to reduce the amount of Energy the LSE purchases in the Day-Ahead Market and to reduce the LSE's annual capacity obligation. Under existing price-capped load bidding rules, an LSE may choose to submit price-sensitive Day-Ahead load Bids for some, or all, of the load it must procure. That is, a LSE may choose the Day-Ahead Market price at which it will serve its load. If the Day-Ahead price exceeds the LSE's price-capped load bid, the LSE will then either reduce its load or procure energy through another source (such as a distributed energy resource).<sup>11</sup> Under this approach, the distributed energy resource does not directly participate in the wholesale markets.

Similarly, distributed energy resources may be used as load modifiers by LSEs. The distributed energy resource would not participate as a wholesale market resource, but instead would be used by an LSE to reduce its wholesale market load. Load modifiers can consist of many different technologies that LSEs can use to manage their load. They are primarily used to avoid purchasing high-cost power during peak hours and to reduce the LSE's annual capacity obligations. Load modifiers are not dispatched by the NYISO, and therefore any load reduction is not based on an explicit bulk power system or wholesale market need.

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*FERC*, 753 F.3d 216 (D.C. Cir. 2014), *rev'd & remanded sub nom. FERC v. Elec. Power Supply Ass'n*, 136 S.Ct. 760 (2016).

<sup>9</sup> As of May 2019, the DSASP had 116.5 MW of registered capability providing Ancillary Services.

<sup>10</sup> Examples of potential BTM:NG Resources include industrial complexes, large residential facilities, and college campuses. The Resource must have nameplate generation capability with a minimum rating of at least 2 MW, a minimum Load of at least 1 MW, and an interconnection allowing an export of at least 1 MW to the New York State Transmission System.

<sup>11</sup> In a typical scenario, LSEs would rely more heavily on wholesale energy purchases during periods of low prices while activating distributed energy resources to displace wholesale energy purchases during periods of high market prices.

**B. NYISO Initiative to Expand Distributed Energy Resources' Participation in its Markets**

In May 2016, the NYISO initiated a process to more fully integrate distributed energy resources in its wholesale markets.<sup>12</sup> The NYISO identified numerous benefits distributed energy resources are expected to bring, including improving system reliability, energy security, and fuel diversity, along with lowering consumer prices, improving market efficiency, and allowing consumers to take greater control of their electricity use and costs through a variety of new technologies.

The NYISO developed its proposal with its stakeholders and, in February 2017, issued a *Distributed Energy Resources Roadmap for New York's Wholesale Electricity Markets* ("DER Roadmap").<sup>13</sup> The DER Roadmap set forth high-level concepts to facilitate the development of a market design that more fully integrated distributed energy resources into the NYISO-administered markets.

Based on the DER Roadmap and discussions in numerous stakeholder meetings, the NYISO subsequently developed and issued in December 2017 its *Distributed Energy Resources Market Design Concept Proposal* ("DER Market Design Proposal").<sup>14</sup> The DER Market Design Proposal built on the DER Roadmap and expanded the breadth and details of the NYISO's proposal, with a particular focus on rules concerning: (i) aggregations and modeling; (ii) measurement and verification, and monitoring and control; (iii) performance obligations; and (iv) dual participation in wholesale and retail markets.

The NYISO then worked with stakeholders throughout 2018 and early 2019 to develop and enhance the market design and to develop the related tariff requirements. The NYISO discussed with stakeholders its concepts and design features at numerous working group meetings, including stand-alone and joint meetings of the stakeholder Installed Capacity, Market Issues, and Price-Responsive Load Working Groups. At each of these meetings the NYISO requested, received, and considered comments from all interested parties and made modifications to its proposed market design and the related tariff revisions in light of stakeholder feedback.

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<sup>12</sup> See *Distributed Energy Resources Roadmap Kickoff (Concepts for the Wholesale Market) Presentation*, Market Issues Working Group (May 24, 2016); available at: <https://www.nyiso.com/documents/20142/1409369/DER%20Roadmap%20Kickoff.pdf>.

<sup>13</sup> See *Distributed Energy Resources Roadmap for New York's Wholesale Electricity Markets* (Feb. 2017) ("DER Roadmap"), available at: [http://www.nyiso.com/public/webdocs/markets\\_operations/market\\_data/demand\\_response/DER\\_Roadmap/Distributed\\_Energy\\_Resources\\_Roadmap.pdf](http://www.nyiso.com/public/webdocs/markets_operations/market_data/demand_response/DER_Roadmap/Distributed_Energy_Resources_Roadmap.pdf).

<sup>14</sup> See *Distributed Energy Resources Market Design Concept Proposal* (Dec. 2017) ("DER Market Design Proposal"), available at: [http://www.nyiso.com/public/webdocs/markets\\_operations/market\\_data/demand\\_response/DER\\_Roadmap/DER\\_Roadmap/Distributed-Energy-Resources-2017-Market-Design-Concept-Proposal.pdf](http://www.nyiso.com/public/webdocs/markets_operations/market_data/demand_response/DER_Roadmap/DER_Roadmap/Distributed-Energy-Resources-2017-Market-Design-Concept-Proposal.pdf).

### **C. Commission Consideration of Requirements for Distributed Energy Resource Aggregations**

In November 2016 the Commission issued a Notice of Proposed Rulemaking in which it proposed to amend the Commission’s regulations to remove barriers to the participation of electric storage resources and distributed energy resource aggregations in the capacity, energy, and ancillary service markets operated by Regional Transmission Organizations (“RTOs”) and Independent System Operators (“ISOs”). Among other things, the November 2016 NOPR proposed to require RTO/ISOs to revise their tariffs to allow distributed energy resource aggregators to participate directly in their organized wholesale electric markets and to establish market rules to accommodate the participation of such aggregations.<sup>15</sup>

On February 15, 2018, the Commission issued a final rule in the proceeding - Order No. 841.<sup>16</sup> In Order No. 841, the Commission elected not to take final action concerning its proposed revisions for distributed energy resource aggregations, determining that more information was required concerning its proposals.<sup>17</sup> The Commission instead initiated a new proceeding and held a Technical Conference to gather additional information to determine which actions to take concerning its proposed distributed energy resource aggregation reforms.<sup>18</sup> At the time of filing, the Commission has not taken further action in that proceeding.

## **II. Overview**

### **A. The NYISO’s Proposed Aggregation Participation Model and Related Rules**

The NYISO proposes to establish a new Aggregation participation model and related market, operating, and planning requirements pursuant to which a Market Participant – an “Aggregator” – may combine individual facilities, including distributed energy resources, located on the transmission or distribution system as a single unit – an “Aggregation” – for purposes of participating in the NYISO-administered Energy, Ancillary Services, and Installed Capacity markets. The NYISO’s proposed tariff revisions will remove barriers to entry and enhance opportunities for certain facilities that cannot currently participate or cannot fully participate through existing participation models due to their size, physical or operational characteristics, or commitments to the local distribution system or host load. The NYISO’s proposed tariff revisions establish reasonable and not unduly burdensome requirements that will enable these facilities’ participation, while maintaining the effectiveness of the NYISO-administered markets and the reliability of the grid. Because the November 2016 NOPR’s specific distributed energy resource proposals have not yet been adopted by the Commission, the

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<sup>15</sup> November 2016 NOPR at P 132.

<sup>16</sup> See *Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Order No. 841, 162 FERC ¶ 61,127 (February 15, 2018), 83 Fed. Reg. 9580 (Mar. 6, 2018), Errata Notice (Feb. 28, 2018) (“Order No. 841”). All citations to Order No. 841 in this compliance filing are to the revised order included with the February 28, 2018, errata notice.

<sup>17</sup> Order No. 841 at P 5.

<sup>18</sup> *Id.*

NYISO is not yet required to adopt them. Nevertheless, as is noted in various places throughout this filing the NYISO believes that its proposed revisions are consistent with or superior to the Commission's proposals in light of the unique market structure and operating and planning requirements in New York. There is no question that the NYISO's proposed revisions support the Commission's overall policy goal of removing barriers to distributed energy resources' participation in the NYISO-administered markets.

### *1. Aggregations and Distributed Energy Resources*

As described in Part IV of this filing letter, an Aggregator may group individual facilities into an Aggregation to meet the minimum eligibility requirements and performance obligations required to participate in the NYISO-administered Energy, Ancillary Services, and Installed Capacity markets. An Aggregator will be a NYISO Market Participant that may combine facilities across a broad range of Resource types and sizes to participate in the NYISO markets as a single entity – the Aggregation. The Aggregator will be required to register as a NYISO Market Participant, to register Aggregations with the NYISO, and to enroll the individual facilities in an Aggregation. The individual facilities will be required to satisfy certain requirements to enter into, exit, and switch between Aggregations.

The Aggregation will be a Resource under the NYISO Tariffs and may include any combination of two or more individual Generators, Demand Side Resources, and/or Distributed Energy Resources. A Distributed Energy Resource may be one of the following categories of facilities electrically located in the New York Control Area ("NYCA"): (i) a facility comprising two or more different technology types located behind a single point of interconnection with a maximum Injection Limit of 20 MW, (ii) a Demand Side Resource, or (iii) a Generator with a maximum Injection Limit of 20 MW. An Aggregation may also be comprised of a single Demand Side Resource.<sup>19</sup>

An Aggregation's market participation, performance, and settlements will all be administered at the Aggregation-level. All of the facilities in an Aggregation must be electrically connected to the same designated bus located in the NYCA – a "Transmission Node."<sup>20</sup> The NYISO, in coordination with the New York Transmission Owners, will establish the set of Transmission Nodes for use by Aggregations. Transmission Nodes will represent the point on the transmission system where an Aggregation's Energy injections, Energy withdrawals, and Demand Reduction will be modeled, and the point at which its Locational Based Marginal Prices ("LBMPs") will be calculated. One or more Aggregators can each enroll one or more Aggregations at a Transmission Node. There will not be an upper limit on the number of

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<sup>19</sup> The NYISO's demand response programs currently permit aggregations of a single Demand Side Resource to provide wholesale market services if the Demand Side Resource meets the applicable eligibility requirements. The NYISO's proposed Aggregation rules will continue to allow individual Demand Side Resources to participate as an Aggregation of one.

<sup>20</sup> Although the individual facilities must be electrically connected to the same designated Transmission Node, they do not need to directly connect to the Transmission Node itself.

individual facilities or total capability (in MW) included in an Aggregation, although there will be a 20 MW maximum Injection Limit for each individual participant comprising the Aggregation.

An Aggregation's mix of Resource types<sup>21</sup> will determine which market rules apply to that Aggregation. An Aggregation that is composed of a single Resource type, with the exception of Demand Side Resources, will be subject to the market rules applicable to that Resource type. For example, an Aggregation that is made up entirely of Intermittent Power Resources will be subject to all of the market rules that apply to Intermittent Power Resources. The NYISO has revised the rules applicable to specific Resources types to accommodate Aggregations comprised solely of those Resource types. An Aggregation that includes more than one Resource type, only Demand Side Resources, or facilities participating as Distributed Energy Resources will be referred to as a "DER Aggregation" and will be subject to certain DER Aggregation-specific rules.

## 2. *Energy and Ancillary Services Market Requirements*

The requirements for an Aggregation's participation in the NYISO-administered Energy and Ancillary Services markets are detailed in Part V of this filing letter. Each Aggregation's eligibility to provide services in the Energy and Ancillary Services markets will depend upon the characteristics of the facilities included in the Aggregation.

All Aggregations, regardless of their Resource type mix, will be bid into the Energy market and settled as a single entity. An Aggregation will be "dispatch-only" and will not provide commitment parameters (*e.g.*, start-up time, minimum generation MW) to the NYISO or receive a unit commitment from the NYISO. An Aggregation that contains at least one Withdrawal-Eligible Generator, such as an Energy Storage Resource, may Bid to withdraw Energy for a market interval. The minimum offer requirement for an Aggregation will be 100 kW. An Aggregation that offers a combination of Energy injections, Energy withdrawals, and/or Demand Reduction must offer the minimum offer level of 100 kW for each response type.<sup>22</sup> An Aggregation will only be permitted to offer the Ancillary Services that all individual facilities in the Aggregation are qualified to provide.

The NYISO's existing economic-based DADRP and DSASP will be replaced by the new Aggregation participation model. This will provide a single set of rules for dispatchable Demand

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<sup>21</sup> Section 2.18 of the Services Tariff identifies a limited set of facilities as "Resources" (*e.g.*, Energy Storage Resources, Generators, Intermittent Power Resources). When used in this filing, the term "Resource type" means any of the types of facilities identified in the definition of Resource.

<sup>22</sup> The NYISO does not propose to change the manner in which an end-use customer serves its Load in this filing, even if that customer is providing wholesale market services. Both Energy injections and Demand Reductions will be considered "supply," and Energy withdrawals by Withdrawal-Eligible Generators will be considered "negative generation" in the same manner as proposed in the NYISO's Order No. 841 compliance filing. *See New York Independent System Operator Inc.*, Compliance Filing and Request for Extension of Time of Effective Date, Docket No. ER19-467-000 (December 3, 2018) at 21-22.

Side Resources to streamline and enhance their market participation opportunities.<sup>23</sup> The NYISO's reliability-based SCR program and EDRP will continue to be available to Demand Side Resources that are not capable of responding to real-time dispatch signals.

Aggregations that contain Demand Side Resources will continue to be subject to the Net Benefits Test, cost allocation rules, and appropriate measurement and verification methodologies set forth in Order No. 745. When the real-time LBMP in a dispatch interval is less than a Monthly Net Benefits Threshold,<sup>24</sup> Demand Reductions provided by an Aggregation for that interval will not be compensated for Energy. The NYISO's proposed balancing market settlements rules have been revised so that Demand Side Resources' participation in Aggregations complies with Order No. 745.

Finally, Aggregations will be subject to appropriate market mitigation requirements in connection with their provision of Energy and Ancillary Services.

### *3. Dual Participation*

As described in Part VI of this filing letter, a Generator, Demand Side Resource, or Distributed Energy Resource that is electrically located in the NYCA will be able to simultaneously participate in the NYISO-administered markets and in programs or markets operated to meet the needs of distribution systems located in the NYCA, or of host facilities. Resources that participate in retail utility programs while also participating in the NYISO-administered markets will be required to meet all the eligibility, participation, measurement, and performance rules and requirements of Suppliers that exclusively participate in the NYISO-administered Energy, Ancillary Services, and Installed Capacity markets.

### *4. Metering and Telemetry*

As described in Part VII of this filing letter, the NYISO is enacting a comprehensive reform of its metering requirements applicable to Aggregators, Responsible Interface Parties enrolling resources in the SCR program, and Curtailment Service Providers enrolling resources in the EDRP. As revised, an Aggregator, Responsible Interface Party, or Curtailment Service Provider may obtain wholesale metering and/or meter data services from either: (i) a Member System,<sup>25</sup> or (ii) a new third-party entity – a Meter Services Entity. This new framework will

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<sup>23</sup> Dispatchable Demand Side Resources are those Demand Side Resources that are capable of responding to the NYISO's direction in real-time (*i.e.*, five-minute Energy Base Point Signals, and six-second Base Point Signals for Regulation Service).

<sup>24</sup> The Services Tariff currently includes the defined term "Monthly Net Benefit Offer Floor." Services Tariff Section 2.13. As described in Part V.C, the NYISO proposes to change the application of the Net Benefit Test from an offer floor to an after-the-fact evaluation, and therefore proposes to revise the defined term to "Monthly Net Benefit Threshold."

<sup>25</sup> The Services Tariff defines "Member Systems" as "[t]he eight Transmission Owners that comprised the membership of the New York Power Pool, which are: (1) Central Hudson Gas & Electric Corporation, (2) Consolidated Edison Company of New York, Inc., (3) New York State Electric & Gas Corporation, (4) Niagara Mohawk Power Corporation d/b/a National Grid, (5) Orange and Rockland Utilities, Inc., (6) Rochester Gas and

replace the existing requirements pursuant to which the Market Participant may only use certain third-party providers of metering and/or meter data services that have been certified by the New York Public Service Commission (“NYPSC”).

The NYISO further proposes to require that Aggregations meet the metering and telemetry standards applicable to Generators, including the requirement that Generators provide six-second telemetry. This proposal will align the metering and telemetry standards for Generators and Aggregations, and will provide the NYISO with both the real-time operational data and after-the-fact settlement data needed to ensure Aggregations are responding to NYISO direction and are accurately settled.

### *5. Settlement Rules*

As described in Parts V.B, VIII.A and VIII.B, the NYISO proposes revisions to the Real-Time Market Settlement rules, Bid Production Cost Guarantee (“BPCG”) payment rules, and Day-Ahead Margin Assurance Payment (“DAMAP”) rules to incorporate Aggregations and Distributed Energy Resources. Real-Time Market Settlements will account for Energy injections, Energy withdrawals by Withdrawal-Eligible Generators, and Demand Reduction provided as supply from Demand Side Resources. The BPCG payment rule modifications and DAMAP rule modifications account for the new Aggregation participation model and the removal of the DADRP and DSASP rules.

### *6. Installed Capacity Market Requirements*

The requirements for an Aggregation’s participation in the NYISO-administered Installed Capacity market are detailed in Part IX of this filing letter. Each Aggregation’s eligibility to provide services in the Installed Capacity market will depend upon the characteristics of the Resources included in the Aggregation.

In anticipation of Distributed Energy Resources entering the NYISO-administered markets, the NYISO developed rules for Installed Capacity Suppliers that have daily run-time limitations—which the NYISO proposes to define as a “Resource with Energy Duration Limitation”—to enable their participation in the NYISO-administered Installed Capacity market.

As described in Part IX.C, the NYISO proposes that an Aggregation may qualify to be a Resource with Energy Duration Limitation based on the characteristics of the individual facilities in the Aggregation. The eligibility requirements for Aggregations in the Installed Capacity market are further described in that Part.

The NYISO also proposes to amend the market mitigation requirements for the Installed Capacity market to address the new Aggregation Resource type. The proposed rules concerning Aggregations’ participation in the NYISO-administered Installed Capacity market aim to align

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Electric Corporation, (7) the Power Authority of the State of New York, and (8) Long Island Lighting Company d/b/a Long Island Power Authority.

with the rules for existing (individual) Resources, while recognizing the unique characteristics of Aggregations.

### *7. Interconnection Requirements*

As described in Part X of this filing letter, the NYISO proposes revisions to its interconnection requirements, including revisions to the requirements concerning Capacity Resource Interconnection Service (“CRIS”). A facility that injects Energy onto the system must obtain CRIS to qualify as an Installed Capacity Supplier.<sup>26</sup> The revisions are required to address the unique physical and operational characteristics of Distributed Energy Resources (i) with Energy Duration Limitations, and/or (ii) comprised of multiple units of the same or different technology type at a single location. The NYISO proposes to amend the data requirements applicable to these facilities, the manner in which they are evaluated in the interconnection process, the level of CRIS they may request, the manner in which the requests will be evaluated, and the manner in which proposed modifications and CRIS transfers will be processed.

#### **B. Stakeholder Process**

As detailed above, the NYISO’s proposed market design and related tariff revisions were developed through a multi-year process with extensive stakeholder involvement and input. The market concepts were approved by a substantial majority of stakeholders at the April 17, 2019, Business Issues Committee, and the related tariff requirements were similarly approved at the April 24, 2019, Management Committee meeting by a show of hands with abstentions and one vote in opposition. On May 21, 2019, the NYISO Board of Directors approved the proposed tariff revisions for filing with the Commission, pursuant to Section 205 of the Federal Power Act.

#### **III. Documents Submitted**

Along with this filing letter, the NYISO respectfully submits the following documents:

1. A clean version of the proposed revisions to Services Tariff Section 4.5 to be effective August 27, 2019 (“Attachment I”)
2. A blacklined version of the proposed revisions to Services Tariff Section 4.5 to be effective August 27, 2019 (“Attachment II”)
3. A clean version of the proposed revisions to Services Tariff Sections 2.13, 13 and 15.10 to be effective November 1, 2019 (“Attachment III”);
4. A blacklined version of the proposed revisions to Services Tariff Sections 2.13, 13, and 15.10 to be effective November 1, 2019 (“Attachment IV”);

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<sup>26</sup> Demand Side Resources do not currently need to obtain CRIS to qualify as an Installed Capacity Supplier. The NYISO does not propose to require CRIS for Demand Side Resources as part of the instant filing.



5. A clean version of the proposed revisions to Services Tariff Sections 2.2 and 4.1.11 to be effective May 1, 2020 (“Attachment V”);
6. A blacklined version of the proposed revisions to Services Tariff Sections 2.2 and 4.1.11 to be effective May 1, 2020 (“Attachment VI”);
7. A clean version of the proposed revisions to OATT Sections 25, 30, and 32 (Attachments S, X, and Z) to be effective May 1, 2020 (“Attachment VII”);
8. A blacklined version of the proposed revisions to OATT Sections 25, 30, and 32 (Attachments S, X, and Z) to be effective May 1, 2020 (“Attachment VIII”);
9. A clean version of the proposed revisions to Services Tariff Sections 5.1, 5.2, 5.3, 5.7, 5.9, 5.10, 5.11, 5.12, 5.13, and 5.14 to be effective March 1, 2020 (“Attachment IX”);
10. A blacklined version of the proposed revisions to Services Tariff Sections 5.1, 5.2, 5.3, 5.7, 5.9, 5.10, 5.11, 5.12, 5.13, and 5.14 to be effective March 1, 2020 (“Attachment X”);
11. A clean version of the remainder of the proposed revisions to the Services Tariff with an effective date to be determined (“Attachment XI”);
12. A blacklined version of the remainder of the proposed revisions to the Services Tariff with an effective date to be determined (“Attachment XII”);
13. A clean version of the remainder of the proposed revisions to the OATT with an effective date to be determined (“Attachment XIII”);
14. A blacklined version of the remainder of the proposed revisions to the OATT with an effective date to be determined (“Attachment XIV”);
15. An exhibit showing a blackline of the complete set of proposed revisions to the Services Tariff that shows the revisions proposed in the NYISO’s Order No. 841 compliance filing in italics (“Attachment XV”); and
16. An exhibit showing a blackline of the complete set of proposed revisions to the OATT that shows the revisions proposed in the NYISO’s Order No. 841 compliance filing in italics (“Attachment XVI”).

#### **IV. Aggregations and Distributed Energy Resources**

##### **A. Aggregation Participation Model**

The NYISO proposes to establish a new participation model pursuant to which an “Aggregator” may combine individual facilities as a single unit—or “Aggregation”—to provide Energy, Ancillary Services, and Capacity in the NYISO-administered markets.<sup>27</sup>

The Aggregator will be the Market Participant that interfaces with the NYISO concerning the participation of the Aggregation in the NYISO-administered markets.<sup>28</sup> Specifically, the Aggregator will be a “Supplier” under the NYISO Tariffs that may offer “Capacity, Energy, and/or Ancillary Services for an Aggregation.”<sup>29</sup>

The Aggregation will be identified as a “Resource” under the NYISO Tariffs that may participate in the NYISO-administered markets. The NYISO proposes to define an Aggregation as “[a] Resource, comprised of two or more individual Generators, Demand Side Resources, or Distributed Energy Resources, or one or more individual Demand Side Resources, at separate points of interconnection and that are grouped and dispatched as a single unit by the ISO, and for which Energy injections, withdrawals and Demand Reductions are modeled at a single Transmission Node.”<sup>30</sup> The NYISO proposes to establish specific rules consistent with this definition concerning the permissible composition of Aggregations (described in Part IV.C), the market rules that will apply to a given Aggregation (described in Part IV.D), and where an Aggregation may be located on the grid (described in Part IV.E).

An Aggregation will have to satisfy the minimum eligibility and performance requirements for wholesale market participation in the same manner as any other Resource.<sup>31</sup>

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<sup>27</sup> Proposed revisions to Services Tariff Section 4.1.10.

<sup>28</sup> The November 2016 NOPR proposed to define a distributed energy resource aggregator as a “type of market participant that can participate in the organized wholesale electric markets under the participation model that best accommodates the physical and operational characteristics of its distributed energy resource aggregation.” November 2016 NOPR at PP 124, 128. The NYISO’s proposal is generally consistent with this approach. An Aggregator will be a NYISO Market Participant whose Aggregation can participate as a Resource in the NYISO-administered markets. The specific market rules that will apply to an Aggregation will be based on the mix of facilities included in the Aggregation. For example, a Aggregation comprised solely of Energy Storage Resources will be subject to the Energy Storage Resource-specific requirements in the NYISO Tariffs. In addition, any type of entity that meets the eligibility requirements for an Aggregator can be an Aggregator. *See* November 2016 NOPR at P 158.

<sup>29</sup> Proposed revisions to Services Tariff Section 2.1.9. The NYISO proposes to revise the definition of Supplier to include Aggregators.

<sup>30</sup> Proposed revisions to Services Tariff Section 2.18. The NYISO proposes to revise the definition of Resource to provide for Aggregations.

<sup>31</sup> Proposed Services Tariff Section 4.1.10. The NYISO’s proposal is consistent with the Commission’s proposal in its November 2016 NOPR that “the distributed energy resource aggregation must still satisfy any eligibility requirements of the applicable participation model before it can participate in the organized wholesale electric markets under that participation model.” *See* November 2016 NOPR at P 128.

The individual facilities that make up an Aggregation will not be individually required to meet these minimum requirements, except where specifically noted.<sup>32</sup> In addition, each Aggregation will be offered in the NYISO-administered markets as a single unit, and all bidding and offer obligations under the NYISO Tariffs will apply to the Aggregator or Aggregation, not to the individual facilities that comprise the Aggregation.<sup>33</sup>

As detailed below, most Resource types that are currently eligible to participate in the NYISO-administered markets will be eligible to participate in the markets as part of an Aggregation.<sup>34</sup> In addition, certain facilities that are not currently eligible to participate in the NYISO-administered markets or that cannot fully participate will have the opportunity to do so by joining an Aggregation. This includes, for example, small facilities that are not individually capable of satisfying minimum participation requirements, facilities seeking to provide both wholesale and retail services simultaneously, and run-time limited facilities. The Aggregation participation model will facilitate participation in the NYISO-administered markets by: (i) permitting multiple individual facilities to combine their capability to meet minimum eligibility requirements; (ii) providing flexibility to Aggregators seeking to manage obligations among the wholesale market, local distribution system, and host facility; and (iii) allowing Aggregators to stack individual facility capability sequentially to meet minimum run-time requirements for participation in the NYISO's Energy, Ancillary Services, and Capacity markets.

## **B. Distributed Energy Resources**

As part of the new Aggregation participation model, the NYISO proposes to provide for the participation of "Distributed Energy Resources." Distributed Energy Resources will include the categories of facilities described below that are electrically located in the NYCA, which facilities will be eligible to participate in the NYISO-administered markets through a type of Aggregation to be known as a "DER Aggregation" (as described in Part IV.D below).<sup>35</sup>

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<sup>32</sup> Proposed Services Tariff Section 4.1.10. For example, the Aggregation, not individual facilities, will be required to meet the NYISO's minimum offer requirement of 100 kW. Individual facilities within an Aggregation may have less than 100 kW of capability so long as the Aggregation itself can meet the minimum offer requirement.

<sup>33</sup> Proposed Services Tariff Section 4.1.10.

<sup>34</sup> The NYISO's proposal is generally consistent with the Commission's proposal in the November 2016 NOPR ("we propose that each RTO/ISO revise its tariff so that it does not prohibit the participation of any particular type of technology in the organized wholesale electric markets through a distributed energy resource aggregator."). See November 2016 NOPR at P 133. However, assets that participate in the NYISO-administered markets through the following Resource types will not be eligible to participate in an Aggregation: Generators with PURPA contracts, Limited Control Run-of-River Resources, Behind-the-Meter Net Generation Resources, Municipally-owned Generation, System Resources, and Control Area System Resources. Proposed Services Tariff Section 4.1.10. Each of these Resource types have specific rules in the NYISO's tariffs that address unique operating characteristics, which the NYISO's proposed Aggregation participation model is not designed to accommodate.

<sup>35</sup> Proposed revisions to Services Tariff Section 2.4.

The first category of Distributed Energy Resources will be made up of facilities that have two or more different technology types located behind a common point of interconnection. Such facilities will have a maximum Injection Limit of 20 MW.<sup>36</sup>

The NYISO's existing rules provide facilities that employ different technologies with avenues for wholesale market participation. However, the existing rules treat such facilities differently based on the Resource types that comprise the facility, which limits the opportunities for these facilities to fully participate in the NYISO-administered markets. For example, if a facility had two assets that could inject Energy onto the grid (*e.g.*, an Energy Storage Resource and an Intermittent Power Resource, such as a solar facility), the facility would currently be required to register the two assets as separate Resources with different Point Identifiers (or "PTIDs"). The Resources would be modeled as separate facilities in the NYISO's interconnection process and market model. As another example, if a facility includes both Demand Reduction capability and the ability to inject Energy onto the grid, and the facility registered as a Demand Side Resource to participate in one of the NYISO's demand response programs, the facility would be prohibited from injecting Energy onto the grid. Alternatively, if the facility registered as a Generator, its Demand Reductions would not be recognized as supply. The NYISO's proposed rules will enable these facilities that employ different technologies to enter into an Aggregation, where the facilities may combine their capabilities to satisfy the eligibility and performance requirements, enhancing the opportunities for these facilities to fully participate in the NYISO-administered markets, reducing barriers to entry, and permitting such facilities to provide all services for which they are technically capable.

For purposes of the definition of a Distributed Energy Resource, an "individual facility" will be a facility that is either: (i) a single facility at a distinct physical location (*e.g.*, street address and utility account number), or (ii) a single physical location with (a) more than one facility with separate utility account numbers and/or points of interconnection with the distribution system, and (b) operated independently from other facilities at that physical location.<sup>37</sup> For example, an apartment building where the entire building is commonly metered and has a single utility account for all of the apartments would likely be considered one "individual facility." On the other hand, a commercial building where each unit is separately owned, operated, and metered may qualify to be multiple "individual facilities." The NYISO seeks to provide flexibility to Aggregators to develop Aggregations that best suit the Aggregator's needs considering both the capability and metering configuration of the individual

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<sup>36</sup> The NYISO proposes to revise the definition of "Injection Limit" in Section 2.9 of the Services Tariff as: the "maximum injection of BTM:NG Resources and Distributed Energy Resources, in MW, into the NYS Transmission System or distribution system at the BTM:NG Resource's Point of Injection or Distributed Energy Resource's point of interconnection. The Injection Limit for a BTM:NG Resource must be at least 1 MW."

<sup>37</sup> The NYISO has similar rules for enrolling Special Case Resources where there are multiple units or utility account numbers. *See* Installed Capacity Manual § 4.12.2. While the NYISO has not yet begun developing the ISO Procedures associated with identifying individual facilities, it expects to provide a detailed explanation of its evaluation procedures as well as examples to assist Market Participants in developing Aggregations for wholesale market participation.

facilities. The NYISO will work with Aggregators that seek guidance on compliance with this market rule.

The second category of Distributed Energy Resources will be dispatchable Demand Side Resources.<sup>38</sup> As described in Part I.A above, the NYISO currently has four demand response programs in which Demand Side Resources can participate. As detailed in Part V.A.4 below, the NYISO proposes to eliminate the two economic-based demand response programs: the DADRP and DSASP.<sup>39</sup> In their place, one or more Demand Side Resources that are dispatchable in real-time may elect to provide Energy, Ancillary Services, and Capacity as Distributed Energy Resources through a DER Aggregation.<sup>40</sup> A Demand Side Resource may either participate as its own single-facility DER Aggregation or participate in a DER Aggregation with one or more additional facilities.<sup>41</sup> Demand Side Resources will also continue to be able to participate in the NYISO's two reliability-based demand response programs—*i.e.*, the EDRP or SCR program.<sup>42</sup> Demand Side Resources choosing to participate in the EDRP or SCR program will follow the existing rules set forth in Sections 22 (Att. G) and 5.12.11 of the Services Tariff, respectively.<sup>43</sup>

The third category of Distributed Energy Resources are Generators with an Injection Limit of 20 MW or less. Such Generators may continue to participate in the NYISO-administered markets as stand-alone Generators or in Aggregations, so long as they satisfy the relevant eligibility requirements. However, Generators up to 20 MW in size will also have the opportunity to join a DER Aggregation as a Distributed Energy Resource, which will provide additional options and greater flexibility to Market Participants.

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<sup>38</sup> As described throughout this filing, the NYISO defines dispatchable as the capability to respond to the NYISO's Base Point Signals in real-time.

<sup>39</sup> The NYISO adopted the DSASP and DADRP in 2008 and 2001 respectively. The DSASP has limited, but steady participation. The DADRP enrollment has been static for several years, and enrolled resources have not participated in the Energy market for more than four years.

<sup>40</sup> Under the NYISO's existing requirements, a dispatchable Demand Side Resource may participate in either the Day-Ahead Demand Response Program *or* the Demand Side Ancillary Service Program.

<sup>41</sup> *See* proposed revisions to Services Tariff Section 2.4 (definition of "DER Aggregation"). The November 2016 NOPR stated that a "single qualifying distributed energy resource [should be able to] avail itself of the proposed distributed energy resource aggregation rules by serving as its own distributed energy resource aggregator." November 2016 NOPR at P 137. Under the NYISO's proposal, individual facilities that meet the established minimum eligibility requirements may participate in an existing participation model (*e.g.*, Generator or Energy Storage Resource). If an individual facility does not meet the individual eligibility requirements to provide wholesale services, it will be permitted to participate in an Aggregation, subject to the rules described in this filing. Dispatchable Demand Side Resources will not have a separate participation model, and therefore will be required to participate in a "DER Aggregation." For this reason, and because the NYISO currently allows single Demand Side Resource participation in its DADRP and DSASP, the NYISO proposes to allow such Demand Side Resources to form a DER Aggregation of a single facility, provided the facility meets all of the minimum eligibility requirements.

<sup>42</sup> Demand Side Resources that are not dispatchable in real-time will be limited to participating in the NYISO's Emergency Demand Response Program or Special Case Resource program, which offer wholesale market participation opportunities to facilities that can reduce their Load at the request of the NYISO with appropriate day-ahead and in-day notice. *See* Services Tariff Sections 22.6 and 5.12.11.1. Demand Side Resources may not simultaneously participate as a Distributed Energy Resource and in the SCR program or EDRP.

<sup>43</sup> Proposed Services Tariff Section 4.1.10.

The NYISO's definition of Distributed Energy Resources is more expansive than that proposed by the Commission in the November 2016 NOPR, which characterized a distributed energy resource as a "source or sink of power that is located on the distribution system, any subsystem thereof, or behind a customer meter."<sup>44</sup> The NYISO's proposal does not require Distributed Energy Resources to be located on the distribution system, or co-located with Load. Instead, the NYISO proposes to allow Distributed Energy Resources to be interconnected at any point on the transmission system or distribution system, and directly connected or located behind an end-use customer's meter. These proposed rules will allow developers to choose the location and configuration that best fits their, and their customers', needs. This will provide greater flexibility to small facilities and Aggregators. Expanding the pool of individual facilities that may participate as Distributed Energy Resources lowers barriers to entry and will encourage greater participation in the NYISO-administered markets.

### **C. Composition of Aggregations**

An Aggregation (and a DER Aggregation) must be comprised of at least two individual facilities,<sup>45</sup> with one exception. A single Demand Side Resource may enroll as a single-facility DER Aggregation if it meets all applicable eligibility requirements.<sup>46</sup> This exception is consistent with the NYISO's current approach of permitting individual Demand Side Resources that meet applicable eligibility requirements to participate in the DADRP and DSASP.<sup>47</sup>

The NYISO does not propose to establish an upper limit on the number of individual facilities that can participate in an Aggregation, or the total capability (in MW) of an Aggregation. The NYISO also does not propose to establish an upper limit on the amount of Demand Reduction that a Distributed Energy Resource participating in an Aggregation may provide.<sup>48</sup> However, the NYISO does propose to establish a maximum physical injection limit of 20 MW for each individual facility participating in an Aggregation.<sup>49</sup> The maximum physical

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<sup>44</sup> November 2016 NOPR at P 104.

<sup>45</sup> Proposed Services Tariff Section 4.1.10.1. A facility that contains multiple assets behind a common point of interconnection (*e.g.*, a facility that combines Demand Reduction from a commercial building and an Energy Storage Resource) will be considered an "individual facility" if the facility is configured to use a single meter to measure all Energy withdrawals and injections. Such facilities may separately meter and independently operate the assets to create two or more individual facilities.

<sup>46</sup> *Id.*

<sup>47</sup> Resources that fall into other categories, such as Generators or Intermittent Power Resources, may also participate individually in the markets under the existing rules for that Resource type, but cannot participate as a single Resource Aggregation.

<sup>48</sup> Proposed Services Tariff Section 4.1.10.1.

<sup>49</sup> In the November 2016 NOPR, the Commission did not propose a minimum or maximum capacity requirement for individual distributed energy resources participating in an aggregation, but instead sought comments on whether to establish such a requirement. *See* November 2016 NOPR at P 135. The NYISO does not propose to establish a minimum capacity (MW) requirement for an individual resource participating in an Aggregation. The NYISO did, however, consider a range of values for an upper Injection Limit for individual facilities participating in an Aggregation. The NYISO ultimately decided to align the Injection Limit for Distributed Energy Resources with

injection capability will be measured as the facility's nameplate capacity, unless the facility (or Aggregator) demonstrates to the NYISO (and, where appropriate, the local utility) that it has sufficient physical protections and/or control schemes to limit the injection capability of the facility to 20 MW or less.<sup>50</sup> The evaluation of a facility's physical protection and control schemes will be performed on a case-by-case basis, and the particular facility will not be permitted to participate in the Aggregation until approved by the NYISO.

#### **D. Market Rules Applicable to Aggregations**

An Aggregation may be composed of either a single Resource type<sup>51</sup> or multiple Resource types.<sup>52</sup> An Aggregation's mix of Resource types will determine which market rules will apply to that Aggregation.<sup>53</sup>

##### *1. Single Resource Type Aggregations*

An Aggregation that is only composed of a single Resource type, with the exception of Demand Side Resources, will be subject to the existing rules for that particular Resource type, along with the general rules applicable to all Aggregations.<sup>54</sup> For example, an Aggregation that is composed of only Energy Storage Resources will be subject to the rules in the NYISO's tariffs and procedures for Energy Storage Resources, along with the general rules applicable to all Aggregations.<sup>55</sup> This approach provides Market Participants with the ability to aggregate facilities, while ensuring that the market rules applicable to specific Resource types continue to apply.

An Aggregation of (i) Intermittent Power Resources, (ii) Energy Limited Resources, (iii) Capacity Limited Resources, and (iv) Limited Energy Storage Resources will only be considered a "single Resource type" when each facility in the Aggregation has the same intermittent, Energy

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the upper limit for the Small Generator Interconnection Procedures. Allowing individual facilities up to 20 MW to participate in an Aggregation provides flexibility to Aggregators seeking to maximize the services offered by the Aggregation. It is also consistent with NYISO system operator needs to have operational visibility and operational control of large Generators.

<sup>50</sup> Proposed Services Tariff Section 4.1.10.1.

<sup>51</sup> "Resource" is currently defined in Section 2.18 of the Services Tariff as "An Energy Limited Resource, Energy Storage Resource, Limited Energy Storage Resource, Generator, 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. The phrase "Resource type" used in this filing refers to the thirteen different types of assets currently identified in the definition of "Resource." The NYISO proposes to revise the definition of Resource to incorporate an Aggregation as a separate Resource type.

<sup>52</sup> Proposed Services Tariff Section 4.1.10.1.

<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

<sup>55</sup> *See, e.g.*, proposed revisions to the terms "ISO-Committed Fixed" and "ISO-Committed Flexible" in Section 2.9 of the Services Tariff.

limiting, or capacity limiting characteristics.<sup>56</sup> For example, an Aggregation of gas turbines that participate in the NYISO-administered markets as Energy Limited Resources due to air permit restrictions will constitute a single Resource type because the Energy limiting characteristic (*i.e.*, the air permit) is the same. Conversely, an Aggregation comprising a pumped storage facility and a gas turbine with an air permit restriction would not be considered a “single Resource type” for purposes of the Aggregation rules despite both individual facilities participating as Energy Limited Resources.

## 2. *Multiple Resource Type “DER Aggregations”*

An Aggregation that includes (i) more than one Resource type, or (ii) only Demand Side Resources will be known as a “DER Aggregation.”<sup>57</sup> A DER Aggregation will be a subset of Aggregations that is subject to the general rules for Aggregations and certain DER Aggregation-specific rules. For example, an Aggregation that includes an Energy Storage Resource and a Demand Side Resource would be a DER Aggregation. Facilities participating as Distributed Energy Resources will participate through a DER Aggregation. In addition, an Aggregation containing multiple facilities with the same Resource type—*i.e.*, Intermittent Power Resources, Energy Limited Resources, Capacity Limited Resources, or Limited Energy Storage Resources—but with different characteristics must satisfy the rules applicable to DER Aggregations.<sup>58</sup>

## 3. *Summary of Aggregation Types*

Figure 1 summarizes the Aggregation types that will be available upon implementation of the proposed market rules.

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<sup>56</sup> Proposed Services Tariff Section 4.1.10.1.

<sup>57</sup> *Id.* A “DER Aggregation” is defined as “[a]n Aggregation consisting of one or more Demand Side Resources, or two or more different Resource types ....” Proposed revisions to Services Tariff Section 2.4.

<sup>58</sup> Proposed Services Tariff Section 4.1.10.1.



<b>Dispatchable</b>	<b>Aggregations</b>	<b>Generator Model</b>	<b>Consisting of Only Generators of the same Resource type</b> • Aggregation must consist of 2 or more Generators
		<b>Energy Storage Resource Model</b>	<b>Consisting of Only Energy Storage Resources (ESR)</b> • Aggregation must consist of 2 or more ESRs
		<b>DER Aggregations</b>	<b>Consisting of Only Demand Side Resources (DSR)</b> • Aggregation must consist of 1 or more Demand Side Resources • Demand Reduction only; no Energy injections
			<b>Mix of Generators, Energy Storage Resources, DER, and/or Demand Side Resources</b> • Aggregation must consist of 2 or more Resource types (e.g., Generator, ESR, DSR) • Capable of injection, Energy withdrawals, and/or Demand Reduction
<b>Non-Dispatchable</b>	<b>Individual Resource</b>	<b>Generator Model or Energy Storage Resource Model</b>	<b>Individual Generator or Energy Storage Resource</b> • Individual Generator or Energy Storage Resource • Capable of Energy injections and/or Energy Withdrawals
		<b>Special Case Resource Model</b>	<b>Special Case Resources (SCR)</b> • Individual Demand Side Resources or Small Customer Aggregation under the responsibility of a Responsible Interface Party (RIP) • Qualified to participate in Capacity market
<b>Non-Dispatchable</b>	<b>Non-Dispatchable Aggregation or Individual Demand Side Resources</b>	<b>Emergency Demand Response Model</b>	<b>Emergency Demand Response Program (EDRP)</b> • Individual Demand Side Resources under the responsibility of a Curtailment Service Provider (CSP) • Qualified to provide Energy during reliability events

Figure 1: Wholesale Market Participation Options

### E. Electrical Locations of Aggregations

The NYISO proposes to require that each individual facility within an Aggregation be electrically located in the NYCA, and electrically connected to the same NYISO-identified Transmission Node.<sup>59</sup> Requiring facilities within an Aggregation to be electrically connected to the same Transmission Node will enable the NYISO to manage transmission constraints and reliability concerns thereby resulting in lower overall production cost. It also encourages location-specific development of Distributed Energy Resources in areas where additional supply is beneficial. Settling Aggregations at the individual Transmission Node LBMP, rather than a zonal average LBMP, will encourage Distributed Energy Resources to locate where they will improve grid reliability while also benefitting consumers.

The NYISO will identify Transmission Nodes throughout the NYCA, following consultation with the New York Transmission Owners, and will reflect the collection of electrical facilities (e.g., distribution system feeder lines) associated with the Transmission Node to which individual facilities may aggregate.<sup>60</sup> The NYISO has already begun working with the

<sup>59</sup> Proposed Services Tariff Section 4.1.10.2. The NYISO proposes to define “Transmission Node” as: “[a] bus located inside the NYCA that is identified by the ISO to represent an electrical area to which individual Distributed Energy Resources may aggregate and at which LBMPs are calculated.” Proposed revisions to Services Tariff Section 2.20.

<sup>60</sup> Proposed Services Tariff Section 4.1.10.2.

Transmission Owners to identify Transmission Nodes. The process for identifying Transmission Nodes and mapping electrical facilities to Transmission Nodes first considers a broad set of electrical facilities for each Transmission Node, and then, if necessary, the set of electrical facilities is reduced for the Transmission Node until the NYISO and applicable Transmission Owner agree that the Transmission Node appropriately reflects the electrical conditions on the system.<sup>61</sup>

The NYISO proposes to identify each Transmission Node in the ISO Procedures.<sup>62</sup> This will provide transparency to Market Participants and other parties interested in developing Aggregations. The NYISO also proposes to review the set of Transmission Nodes on an annual basis and to update the set of Transmission Nodes if necessary to account for changing conditions on the New York State Transmission System and underlying distribution systems.<sup>63</sup> The annual review process will allow the NYISO to respond to changing system conditions resulting from the increased penetration of Distributed Energy Resources and Energy Storage Resources while also providing Market Participants with certainty that the Transmission Nodes will not change within a Capability Year. If the NYISO determines changes are necessary to the set of Transmission Nodes, it will post a notice on its website of those changes at least 90 days prior to the start of a Capability Year (*i.e.*, at least 90 days prior to May 1), which changes will take effect on the first day of that Capability Year.<sup>64</sup> Prior to the start of the applicable Capability Year, Aggregators must certify to the NYISO, in accordance with ISO Procedures, that their Aggregations affected by changes to Transmission Nodes continue to meet all of the applicable electrical location requirements.<sup>65</sup> Aggregator certification is necessary to ensure the NYISO can accurately represent the Aggregation to system operators.

The NYISO's proposal does not limit the total number of Aggregations permitted at a single Transmission Node, and allows one or more Aggregators to enroll one or more Aggregations at a Transmission Node.<sup>66</sup> This will provide flexibility to create Aggregations in a manner that best suits the Aggregator's and customers' needs, and the capability of individual facilities.

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<sup>61</sup> The NYISO's proposed approach is consistent with the Commission's proposal in the November 2016 NOPR that each RTO/ISO "establish locational requirements for distributed energy resources to participate in a distributed energy resource aggregation that are as geographically broad as technically feasible." November 2016 NOPR at P 139. The NYISO's proposed approach will provide for the electrical footprint of each Transmission Node to be as large as possible while accounting for the efficiency of the NYISO-administered markets and the reliability of the grid.

<sup>62</sup> Proposed Services Tariff Section 4.1.10.2. Aggregators will work with the applicable Transmission Owner to determine the Transmission Node to which an individual facility is mapped.

<sup>63</sup> *Id.*

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

<sup>66</sup> *Id.*

## **F. Switching Aggregations**

An individual facility may leave an Aggregation or change the Aggregation in which it participates.<sup>67</sup> The NYISO must receive at least thirty calendar days' notice of a facility's intent to change Aggregations, and all changes will become effective at the start of a calendar month.<sup>68</sup> An individual facility may participate in the new Aggregation only upon approval of the NYISO.<sup>69</sup> This provides both flexibility to individual facilities and Aggregations, while balancing the administrative and operational needs of the NYISO.<sup>70</sup> Facilities seeking to change Aggregations that are participating in the NYISO-administered Installed Capacity market must also satisfy the capacity-related switching requirements detailed in Part IX.D of this filing letter.

## **G. Registration Requirements for Aggregators and Aggregations**

An Aggregator must register as a NYISO Customer.<sup>71</sup> An Aggregator will be required to: (i) comply with the registration requirements set forth in the NYISO's Tariff and ISO Procedures; (ii) designate one or more contact persons to receive ISO communications; and (iii) comply with the metering requirements set forth in Section 13 of the Services Tariff and the associated ISO Procedures. These requirements are similar to the requirements for all Market Participants.

The Aggregator will also be responsible for registering Aggregations with the NYISO and enrolling the individual facilities in each Aggregation in accordance with ISO Procedures. The NYISO will provide those processes and procedures to stakeholders prior to implementing the new rules for Aggregations.

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<sup>67</sup> The NYISO's proposed approach for permitting resources to change Aggregations is consistent with the proposal in the November 2016 NOPR that modifications to the list of resources in an aggregation not be unduly burdensome and not require the re-registering of all of the resources in the aggregation. *See* November 2016 NOPR at PP 148-149. Additional requirements for Aggregations that are Installed Capacity Suppliers are addressed in Part IX.D.

<sup>68</sup> Proposed Services Tariff Section 4.1.10.3.

<sup>69</sup> *Id.*

<sup>70</sup> When an individual facility changes Aggregations, the NYISO will need to complete a set of administrative tasks to ensure the NYISO's systems accurately reflect the capability of the Aggregation losing the individual facility as well as the Aggregation gaining the individual facility. In addition, making the change effective at the start of a calendar month aligns with the NYISO's capacity market spot auctions.

<sup>71</sup> Proposed Services Tariff Section 4.1.10.5. As with all other NYISO Customers, an Aggregator will have to execute service agreements for the OATT and Services Tariff, to satisfy the existing customer registration requirements, register their Aggregations, and enroll individual facilities in accordance with ISO Procedures. These requirements are consistent with the Commission's proposal in the November 2016 NOPR that an aggregator "execute an agreement with the RTO/ISO that defines its roles and responsibilities and its relationship with the RTO/ISO before it can participate in the organized wholesale electric markets." *See* November 2016 NOPR at P 157.

## **V. Requirements for Aggregations' Participation in NYISO-Administered Energy and Ancillary Services Markets**

### **A. Bidding and Scheduling Requirements**

As described in Part IV above, an Aggregator is a type of Supplier under the NYISO Tariffs and the ISO Procedures, and an Aggregation, including a DER Aggregation, is a type of Resource. Aggregators will offer an Aggregation as a single unit in the NYISO-administered markets, and the bidding and offer obligations will apply to the Aggregator or Aggregation, not to the individual facilities within the Aggregation.<sup>72</sup>

The vast majority of the bidding and scheduling constructs in the NYISO's existing market rules will apply to Aggregations in the same manner as they currently apply to Generators. However, there are physical and operational characteristics of Aggregations that are not captured in the existing market rules. The particular services that an Aggregation may provide will depend on its ability to meet the revised market rules.

#### *1. Aggregations Will Be Dispatch-Only*

##### a. Commitment and Dispatch Requirements for Conventional Generators

The NYISO's review of a conventional Generator's Day-Ahead and Real-Time Market Bids generally includes an evaluation of both its commitment and dispatch parameters. Commitment parameters include certain physical characteristics (*e.g.*, minimum run-time) and costs (*e.g.*, start-up costs) that are required to bring a Resource to its minimum generation level for the evaluated interval.<sup>73</sup> Dispatch parameters include the costs (and time, defined by response rate) necessary to bring a Resource to a particular output level.

While the majority of Bids for Generators participating in the NYISO-administered markets include both commitment and dispatch parameters, certain Resources are considered to be "dispatch-only." For example, Behind-the-Meter Net Generation Resources, which serve an on-site Host Load and offer excess generating capacity to the wholesale market, are evaluated only on their dispatch parameters. They do not submit commitment parameters because they must be already online and operating (*i.e.*, committed) to meet their local load prior to offering to the wholesale market. Similarly, the NYISO has proposed that Energy Storage Resources be evaluated based only on their dispatch parameters.<sup>74</sup> Energy Storage Resources will not submit commitment parameters because they are capable of being synchronized to the grid without

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<sup>72</sup> Proposed Services Tariff Section § 4.1.10.

<sup>73</sup> When the Resource being evaluated is online and at (or above) its minimum generation level, the commitment cost may be zero dollars for the market interval under evaluation because the resource is already operating.

<sup>74</sup> *New York Independent System Operator Inc.*, Compliance Filing and Request for Extension of Time of Effective Dates, Docket No. ER19-467-000 (December 3, 2018) at 19-21 ("Order No. 841 Compliance Filing"). The Order No. 841 Compliance Filing was submitted in compliance with Order No. 841, *see supra* n. 16.

injecting or withdrawing any Energy, and can be dispatched to inject or withdraw Energy from an idle state.

b. Dispatch-Only Model for Aggregations

The NYISO's participation model for Aggregations provides that the Aggregation will not, regardless of its composition, receive a unit commitment from the NYISO.<sup>75</sup> Instead, it will operate as a dispatch-only Resource when participating in the NYISO-administered markets. The Aggregation will offer Energy using a fully dispatchable continuous bid curve representing the entire operating range of the Aggregation. This may include bids to withdraw Energy if the Aggregation contains at least one Withdrawal-Eligible Generator.<sup>76</sup>

Aggregations will be treated as always available for dispatch, consistent with their Bids. The NYISO will not require the submission of commitment parameters, nor will it evaluate those commitment parameters for two reasons. First, the NYISO does not have the means to effectively economically optimize the starts and stops of individual facilities within an Aggregation. The NYISO will not have operational visibility of the electric system (*i.e.*, the distribution system) to which many of these resources will be interconnected. Second, the individual facilities that make up the Aggregation may have a primary function other than providing Energy and Ancillary Services to the NYISO-administered markets, and may already be operating to perform their primary function. Accordingly, the NYISO will treat Aggregations as dispatch-only and will not require or consider any commitment parameters, such as start-up time, in its market evaluation of Aggregations.

c. Tariff Changes to Accommodate Dispatch-Only Model

Because the NYISO will not be committing Aggregations, the NYISO proposes to revise Section 4.2.3 of the Services Tariff to provide that for the Day-Ahead Market, the Day-Ahead Security Constrained Unit Commitment ("SCUC") software will treat Aggregations as available to be scheduled based on their Bids. Similarly, the NYISO proposes to revise Section 4.4.1.1 of the Services Tariff to provide that the Real-Time Commitment ("RTC") software for the Real-Time Market will treat Aggregations as available to be scheduled based on their Bids.

As Aggregations are dispatch-only, they are not eligible to submit Start-up Bids or to recover start-up costs. The NYISO proposes to revise the definitions of Start-Up Period and Start-Up Bid such that the Start-Up Period for Aggregations shall be set to zero, and that Aggregators shall not submit a Start-Up Bid for an Aggregation.<sup>77</sup> The NYISO also proposes to

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<sup>75</sup> Proposed Services Tariff Section 4.1.10.

<sup>76</sup> Proposed Services Tariff Section 4.1.10.1. The NYISO has proposed to define a Withdrawal-Eligible Generator as part of its Order No. 841 compliance filing as "[a] Generator that is eligible to withdraw energy from the grid at a price for the purposes of recharging or refilling for later injection back into the grid." An Energy Storage Resource is an example of a Withdrawal-Eligible Generator.

<sup>77</sup> See proposed revisions to the Start-Up Period and Start-Up Bid definitions in Services Tariff Section 2.19 and proposed revisions to the Start-Up definition in OATT Section 1.19.

revise the definition of Shutdown Period such that the Shutdown Period for Aggregations shall be zero.<sup>78</sup> Because Aggregations are required to operate using a fully dispatchable, continuous Bid curve across their entire operating range, they are not eligible to include Minimum Generation Bids with their offers. Accordingly, the NYISO proposes to revise the definition of Minimum Generation Bid and Minimum Generation Level to indicate that if a Supplier is an Aggregation, it shall not submit these commitment-related parameters.<sup>79</sup> The NYISO also proposes to make certain conforming revisions in its Services Tariff.<sup>80</sup>

## 2. *Aggregation Bid Requirements*

### a. Minimum Offer Requirement

The NYISO proposes to require that each transaction offered in the Energy, Ancillary Services, and Installed Capacity markets on behalf of an Aggregation have a minimum offer of 100 kW.<sup>81</sup> This requirement reflects the NYISO's goal of encouraging integration of small facilities in the NYISO-administered markets.<sup>82</sup> It is consistent with the lowest minimum offer requirement available to participants in the NYISO-administered markets (*i.e.*, for Energy Storage Resources and Demand Side Resources). It is also consistent with the minimum offer requirement for electric storage resources required by the Commission in Order No. 841.<sup>83</sup> The NYISO believes that employing a 100 kW minimum offer requirement for all Aggregations will assist Aggregators in bringing new facilities to the market.

If an Aggregation offers a combination of Energy injections, Energy withdrawals, and/or Demand Reductions, the Aggregation must offer the minimum offer level of 100 kW for each

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<sup>78</sup> Proposed revisions to the definition of Shutdown Period in Section 2.19 of the Services Tariff. The revisions to this definition make the same change for Behind-the-Meter Net Generation Resources and Energy Storage Resources. Both of those Resource types are dispatch-only and may not submit Shutdown Period information with their Bids.

<sup>79</sup> See proposed revisions to the Minimum Generation Bid and Minimum Generation Level definitions in Services Tariff Section 2.13 and OATT Section 1.13.

<sup>80</sup> See proposed revisions to Services Tariff Section 4.1.8.

<sup>81</sup> Proposed revisions to Services Tariff Section 4.1.4.

<sup>82</sup> The NYISO's proposed 100 kW minimum offer requirement is more expansive than the minimum size requirement considered by the Commission for distributed energy resource aggregations in its November 2016 NOPR. The November 2016 NOPR stated that "we propose that [distributed energy resource] aggregations meet any minimum size requirements of the participation model under which they elect to participate in the organized wholesale electric markets." November 2016 NOPR at P 136. The November 2016 NOPR provided the example of an aggregation participating under the Energy Storage Resource participation model in which the minimum size would be set at 100 kW, consistent with the minimum size requirement for Energy Storage Resources. Similarly, the November 2016 NOPR provided that for an aggregation participating under a Generator participation model, the aggregation would have to meet the minimum size requirement for that generator participation model. Under the NYISO's proposal, the minimum offer requirement for all Aggregations will be 100 kW, regardless of the Resource mix of the Aggregation.

<sup>83</sup> See Order No. 841 at P 270.

response type.<sup>84</sup> This requirement is necessary because the NYISO will separately process Energy injections, Energy withdrawals, and Demand Reductions in the settlements evaluation for the purposes of meeting Order No. 745 requirements, and 100 kW is currently the smallest common increment used throughout the NYISO's various bidding, scheduling, billing, and settlement software. Although each response type will be processed separately, the NYISO proposes to re-combine the separate pieces of the aggregate response and settle the Aggregation as a whole.

b. DER Aggregation-Specific Bidding Requirements

A DER Aggregation may submit Bids representing its entire operating range, including Bids to withdraw Energy if the DER Aggregation contains at least one Withdrawal-Eligible Generator.<sup>85</sup> The NYISO proposes to establish certain Day-Ahead and Real-Time Market Bid requirements for Bids by DER Aggregations that include at least one Withdrawal-Eligible Generator. The proposed revisions address situations where one or more Withdrawal-Eligible Generator(s) in a DER Aggregation seeks to refill or recharge in an interval in which the DER Aggregation also seeks to provide supply (*i.e.*, Energy injections or Demand Reductions). In this situation, the Bid for the Aggregation should reduce its offered supply by the amount of Energy it seeks to withdraw. Conversely, if the Energy withdrawals by a Withdrawal-Eligible Generator will be greater than the Energy supplied, the Bid for the Aggregation should reduce its offered withdrawals by the amount of Energy it intends to supply.

In both Sections 4.2.1.3.1 and 4.2.1.4, the NYISO proposes to establish that when the Energy market Bid for a DER Aggregation incorporates both Energy supply (which includes Demand Reductions by Demand Side Resources and Distributed Energy Resources)<sup>86</sup> and Energy withdrawals by a Withdrawal-Eligible Generator that is a component of the Aggregation, each point of the DER Aggregation's Bid Curve (or, for a Self-Committed Fixed Bid, the DER Aggregation's Bid) shall reflect the net offer, such that any expected Energy withdrawals reduce the Energy that the Aggregation is capable of supplying.

The NYISO proposes to revise the bidding rules in Section 4.2.1.3.1 for Suppliers using the ISO-Committed Flexible, Self-Committed Flexible, or ISO-Committed Fixed Bid modes to provide that a Supplier's hourly Day-Ahead Bids for a DER Aggregation to withdraw Energy and to inject Energy shall be submitted as a single continuous bid curve representing the Capacity, in MW, available for each hour of the Dispatch Day.<sup>87</sup> The NYISO also proposes to

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<sup>84</sup> Proposed Services Tariff Section 4.1.10.

<sup>85</sup> Proposed Services Tariff Section 4.1.10.1. A Supplier's Self-Committed Flexible or Self-Committed Fixed Bid may also include Energy withdrawals if the aggregation includes at least one Withdrawal-Eligible Generator.

<sup>86</sup> See proposed revision to the definition of Energy in Section 2.5 of the Services Tariff.

<sup>87</sup> ISO-Committed Fixed, ISO-Committed Flexible, Self-Committed Fixed, and Self-Committed Flexible are bidding modes defined in the Services Tariff. Both ISO-Committed Fixed and ISO-Committed Flexible bidding modes require the NYISO to evaluate economic Bids prior to scheduling resources. ISO-Committed Fixed is a bidding mode in which a Generator requests that the NYISO commit and schedule it in the Day-Ahead Market. In

revise the bidding rules in Section 4.2.1.4 for Suppliers using the Self-Committed Fixed Bid Mode for its Day-Ahead Bids to accommodate Aggregations.

To determine compliance with NYISO-issued Base Point Signals for settlement purposes, the NYISO proposes to measure Aggregations with at least one Withdrawal Eligible Generator based on their net performance. That is, when the Aggregation receives a positive Base Point Signal, Energy injections and Demand Reductions (*i.e.*, supply) by individual facilities in the Aggregation will be reduced by any Energy withdrawals by Withdrawal-Eligible Generators during the interval.<sup>88</sup> Conversely, if the Aggregation receives a negative Base Point Signal, Energy withdrawals by Withdrawal-Eligible Generators in the Aggregation will be netted against any Energy injections and Demand Reductions by other individual facilities in the Aggregation.

The NYISO proposes to make similar revisions in Section 4.4.1.2 to the Real-Time Market Self-Committed Flexible and Self-Committed Fixed Bid requirements.<sup>89</sup> In addition, the NYISO will apply the Order No. 745 Monthly Net Benefits Threshold in the Real-Time Market (see Part V.C, below) when establishing the total supply provided for the DER Aggregation. The Monthly Net Benefits Threshold will be used to determine when Demand Reductions should be paid the LBMP. Consistent with the application of the Monthly Net Benefits Threshold to determine compensation, a DER Aggregation will not be permitted to balance Energy withdrawals by Withdrawal Eligible Generators with Demand Reductions in a given Real-Time Market interval if the LBMP for that interval is less than the Monthly Net Benefits Threshold value. Allowing Demand Reductions to be paid the LBMP to offset Energy Withdrawals at times when the LBMP is less than the Monthly Net Benefits Threshold would effectively permit uneconomic supply to be used to meet demand.

### c. Bidding Parameters

The NYISO proposes minor revisions to the Bid parameter requirements in Section 4.2.1.3.3 to provide that they are applicable to Aggregations and to clarify that an Aggregation with at least one Withdrawal-Eligible Generator will be required to provide the Generator's Lower Operating Limit for each hour. The NYISO also proposes to revise Section 4.2.1.3.4 to

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the Real-Time Market, it is a bidding mode in which a Generator, with NYISO approval, requests that the NYISO schedule it no more frequently than every 15 minutes. ISO-Committed Flexible is a bidding mode in which a Dispatchable Generator or Demand Side Resource is committed by and follows Base Point Signals issued by the NYISO. *See* Services Tariff Section 2.9. With Self-Committed Fixed and Self-Committed Flexible bidding modes, resources can self-schedule (or self-commit) their output regardless of the LBMP. Self-Committed Fixed is a bidding mode in which a Generator is self-committed and opts not to be Dispatchable over any portion of its operating range. Self-Committed Flexible is a bidding mode in which a Dispatchable Generator self-commits to a specified output level, but is also made available to follow NYISO-issued Base Point Signals within a portion of its operating range. *See* Services Tariff Section 2.19.

<sup>88</sup> Proposed Services Tariff Section 4.1.10.1.

<sup>89</sup> Suppliers may offer both Self-Committed Flexible and Self-Committed Fixed Real-Time Market Bids for DER Aggregations. When Bids for DER Aggregations include both Energy withdrawals and Energy supply, the Bid should reflect the net offer as described above.



provide that an Aggregation comprised only of Energy Storage Resources will have to provide the same Bid parameters that are applicable to Energy Storage Resources.<sup>90</sup>

### 3. *Comparable Treatment of Aggregations and Other Resource Types*

Throughout the proposed tariff revisions, the NYISO has added “and Aggregations” to requirements currently applicable to Generators where appropriate.<sup>91</sup> Applying the Generator requirements to Aggregations maintains comparable treatment of similarly situated Resources. Likewise, where a Resource type has particular rules (*e.g.*, for Energy Storage Resources), the NYISO has proposed to also apply those rules to Aggregations comprised of facilities of that Resource type.

### 4. *Replacement of DADRP and DSASP*

As part of its comprehensive Aggregation and Distributed Energy Resource market design, the NYISO proposes to terminate the DSASP and DADRP. The tariff revisions proposed in this filing will expand the participation options for Demand Side Resources qualified to participate in the two existing programs by offering a single model under which those Resources can qualify to provide, and be co-optimized for, Energy and Ancillary Services.

The NYISO revised the following provisions in its Services Tariff and OATT to remove the requirements associated with the DADRP and the DSASP and/or to replace the existing Demand Side Resource requirements with requirements for Aggregations.

- Deleted the definitions of Curtailment Customer Aggregator, Curtailment Initiation Cost, DADRP Component, Demand Reduction Aggregator, Demand Reduction Incentive Payment, Demand Reduction Provider, Demand Side Ancillary Services Program (DSASP), Demand Side Ancillary Services Program Resource (DSASP Resource),

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<sup>90</sup> See also proposed revisions to Services Tariff Sections 2.2 (definition of “Beginning Energy Level”), 2.5 (definitions of “Energy Level” and “Energy Level Management”), 2.9 (definition of “ISO-Managed Energy Level”), 2.12 (definitions of “Lower Operating Limit” and “Lower Storage Limit”), 2.14 (definition of “Normal Upper Operating Level”) 2.18 (definition of “Roundtrip Efficiency”), 2.19 (definition of “Self-Managed Energy Level”), 2.21 (definition of “Upper Storage Limit”), 4.2.1.3.4, and 4.4.2.1.

<sup>91</sup> See, *e.g.*, proposed revisions within the following tariff sections of the Services Tariff: Sections 2 (including definitions for Automatic Generation Control, Availability, Base Point Signals, Bid Production Cost, Compensable Overgeneration, Control Area, Dependable Maximum Net Capability, Emergency Upper Operating Limit, Imputed LBMP Revenue, Installed Capacity Supplier, Lost Opportunity Cost, New York State Power System, Normal Upper Operating Limit, Operating Reserves, Performance Index, Performance Tracking System, Self-Committed Fixed, Self-Committed Flexible, and Supplemental Resource Evaluation), 4.1, 4.2, 4.4, 4.5, 4.6, 5.12, 5.14, 7.4, 13, 15.3, 15.3A, 15.4, 17.1, 17.2, 18, 23.2, 23.3, 23.4, 23.5, 25, and 30.4; see also proposed revisions within the following tariff sections of the OATT Sections 1 (including definitions for Automatic Generation Control, Availability, Base Point Signals, Bid Production Cost, Control Area, Dependable Maximum Net Capability, Lost Opportunity Cost, New York State Power System, Performance Tracking System, Self-Committed Fixed, Self-Committed Flexible, and Supplemental Resource Aggregation), 2.7, 6.3, 6.4, and 31.2.

Demand Side Ancillary Service Program Provider (DSASP Provider), DSASP Baseline MW, DSASP Component; and Reserve Performance Index<sup>92</sup>

- Removed references and requirements concerning Demand Side Resources, DADRP, and DSASP and/or replaced with references concerning Aggregations in the definitions of Adjusted Actual Load, Base Point Signal, Demand Reduction, Dispatchable, Emergency Upper Operating Limit, ISO-Committed Flexible, Minimum Generation Bid, Monthly Net Benefit Threshold, Net Benefits Test, Normal Upper Operating Limit, Operating Reserves, Start-Up Bid, and Supplier;<sup>93</sup>
- Removed references and requirements concerning Demand Side Resources, DADRP, and DSASP and/or replaced with references concerning Aggregations in Market Services, Day-Ahead and Real-Time Market bidding and scheduling, and LBMP calculation rules;<sup>94</sup>
- Removed references and requirements concerning Demand Side Resources, DADRP, and DSASP from the Day-Ahead and Real-Time Bid Production Cost Guarantee rules;<sup>95</sup>
- Removed references and requirements concerning Demand Side Resources and/or replaced with references concerning Aggregations in the Day-Ahead Margin Assurance Payment rules;<sup>96</sup>
- Removed requirements concerning DADRP and DSASP from the Special Case Resource rules;<sup>97</sup>
- Removed references and requirements concerning Demand Side Resources and/or replaced with references concerning Aggregations in Regulation Service and Operating Reserves rules;<sup>98</sup> and
- Removed references and requirements to the DADRP Component and DSASP Component from the calculation of the Operating Requirement in the NYISO's credit

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<sup>92</sup> Services Tariff Sections 2.2, 2.4, 2.18; OATT Section 1.4.

<sup>93</sup> Services Tariff Sections 2.1, 2.2, 2.4, 2.5, 2.9, 2.13, 2.14, 2.15, 2.19; OATT Sections 1.4, 1.9, 1.13, 1.15, 1.19.

<sup>94</sup> Services Tariff Sections 4.1.2, 4.1.6, 4.2.1.1, 4.2.1.3.1, 4.2.1.3.2, 4.2.1.3.3, 4.2.1.9, 4.2.3, 4.2.6, 4.4.1.2.1, 4.4.2.1, 4.4.2.5, 4.4.2.6, 4.5.2.1, 4.5.3.1, 17.1.3.

<sup>95</sup> Services Tariff Sections 4.6.6.7, 4.6.6.9, 4.6.6.10, 18.1, 18.8, 18.10, 18.11; OATT Section 6.1.12.

<sup>96</sup> Services Tariff Sections 25.2.1, 25.3.2.

<sup>97</sup> Services Tariff Sections 5.12.11.1.1, 5.12.11.1.2, 5.12.11.1.5.

<sup>98</sup> Services Tariff Sections 15.3.1.2, 15.3.6.1, 15.3.6.2.1, 15.4.1.2.1, 15.4.1.2.2, 15.4.1.2.3, 15.4.1.3, 15.4.5.2, 15.4.6.4.

requirements and removed the additional financial assurance policies for Demand Side Resources offering Ancillary Services.<sup>99</sup>

## **B. Real-Time Market Settlements**

Under the NYISO's rules, all injections and withdrawals not scheduled in the Day-Ahead Market, including real-time deviations from Day-Ahead schedules, are subject to the Real-Time Market Settlement (also commonly referred to as balancing market settlements). Balancing payments and charges account for differences between scheduled and Actual Energy Injections/Withdrawals, and between real-time Energy schedules and Day-Ahead Energy schedules. Section 4.5 of the Services Tariff describes the real-time Settlement rules for Transmission Customers and other Customers, including Suppliers, Importers, Load, and Exporters. Section 4.5.2 of the Services Tariff currently details the Settlement rules for Suppliers injecting Energy and for certain Demand Reductions.

The NYISO proposes numerous revisions throughout Section 4.5 of the Services Tariff to establish real-time Settlement rules for Aggregations, including but not limited to DER Aggregations. Aggregations will generally be paid, or pay, for Energy injections and withdrawals<sup>100</sup> in the same way that Generators are paid, or pay, for Energy injections and withdrawals. Therefore, the NYISO proposes to expand the two existing real-time Settlement formulas for Suppliers in Section 4.5.2 of the Services Tariff (*i.e.*, Section 4.5.2.1.1 for positive LBMPs, and Section 4.5.2.1.2 for negative LBMPs, maximum generation pickup, and reserve pickups) to include all Energy injections and withdrawals by Aggregations. Similar to the rules the NYISO has proposed for Energy Storage Resources, Aggregations that include one or more Withdrawal-Eligible Generators will also pay for Actual Energy Withdrawals as negative generation at their Transmission Node in accordance with the Supplier Settlement formulas in Section 4.5.2.1 of the Services Tariff.

Real-Time Market Settlements will account for all aspects of Aggregation performance. DER Aggregations, in particular, will be subject to a Settlement formula that accounts for Energy provided through Demand Reductions, in addition to the injection and withdrawal Settlements discussed above. DER Aggregations will be paid for Actual Demand Reductions provided in real-time at the Real-Time LBMP if the Actual Demand Reduction is eligible for Energy payments pursuant to proposed Sections 4.5.7 or 4.5.2.1.2 of the Services Tariff.<sup>101</sup> Under normal circumstances Actual Demand Reductions will be eligible for real-time Energy payments when the Real-Time LBMP is equal to or greater than the Monthly Net Benefit Threshold price. However, Actual Demand Reductions will be eligible for real-time Energy payments regardless of the Monthly Net Benefit Threshold when the DER Aggregation is dispatched by the NYISO or a Transmission Owner to meet NYCA or local system reliability.

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<sup>99</sup> Services Tariff Sections 26.4.2, 26.4.2.7, 26.4.2.8, 26.10.

<sup>100</sup> Aggregations that include one or more Energy Storage Resources will pay for Energy withdrawals in accordance with the Supplier payment formula in Section 4.5.2.1.1 of the Services Tariff.

<sup>101</sup> The NYISO proposes to define "Actual Demand Reduction" in Section 2.1 of the Services Tariff as "Demand Reductions that are measured using a revenue-quality real-time meter."

DER Aggregations will be required to measure Energy injections, Energy withdrawals, and Demand Reductions separately in order for the NYISO to appropriately calculate the corresponding settlements. Bid Production Cost guarantee payments and Day Ahead Margin Assurance Payments are discussed in Part VIII below.

### **C. Compliance with Order No. 745**

On March 15, 2011, and as refined in subsequent orders, the Commission promulgated a set of rules related to the compensation of demand response resources participating in wholesale energy markets administered by ISOs and RTOs (“Order No. 745”).<sup>102</sup> Order No. 745 provides that when a demand response resource participating in the ISO/RTO-administered energy market can balance supply and demand as an alternative to generation, and when dispatch of the demand response resource is cost-effective as determined by a net benefits test, the demand response resource must be compensated for its demand reduction in the energy market at the locational marginal price.<sup>103</sup> To implement this compensation approach, Order No. 745 established requirements for a net benefits test, required the review and modification (if necessary) of measurement and verification procedures, and required a method for allocating the costs of demand response payments among the Loads that benefit from the resources being scheduled to perform Demand Reductions.<sup>104</sup>

In orders dated January 30 and May 12, 2017, the Commission accepted the NYISO’s proposed tariff revisions to comply with Order No. 745. The NYISO’s Tariff revisions established: (i) a Net Benefits Test methodology to determine the Monthly Net Benefit Offer Floor, (ii) the Economic Customer Baseline Load calculation to measure Demand Reductions for participants in the NYISO’s Energy market, and (iii) a cost allocation methodology under which the beneficiaries of Demand Reductions at the time and place of Demand Side Resource dispatch were allocated the costs of dispatching Demand Side Resources.

As described above, the NYISO proposes to replace the DADRP and DSASP with the new Aggregation participation model. Under the proposed tariff revisions, DER Aggregations will continue to be able to provide Demand Reductions that will be treated as “supply” in the Energy and Ancillary Services markets.<sup>105</sup> Therefore, the NYISO proposes to continue applying the tariff revisions accepted in compliance with Order No. 745, with certain revisions to reflect the changed participation model proposed in this filing. The modifications described below will tailor the application of the existing Net Benefits Test, the cost allocation rules, and the

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<sup>102</sup> *Demand Response Compensation in Organized Wholesale Energy Markets*, Order No. 745, FERC Stats. & Regs. ¶ 31,322 (“Order No. 745”), *order on reh’g and clarification*, Order No. 745-A, 137 FERC ¶ 61,215 (2011), *reh’g denied*, Order No. 745-B, 138 FERC ¶ 61,148 (2012), *vacated sub nom. Elec. Power Supply Ass’n v. FERC*, 753 F.3d 216 (D.C. Cir. 2014), *rev’d & remanded sub nom. FERC v. Elec. Power Supply Ass’n*, 136 S.Ct. 760 760 (2016).

<sup>103</sup> Order No. 745 at P 2.

<sup>104</sup> Order No. 745 at PP 4-6.

<sup>105</sup> *See* proposed revision to the definition of “Energy” in Section 2.5 of the Services Tariff.

Economic Customer Baseline Load calculation to the new proposed Aggregation participation model.

### *1. Application of Net Benefits Test*

Under the NYISO's existing rules, the result of each Monthly Net Benefit Test sets an offer floor applicable to Energy offers for Demand Side Resources for the applicable month.<sup>106</sup> The Monthly Net Benefit Offer Floor effectively ensures that Demand Side Resources are compensated for Demand Reductions only when they are cost-effective. It also alleviates the "billing unit effect" identified by the Commission that occurs when the dispatch of demand response resources results in an increased cost per megawatt-hour to the remaining Load.<sup>107</sup> Under the Monthly Net Benefit Offer Floor construct, a Demand Reduction Bid for a Demand Side Resource is automatically rejected by the NYISO's software if the dollar value of the offer was less than the offer floor.

The NYISO's DER Aggregation proposal permits Aggregations of facilities, depending on their composition, to inject Energy, withdraw Energy, and/or reduce demand. In order to provide greater flexibility to Aggregators, the NYISO's proposal does not require Aggregators to distinguish Demand Reductions from Energy injections in its Bids. Therefore, the NYISO cannot and will not apply a Monthly Net Benefit Offer Floor to DER Aggregation Bids. Instead, the NYISO proposes to evaluate Actual Demand Reductions against the Monthly Net Benefit Threshold<sup>108</sup> after the fact, and to compensate Demand Reductions only when the Real-Time LBMP meets or exceeds the Monthly Net Benefit Threshold. If the Real-Time LBMP does not meet or exceed the Monthly Net Benefit Threshold, Demand Reductions provided by a DER Aggregation will not be compensated. While this proposal is different than the NYISO's existing rules, it continues to meet the Order No. 745 requirement that Demand Reductions be compensated at the LBMP when two conditions are met: (i) a demand response resource participating in the NYISO-administered Energy market can balance supply and demand as an alternative to generation, and (ii) the dispatch of the demand response resource is cost-effective as determined by the Net Benefits Test.<sup>109</sup>

To help facilitate this change, the NYISO proposes to move the tariff language describing the Net Benefit Test from Section 4.2 of the Services Tariff, which provides rules for Day-Ahead Markets and Schedules,<sup>110</sup> to Section 4.5.7 of the Services Tariff, Settlements for Demand Reductions. While the actual text of the tariff language does not change, moving the Net Benefit Test application rules to the new section reflects the change from an offer floor applied to a Bid

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<sup>106</sup> See NYISO Monthly Net Benefit Offer Floor Prices, available at: <https://www.nyiso.com/documents/20142/1395792/Monthly-Net-Benefit-Offer-Floor-Prices.pdf>.

<sup>107</sup> Order No. 745 at P 3.

<sup>108</sup> See Services Tariff Section 2.13 (revising current definition of "Monthly Net Benefit Offer Floor").

<sup>109</sup> Order No. 745 at P 47.

<sup>110</sup> See proposed revisions to Services Tariff Sections 4.2.1.9 and 4.5.7; see also proposed revisions to Services Tariff Section 2.14 (definition of "Net Benefits Test").

to an after-the-fact evaluation during the settlements process. The after-the-fact application of the Net Benefit Test in this manner will continue to address the “billing unit effect” because Demand Reductions will not be compensated if the Real-Time LBMP is less than Monthly Net Benefit Threshold.

## *2. Demand Reduction Cost Allocation Methodology*

Section 24.1 of the OATT currently allocates the cost of Demand Reductions to benefitting Loads on the basis of their load ratio share. The NYISO does not propose to change the substantive provisions of this section. The NYISO does, however, propose certain ministerial revisions that will update the existing language to reflect the change from the DADRP and DSASP to the proposed Aggregation and Distributed Energy Resource rules.

In addition to removing the introductory paragraph in Section 24 because it is no longer accurate, the NYISO proposes to make the following revisions in Section 24.1 of the OATT:

- Clarify that the “Schedule 1 Program Costs” for Demand Reductions are equal to the payments for Demand Reductions in accordance with Section 4.5.2 of the Services Tariff, and that those costs attributable to DER Aggregations will be allocated to Transmission Customers;
- Replace “Generator Bus” with “Transmission Node” throughout to reflect the changed terminology;
- Revise language to reflect changed terminology that “Demand Reductions” are “Energy supply;”
- Clarify the description of certain variables (identified as a5, a6, and a7) used in the determination of the Schedule 1 Program Costs allocated to Transmission Customers; and
- Make ministerial, housekeeping revisions to terminology.

## *3. Energy Baseline and Real-Time Response for Demand Reduction in an Aggregation*

The NYISO proposes to make several changes to the existing Economic Customer Baseline Load calculations and real-time response measurement and verification provisions in Section 24.2 of the OATT concerning the: (i) calculation of the Economic Customer Baseline Load; (ii) measurement of individual Distributed Energy Resource Demand Reductions when dispatched for Energy; (iii) measurement of individual Distributed Energy Resource Demand Reductions when dispatched for Regulation Service; and (iv) calculation of Demand Reductions for DER Aggregations.

The proposed revisions are consistent with the existing rules used today for Demand Side Resource’s participation in the DADRP and DSASP, but have been updated and expanded to

accommodate the participation model proposed in this filing. The NYISO also makes certain conforming revisions to Sections 24.3 and 24.4 of the OATT to update the terminology and change from hourly intervals to five-minute or six-second intervals as appropriate. The revisions in Sections 24.3 and 24.4 do not materially change the existing requirements. These revisions are necessary to accommodate the change in the Energy dispatch interval duration from one-hour in the DADRP to five-minute real-time dispatch for Energy and Operating Reserves and six-seconds for Regulation Service under the proposed participation model.

#### *4. Calculation of the Economic Customer Baseline Load*

The NYISO currently calculates the Economic Customer Baseline Load (to measure Demand Reductions in the Energy market) for both weekday and weekend dispatch. The proposed revisions add a third calculation for the baseline of a Distributed Energy Resource when dispatched for Regulation Service. These separate calculations will tailor the calculation to the conditions under which the Distributed Energy Resource was operating prior to the dispatch interval.

In order to provide clarity to the terms used in the Economic Customer Baseline Load (“ECBL”) methodologies, existing Section 24.2.1 includes a set of specially defined terms applicable only to that section: Adjusted Weekday ECBL, ECBL-In-Day Adjustment Factor, ECBL In-Day Adjustment Period, ECBL Weekday Window, ECBL Weekend Window, Weekday Proxy and Weekend Proxy. The NYISO proposes to replace the defined terms Weekday Proxy and Weekend Proxy with “Proxy Load.” The NYISO also proposes to update the definitions of Adjusted Weekday ECBL, ECBL Weekday Window, and ECBL Weekend Window to conform the time horizons to real-time five-minute and six-second values and to make certain changes to conform with terminology used throughout the revisions proposed in this filing. The revisions to the definitions of ECBL In-Day Adjustment Factor and ECBL In-Day Adjustment Period are more substantive, and generally fall into two categories: (i) revisions to address real-time (five-minute and six-second) time dispatch intervals, and (ii) revisions to address the potential for Distributed Energy Resources to be dispatched for Energy and Regulation Service simultaneously or in successive dispatch intervals:

**ECBL In-Day Adjustment Factor<sup>111</sup>:** The ECBL In-Day Adjustment shall be an adjustment factor that is applied to the ECBL for each five-minute interval ~~hour of the scheduled Demand Reduction period~~.

- a) Calculate the ECBL In-Day Adjustment by ~~dividing~~ subtracting the average of the unadjusted ECBL over the three five-minute intervals of the ECBL In-Day Adjustment Period from the average of the metered load for same three five-minute intervals ~~the two hours of the ECBL In-Day Adjustment Period on the day of the scheduled Demand Reduction, provided that the DER Aggregation did not respond to the NYISO’s dispatch~~

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<sup>111</sup> The tariff revisions approved by the NYISO’s stakeholders inadvertently omitted the blacklined deletion of certain currently effective tariff language. The tariff revisions provided in this filing letter and included in Attachments 9 and 10 include the previously omitted phrase “by the average of the ECBL for the same two hours.”

~~instructions, was not dispatched for Energy and/or Regulation Service in any of the three five-minute intervals of the ECBL In-Day Adjustment Period.~~

- b) If the DER Aggregation was dispatched for Energy and/or Regulation Service during one or more of the three five-minute intervals of the ECBL In-Day Adjustment Period, calculate the ECBL In-Day Adjustment by replacing the metered loads in step (a) above by the Proxy Load values for one or more of the three five-minute intervals of the ECBL In-Day Adjustment Period in which the DER Aggregation was dispatched for Energy and/or Regulation Service.
- c) The ECBL In-Day Adjustment Factor shall be limited to  $\pm 20\%$  of the ECBL value for the five-minute interval it is applied to a minimum of 0.8 and a maximum of 1.2.

**ECBL In-Day Adjustment Period:** The ECBL Adjustment Period is the time prior to the ~~scheduled~~ Demand Reduction period that is used to determine the ECBL In-Day Adjustment. ~~The intervals~~ hours to be used in the ECBL Adjustment Period shall be ~~the two three~~ three consecutive five-minute intervals starting 60 minutes prior to the first operating interval of dispatch and ending 45 minutes prior to the operating interval of dispatch. All the subsequent intervals of uninterrupted dispatch following the first interval of dispatch shall use the same ECBL In-Day Adjustment Period. The ECBL In-Day Adjustment Period shall be recalculated for every interval of dispatch which is preceded by an interval of non-dispatch hours that occur four hours prior to the first hour of the scheduled Demand Reduction period, provided that the hours are part of the same calendar day.

~~To determine the two hours of the ECBL In Day Adjustment Period:~~

- a) ~~—The fourth hour before the first hour of the scheduled Demand Reduction period shall be the first hour of the ECBL In Day Adjustment Period, except when the fourth hour before first hour of the scheduled Demand Reduction period occurs on the previous day.~~
- b) ~~—The third hour before the first hour of the scheduled Demand Reduction period shall be the second hour of the ECBL In Day Adjustment Period, except when the third hour before the first hour of the scheduled Demand Reduction period occurs on the previous day.~~
- e) ~~—When the third and/or fourth hour of the ECBL In Day Adjustment Period occurs on the previous day, the ISO shall use as a substitute the hour beginning midnight on the day of the scheduled Demand Reduction. Both hours of the ECBL In Day Adjustment Period may equal the hour beginning midnight on the day of the scheduled Demand Reduction.~~

The majority of the revisions to the defined terms in Section 24.2.1 relate to the NYISO's transition from an hourly calculation used for Day-Ahead Market intervals, to a five-minute calculation needed for real-time (five-minute) intervals. The NYISO also proposes to revise the multiplicative adjustment "factor" to an additive adjustment. This change will improve the accuracy of the baseline by reducing the potential volatility of a scalar adjustment. Finally, the NYISO proposes to change the In-Day Adjustment Period from the two consecutive hours (in the



same calendar day) prior to the first hour of scheduled Demand Reductions to the three consecutive five-minute intervals starting 60 minutes prior to the dispatch interval. This change aligns with the switch from the one-hour dispatch interval in the Day-Ahead Market to the five-minute real-time dispatch interval in the Real-Time Market. In addition, real-time calculation of the ECBL will provide a more accurate measure of the Distributed Energy Resource's Load prior to the dispatch interval.

The existing calculations in Sections 24.2.1.2 and 24.2.1.3 of the OATT that describe the calculations of the Economic Customer Baseline Load for Energy on a weekday and weekend have been revised to conform to new terminology and to change the time intervals from hourly to five-minutes.

The NYISO proposes a new calculation for the Economic Customer Baseline Load to be used in intervals when the Distributed Energy Resource is dispatched for Regulation Service. This calculation was not previously required for the DADRP because Demand Side Resources participating in the DADRP were limited to providing Energy only. The new Distributed Energy Resource participation model allows a single Distributed Energy Resource to provide Energy and/or Regulation Service, and therefore the new calculation is necessary.

The NYISO proposes that the Aggregator shall calculate a Distributed Energy Resource's baseline during intervals in which it was dispatched for Regulation Service as: the six-second telemetered Load for the interval immediately prior to the interval in which the Distributed Energy Resource is dispatched for Regulation Service, *unless* the Distributed Energy Resource was dispatched for Energy (but not Regulation Service) in the immediately prior interval. In such case, the baseline is the Proxy Load value corresponding to the five-minute interval immediately preceding the interval in which the Distributed Energy Resource was dispatched for Regulation Service. Regulation Service Base Point Signals are the NYISO's direction for a Resource to change its output from the last six-second interval. Therefore, the proposal to use the actual telemetered Load just prior to the dispatch interval is appropriate for measuring Distributed Energy Resource's Demand Reduction response to Regulation Service Dispatch.

*5. Measurement of Individual Distributed Energy Resource's Demand Reductions when Dispatched for Energy*

The Aggregator will be responsible for calculating Demand Reductions by individual Distributed Energy Resources participating in an Aggregation. In Section 24.2 of the OATT, the NYISO proposes that the Aggregator calculate Distributed Energy Resource's Demand Reductions when dispatched for Energy as the greater of: (i) the Distributed Energy Resource's adjusted Economic Customer Baseline Load for each five-minute interval minus the actual metered load for each six-second interval, and (ii) zero.

*6. Measurement of Individual Distributed Energy Resource's Demand Reductions when Dispatched for Regulation Service*

When dispatched for Regulation Service, the NYISO proposes that the Aggregator calculate Demand Reductions by individual Distributed Energy Resources as the Distributed Energy Resource's Baseline Load for each six-second interval of Regulation Service, minus the Distributed Energy Resource's telemetered Load value for each six-second interval. These calculations will allow Aggregators to measure Demand Reductions in real-time based on the Distributed Energy Resource's Load in close time proximity to the six-second dispatch interval, which more accurately represents the Load of the Distributed Energy Resource at the time of dispatch.

### *7. Calculation of Demand Reductions for DER Aggregations*

The Aggregator will not be required to provide the NYISO with Demand Reductions for each individual Distributed Energy Resource in real-time. Instead, the Aggregator will be required to provide the NYISO with the total amount of Demand Reduction from all Distributed Energy Resources in an Aggregation. Demand Reduction by a DER Aggregation will be calculated as the sum of Demand Reduction from each individual Distributed Energy Resource within the DER Aggregation. The Aggregator will be required to provide the summed value to the NYISO for each six-second interval using appropriate real-time telemetry consistent with the rules contained in Section 13 of the Services Tariff and the ISO Procedures.

## **D. Ancillary Services**

### *1. Overview*

The NYISO proposes to modify its Ancillary Services requirements to account for the characteristics of Aggregations. The NYISO proposes to establish that an Aggregation may only qualify to offer the Ancillary Services that all individual facilities in the Aggregation are qualified to provide.<sup>112</sup> In addition, the NYISO proposes to make certain revisions to the requirements of individual Ancillary Services as detailed below.

### *2. Aggregation's Provision of Regulation Service*

An Aggregation may provide Regulation Service when all of the individual facilities in the Aggregation meet the eligibility requirements to provide this service, except as follows.

An Aggregation that is comprised of one or more generating units is not eligible to provide Regulation Service, unless each of the generating units in the Aggregation use inverter-based energy storage technology.<sup>113</sup> Regulation Service is provided by qualified Resources whose output or demand can be raised or lowered as necessary in six-second increments to follow changes in Load. Resources, with the exception of units using inverter-based energy storage technology, providing Regulation Service must, therefore, be synchronized to the grid, at or above the unit's Minimum Generation Level, and be capable of responding to six-second

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<sup>112</sup> Proposed revisions to Services Tariff Section 4.2.1.3.1.

<sup>113</sup> Proposed revisions to Services Tariff Sections 4.2.1.3.1, 15.3.

dispatch signals. When an Aggregation that is comprised of one or more generating units is dispatched, there is no certainty that the next increment of output will be provided by a unit that is online and synchronized to the system. Therefore, Aggregations with at least one generating unit, except for generating units utilizing inverter-based energy storage technology, will be prohibited from providing Regulation Service. Because facilities utilizing inverter-based energy storage technology can respond instantly to dispatch instructions, Aggregations in which all generating units utilize inverter-based energy storage technology will be eligible to provide Regulation Service.

For the same reasons described above, an Aggregation of Demand Side Resources in which at least one Demand Side Resource facilitates its Demand Reduction by using a Local Generator will not be eligible to provide Regulation Service unless each Local Generator included in the Aggregation uses inverter-based energy storage technology.<sup>114</sup>

For any interval in which an Aggregation (other than an Aggregation of Limited Energy Storage Resources) is providing Regulation Service, the Aggregation shall receive a settlement payment for Energy consistent with a real-time Energy injection equal to the lower of the actual Energy it provides or its AGC Base Point Signal.<sup>115</sup> However, Demand Reductions from Aggregations providing Regulation Service are only eligible for payment for Energy when the real-time LBMP, at the Aggregation's Transmission Node, meets or exceeds the Monthly Net Benefit Threshold for the applicable period.<sup>116</sup> In such case, the Aggregation shall receive an Energy payment for Demand Reduction equal to the lower of the Demand Reduction's contribution to the actual Energy provided or the Aggregation's AGC Base Point Signal.<sup>117</sup>

### *3. Persistent Undergeneration Charges and Persistent Over-Withdrawal Charges*

Pursuant to Rate Schedule 3-A of the Services Tariff, a Resource that is *not* providing Regulation Service may be subject to special settlement charges if it deviates from its Energy schedule. An Aggregation will be subject to two such charges when it deviates in the following manner.

First, as with other Suppliers (with certain exceptions), an Aggregation will be subject to a "Persistent Undergeneration Charge" when it operates below its Energy schedule, subject to a *de minimis* tolerance band. For the purposes of calculating whether an Aggregation is subject to the Persistent Undergeneration Charge, the NYISO will evaluate the Aggregation's total response,<sup>118</sup> that is, the sum of the Aggregation's Actual Energy Injections, Actual Energy

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<sup>114</sup> Proposed revisions to Services Tariff Section 15.3.

<sup>115</sup> Proposed revisions to Services Tariff Section 15.3.6.1.A.

<sup>116</sup> Proposed Services Tariff Section 15.3.6.1.B.

<sup>117</sup> *Id.*

<sup>118</sup> The term "total response" used in this filing is used to mean the same thing as the undefined phrase "actual Energy provided by the Supplier" used in Section 15.3A.1 of the Services Tariff.

Withdrawals, and Actual Demand Reductions.<sup>119</sup> The requirements for the Persistent Undergeneration Charge are set forth in Section 15.3A.1 of the Services Tariff. The NYISO proposes to revise the list of Generators exempted from this charge to make clear that the following Aggregations are not subject to this charge – Aggregations of Intermittent Power Resources, Aggregations of Capacity Limited Resources, and Aggregations of Energy Limited Resources. Each of these individual Resource types are not currently subject to the charge.<sup>120</sup> The NYISO also clarifies that a Generator in an Aggregation that is providing Energy under contract remains subject to this charge.<sup>121</sup>

Second, the NYISO proposed in its Order No. 841 compliance filing to establish a “Persistent Over-Withdrawal Charge.” The “Persistent Over-Withdrawal Charge” was included in a new Section 15.3A.1.2 of the Services Tariff and would apply to an Energy Storage Resource scheduled to withdraw that is not providing Regulation Service and that persistently withdraws Energy at a level exceeding its scheduled withdrawal level, subject to the same *de minimis* tolerance band used in the Persistent Undergeneration Charge. The NYISO proposes to revise Section 15.3A.1.2 to provide that the Persistent Over-Withdrawal Charge also applies to Aggregations of Energy Storage Resources and DER Aggregations that include at least one Withdrawal Eligible Generator.

#### 4. Operating Reserves

The NYISO procures several different Operating Reserves products, including: (i) Spinning Reserve (also known as 10-Minute Synchronized Reserve); (ii) 10-Minute Non-Synchronized Reserve; and (iii) 30-Minute Reserve (which includes both synchronized and non-synchronized components). As with other Resources, an Aggregation’s eligibility to provide a particular Operating Reserves product will be defined by the criteria for the particular product and the characteristics and operating status of the individual facilities in the Aggregation.<sup>122</sup>

Except as described below, an Aggregation may provide Spinning Reserve when it: (i) is Bid as ISO-Committed Flexible or Self-Committed Flexible; (ii) is operating within the dispatchable portion of its operating range; (iii) is capable of responding to NYISO instructions to change its operating level within ten minutes; and (iv) meets the qualifications identified in the ISO Procedures.<sup>123</sup> The following Aggregation types may only provide Spinning Reserves if all of the generating units in their Aggregation use inverter-based energy storage technology and they meet the criteria in the NYISO’s procedures: (i) Aggregations comprised of one or more

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<sup>119</sup> The NYISO will not evaluate the Actual Demand Reduction component as against the Monthly Net Benefit Threshold for the purposes of determining the total response, but, as described above, Demand Reductions will not be compensated if the LBMP for a given interval at the Aggregation’s Transmission Node is less than the Monthly Net Benefit Threshold.

<sup>120</sup> Proposed revision to Services Tariff Sections 15.3A.2.4, 15.3A.2.5.

<sup>121</sup> Proposed revision to Services Tariff Section 15.3A.2.1.

<sup>122</sup> Pursuant to Northeast Power Coordinating Council requirements, all offers to supply Operating Reserve must be sustainable for a minimum of one hour.

<sup>123</sup> Proposed revisions to Services Tariff Sections 2.15, 15.4.1.2.1.

generating units, and (ii) Aggregations that include Demand Side Resource(s) where at least one Demand Side Resource facilitates its Demand Reduction by using a Local Generator.

An Aggregation may provide 10-Minute Non-Synchronized Reserve if it is comprised of generating units (including Local Generators facilitating Demand Reductions by Demand Side Resources) and is capable of increasing its supply level within ten minutes and meets the criteria in the NYISO's procedures.<sup>124</sup>

Except as described below, an Aggregation may provide 30-Minute synchronized reserve when it: (i) is offered as ISO-Committed Flexible or Self-Committed Flexible, and (ii) operating within the dispatchable portion of its operating range. As described above for Spinning Reserves, an Aggregation may not provide 30-Minute synchronized reserve if it has one or more generating units in the Aggregation, unless all such generating units (including Local Generators facilitating Demand Reductions by Demand Side Resources) utilize inverter-based energy storage technology. An Aggregation whose facility mix includes one or more generating units (including Local Generators facilitating Demand Reductions by Demand Side Resources) is eligible to provide 30-Minute non-synchronous reserve.

Finally, the NYISO clarifies that Aggregations using the Self-Committed Fixed Bid mode are not eligible to provide any kind of Operating Reserve.<sup>125</sup> This is consistent with the current requirements for individual Generators that Bid in this manner.

#### *5. Voltage Support Service*

Aggregations are primarily expected to be comprised of facilities connected to the distribution system. They are unlikely to provide measurable and beneficial voltage support to the Bulk Electric System because any reactive power provided on the distribution system will experience high losses due to motors, transformers, and impedance at the distribution level. Therefore, the NYISO proposes to prohibit Aggregations from providing Voltage Support Service.<sup>126</sup>

### **E. Market Monitoring**

#### *1. Description of Distributed Energy Resource Energy and Ancillary Services Market Mitigation Revisions*

The revisions to the Mitigation Measures<sup>127</sup> and Market Monitoring Plan<sup>128</sup> that the NYISO proposes to apply for Energy market mitigation to Distributed Energy Resources and, in

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<sup>124</sup> Proposed revisions to Services Tariff Sections 2.15, 15.4.1.2.2.

<sup>125</sup> Proposed revisions to Services Tariff Sections 2.15, 15.4.1.2.4.

<sup>126</sup> Proposed revision to Services Tariff Section 15.2.

<sup>127</sup> The Mitigation Measures are located in Section 23 of the Services Tariff.

<sup>128</sup> The Market Monitoring Plan is located in Section 30 of the Services Tariff.

particular, Aggregations, build on the proposed changes that the NYISO submitted in its Energy Storage Resource filing.<sup>129</sup> Key changes that the NYISO proposed in its Energy Storage Resource filing that are also pertinent to developing appropriate Energy market mitigation rules for Distributed Energy Resources and Aggregations include:

- (1) new mitigation thresholds that apply to Bids to withdraw Energy and to the difference between the price (LBMP) at which an Energy Storage Resource is willing to purchase Energy to charge and the price at which the Energy Storage Resource is willing to inject Energy onto the grid;
- (2) the ability for all Generators, including Energy Storage Resources, to submit opportunity costs with their Energy/Ancillary Service Bids. The NYISO screens the opportunity cost submissions and uses the submitted opportunity costs to adjust the reference levels that it employs to apply conduct and impact mitigation; and
- (3) rules to address the interaction between Bids to withdraw Energy and Virtual Bids (Bids to withdraw Energy can impact the LBMP at which Virtual Supply positions are settled).

The additional revisions to the Mitigation Measures and Market Monitoring Plan proposed in this filing to address Distributed Energy Resources and Aggregations include the following broad categories of changes:

- (A) revising the Energy and Ancillary Service market mitigation rules to include and accommodate Aggregations that may include a variety of different Resource types, and where the aggregated facilities may not all be at the same electrical location; and
- (B) adding new rules to explicitly identify as Tariff violations uses of the Aggregation construct to avoid the application of mitigation or financial sanctions under the Market Mitigation Measures, or to sidestep other requirements of the NYISO's Tariffs.<sup>130</sup>

The vast majority of the proposed changes are to incorporate Aggregations into the Energy market mitigation rules. Proposed changes to specific sections of the Mitigation Measures and Market Monitoring Plan are described in greater detail below.

## *2. Description of Changes to Specific Tariff Provisions*

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<sup>129</sup> The revisions that the NYISO proposed to implement as new and improved mitigation rules for Energy Storage Resources are described in the filing letter that the NYISO submitted to the Commission on December 3, 2018 in Docket No. ER19-467-000 at pp. 55-61.

<sup>130</sup> See proposed Services Tariff Section 23.8 (Monitoring of Aggregations).

a. Changes to Make Clear that the Mitigation Measures Apply to Aggregations

To incorporate the mitigation of Aggregations into its Mitigation Measures, the NYISO proposes to add references to Aggregations to the following Sections of its Services Tariff.

- The NYISO proposes to revise the definition of an Electric Facility in Section 23.2.1 of the Mitigation Measures to include “an Aggregation.” This is appropriate because the term Electric Facility is often used as a catch-all in the Mitigation Measures.
- In Sections 23.2.4.1.1, 23.3.1.1.1, 23.3.1.1.1.1, and 23.3.1.1.1.2, the NYISO proposes to revise the physical withholding conduct thresholds to include Aggregations.
- The NYISO proposes to revise the economic withholding conduct thresholds set forth in Sections 23.3.1.2.1, 23.3.1.2.1.1.2, 23.3.1.2.1.4, 23.3.1.2.1.5, 23.3.1.2.2, 23.3.1.2.2.1, 23.3.1.2.2.2, 23.3.1.2.2.3, and 23.3.1.2.2.2.6 of the Mitigation Measures to include Aggregations.
- In Sections 23.3.1.2.3 through 23.3.1.2.3.3 of the Mitigation Measures, the NYISO proposes to revise its rest-of-state reliability mitigation measure to apply to Aggregations.
- The NYISO proposes to revise the uneconomic production conduct thresholds in Section 23.3.1.3.1.2 to apply to Aggregations.
- In Sections 23.3.1.3.2, 23.3.1.3.2.1, and 23.3.1.3.2.2, the NYISO proposes to revise the uneconomic withdrawal conduct thresholds to apply to Aggregations that contain Withdrawal-Eligible Generators.
- The NYISO proposes to revise the reference level calculation rules in Sections 23.3.1.4.1 through 23.3.1.4.2 to address how reference levels will be calculated for Aggregations.
- The NYISO proposes to revise Section 23.3.1.4.5 to include Aggregations in the rules that address real-time Operating Reserves Availability Bids.
- The NYISO proposes to revise Sections 23.3.1.4.6.2, 23.3.1.4.6.2.1, and 23.3.1.4.6.4 through 23.3.1.4.7 of the Mitigation Measures to apply the rules for submitting fuel cost adjustments to Aggregations.
- The NYISO proposes to revise Section 23.3.1.4.8.1 to clarify that Withdrawal-Eligible Generators and Aggregations containing Withdrawal-Eligible Generators are not permitted to submit costs they expect to incur to withdraw Energy in order to charge as a fuel cost.
- The NYISO proposes to revise Sections 23.3.1.4.8.3 through 23.3.1.4.8.9 of the Mitigation Measures to apply the rules for submitting opportunity cost adjustments to Aggregations.
- The NYISO proposes to revise Sections 23.3.2.1.2 and 23.3.2.1.3 to apply the market impact thresholds to Aggregations.

- In Section 23.3.2.3.2 the NYISO proposes to revise the rules for submitting a Federal Power Act Section 205 filing to address circumstances where an Aggregation engages in conduct that increases its guarantee payment by 100 percent or more.
- In Sections 23.3.3.1.1 through 23.3.3.3.2.4 of the Mitigation Measures, the NYISO proposes to revise its consultation rules, including its real-time guarantee payment and rest-of-state reliability commitment consultation rules, to apply to Aggregations.
- The NYISO proposes to revise Sections 23.4.3.2 through 23.4.3.3.4 of the Mitigation Measures, which address the assessment of financial penalties, to apply to Aggregations.
- The NYISO proposes to revise Sections 23.4.1, 23.4.3.2(ix), and 23.4.3.3.1.1.1 of the Mitigation Measures to apply the mitigation rules and associated financial penalties it proposed in its Energy Storage Resource compliance filing to both Energy Storage Resources and Aggregations made up solely of Energy Storage Resources.
- The NYISO proposes to revise the mitigation measures that may apply when a Resource changes its real-time Bid for Energy that was scheduled Day-Ahead to apply to Aggregations. *See* Services Tariff Sections 23.4.7 through 23.4.7.3.1.4.
- In Sections 23.5.1, 23.5.3, and 23.5.3.2, the NYISO proposes to apply certain mitigation measures that only apply in the New York City Constrained Area to Aggregations.

b. Other Proposed Changes to the Mitigation Measures

Proposed changes to the Mitigation Measures that go beyond adding Aggregations to the existing Mitigation Measures, or to the new mitigation measures proposed in the NYISO's Energy Storage Resource filing, are described below.

Section 23.3.1.2.1.1.2 of the Mitigation Measures consists of proposed language that is pending Commission review in Docket No. ER19-467 (*i.e.*, the NYISO's Order No. 841 compliance filing). It proposes new conduct thresholds that are designed to apply to Bids that the NYISO evaluates as a price spread for purposes of scheduling and dispatch. The NYISO proposes two types of changes to Section 23.3.1.2.1.1.2 of the Mitigation Measures. First, the NYISO proposes to clarify that the mitigation rules will only apply to Energy Storage Resources and to Aggregations that consist solely of Energy Storage Resources. Second, the NYISO proposes improvements to the calculation of Hourly Thresholds in Sections 23.3.1.2.1.1.2(a) and (b) to clarify that when the reference level spread is very tight (*i.e.*, when the difference in LBMPs is expected to be less than \$25/MWh), then it is appropriate to apply a minimum hourly threshold of \$75/MWh. Without this addition, the NYISO is concerned that competitive Bids might be inappropriately determined to have violated the conduct threshold.

Proposed Section 23.8 is a new provision that is designed to identify potentially abusive conduct that Market Parties are not permitted to engage in, and that the NYISO will monitor for. The provision addresses the potential for Market Parties to create or dissolve Aggregations, or to move facilities between Aggregations, in order to avoid the application of mitigation, or in order to avoid or escape other obligations set forth in the NYISO's Tariffs. The proposed rule will



provide the Market Party an opportunity to demonstrate to the NYISO that its actions were consistent with competitive behavior. If the identified conduct is not demonstrated to be competitive, then the NYISO will refer the Market Party to its external Market Monitoring Unit for possible referral to the Commission's Office of Enforcement. After the NYISO gains experience with how Market Parties use Aggregations to participate in its markets, the NYISO may propose a more specific set of mitigation measures. The NYISO will comply with its obligation to propose a new mitigation measure in accordance with Section 23.3.2.3 of the Mitigation Measures if it identifies conduct that departs significantly from the conduct that would be expected under competitive market conditions, but that does not violate the conduct and impact thresholds in the Mitigation Measures, if the conduct has a significant effect on market prices or guarantee payments.

c. Proposed Changes to the Market Monitoring Plan

The NYISO proposes the following changes to its Market Monitoring Plan, which is Section 30 of the Services Tariff. The NYISO proposes to incorporate Aggregations into Section 30.4.6.2.3 of its Market Monitoring Plan and to revise the numbering of cross-references to the Mitigation Measures. The NYISO also proposes revisions to Section 30.4.6.2.6 of the Market Monitoring Plan to address both opportunity cost adjustments to reference levels and Aggregations. In addition, the NYISO proposes to revise Section 30.6.1 of the Market Monitoring Plan to clarify that sources of supply are not limited to generation. Finally, the NYISO proposes clarifications to Sections 30.6.2.2.1 and 30.6.2.2.3 of the Market Monitoring Plan, which address data that must be retained and provided to the NYISO on request.

## **VI. Dual Participation**

The NYISO does not currently have rules in place for Generators to simultaneously provide service to the NYISO-administered markets and to distribution systems.<sup>131</sup> The NYISO proposes to establish a new Section 4.1.11 of its Services Tariff to permit Generators, Demand Side Resources, and Distributed Energy Resources that are electrically located in the NYCA to simultaneously participate in the NYISO-administered markets and in programs or markets operated to meet the needs of distribution systems located in the NYCA. All wholesale Market Participants, not just DER Aggregations, will be permitted to use the proposed dual participation rules.<sup>132</sup> The NYISO's proposed dual participation rules will provide Resources with the flexibility to meet both wholesale and distribution system needs, delivering the maximum benefit to New York electricity consumers.

An entity engaged in dual participation must continue to meet all applicable rules and obligations set forth in the NYISO's Tariffs concerning the services it provides in the NYISO-

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<sup>131</sup> The NYISO does permit Special Case Resources and Emergency Demand Response Program participants to also provide services to the applicable utilities.

<sup>132</sup> The NYISO proposes to revise the definition of "Behind-the-Meter Net Generation Resource" in Section 2.2 of the Services Tariff to remove the explicit prohibition of dual participation for those Resources.

administered markets.<sup>133</sup> The entity's failure to comply with the NYISO's Tariff obligations may result in financial penalties and/or termination from wholesale market participation. An entity with obligations outside the NYISO-administered markets must Bid in the NYISO's markets in a manner that ensures it is dispatched by the NYISO to meet its obligations.<sup>134</sup> Consistent with the practices established for existing resources, the NYISO and New York Transmission Owners will coordinate the scheduling and dispatch of all entities engaged in dual participation in accordance with the NYISO's procedures. Importantly, however, the NYISO will have the authority, *i.e.*, the final decision, to schedule and/or dispatch all wholesale market participants, including those wholesale market participants providing services to the distribution system and/or a host facility. This will ensure that bulk electric system operators have all of the tools at their disposal for bulk system reliability when necessary. The NYISO notes that Transmission Owners will continue to be able to use the NYISO's Supplemental Resource Evaluation procedures (for both conventional Generators and Aggregations) to address local reliability needs.

Since 2016 the NYISO has worked with the New York Transmission Owners to identify and develop appropriate operating procedures and protocols to facilitate dual participation. The scheduling and dispatch of such resources requires operational coordination among the wholesale Market Participant, the NYISO, and the applicable Transmission Owner. This coordination will build upon and enhance the operational coordination that has been developed and refined over time for conventional Generators. New York Transmission Owners are currently able to directly contact the NYISO to request that a Resource (or Resources) be scheduled in order to meet a local reliability need.<sup>135</sup> The NYISO then reviews the request to ensure the requested schedule will not harm bulk power system reliability, and, if not, will schedule the Resource as requested.

As part of the instant proposal, the existing process to address local reliability will remain in place and will be supplemented by processes that allow dual participating Resources to be scheduled through the NYISO for local, non-reliability, *e.g.*, economic, reasons. The new processes will allow the Market Participant to request a schedule (through its Bids) for a Resource as needed by the Transmission Owner for local reasons when the Resource may not have otherwise been scheduled by the NYISO. Market Participants that seek to operate to meet the Transmission Owner's local needs must be scheduled by the NYISO through one of two means: (i) use of either the Self-Scheduled Fixed or Self-Schedule Flexible bidding mode (depending on the Transmission Owner need), or (ii) submission of a "price-taker" Bid.<sup>136</sup> Barring bulk power system operational or reliability concerns, Resources using one of these methods will be scheduled by the NYISO consistent with its Bids. Importantly, the Market

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<sup>133</sup> Proposed Services Tariff Section 4.1.11.

<sup>134</sup> *Id.*

<sup>135</sup> This process is used only to address resource deficiencies, not to reduce costs.

<sup>136</sup> *See* proposed Services Tariff Section 4.1.11 ("Generators, Demand Side Resources, and Distributed Energy Resources operating to meet an obligation outside of the ISO-administered wholesale markets must Bid in a manner that ensures they will be dispatched by the ISO . . . .")

Participant must be mindful of, and account for, any other wholesale market obligations it may have (for example, a Day-Ahead schedule) when submitting Bids to meet the Transmission Owner's local needs.

As an example of dual participation bidding behavior, consider a 2 MW/2 MWh Energy Storage Resource with a wholesale market Day-Ahead Schedule to provide 1 MW in hours beginning ("HB") 14 and 15, and where the Transmission Owner requested the Resource for 1 MW in HB 19 and HB 20 for a local need. In order to meet those obligations, the Energy Storage Resource would need to undertake the following wholesale market actions: (i) have at least 2 MWh of Energy stored prior to HB 14, (ii) submit real-time Bids to inject Energy up to 1 MW in each of HB 14 and HB 15, (iii) be self-scheduled (or be a price-taker) and pay the corresponding wholesale market Energy price to withdraw Energy during all or a portion of the period HB 16 through HB18 in order to refill to meet the Transmission Owner's local need, and (iv) be self-scheduled (or be a price-taker) to inject 1 MW in each of HB19 and HB20 to meet the Transmission Owner's local need.

The NYISO previously informed the Commission of its intent that the dual participation requirements being submitted as part of this filing be in place and available for use by Energy Storage Resources by the time that the Energy Storage Resource related rules filed by the NYISO in response to Order No. 841 are implemented.<sup>137</sup> Accordingly, as described in Part XII, the NYISO respectfully requests that the dual participation requirements in Section 4.1.11 of the Services Tariff become effective as of May 1, 2020, which will ensure that Energy Storage Resources will be able to make use of the provisions once the NYISO's tariff revisions in compliance with Order No. 841 become effective. The NYISO is in the process of developing the appropriate operating procedures with the New York Transmission Owners to facilitate operational coordination at the bulk power system and distribution system levels for dual participation, and those procedures will be in place prior to the effective date of these requirements.

## **VII. Metering and Telemetry**

The NYISO must maintain effective measurement and verification requirements to ensure that Resources participating in its wholesale markets respond and perform as directed in real-time and are properly compensated thereafter based on their actual performance. As part of this Distributed Energy Resource initiative, the NYISO evaluated its existing metering and telemetry requirements for Generators and Demand Side Resources to determine whether revisions were required. Based on its evaluation, the NYISO proposes the following revisions to its metering and telemetry requirements.

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<sup>137</sup> See *New York Independent System Operator, Inc.*, Response to April 1, 2019 Letter and Notification of Implementation Issues that Necessitate Additional Limited Compliance Tariff Revisions in Docket No. ER19-467-000, Docket No. ER19-467-001 at pp 14-15 (May 1, 2019).

## A. Metering Requirements

The NYISO proposes a comprehensive reform to its metering requirements applicable to Responsible Interface Parties, Curtailment Service Providers and Aggregators of DER Aggregations participating in its wholesale markets to improve the ability of third parties, including the Market Participant itself, to provide metering and/or meter data services.

### 1. Background

Section 13.2 of the Services Tariff provides that the “ISO shall establish metering specifications and standards for all metering that is used as a data source by the ISO” and that such metering information “will be provided on a timely basis and in the formats prescribed in the ISO Procedures.” Currently, the NYISO’s tariffs and procedures require Market Participants participating in its economic and reliability-based demand response programs to obtain metering and/or meter data services from either: (i) the local New York Transmission Owner,<sup>138</sup> or (ii) an entity that has been certified as a Meter Service Provider (“MSP”) or Meter Data Service Provider (“MDSP”) by the New York Public Service Commission.<sup>139</sup> This applies to Market Participants participating as Curtailment Service Providers in the EDRP, as Responsible Interface Parties in the SCR program, in the DADRP, and in the DSASP.

As part of its Distributed Energy Resource initiative, the NYISO revisited these metering requirements with its stakeholders, including examining the existing NYPSC rules and regulations and the requirements in other ISOs and RTOs. Based on this review, the NYISO identified improvements to its metering requirements to enhance opportunities for third parties to provide metering and meter data services to Distributed Energy Resources and Demand Side Resources. Further, in the time since the NYISO initiated its review of those requirements, the NYPSC issued an order terminating the MSP and MDSP programs immediately and cancelled all certifications awarded through those programs.<sup>140</sup>

### 2. Revised Metering Framework

The NYISO proposes to revise Section 13 of the Services Tariff to establish a new framework pursuant to which an Aggregator of a DER Aggregation, Curtailment Service Provider, or Responsible Interface Party participating in the NYISO-administered markets may obtain wholesale metering and/or meter data services from either: (i) the Member System in

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<sup>138</sup> The New York transmission owners were granted MSP and MDSP status by order of the NYPSC. *See* Order Providing for Competitive Metering, NYPSC Case No. 94-E-0952 at p 24 (May 19, 1999).

<sup>139</sup> The NYISO’s manuals refer to a NYPSC-certified MDSP. In practice, an interested entity submitted its application to the NYDPS requesting eligibility to provide meter data services in New York.

<sup>140</sup> Case No. 18-E-0595, *et al.*, *In re Meter Service Provider/Meter Data Service Provider Programs*, Order Terminating Metering Programs (Feb. 8, 2019). The NYISO published a Technical Bulletin as an interim measure to permit Responsible Interface Parties and Curtailment Service Providers that were using a previously certified MSP or MDSP to continue to use those entities. *See Technical Bulletin No. 247: Responsible Interface Party (RIP) and Curtailment Service Provider (CSP) Meter Data Submission* (Feb. 27, 2019), available at: <https://www.nyiso.com/documents/20142/2931465/TB-247-v2019-02-27-Final.pdf>.

which Transmission District the entity is located, or (ii) a new third-party entity—Meter Services Entity—that complies with certain eligibility requirements detailed below.<sup>141</sup> The new Meter Services Entity framework will replace the existing requirements that provide for the Market Participant to use a certified MSP or MDSP.<sup>142</sup>

As the Member Systems provide metering and meter data services throughout the NYCA, each Aggregator, Curtailment Service Provider, or Responsible Interface Party will have the opportunity to evaluate whether the local Member System or a Meter Services Entity would best meet its metering and meter data service needs. In addition, the Aggregator, Curtailment Service Provider, or Responsible Interface Party may also serve as its own Meter Services Entity if it satisfies the eligibility requirements.<sup>143</sup>

The Aggregator, Curtailment Service Provider, and Responsible Interface Party will ultimately be responsible for ensuring that all required metering and meter data services are provided pursuant to the NYISO's tariffs and procedures,<sup>144</sup> will be responsible for compensating the Member System or Meter Services Entity for providing them with these services, and will be responsible for any applicable penalties concerning these services.<sup>145</sup> In addition, each Aggregation must have adequate metering, including each individual facility in the Aggregation.<sup>146</sup>

### 3. *Meter Services Entity's Eligibility Requirements*

A Meter Services Entity will be an “entity registered with the ISO and authorized to provide metering and meter data services, as applicable, to an Aggregator, Responsible Interface Party or Curtailment Service Provider.”<sup>147</sup> The NYISO proposes to establish an application process that a Meter Services Entity must satisfy to be eligible to provide metering or meter data services.<sup>148</sup> The proposed eligibility requirements include requirements regarding the applicant's general business competence, its ability to perform the specific metering and/or meter data service functions of a Meter Services Entity, and its ability to comply with the NYISO's tariffs and procedures.

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<sup>141</sup> Proposed Services Tariff Section 13.3.1.1.

<sup>142</sup> The revised requirements will be located in a new Section 13.3 of the Services Tariff and will replace the prior third-party requirements in Section 13.2.3, which applied to entities qualified by state regulatory authorities (*i.e.*, MSPs and MDSPs) and are no longer applicable.

<sup>143</sup> Proposed Services Tariff Section 13.3.1.1.

<sup>144</sup> While a Market Participant that satisfies the Meter Services Entity eligibility requirements may act as its own Meter Services Entity, the Meter Services Entity type will not itself be a Market Participant under the NYISO tariffs.

<sup>145</sup> Proposed Services Tariff Sections 13.3.1.2 and 13.3.1.3.

<sup>146</sup> Proposed revisions to Services Tariff Section 13.1.

<sup>147</sup> Proposed revisions to Services Tariff Section 2.13.

<sup>148</sup> Proposed Services Tariff Sections 13.3.2.1.1, 13.3.2.1.2.

In particular, an applicant must provide the NYISO with the following information: (i) financial eligibility and insurance coverage information; (ii) proof of eligibility to do business in New York State; (iii) a list of the Transmission Owners in whose service territories it will provide metering and/or meter data services; (iv) a description of the metering and/or meter data services that it will provide; (v) its attestation of its employees' qualifications, training, and certification to perform the listed services; (vi) a description of the meter testing facilities, including its attestation that its meter testing programs comply with the NYISO's procedures and Good Utility Practice; (vii) its agreement that its services will be subject to audit by the NYISO, the Transmission Owners, and/or their designated agents, as applicable; (viii) its agreement to comply with the metering requirements in the NYISO's tariffs and procedures, as such requirements may be amended from time to time; (ix) a revenue-grade settlement meter and real-time telemetry data plan; (x) a meter data validation, editing, and estimation ("VEE") plan; (xi) a security plan and description of how it will protect meter equipment and meter data from unauthorized physical or electronic entry or tampering; (xii) a description of how and where records of meter installations and meter data will be kept and its agreement to retain these records in accordance with the NYISO's recordkeeping requirements;<sup>149</sup> and (xiii) any other information required by the NYISO's procedures or requested by the NYISO.<sup>150</sup> The entity applying to be a Meter Services Entity must also provide a non-refundable \$1,000 application fee, which will cover the NYISO's costs in administering the application process.<sup>151</sup>

The NYISO will review the application within 30 days of its receipt, determine whether it is sufficient or additional information is required, and coordinate with the applicant to obtain any additional information within a set timeframe.<sup>152</sup> Upon the NYISO's determination that an applicant satisfies the eligibility requirements,<sup>153</sup> the entity will be registered as a Meter Services Entity with the NYISO, included on a list posted on the NYISO's website, and be eligible to provide metering and/or meter data services to itself and/or to other Aggregators, Responsible Interface Parties, or Curtailment Service Providers.

The NYISO's proposed application process establishes reasonable eligibility requirements that an interested entity must satisfy before being authorized to provide metering or meter data services.<sup>154</sup> The requirements provide the NYISO with a basis for ensuring that an

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<sup>149</sup> Included in these metering services is the maintenance of each individual Distributed Energy Resource's revenue and telemetry meter records that the NYISO may request from an Aggregator to support the mandatory and regularly submitted aggregated meter data.

<sup>150</sup> Proposed Services Tariff Section 13.3.2.1.2.

<sup>151</sup> Proposed Services Tariff Section 13.3.2.1.1.

<sup>152</sup> Proposed Services Tariff Section 13.3.2.1.2.

<sup>153</sup> If the NYISO determines an entity is not eligible, the NYISO shall provide the applicant with the reasons for its determination. The entity may seek to re-apply, but will be required to pay a new application fee. Proposed Services Tariff Section 13.3.2.1.1.

<sup>154</sup> The NYISO understands that certain other ISO/RTOs, such as PJM Interconnection, L.L.C. ("PJM"), permit third parties to self-certify. PJM, however, has a built-in process for additional review and validation of meter data by local utilities. See Section 10.4 of PJM Manual 11: Energy and Ancillary Services Market Operations ("PJM Manual 11"); available at: <https://www.pjm.com/-/media/documents/manuals/m11.ashx>. New York does not

entity offering metering and meter data services in the NYCA satisfies basic qualifications, has demonstrated a baseline competence to provide these services to accurately measure and verify meter data, and will maintain this competence going forward. Once the NYISO determines an entity is qualified as a Meter Services Entity, that entity will not be required to obtain further approvals or verifications, other than being subject to the NYISO's oversight authority.

The initial qualification and going forward requirements are essential to minimize the potential for market issues due to failure to have minimum competencies to provide metering and meter data services. The requirements constitute a reasonable and appropriate balancing of the interests of all customers for accurate and timely meter data with the interests of entities seeking to provide metering and meter data services. Timely and accurate real-time meter data assists the NYISO's system operators in maintaining the reliability of the system by confirming that all Resources are following their Base Point Signals, and accurate revenue meter data helps ensure that wholesale market settlements reflect the actual performance of each Resource, and that costs are appropriately allocated. The NYISO's proposed requirements will reduce the potential for market harm that must be remedied after they occur.

#### *4. Meter Services Entity Obligations*

A Meter Services Entity will have a continuing obligation to comply with the NYISO's metering and meter data requirements, along with the information and plans that it submits as part of the application process. The Meter Services Entity must inform the NYISO of changes to the information that was included in its application and of its compliance with any changes to the NYISO's metering requirements to ensure it remains qualified to provide metering and/or meter data services.<sup>155</sup> The Meter Services Entity must also ensure that all physical metering infrastructure and meter data communications infrastructure that it uses complies with requirements in the NYISO's tariffs and procedures.<sup>156</sup>

A Market Participant that serves as a Meter Services Entity and offers metering and/or meter data services to other Market Participants will also be subject to certain standards of conduct that require the Market Participant to treat all customers, Affiliated and non-Affiliated, on a non-discriminatory basis, and not to make or grant any undue preference or advantage in the provision of metering and/or meter data service.<sup>157</sup>

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have a similar process, and it would not be cost effective to create one. The NYISO instead believes that an initial review and approval from the NYISO that the entity has the baseline competence to provide these metering services, coupled with on-going NYISO oversight of these entities, strikes the right balance for having accurate and verifiable meter data while also being cost effective.

<sup>155</sup> Proposed Services Tariff Sections 13.3.2.1.3 and 13.3.2.1.4. If the NYISO determines that the Meter Services Entity no longer complies with the eligibility requirements, it may suspend the Meter Services Entity from providing metering services until it complies with the requirements. Proposed Services Tariff Section 13.3.2.1.3.

<sup>156</sup> Proposed Services Tariff Section 13.3.2.1. The NYISO will incorporate industry-wide accepted standards into its procedures, including appropriate standards established by groups such as the American National Standards Institute ("ANSI") and the North American Energy Standards Board ("NAESB").

<sup>157</sup> Proposed Services Tariff Section 13.3.2.2.

### 5. *NYISO Oversight of Meter Services Entities*

Consistent with its oversight role for all Market Participants,<sup>158</sup> the NYISO will have the authority to oversee and audit the metering and meter data services provided by Meter Services Entities to validate compliance with the responsibilities specified in the NYISO's tariffs and procedures. Specifically, the NYISO or a designated entity may, upon reasonable notice, perform an audit, inspection, or test of the Meter Services Entity's metering facilities, meters, or meter data records to ensure they comply with the NYISO's tariffs and procedures and the plans submitted by the Meter Services Entity.<sup>159</sup>

The NYISO's audit of a Meter Services Entity's services may involve, but is not limited to, the review, inspection, and performance testing, of corrective actions taken concerning: the validation, estimation, and editing methodology; site meter configurations; meter compliance with the NYISO's rules and procedures; the Meter Services Entity's operational protocols, procedures, recordkeeping, and compliance with the NYISO's rules and procedures; and telemetry and communication data and records.<sup>160</sup>

If the NYISO determines, at any time, that a Meter Services Entity does not comply with the eligibility requirements or the metering or meter data requirements in the NYISO's tariffs and procedures, the NYISO may suspend or revoke the eligibility of the Meter Services Entity.<sup>161</sup>

### 6. *NYISO Cost Recovery*

The entities that make use of and benefit from the Meter Services Entity framework will be responsible for the NYISO's costs associated with administering the Meter Services Entity requirements.<sup>162</sup> Specifically, an Aggregator, Responsible Interface Party, or Curtailment Service Provider using a Meter Services Entity will be responsible for the NYISO's audit costs of that Meter Services Entity.<sup>163</sup>

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<sup>158</sup> See, e.g., Services Tariff Section 10 (*Recordkeeping and Audit*) ("Upon thirty (30) days prior written notice, and subject to the provisions in Article 6, the Customer, the ISO, the applicable Transmission Owner, the NYSRC, the Commission or the PSC shall have the right to inspect all records, meter readings and memoranda for the purpose of ascertaining the accuracy of all settlement information prepared pursuant to Article 7 and in compliance with the provisions of the ISO Services Tariff and the Reliability Rules.").

<sup>159</sup> Proposed Services Tariff Section 13.3.2.3.1.

<sup>160</sup> *Id.*

<sup>161</sup> Proposed Services Tariff Section 13.3.2.3.2.

<sup>162</sup> As described above, an applicant applying to be a Meter Service Entity will be responsible for a non-refundable \$1,000 application fee to address the NYISO's administrative costs associated with the application process.

<sup>163</sup> Proposed Services Tariff Sections 13.3.1.3 and 5.10.



The NYISO proposes to establish a new Rate Schedule 10 of the Services Tariff to recover the costs it incurs in auditing Meter Services Entities.<sup>164</sup> The NYISO will calculate the costs of any such audits, inspections, or tests and will assess such charges each Billing Period.<sup>165</sup> Specifically, the NYISO will recover from each Responsible Interface Party, Curtailment Services Provider, and Aggregator using a Meter Services Entity the sum of the NYISO's labor costs to complete each audit task conducted by the NYISO concerning the applicable Meter Services Entity based on a combination of an NYISO employee hourly rate and a pro-rated cost of overhead.<sup>166</sup> In addition, if the NYISO uses a third-party vendor to complete audit tasks, the cost of the vendor will be billed to the Responsible Interface Party, Curtailment Services Provider, or Aggregator using the Meter Services Entity for its services.<sup>167</sup>

The NYISO will also have the authority to impose financial penalties on the Responsible Interface Party, Curtailment Services Provider, or Aggregator in connection with metering or meter data services that do not comply with the NYISO's tariffs and procedures.<sup>168</sup> For example, Sections 5.12.12 and 5.14.2 of the Services Tariff establish that the NYISO may issue fines or charges associated with the submission of late or misleading data.

### 7. *NRG Proceeding*

In an Order issued December 20, 2018, the Commission determined, in response to a complaint submitted by NRG Curtailment Solutions, Inc. ("NRG"),<sup>169</sup> that the NYISO's metering requirements were unjust and unreasonable, unduly discriminatory or preferential to the extent they require Curtailment Service Providers and Responsible Interface Parties that are not transmission owners to be certified as MSPs or MDSPs by the NYDPS to provide metering services in the NYISO-administered markets.<sup>170</sup> The Commission established a paper hearing to obtain additional information concerning what metering requirements could be implemented to address the matter.<sup>171</sup> The NYISO and NRG submitted initial and reply briefs. In its briefs, the NYISO detailed the revisions to its metering requirements that it developed with stakeholders as part of this Distributed Energy Resource initiative and indicated it would submit these revisions to the Commission in a filing pursuant to Section 205 of the Federal Power Act following

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<sup>164</sup> Proposed Services Tariff Section 15.10.

<sup>165</sup> Proposed Services Tariff Sections 15.10, 15.10.1, 15.10.2.

<sup>166</sup> Proposed Services Tariff Section 15.10.

<sup>167</sup> *Id.*

<sup>168</sup> Proposed Services Tariff Section 13.3.1.2.

<sup>169</sup> See *NRG Curtailment Solutions, Inc. v. New York Independent System Operator, Inc.*, Request for Waiver, Or In The Alternative, Complaint of NRG Curtailment Solutions, Inc., Docket No. EL18-188-000 (July 24, 2018).

<sup>170</sup> See Order on Complaint, Denying Tariff Waiver, and Establishing a Paper Hearing, 165 FERC ¶ 61,247 (2018).

<sup>171</sup> See *id.*

approval by NYISO stakeholders and the NYISO Board of Directors.<sup>172</sup> The NYISO submitted the draft tariff language, as approved by the NYISO stakeholders, for informational purposes on May 10, 2019.

Following stakeholders' approval of the proposed Distributed Energy Resources tariff revisions, the NYISO submitted a motion in the NRG proceeding to hold the paper hearing in abeyance as the NYISO was advancing for the Commission's consideration the tariff revisions developed in the Distributed Energy Resource initiative, including revised metering requirements that address the Commission's concerns raised in the proceeding.<sup>173</sup> The NYISO reiterates here that the resolution of the metering issues pending in the NRG proceeding can best be accomplished through Commission action in this Distributed Energy Resource proceeding. This approach will minimize duplication of work and the risk of contradictory or otherwise confusing directives and will lead to a quicker and more efficient resolution of the applicable issues.

## **B. Telemetry Requirements**

Market Participants' telemetry requirements are detailed in the NYISO's procedures.<sup>174</sup> The NYISO proposes to revise Section 13 of the Services Tariff to outline these telemetry requirements consistent with its existing practices. Specifically, the NYISO proposes to revise Section 13.2 to provide that it is responsible for establishing the real-time telemetry specifications and standards for all telemetry used by the NYISO, which specifications and standards will be set forth in the NYISO's procedures.<sup>175</sup> Section 13.2 will also provide that NYISO customers shall maintain telemetry hardware and infrastructure at their own expense.<sup>176</sup>

The NYISO also proposes to specify that Customers shall provide real-time telemetry for Generators and Aggregations, nominally every six (6) seconds, in accordance with the specifications set forth in the NYISO's procedures.<sup>177</sup> In addition, real-time telemetry data errors and transmission disruptions shall be remedied in accordance with the NYISO's procedures.<sup>178</sup>

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<sup>172</sup> See *NRG Curtailment Solutions, Inc. v. New York Independent System Operator, Inc., Initial Brief of New York Independent System Operator, Inc.*, Docket No. EL18-188-000 (February 4, 2019); *NRG Curtailment Solutions, Inc. v. New York Independent System Operator, Inc., Reply Brief of New York Independent System Operator, Inc.*, Docket No. EL18-188-000 (March 6, 2019).

<sup>173</sup> See *NRG Curtailment Solutions, Inc. v. New York Independent System Operator, Inc.*, Motion to Hold Proceeding in Abeyance, Docket No. EL18-188-000 (May 10, 2019).

<sup>174</sup> The telemetry requirements are found in the NYISO's Direct Communications Procedure and Control Center Requirements Manual. Both documents are protected as Critical Energy Infrastructure Information.

<sup>175</sup> Proposed revision to Services Tariff Section 13.2.

<sup>176</sup> *Id.*

<sup>177</sup> Proposed revision to Services Tariff Section 13.2.

<sup>178</sup> *Id.*

The six-second telemetry requirements represent the existing requirements for Generators participating in the NYISO-administered markets. This requirement is crucial for the NYISO to effectively maintain the reliability of the New York Bulk Power System. It provides essential two-way communications of operational data between Resources and the NYISO. The NYISO relies on this telemetry for the situational awareness necessary to balance supply and demand within the NYCA and to identify and respond to normal and abnormal conditions.<sup>179</sup>

### **C. Aggregation and DER Aggregation-Specific Rules for Telemetry Data and Revenue-Quality Meter Data**

The NYISO will send real-time Base Point Signals to, and receive real-time telemetry from, an Aggregation, not the individual facilities within the Aggregation.<sup>180</sup> The NYISO will also collect revenue-quality meter data from the Aggregation rather than the individual facilities for settlement purposes.<sup>181</sup> Communicating with the Aggregation, rather than the individual facilities, will minimize the real-time and after-the-fact administrative burden on the NYISO, Aggregators, and individual facilities. It is also consistent with the NYISO's proposed bidding and settlement rules, which treat the Aggregation as a singular Resource.

Consistent with Generators currently participating in the NYISO-administered markets, Aggregations will be required to send telemetry signals for 24 hours a day, seven days a week. The Aggregator will be responsible for measuring the injection, withdrawal, and load reduction of all individual facilities in the Aggregation during dispatch. The Aggregator must do so, regardless of the use of the assets for meeting the dispatch. This applies to both real-time telemetry and settlement data submission.

Aggregators will be required to provide the NYISO with multiple streams of telemetry and revenue meter data for DER Aggregations. Real-time telemetry for each DER Aggregation will consist of three parts: (i) the net of Energy injections and Energy withdrawals (when the Aggregation contains at least one Withdrawal-Eligible Generator), (ii) Demand Reductions, and (iii) the sum of both (i) and (ii). In addition, an Aggregator of a DER Aggregation will have to provide three streams of after-the-fact revenue-quality meter data: (i) Energy injections, (ii)

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<sup>179</sup> See *DER Real-Time Telemetry and Alternate Telemetry Approach for Small DER*, Market Issues Working Group Presentation (Sept. 28, 2018), available at: <https://www.nyiso.com/documents/20142/2549675/DER%206-Second%20Telemetry%20-%20MIWG%2020180928%20MIWG.pdf>.

<sup>180</sup> Proposed Services Tariff Section 4.1.10.4. The November 2016 NOPR declined to propose specific metering and telemetry standards and systems for distributed energy resource aggregators, but added that any metering and telemetry standards proposed by ISOs/RTOs should not impose undue burdensome requirements on aggregators or individual resources such that those standards created a barrier to entry. November 2016 NOPR at P 151. The NYISO's proposal does not create an unnecessary burden or barrier to entry. The NYISO merely proposes to extend the existing telemetry requirements to the Aggregator, and not require each individual facility to provide telemetry to the NYISO. Moreover, the proposal provides flexibility to small facilities (under 100 kW in size) to develop alternative measurement and verification tools to avoid installing more costly hardware and software required of conventional Resources.

<sup>181</sup> Proposed Services Tariff Section 4.1.10.4.

Energy withdrawals by Withdrawal-Eligible Generators, and (iii) Demand Reductions. The NYISO requires this information for measuring both performance and settlements. Specifically, the NYISO requires the individual signals to pair with the different revenue-grade meter files that will be submitted one day after dispatch. Each of these categories have slightly different treatment when being evaluated for settlements, such as the application of the Monthly Net Benefits Threshold to the Demand Reduction portion of response. The cumulative telemetry signal is used in real-time to evaluate response to dispatch in aggregate. Aggregations of like Resource types will be subject to the existing metering and telemetry rules for that Resource type.

The Aggregator will be responsible for ensuring that all measurements for metering and telemetry for the individual facilities it represents derive from either directly measured or calculated values, or a combination thereof, in accordance with the requirements set forth in the NYISO's procedures.<sup>182</sup> The real-time six-second status of an individual facility may be calculated through a NYISO-approved methodology for facilities that are 100 kW or smaller. The use of such an alternative telemetry solution must be communicated and approved by the NYISO prior its use and must only augment directly metered values that are measured at a periodicity of 5-minutes or faster.

## **VIII. Settlement Rules for Distributed Energy Resources**

### **A. Bid Production Cost Guarantee Payments**

A Bid Production Cost Guarantee ("BPCG") payment is the mechanism by which the NYISO enables a qualifying Supplier to recover its as-bid costs over the applicable period if it is committed by the NYISO. Different rules for paying BPCG apply to the Day-Ahead and Real-Time Markets. The NYISO proposes to revise the BPCG requirements in Section 18 (Attachment C) of the Services Tariff to establish when Aggregations are eligible for Day-Ahead and/or real-time BPCG payments. At the same time, the NYISO proposes to delete the tariff sections describing BPCG for Demand Reduction in the Day-Ahead Market, BPCG for Demand Side Resources providing Operating Reserves and/or Regulation Service in the Day-Ahead Market, and BPCG for Demand Side Resources providing Operating Reserves and/or Regulation Service in the Real-Time Market. These three categories of BPCG will become unnecessary due to termination of the DADRP and DSASP as proposed in this filing.

#### *1. Day-Ahead BPCG Payments*

The NYISO proposes to revise Section 18.2.1 of the Services Tariff to provide that an Aggregation may be eligible to receive a Day-Ahead BPCG payment. Consistent with the existing eligibility requirements, an Aggregation must be scheduled by the NYISO based on an ISO-Committed Fixed or ISO-Committed Flexible Bid to be eligible for a Day-Ahead BPCG payment.<sup>183</sup> Since the NYISO's Day-Ahead Market evaluation selects the least cost mix of

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<sup>182</sup> Proposed Services Tariff Section 13.3.3.

<sup>183</sup> See proposed revisions to Services Tariff Section 18.2.1.1.

Ancillary Services and Energy over a 24-hour market day, the NYISO will make an Aggregation whole to its Bids if it accrued a net loss over the 24-hour Day-Ahead Market day, consistent with the rules and calculations in Section 18.2 of the Services Tariff. The NYISO also proposes to revise the variable definitions for the Day-Ahead BPCG formula in Section 18.2.2 to include Aggregations as well as Generators.

Consistent with existing criteria, Aggregations will be ineligible for Day-Ahead BPCG if they self-schedule. If a Resource is scheduled for any hour of the day as a result of Self-Committed Fixed or Self-Committed Flexible Bids, it is not eligible to receive a Day-Ahead BPCG payment.<sup>184</sup> These Resources are ineligible for Day-Ahead BPCG because they are scheduling themselves at specified operating levels regardless of the LBMP, rather than asking the NYISO to schedule them based on the economics of their offers and Day-Ahead LBMPs. Since Self-Committed Resources' schedules are not the result of an economic evaluation, their costs are not protected through a Day-Ahead BPCG payment.<sup>185</sup>

## 2. *Real-Time BPCG Payments*

The NYISO proposes to revise Section 18.4.1 of the Services Tariff to describe the circumstances when an Aggregation is eligible for a real-time BPCG payment. Aggregations will only be eligible for a real-time BPCG payment when they are instructed to operate Out-of-Merit to protect system reliability, or as part of a Supplemental Resource Evaluation to meet NYCA or local system reliability.<sup>186</sup> There is one exception related to Aggregations comprised entirely of Energy Storage Resources, as discussed below.

Aggregations comprised entirely of Energy Storage Resources will also be eligible for real-time BPCG payments when the Aggregation is Self-Managing the Energy Level for all Energy Storage Resources in the Aggregation, as proposed in the NYISO's Order No. 841 compliance filing, as long as they satisfy all eligibility requirements.<sup>187</sup> However, Aggregations and Energy Storage Resources will not be eligible for real-time BPCG if their Energy offers do not permit the Resource to receive a schedule of zero MW. Resources offering in a manner that precludes the NYISO from dispatching them to zero MW will only be eligible for real-time BPCG if they are operating Out-of-Merit or as part of a Supplemental Resource Evaluation to meet NYCA or local system reliability.

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<sup>184</sup> See proposed revisions to Services Tariff Section 18.2.1.2.

<sup>185</sup> A Resource using the Self-Committed Flexible bidding mode schedules itself at a specified minimum operating level without an economic evaluation. While the Resource may also be scheduled above its minimum operating level based on the economic evaluation of its Bid, the Resource remains ineligible for Day-Ahead BPCG because its minimum operating level schedule was not based on an economic evaluation.

<sup>186</sup> See also proposed revisions to Services Tariff Section 2.19 (definition of Supplemental Resource Evaluation”).

<sup>187</sup> Consistent with the Order No. 841 Compliance Filing, Suppliers, including Aggregations, bidding Energy Storage Resources will be eligible for real-time BPCG payments if they Bid with a Self-Managed Energy Level in the Real-Time Market, as long as they satisfy the existing eligibility requirements.

## **B. Day-Ahead Margin Assurance Payments**

Day-Ahead Margin Assurance Payments (“DAMAP”) protect Day-Ahead Margins that are lost when a Generator offers flexibly in real-time and follows its real-time dispatch. Protecting a Generator’s Day-Ahead Margin provides an incentive for it to respond to the NYISO’s instruction in real-time. Generators that offer as ISO-Committed Flexible or Self-Committed Flexible for the same hours in the Day-Ahead Market and Real-Time Market are eligible for DAMAP. If a Supplier increases its real-time minimum operating level (in MW) above its Day-Ahead minimum operating level, or increases the price component of its Incremental Energy Bid for the accepted portion of its Day-Ahead schedule, it will become ineligible to receive a DAMAP.

The NYISO proposes to revise Section 25.2.1 of the Service Tariff such that Aggregations are only eligible for DAMAP when the NYISO schedules them Out-of-Merit for reliability, or derates or decommits the Aggregation in response to a NYISO or Transmission Owner system security need or to permit the NYISO to procure additional Operating Reserves. Aggregations will not have a Day-Ahead Margin to protect as they are dispatch-only Resources and many Aggregations will have intertemporal constraints that limit their injecting/withdrawing capabilities, similar to Energy Storage Resources.<sup>188</sup> For these reasons, the NYISO’s DAMAP eligibility for Aggregations follow the same requirements as Energy Storage Resources. DAMAP for Aggregations will be determined using the formulas currently used for Generators and proposed for Energy Storage Resources.

The NYISO proposes further revisions throughout Section 25 of the Services Tariff to account for Aggregations. The revisions include adding Actual Demand Reduction to the terms used in Section 25 and to the definitions of terms used in Section 25.3.3 of the Services Tariff. The NYISO also proposes to remove DAMAP for Demand Side Resources providing Operating Reserves or Regulation Service from Sections 25.2.1 and 25.3.2 of the Services Tariff, which becomes unnecessary with termination of the DSASP as proposed in this filing.<sup>189</sup> Lastly, Aggregations comprised entirely of Limited Energy Storage Resources will be eligible for DAMAP in the same way that Limited Energy Storage Resources are eligible today.

## **IX. Requirements for Aggregations’ Participation in NYISO-Administered Installed Capacity Markets**

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<sup>188</sup> Energy Storage Resources, and Aggregations that contain Energy Storage Resources, have to withdraw Energy from the grid in some intervals for the purposes of recharging or refilling, so that they can inject Energy back onto the grid at a later time. As a result, Energy Storage Resources are affected by intertemporal Energy Level constraints. The decision to withdraw or inject in one interval or hour impacts both the physical ability to withdraw or inject and the opportunity costs of withdrawing or injecting in future intervals or hours. These intertemporal constraints make it impractical to apply the DAMAP settlement construct to Energy Storage Resources. The NYISO expects Suppliers bidding Energy Storage Resources to account for their intertemporal Energy Level constraints and reflect relevant opportunity costs in real-time Bids.

<sup>189</sup> Services Tariff Section 25.3.2, as referred to in this paragraph, is shown in redline as deleted in the attached tariff revisions.

Section 5 of the Services Tariff contains the eligibility, qualification, and participation rules and requirements that govern the participation and performance of supply in the NYISO Installed Capacity market.<sup>190</sup> Attachment H, or Section 23, of the Services Tariff sets forth the rules that dictate the NYISO's Installed Capacity market mitigation measures that are also applicable to supply resources. The NYISO proposes revisions to these provisions in several areas to allow Distributed Energy Resources to participate in the NYISO-administered Installed Capacity market; to allow supply with different energy duration limitations to participate in the Installed Capacity market and be compensated for the reliability value they provide; and to expand opportunities for Distributed Energy Resources and other eligible supply technologies (new and existing) to combine within an Aggregation to participate in the Installed Capacity market.

The proposed revisions modify the rules for existing Installed Capacity Suppliers and add a new ruleset that applies to Distributed Energy Resources and Aggregations that seek to become an Installed Capacity Supplier. The revisions should provide new and more expansive opportunities for Distributed Energy Resources, including but not limited to renewable resources, batteries, and other energy storage technologies, as well as existing Generators, to participate in the Installed Capacity market. The nature of these changes creates additional flexibility for facilities with size limitations and/or daily duration limitations on energy production to participate in the Installed Capacity market by participating in an Aggregation. This flexibility allows facilities, which may not individually qualify to participate in the Installed Capacity market, to combine to meet the size and duration requirements of an Installed Capacity Supplier.

The proposed changes to the Installed Capacity market eligibility, qualification, participation, and payment rules were developed by the NYISO after substantial study work was conducted by it and its consultant, General Electric Energy Consulting ("GE Energy"). The study work was the predicate for extensive review, discussion, and input from stakeholders on the analysis as well as the market design concepts and framework that were integral in the development of this final proposal. The objective of this effort was to ensure that the Installed Capacity provided by new Distributed Energy Resources and Aggregations is treated comparably to megawatts of Installed Capacity procured today from Installed Capacity Suppliers and that the Installed Capacity market continues to support the necessary investment required to meet the resource adequacy criterion for the NYCA. In addition, this filing updates the eligibility, qualification, and participation requirements for the Installed Capacity market that were recently filed in compliance with Order No. 841.<sup>191</sup>

A foundational component of the proposed revisions is their treatment of the eligibility and participation requirements for an Installed Capacity Supplier with limited daily energy production capability. The Services Tariff currently requires most Resources seeking to qualify

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<sup>190</sup> Several additional provisions are being proposed with this filing to Attachments S, X, and Z of the OATT, as discussed below, that govern whether and how Resources seeking to participate in the Installed Capacity market obtain Capacity Resource Interconnection Service ("CRIS").

<sup>191</sup> See Order No. 841 Compliance Filing.

as Installed Capacity Suppliers to be able to operate without any duration constraint, with two exceptions for Energy Limited Resources and Special Case Resources. Both Energy Limited Resources and Special Case Resources are only eligible to participate in the Installed Capacity market under the current tariff requirements if they can operate for a minimum of four (4) consecutive hours each day. Further, all Installed Capacity Suppliers currently receive the same capacity value notwithstanding the 4-hour minimum duration limitation for Energy Limited Resources and Special Case Resources.

In support of this effort to expand the eligibility, qualification, and participation requirements for Installed Capacity Suppliers, a significant amount of study work was conducted to evaluate whether the 4-hour requirement would continue to be sufficient to ensure resource adequacy will be met as a significant amount of incremental duration limited megawatts enter the market. The analytical work conducted by GE Energy indicated that the 4-hour requirement needs to be lengthened due to fundamental changes in the supply mix as well as the system peak demand in order to ensure resource adequacy going forward. The GE Energy analysis was largely consistent with modeling analysis conducted by the MMU and Astrapé Consulting, and confirmed by the NYISO's operational experience. As a result of this work and for the reasons detailed below, the NYISO is proposing to revise its current paradigm that values resources with a daily duration limitation of 4 consecutive hours or greater the same as a Resource with no duration limitation. As discussed below, this change is necessary to expand the eligibility and qualification requirements that apply to Installed Capacity Suppliers to allow new facility types and technologies to participate in the Installed Capacity market.

GE Energy demonstrated that the overwhelming majority of resource adequacy concerns fall within a daily consecutive 8-hour period. As such, the NYISO's proposal recognizes an 8-hour Peak Load Window,<sup>192</sup> which varies seasonally between summer and winter Capability Periods, and defines the participation, availability, and performance requirements for new supply facilities that have daily energy limitations. The NYISO, however, also recognizes that moving to a minimum 8-hour duration requirement would be a significant departure from the existing 4-hour requirement for Energy Limited Resources and Special Case Resources and may pose a hurdle for many of the new supply technologies that are anticipated to enter the market over the

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<sup>192</sup> "Peak Load Window" is a newly defined term proposed in section 2.16 of the Services Tariff as the "[t]ime period during which a Resource with Energy Duration Limitations must offer Energy in the Day-Ahead Market as specified in Section 5.12.14 of the ISO's Services Tariff." As provided in the modifications to Sections 5.12.7, 5.12.12.2 and 5.12.14, Installed Capacity Suppliers with Energy Duration Limitations are required to "(i) schedule a Bilateral Transaction; (ii) Bid Energy in the Day-Ahead Market in accordance with the applicable provisions of Section 5.12.1 of this Tariff; or (iii) notify the ISO of any outages" to account for all of their Installed Capacity sold on a daily basis during the Peak Load Window and for the number of consecutive hours that correspond to their Energy Duration Limitation (except for Energy Storage Resource or an Aggregation comprised entirely of Energy Storage Resources, which must always do so for the entirety of the Peak Load Window regardless of the Energy Duration Limitation). This proposal varies the Peak Load Window by season and also includes a transitional 6 hour Peak Load window that applies to Installed Capacity Suppliers with Energy Duration Limitations up to the 6 hour limitation, provided in Table 1 found in Section 5.12.14 is applicable to determine the Duration Adjustment Factors. An 8-hour period described in Section 5.12.14 is proposed to apply to Installed Capacity Suppliers with an 8-hour Energy Duration Limitation, and after the threshold for Table 2 is reached, this 8-hour Peak Load Window will apply to all Installed Capacity Suppliers with an Energy Duration Limitation.



next several years. Therefore, notwithstanding the identification of an 8 hour peak demand period each day, the NYISO's proposal seeks to significantly lower the eligibility requirement to correspond to a Resource's ability to provide energy for a prescribed consecutive hourly duration in order to qualify as an Installed Capacity Supplier.

This added flexibility proposed in the market rules will apply to all types of technologies that fall within the definition of Resources, as modified by this proposal, but should be particularly helpful to the new, innovative supply technologies as well as Demand Side Resources that may have shorter duration periods than the current 4-hour requirement that applies to Energy Limited Resources and Special Case Resources. The new tariff language the NYISO is proposing will allow Aggregations to time-stack facilities with a daily run-time limitation of one hour or more to meet the minimum duration requirements to participate as an Installed Capacity Supplier.<sup>193</sup> While the NYISO's proposal creates greater access and flexibility for duration limited Resources to participate in its Installed Capacity market, the NYISO is also proposing modifications with regard to compensation to allow only Resources (including Aggregations) with a runtime of at least 6 consecutive hours to receive full value for that capacity for incremental penetration levels below 1,000 MW. Once penetration levels equal or exceed 1,000 MW, only Installed Capacity Suppliers with a runtime of at least 8 consecutive hours will receive full compensation.

Along with this added flexibility to the eligibility and qualification requirements for Resources seeking to participate as Installed Capacity Suppliers, the proposal also includes new participation and performance requirements for duration limited Resources and modifies the Installed Capacity Supplier payment structure in order to align participation, performance, and payment with the contribution that each Installed Capacity Supplier is expected to provide to the resource adequacy of the system. These changes are necessary to ensure that all the megawatts provided by Installed Capacity Suppliers are subject to comparable treatment under the tariff. As such, the NYISO's proposal identifies a significant number of conforming changes to the Services Tariff to ensure the proposed participation requirements of an Installed Capacity Supplier with a 2, 4, 6, or 8-hour duration limit are comparable to an Installed Capacity Supplier without a duration limit. For example, the 8-hour Peak Load Window plays an important role in measuring the availability and/or performance of these duration limited Resources such that Unforced Capacity calculations are conducted on a comparable basis.

## **A. Capacity Value Study**

### *1. Overview*

One of the NYISO's key objectives in this filing is to better align the contribution to reliability of the megawatts of Installed Capacity provided by an Installed Capacity Supplier with the payments made for those same megawatts through the Installed Capacity market. The DER

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<sup>193</sup> The NYISO's proposal excludes Intermittent Power Resources and Limited Control Run of River Hydro facilities from Resources with Energy Duration Limitations. These two categories of Resources will continue to participate as performance-based Installed Capacity Suppliers without an Energy Duration Limitation.

Roadmap prepared by the NYISO recognized that distributed energy resources may have daily energy duration limitations that lessen the reliability value of megawatts of Installed Capacity from such facilities as compared to conventional Resources that participate in the Installed Capacity market without any daily energy duration limitations. In order to pursue this primary objective, the NYISO initiated a study with GE Energy to evaluate the reliability value of megawatts of Installed Capacity with daily energy duration limitations in comparison to Installed Capacity with no energy duration limitation. The starting point for this GE Capacity Value Study,<sup>194</sup> which was conducted in 2018, was the GE MARS database developed for the New York State Reliability Council Study that is the basis for the New York State Reliability Council (“NYSRC”) to establish the annual Installed Reserve Margin.<sup>195</sup> To perform this study, a post processing program was developed by GE Energy to utilize the outputs of the GE MARS model and then, through additions and subtraction of resources, develop capacity values of duration limited Resources.

The 2018 Capacity Value Study builds upon the analysis performed in 2012 for the SCR program and expanded the scope to include more broadly Distributed Energy Resources and other Resources that have daily energy duration limitations. The 2018 study was designed to assess the impacts of a much larger set of resource parameters that included energy duration limitations, penetration of megawatts, persistence of use throughout the year, diversity of resources, seasonal performance variation and limitations, and how these parameters would impact the resource adequacy criterion used by the NYSRC in establishing the Installed Reserve Margin (“IRM”) as well as additional reliability metrics – Hourly Loss of Load Expectation (LOLE hours/year) and Loss of Energy Expectation (“LOEE”) – that are available from the IRM Study. This analysis then aided in the development of Capacity Values for Resources with daily Energy duration limits.<sup>196</sup>

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<sup>194</sup> The NYISO’s Installed Capacity market is designed to ensure that there are sufficient megawatts of Installed Capacity available to supply the system’s peak energy needs while providing adequate operating reserves. The product bought and sold in this market is called Unforced Capacity (“UCAP”). UCAP represents the amount of Installed Capacity that is expected to be available at a particular time, but each Installed Capacity Supplier is obligated to make available to the NYISO the Installed Capacity equivalent of the UCAP sold. Under the New York State Reliability Council Agreement, the New York State Reliability Council, L.L.C. (“NYSRC”) has the authority to establish the statewide IRM. Each year, NYSRC conducts a study in order to establish the Installed Reserve Margin (“IRM”) for the NYCA for the upcoming Capability Year, which spans the period beginning May 1 of a given year and ending April 30 of the following year. Under the agreement, the NYISO must use the statewide IRM set by the NYSRC and, pursuant its tariffs, determine the minimum NYCA requirement and calculate the minimum Locational Minimum Installed Capacity Requirements (“LCRs”) for each Locality within the NYCA.

<sup>195</sup> See *NYSRC Technical Study Report*, New York Control Area Installed Capacity Requirements for the Period May 2018 Through April 2019 (“NYSRC 2018 IRM Study”). In addition, GE Energy Consulting and the NYISO conducted a study for the Installed Capacity Subcommittee in 2011-12 that addressed the contribution to resource adequacy provided by Special Case Resources with a range of duration limitations over a range of penetration levels. See *Special Case Resources: Evaluation of the Performance and Contribution to Resource Adequacy*, A Report by the New York Independent System Operator to the Installed Capacity Subcommittee of the New York State Reliability Council, May 2012 ; *available at*: (<http://www.nysrc.org/pdf/Reports/IRM%20White%20Papers/2012%20SCR%20Study%20Report%20for%20ICS%20-final-05-01-12.pdf>).

<sup>196</sup> The 2018 Capacity Value Study did not consider transmission constraints. The impact of transmission constraints for resources with duration limitations is consistent with the impact for the existing resources that are

The approach taken in the 2018 Capacity Value Study was to start from a reliable system at or better than the 0.1 LOLE Criterion as a reference point. The first step was then to add a certain amount megawatts from the resource under evaluation (a duration limited Resource), recognizing the scheduling constraints of the resource. This caused reliability of the NYCA system to improve. The second step in the process was to decrease the megawatts available to the system in all hours by a constant amount in an iterative fashion until the system returned to the starting reference point value. This step represented the removal of capacity without a daily energy duration limitation. The relative capacity value of the resource was therefore determined as the ratio of the megawatts added in the first step divided by the megawatts removed in the second step to return the system to the reference point LOLE value.

GE Energy's analysis was conducted using two base cases: the 2018 IRM Base Case with Optimized Locational Minimum Installed Capacity Requirements ("LCRs") and the 2018 IRM Base Case with 2000 MW of incremental wind generation and 2000 MW of incremental solar generation added to the supply. This latter case was found to have an IRM of 26.3 % in order to maintain the system at or below the Resource Adequacy Criterion of 0.1 LOLE, which is the starting point for both cases. Additionally, a sensitivity was run on the second base case – 2018 IRM with 2000 MW of incremental wind generation and 2000 MW of incremental solar generation – to reflect the Demand Curve Level of Excess and evaluate what, if any, effect on the capacity value of duration limited Resources was caused by modeling the system at a different level of reliability.

## *2. Impacts of Duration and Penetration*

The impacts of a Resource's daily energy duration limitation and the penetration levels of such resources was evaluated first, consistent with the evaluation performed in the 2012 SCR Study. For each of the two base cases described above, Resources with energy duration limits of 1, 2, 4, 6, 8, 10, 12, and 16 hours were evaluated. Resources with no daily energy limit were also evaluated as a control. Different penetration levels of 100 MW, 250 MW, 500 MW, 1,000 MW, 2,000 MW, and 4,000 MW were studied. No diversity was assumed with all capacity being available at one time with no forced outage rates and no persistence limits modeled (*i.e.*, all MW were available 365 days/year). As summarized in Figures 2 through 4,<sup>197</sup> the analysis demonstrated that as additional penetration of duration limited Resources was added to the system, the capacity value of those Resources decreased. Additionally, Resources with longer energy duration limits had a higher capacity value than Resources with shorter energy duration limits.

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included in the GE MARS IRM Study. Further, LCRs and ICAP Market Clearing Prices would account for the impact of transmission constraints on the reliability value associated with the location of the resources modeled.

<sup>197</sup> See *Valuing Capacity for Resources with Energy Limitations*, GE Energy Consulting, Market Issues Working Group Presentation (Jan. 8, 2019) ("January MIWG Presentation") at 24, 27-28, available at: [https://www.nyiso.com/documents/20142/4358080/01082019%20Capacity%20Value%20of%20Resources%20with%20Energy%20Limitations\\_v2.pdf](https://www.nyiso.com/documents/20142/4358080/01082019%20Capacity%20Value%20of%20Resources%20with%20Energy%20Limitations_v2.pdf).

### Duration of Use – Base Case vs 2,000 MW Wind 2,000 MW Solar At Criteria Fractional Capacity Value (%)

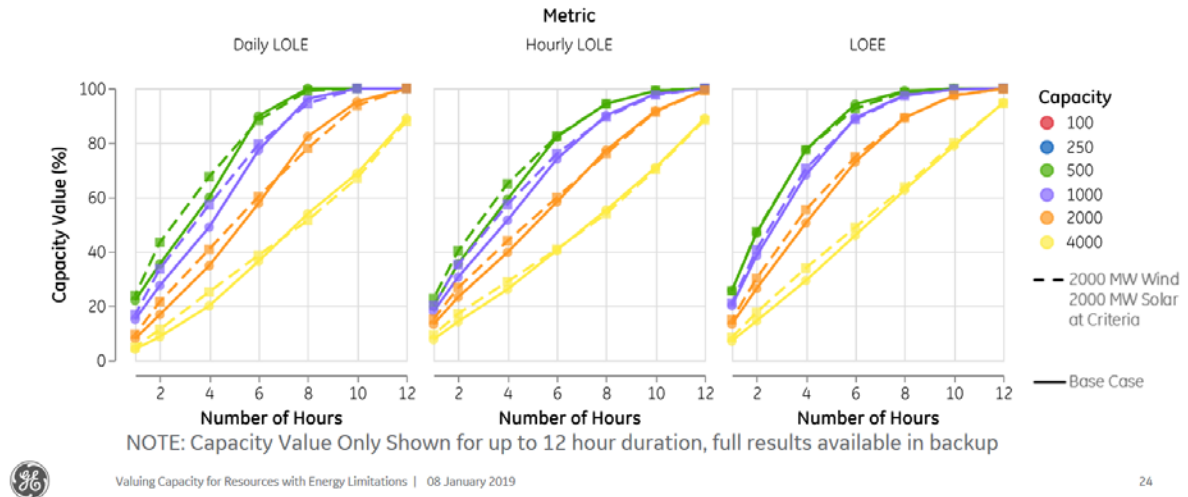


Figure 2: GE Energy – Fractional Capacity Value; Duration of Use – Base Case vs 2,000 MW Wind and 2,000 MW Solar at Criteria

### Penetration – Base Case vs 2,000 MW Wind 2,000 MW Solar at Criteria Fractional Capacity Value (%)

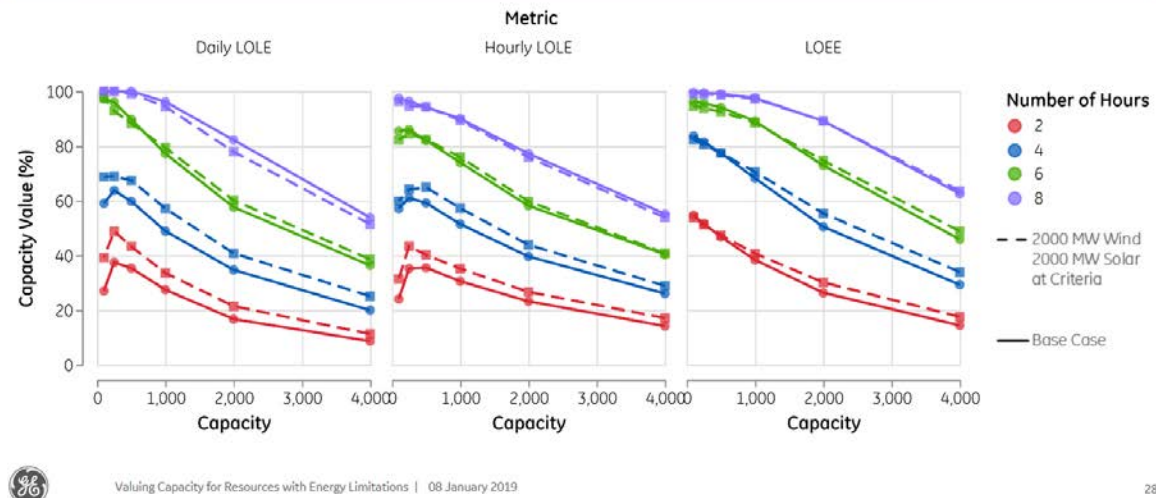


Figure 3: GE Energy – Fractional Capacity Value; Penetration – Base Case vs 2,000 MW Wind and 2,000 MW Solar at Criteria

## Penetration Fractional Capacity Value (%)

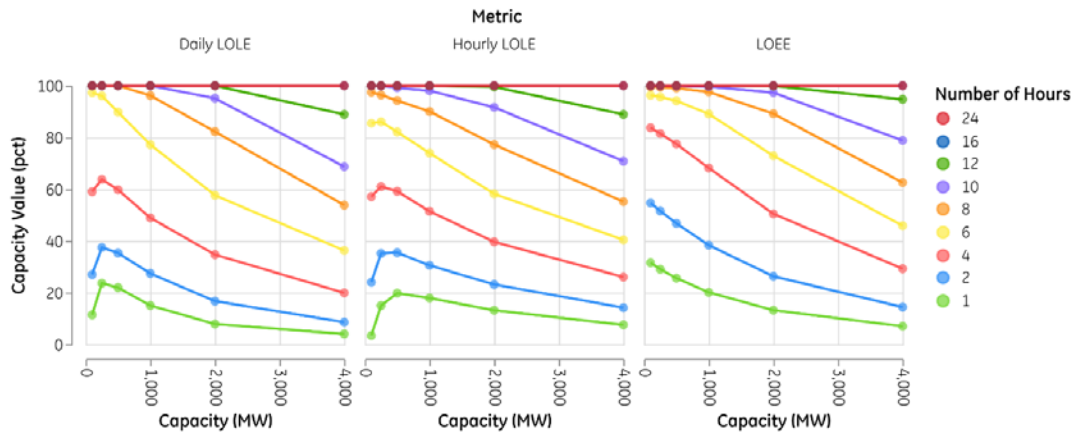


Figure 4: GE Energy – Fractional Capacity Value; Penetration

### 3. Impacts of Persistence Limits

A number of sensitivities were run, using multiple sets of energy duration limits and penetration levels, to understand the impacts on the capacity value of a Resource’s ability to be used multiple times in a year. This was done to understand if there was a need to value Resources that could be called many times in a year differently than Resources that could not be called often. As shown in Figure 5 below,<sup>198</sup> the results of this analysis showed that most of the value of these Resource’s would be captured within the first ten calls in a year.

<sup>198</sup> January MIWG Presentation at 31.

## Persistence

### Absolute Capacity Value (MW) of a 1,000 MW Resource

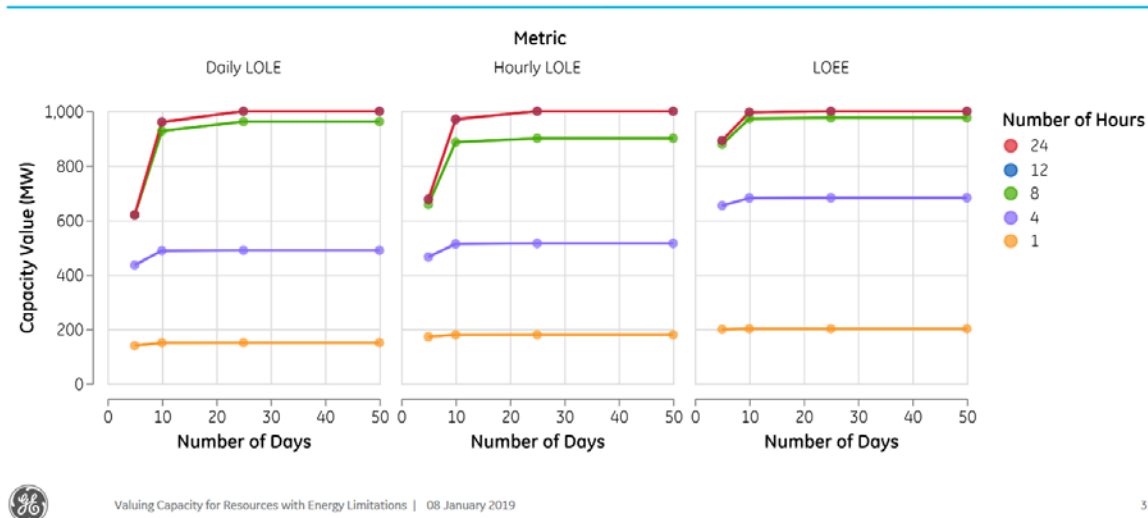


Figure 5: GE Energy Data – Absolute Capacity Value (MW) of a 1,000 MW Resource; Persistence

#### 4. Impacts of Diversity of Resources

Additional sensitivities were run to understand if scheduling the penetration levels using different algorithms caused impacts on the capacity value of the Resources with daily energy duration limitations. These algorithms were to either schedule the entire penetration at once as if the penetration was one large Resource, or to instead schedule the penetration in individual blocks independent of the other block schedules. As observed in Figure 6, the results of these sensitivities indicated that duration limited Resources that could be scheduled independently of other duration limited Resources have a higher capacity value than Resources that must all be called at the same time.<sup>199</sup>

<sup>199</sup> See *Valuing Capacity for Resources with Energy Limitations*, GE Energy Consulting, Market Issues Working Group Presentation (Oct. 9, 2018) at 36, available at: <https://www.nyiso.com/documents/20142/3698135/09242018%20Capacity%20Value%20of%20Resources%20with%20Energy%20Limitations.pdf>.

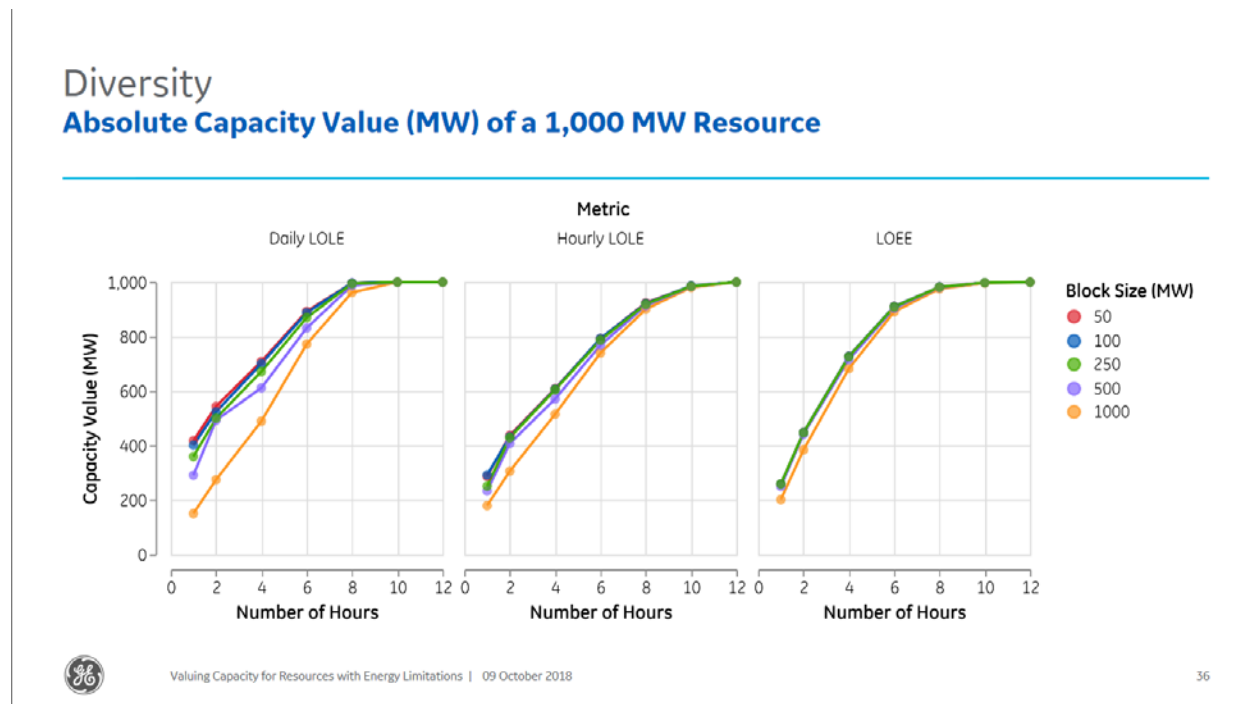


Figure 6: GE Energy Data – Absolute Value (MW) of a 1,000 MW Resource; Diversity

### 5. Other Studies and Analysis

In addition to the GE Study performed on behalf of the NYISO, additional studies were performed by Potomac Economics as the NYISO’s Independent Market Monitor, and Astrapé Consulting on behalf of New York Battery & Energy Storage Technology Consortium (NY-BEST). These studies took alternative approaches to understanding the capacity value of duration limited Resources. In addition to these alternative studies, the NYISO provided additional information on its experience operating the bulk electric system during peak loads and its operational view on the value of duration limited Resources.

Potomac Economics’ analysis focused on evaluating the resources as incremental marginal resources and evaluated the change in Loss of Load Probability to establish capacity values for duration limited Resources. This was done using a post processing tool developed by Potomac Economics using intermediate information from GE MARS runs prior to the usage of emergency operating procedures. The Potomac Economics tool provided its own emergency operating procedures to develop a Loss of Load Probability. The steps were modified to include duration limited Resources being used in these emergency operating procedures to produce energy as reserves are converted to energy, assuming that these resources would otherwise be reserve providers. Potomac Economics found similar results to GE Energy in that capacity values decrease as penetration increases, and different scheduling algorithms can have an impact on the capacity value of duration limited Resources. Figures 7 through 9, below, present Potomac Economics’ results.<sup>200</sup>

<sup>200</sup> See *Alternate ELR Capacity Value Study: Methodology and Updated Results*, Potomac Economics, Installed Capacity Working Group Presentation (Feb. 25, 2019), at 10, 37, 39, available at:



## Comparison of MMU & NYISO Study Approaches

- The table below provides a high-level summary of differences among the MMU’s and NYISO’s estimates of fractional capacity value and the NYISO’s proposal.
  - ✓ See slides 32-35 for additional detail on the MMU’s estimates.
  - ✓ NYISO values based on slide 117 of GE’s October 9 presentation.
- ELRs’ value under the MMU approach is:
  - ✓ Higher at low penetration levels; but
  - ✓ It drops more rapidly as penetration increases because the marginal value falls more quickly than the average value of ELRs.

	<u>500 MW Penetration</u>		<u>2 GW Penetration</u>		<u>NYISO</u>
	<u>MMU</u>	<u>NYISO</u>	<u>MMU</u>	<u>NYISO</u>	<u>Proposal</u>
4-Hr ELRs	95-96%	77%	76-78%	68%	75%
2-Hr ELRs	66-68%	61%	38-41%	52%	37.5%

Figure 7: Potomac Economics – Comparison of MMU & NYISO Study Approaches






## Conclusions: MMU Simulation Results

- Location may not affect fractional capacity value significantly.
  - ✓ However, it is important to control for the location of the ELR.
- Deployment in EOP 6 (when 30-minute reserves are depleted) is unrealistic and should not be considered further.
- For an addition of 4-hour ELRs, fractional capacity value ranges:
  - ✓ From 95 to 96 percent for penetration levels up to 500 MW
  - ✓ From 76 to 78 percent for 2 GW of penetration
- For an addition of 2-hour ELRs, fractional capacity value ranges:
  - ✓ From 64 to 68 percent for penetration levels up to 500 MW
  - ✓ From 38 to 41 percent for 2 GW of penetration
- At high penetration levels, capacity value falls because:
  - ✓ ELRs must be added as peak shaving (rather than EOP 10); and
  - ✓ Load shedding is less concentrated in the highest load hours.

Figure 8: Potomac Economics – Conclusions: MMU Simulation Results



Updated/New

## Conclusions:

### Concerns Related to Scheduling of ELRs as 10-Minute Reserve

- To evaluate its concern, the NYISO requested that we run simulations to estimate the value of ELRs if they are operated as peak shaving only. We found that:
  - ✓ When 4-hour ELRs are peak shaving only, capacity value drops:
    - To 84-94 percent at 500 MW of penetration
    - To 63-65 percent at 2 GW of penetration
  - ✓ When 2-hour ELRs are peak shaving only, capacity value drops:
    - To 55-56 percent at 500 MW of penetration
    - To 35-38 percent at 2 GW of penetration

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ECONOMICS

Figure 9: Potomac Economics – Conclusions: Concerns Related to Scheduling of ELRs as 10-Minute Reserve

Astrapé Consulting’s analysis on behalf of NY-BEST evaluated the capacity value of duration limited Resources under different load level conditions and penetration of renewable resources, as is expected under future conditions. Astrapé Consulting utilized their SERVM modeling tool to perform this analysis, which has the ability to model duration limited Resources intrinsically in its model. Astrapé Consulting diverted from the New York State Reliability Council process in modeling load, and instead produced its own load curves, as shown in Figure 10 below. Astrapé Consulting also assumed an increased penetration of renewable resources for higher penetration of duration limited Resources, as shown in Figure 11. Overall, Astrapé Consulting showed that the capacity value of duration limited Resources is sensitive to both the modeled load curves as well as the penetration of renewable resources.<sup>201</sup>

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<sup>201</sup> See *Valuing Capacity for Resources with Energy Limitations – Independent Assessment*, Astrapé Consulting, Installed Capacity Working Group Presentation (Feb. 15, 2019) (“February ICAPWG Presentation”) at 6, 26, available at: <https://www.nyiso.com/documents/20142/5020603/Astrape%20presentation%20021519.pdf>.

## Effect of Load Scaling for Uncertainty

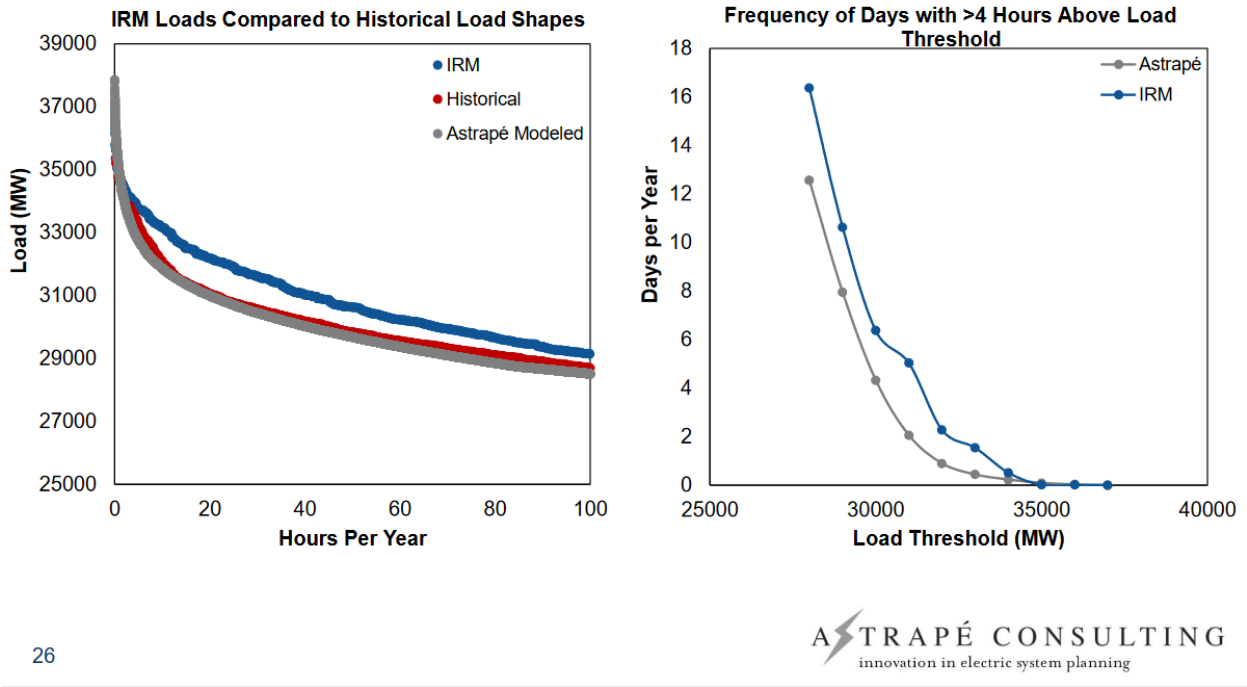
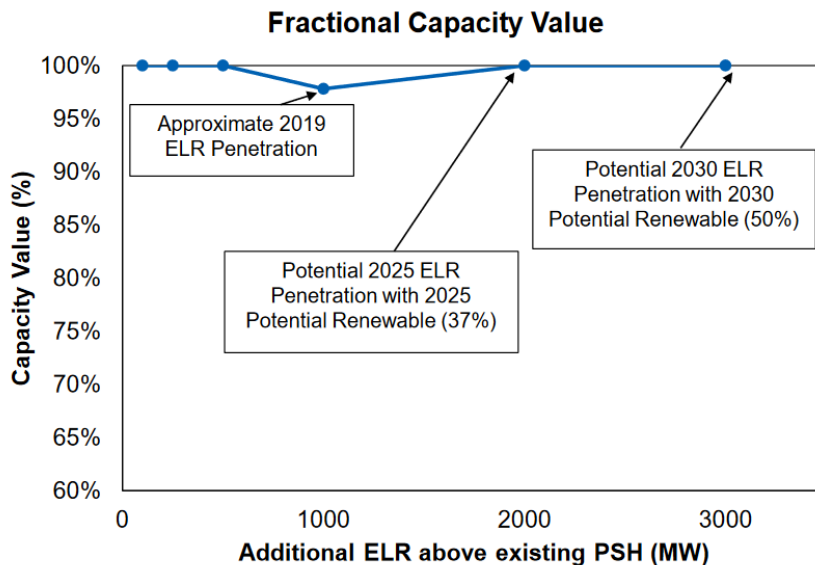


Figure 10: Astrapé Consulting – Effect of Load Scaling for Uncertainty

## 4 Hour Duration Results



\*All energy limited resource portfolios include 1408 MW of 8-hour PSH.

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**ASTRAPÉ CONSULTING**  
innovation in electric system planning

Figure 11: Astrapé Consulting – 4 Hour Duration Results

In addition to the studies performed by Potomac Economics and Astrapé Consulting, the NYISO provided its operational experience, lending unique insight on the value of duration limited Resources in meeting peak load needs. Figure 12 presents a summary of conclusions of the critical components of the market design drawn from the NYISO’s operational experience.<sup>202</sup>

<sup>202</sup> See *Expanding Capacity Eligibility: NYISO Operations’ Experience*, ICAP Working Group Presentation (Mar. 18, 2019) at 14, available at: [https://www.nyiso.com/documents/20142/5517061/DER%20Capacity%20-%20Ops%20Presentation\\_Final\\_031819.pdf](https://www.nyiso.com/documents/20142/5517061/DER%20Capacity%20-%20Ops%20Presentation_Final_031819.pdf).

## Conclusion

- **NYISO Operations has provided input and review on the critical components of the DER market design proposal**
  - Peak Load Window – aligns well with NYISO Operations experience
  - Capacity Value Study – both the GE approach and the MMU approach are consistent with how NYISO Operations expects to deploy these resources
  - Resource Obligations – the combined testing, measurement, and verification rules along with the bidding obligations will help ensure these resources provide reliability value
  - Tiered Approach – recognizes that as the number of short duration resources increases substantially (1000 MW is a reasonable threshold), the value they bring to meet reliability changes
  - Periodic Review – necessary to keep the capacity values aligned with the reliability value as the system changes
- **Based on its review, NYISO Operations supports the comprehensive package of market design changes which position the NYISO to be able to maintain reliability**



Figure 12: NYISO – Conclusions Regarding Duration Limited Resource Market Design

### *6. Addressing Changing System Conditions and Modeling Approaches Going Forward*

The NYISO's proposal to revise the eligibility, qualification, participation requirements, and the payment structure for Installed Capacity Suppliers was largely informed by the GE Energy work presented as the 2018 Capacity Value Study. This work helped define the reliability value, from a resource adequacy perspective, of energy duration limited megawatts and how this reliability value is expected to decrease with the increased penetration of duration limited Resource megawatts on the system. The full suite of Installed Capacity market changes described below in sections B through E allow full access to the market for Distributed Energy Resources and other Resource types that may have energy duration limitations. The revisions also provide comparable treatment and payment of these Resources with Energy Duration Limitations with Installed Capacity Suppliers that have no energy duration limits. It is important to note that the NYISO expects that the capacity value of these duration limited Resources will change through time as the bulk electric system changes. Therefore, the NYISO proposes to add Section 5.12.14.3 to the Services Tariff, which is discussed further below. This provision requires the NYISO to commence a new study that will reevaluate the reliability value of the duration limited megawatts participating in the Installed Capacity market every four years beginning in 2022.

#### **B. Installed Capacity Supplier Payment Structure**

The principal objective of the NYISO's proposal to expand its eligibility, qualification, and participation rules is for all Resources seeking to participate in the markets as Installed

Capacity Suppliers to be treated comparably and to ensure that each Installed Capacity Supplier is compensated for the megawatts of Installed Capacity that it provides commensurate with its expected contribution to meeting the resource adequacy – LOLE – requirements of the NYCA. The proposed payment structure was largely informed by the 2018 Capacity Value Study, which used as its starting point the study model and database used by the New York State Reliability Council for the determination of the Installed Reserve Margin. The proposed tariff revisions with regard to the payment structure were also informed by additional work conducted by the NYISO’s MMU, Potomac Economics, and Astrapé Consulting, along with the NYISO’s operational experience and insight on the value of duration limited Resources. After significant review and discussion of this study work with stakeholders, the NYISO identified a multi-tiered approach to compensating Installed Capacity Suppliers that is based upon the resource adequacy and operational needs of the system.

*1. Aligning Payment Structure with Energy Duration Limitations through Duration Adjustment Factors*

The NYISO proposes to add a new Section 5.12.14 to the Services Tariff that will align the payments for Installed Capacity Suppliers with the appropriate value that each Resource provides to maintain the resource adequacy of the system. The tariff revisions to effectuate this alignment largely rely on three new defined terms: “Energy Duration Limitations,” “Duration Adjustment Factors,” and “Adjusted Installed Capacity.”

Adjusted Installed Capacity is defined as “[t]he amount of Installed Capacity a Resource may offer taking into account the Resource’s applicable Duration Adjustment Factor.”<sup>203</sup> As described in the newly proposed Section 5.12.14.2 of the Services Tariff, the term Adjusted Installed Capacity will now be required in the formula that is used by the NYISO to calculate the Unforced Capacity of all Installed Capacity Suppliers on a comparable basis. Adjusted Installed Capacity is simply a product of the Resource’s Installed Capacity (*e.g.*, the CRIS Adjusted Dependable Maximum Net Capability (“DMNC”) for most Installed Capacity Suppliers) and the Duration Adjustment Factor that corresponds with the Energy Duration Limitation of the Resource. The application of Adjusted Installed Capacity as proposed will ensure that a megawatt of Unforced Capacity from any Installed Capacity Supplier will be valued the same as a megawatt of Unforced Capacity provided from any other Installed Capacity Supplier.

The remaining two newly defined terms are derived directly from the study work conducted as part of this market design effort and are proposed to ensure that there is comparable treatment amongst all Installed Capacity Suppliers that aligns the payment that is received for a megawatt of Installed Capacity with the expected contribution that Installed Capacity provides to the resource adequacy of the NYCA.

The proposed definition of Energy Duration Limitation is “for a Resource that is not capable of providing Energy for twenty-four hours each day, the number of consecutive hours per day that a Resource elects and is obligated, pursuant to Services Tariff Sections 5.12.1 and

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<sup>203</sup> Proposed revision to Services Tariff Section 2.1.

5.12.7, to (i) schedule a Bilateral Transaction; (ii) Bid Energy in the Day-Ahead Market; or (iii) notify the ISO of any outages in the Day-Ahead Market as an Installed Capacity Supplier for the ICAP Equivalent of UCAP sold, as identified in Section 5.12.14 of the ISO Services Tariff.”<sup>204</sup> The proposed definition for the term “Duration Adjustment Factor” is “[t]he value of Installed Capacity, expressed as a percentage, for a Resource as specified in Section 5.12.14 of the ISO Services Tariff.”<sup>205</sup>

The proposed new Section 5.12.14 aligns these two defined terms such that each Energy Duration Limitation has a corresponding Duration Adjustment Factor that was derived from the study work and stakeholder discussions. The linkages between Energy Duration Limitation and Duration Adjustment Factors are provided in Tables 1 and 2 in Section 5.12.14. This new tariff language creates a comparable payment structure that aligns the payment for five different tiers of Installed Capacity Suppliers as defined by their Energy Duration Limitation, or lack thereof, and the corresponding Duration Adjustment Factor. These include Resources without a daily energy duration limitation, whose payments will remain unchanged, and Resources that fall into the four duration limitation time periods – 2, 4, 6, and 8 hours. The Duration Adjustment Factors have been informed by the 2018 Capacity Value Study discussed above and extensive stakeholder discussion to align with the capacity values observed for the different penetration levels of Resources with Energy Duration Limitations. Thus, the proposed revisions create potentially two new payment structures that impact the proposed four new tiers of Resources with daily Energy Duration Limitations. Again, there is no change to the payment structure for Resources that provide Installed Capacity with no daily Energy Duration Limitations.

The new payment structure that is expected to initially apply<sup>206</sup> to Resources with Energy Duration Limitations is found in Table 1, which will apply so long as the incremental penetration of Resources with a 6 hour, 4 hour or 2 hour Energy Duration Limitation has not reached 1,000 MW. The proposed new Section 5.12.14.1 describes the formula for determining the incremental penetration of these Resources and is described in detail below. The payment structure contained in Table 2 will permanently replace that found in Table 1 once the 1,000 MW threshold of incremental penetration is reached. Thus the proposed payment structures for Installed Capacity Suppliers for Resources with an Energy Duration Limitation are as follows:

- Resources with an 8 hour or greater daily Energy Duration Limitation (an “8 hour Energy Duration Limitation”) have a Duration Adjustment Factor of 100% for incremental penetrations level below and above 1,000 MW. These 8 hour Energy Duration Limitation Installed Capacity MW are valued equivalently to Installed Capacity MW provided by Resources that have no Energy Duration Limitations (a 24 hour Resource).

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<sup>204</sup> Proposed revision to Services Tariff Section 2.5.

<sup>205</sup> Proposed revision to Services Tariff Section 2.4.

<sup>206</sup> The NYISO’s proposal includes a periodic review of the payment structure every four years in order to capture changes to (i) the system needs, (ii) the reliability value provided by Resources with Energy Duration Limitations, and (iii) system reliability modeling tools and techniques. This is discussed in more detail below.

- Resources with a daily energy duration limitation less than 8 hours but greater than or equal to 6 hours (a “6 hour Energy Duration Limitation”) will have a Duration Adjustment Factor of 100% pursuant to Table 1 for incremental penetrations level below 1,000 MW, but the contribution to resource adequacy decreases with increasing penetration levels and they will be assigned a Duration Adjustment Factor and be valued in the market at 90% (see Table 2) of the value of a 24 hour Resource or a Resource with an 8 hour Energy Duration Limitation once the 1,000 MW threshold for incremental penetration is reached.
- Resources with a daily energy duration limitation less than 6 hours but greater than or equal to 4 hours (a “4 hour Energy Duration Limitation”) will have a Duration Adjustment Factor of 90% pursuant to Table 1 for incremental penetrations level below 1,000 MW. They will receive 90% of the value received by a 24 hour Resource and Resources with either an 8 or a 6 hour Energy Duration Limitation under Table 1. Again, the contribution to resource adequacy is seen to materially decrease for Resources with a 4 hour Energy Duration Limitation as penetration levels increase, thus once the 1,000 MW threshold is achieved these Resources will have a Duration Adjustment Factor and be valued in the market at 75% (see Table 2) of the value of a 24 hour Resource or a Resource with an 8 hour Energy Duration Limitation.
- Finally, Resources with a daily energy duration limitation less than 4 hours but greater than or equal to 2 hours (a “2 hour Energy Duration Limitation”) are valued at half the value of a Resource with a 4 hour Energy Duration Limitation. The rationale for this valuation is based upon concerns about forecast uncertainty and the ability to effectively use these Resources when they would be most valuable, as well as the market signals that would incent the development of 2-hour Resources. The NYISO has discussed with stakeholders its concern that it has limited look-ahead capability when dispatching these Resources in-day, which is inconsistent with the approach used in the GE Energy Capacity Value Study. The study applied perfect foresight when scheduling these Resources at the time the GE MARS model identified a reliability need. Therefore, the proposal discounts a 2-hour Resource at half the value of the 4-hour Resource due to this limited look-ahead capability in the Real-Time Market, the variability in Capacity Value Study results for this short duration, and also in recognition of the Aggregator’s ability to time-stack these 2-hour Resources to achieve 4-hour duration within an Aggregation. Therefore, Resources with a 2-hour daily Energy Duration Limitation will have a Duration Adjustment Factor of 45% pursuant to Table 1 for incremental penetration level below 1,000 MW. They will receive 45% of the value received by a 24-hour Resource and Resources with either an 8 or a 6-hour Energy Duration Limitation under Table 1. Once the 1,000 MW threshold is achieved, these Resources will have a Duration Adjustment Factor and be valued in the market at 37.5% (see Table 2) of the value of a 24-hour Resource or a Resource with an 8-hour Energy Duration Limitation.

In addition, the NYISO’s proposal to revise eligibility and qualification criteria for Resources participating in an Aggregation will allow Resources with a daily energy duration greater than 1-hour to group with other facilities in an Aggregation in order to participate in any



of the four tiers of Resources with Energy Duration Limitations. Time-stacking is discussed in more detail in section IX.E below.

## *2. Calculation of Incremental Penetration of Resources with Energy Duration Limitations*

As discussed above, two different Installed Capacity payment structures are being proposed with these tariff revisions to reflect the findings of the 2018 Capacity Value Study that the relative contribution of Resources with Energy Duration Limitations falls as the penetration of these Resources increases. After detailed review of the study, which looked at penetration levels as high as 4,000 MW, and taking into account the market drivers and public policy goals for Distributed Energy Resources and Energy Storage Resources, as well as the proposed design to re-study the capacity value of duration limited Resources beginning in 2022,<sup>207</sup> the NYISO believes it is necessary to include in this filing two potential payment structures that are defined by a 1,000 MW incremental penetration level threshold. The proposed new Section 5.12.14.1 of the Services Tariff describes the calculation of this value at a high level.

The calculation of incremental penetration of resources is comprised broadly of the four steps described below. The proposed revisions will require the NYISO to commence these four steps on July 1 of each year and complete the process two weeks later by posting the incremental penetration value on the NYISO website by July 15. While ISO Procedures will be developed to capture and describe all the necessary details of this process, the proposed tariff language does describe each step of this calculation with some particularity. The first step in this calculation sums the CRIS MW of Resources that require CRIS to participate in Installed Capacity market (*i.e.*, Generators) that either entered into service and have participated in ISO Markets after January 1, 2019 and incremental CRIS MW awarded to existing Resources after January 1, 2019 where these Resources have elected to participate with a 2, 4, or 6-hour Energy Duration Limitation. Added to this value will be the MW of Demand Side Resources that are participating in the NYISO-administered markets with a 2, 4, or 6-hour Energy Duration Limitation as of July 1 of the current year. The NYISO will also calculate the number of Energy Duration Resources that participated with a 2, 4, or 6-hour Energy Duration Limitation that have Retired as of July 1 of the current year and subtract the amount of CRIS MW associated with these retirements from this calculation of incremental penetrations levels. The NYISO will also subtract 1309.1 MW of SCRs that were participating in the Installed Capacity market during the Summer 2018 Capability Period (this value was used as an assumed level of SCR participation in the 2018 IRM Base Case). Section 5.12.14.1 provides that once the NYISO posts an incremental penetration level of 1,000 MW or more, Table 2 will become the effective Installed Capacity Supplier payment structure unless and until this Section is proposed to be modified pursuant to the periodic review of capacity values, and this payment structure takes place pursuant to the proposed Section 5.12.14.3, which would require a new capacity value study to begin in 2022 and occur every four years hence forth, as described further below.

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<sup>207</sup> The requirement to periodically re-study and potentially modify the tariff requirements based upon the outcome of these new studies is discussed below.

3. *Periodic Review of Capacity Values and Potential Realignment of Payment Structure*

The NYISO and its stakeholders are well aware that New York's electric grid is changing under pressure from dynamic, rapidly changing market forces and technical innovation, as well as the evolving developments in public policy goals and regulatory requirements, and that these changes will lead to changes in system needs and future market designs. The NYISO therefore is proposing in Section 5.12.14.3 to create a periodic review of the Installed Capacity payment structure proposed herein every four years beginning in 2022. The review will be initiated in accordance with proposed Section 5.12.14.3 *et seq.* by the NYISO presenting a proposed schedule for review by its stakeholders no later than September 1 of the second year prior to the Demand Curve Reset filing year (*e.g.*, 2024, 2028, 2032, etc.) detailing each step of this study process, including:

- The NYISO, after stakeholder review and comment, developing and issuing “a request for study, scope, assumptions and methodology to provide consulting services to determine recommended values for the Duration Adjustment Factors;”
- Selection of a consultant to perform the study work;
- Submission to the ISO and its stakeholders of a draft report from the consultant regarding its “determination of recommended values for the Energy Duration Limitations and associated Duration Adjustment Factors and Peak Load Windows;”
- Stakeholder review and comment on the data, assumptions and conclusions in the draft report;
- An opportunity for the Market Monitoring Unit to review and comment on the NYISO's draft request for proposals, the consultant's draft report and the ISO's proposed Energy Duration Limitations, Duration Adjustment Factors, and Peak Load Windows;
- Issuance of a final report by the consultant;
- Issuance of the ISO's draft recommendations whether to propose adjustments to the effective Energy Duration Limitations, Duration Adjustment Factors, and Peak Load Windows; and
- Issuance of the NYISO's final recommendations regarding whether to propose adjustments to the effective Energy Duration Limitations, Duration Adjustment Factors, and Peak Load Windows taking into account the consultant's final report, recommendations provided by the MMU and the views of stakeholders and including and explanation of the rationale for accepting or rejecting any such input.

If the NYISO proposes adjustment to the Energy Duration Limitations, Duration Adjustment Factors, and/or Peak Load Windows as a result of this study, the NYISO will

undertake appropriate discussions regarding market design and tariff changes through its governance process in support of a filing to the Commission pursuant to Section 205 of the Federal Power Act.

**C. Modifications to Resource Eligibility, Qualification, and Participation Requirements for an Installed Capacity Supplier**

This proposal establishes specific eligibility, qualification, and participation rules for Distributed Energy Resources and Aggregations that are seeking to qualify and participate in the NYISO-administered Installed Capacity market. These rules are designed to ensure comparable treatment amongst the different types of Resources that are available to meet the LOLE Resource Adequacy criterion. The proposal largely deals with entirely new sections of tariff language that apply specifically to Distributed Energy Resources and/or Aggregations, but in some cases these sections clarify or otherwise modify existing eligibility, qualification, and participation requirements for Resources currently participating as Installed Capacity Suppliers. For example, tariff language is being modified or proposed that impacts existing eligibility, qualification, and participation requirements as well as the installed capacity payment structures that apply to Energy Limited Resources. These changes are necessary and are being proposed in order to ensure comparable treatment of all eligible Resources. No substantive changes are being proposed at this time for the eligibility, qualification, and participation requirements for Intermittent Power Resources, Limited Control Run-of-River Hydro Resources, but clarifying changes are being proposed to reflect the opportunity for Intermittent Power Resources 20 MW and less to be eligible to participate in the Installed Capacity market as part of an Aggregation. No substantive changes are being proposed that impact the eligibility, qualification, and participation requirements for the SCR program, however, these Resources will now be valued and subject to the payment structure applicable to a Resource with a 4-hour Energy Duration Limitation. This proposal also includes several proposed clarifying and clean-up revisions to Section 5 of the Services Tariff.

*1. Clarifying and Ministerial Revisions*

As part of this filing multiple clarifying changes and ministerial revisions are being proposed throughout Section 5 of the Services Tariff that are not intended to change the substantive meaning of the Tariff. To facilitate the Commission's review of these ministerial and/or clarifying changes, they are grouped together in the discussion below.

The NYISO proposal adds or substitutes the defined term "Installed Capacity Supplier" in several places throughout Section 5 of the Services Tariff. This occurs in Section 5.1(d) of the Services Tariff where the defined term is added. This clarifies the general requirement that currently applies for all "Installed Capacity Suppliers," and will apply equally to Distributed Energy Resources and Aggregations participating in the Installed Capacity market going forward. This defined term is also used to replace the phrase "Qualified Resources" in Sections 5.10 and 5.11.4. This revision makes these provisions clear in the Services Tariff without changing the substantive meaning by replacing the phrase "Qualified Resources," which is not a

defined term although it is descriptive of the intended meaning, with the appropriate tariff defined term “Installed Capacity Suppliers.”

The proposed tariff revisions also include corrections to typographical errors and proper capitalization of tariff defined terms in Sections 5.1(j), 5.2, 5.3.3, 5.11.1, 5.11.4, 5.12.1.8, 5.12.6.3, 5.13.1, and 5.14.1.3.

*2. Conforming Changes that Ensure Existing Requirements Apply to the Set of Installed Capacity Suppliers Expanded for Distributed Energy Resources and Aggregations*

Several proposed revisions to Section 5 of the Services Tariff can be described as conforming changes that modify the tariff language that currently governs the participation of Installed Capacity Suppliers such as Generators with no Energy Duration Limitations, as well as the provisions that govern the participation of Responsible Interface Parties enrolling SCRs in the Installed Capacity market. These conforming changes, detailed below, are changes that modify the tariff language without impacting the substantive eligibility, qualification, and participation requirements, and performance expectations and penalties that are currently described in the Tariff. These conforming changes can be classified into two categories. First, those changes intended to make the current Tariff requirements broadly and generally applicable to all Installed Capacity Suppliers. This includes general rules and requirements that will continue to be applicable to existing Resources and that will also need to broadly apply to the eligibility, qualification and participation requirements for Distributed Energy Resources and Aggregations. This is typically accomplished with minor language additions or revisions that expand the application of current requirements. An example of this type of conforming change is found in Sections 5.9.2.3, 5.12.1, 5.12.1.1, 5.12.1.11, 5.12.1.11.3, 5.12.6.2.1, and 5.12.8 of the Services Tariff, which replace the defined term “Generator(s)” with the more broadly applicable defined term “Resources,” which is modified as proposed in this filing to now include the defined term “Aggregation.”

Similarly, in Section 5.12.3 of the Services Tariff, the proposed revisions replace the defined term “Generator(s)” with “Installed Capacity Supplier(s)” and replace the generic term “Supplier” with the defined term “Resource.” These proposed changes capture the expanded application of these provisions beyond Generators to include the expanded group of Installed Capacity Suppliers and Resources which now include Aggregations. These changes are discussed in more detail below, but present no substantive change for existing Generators. Another example of this type of change is found in Section 5.12.6.2.1 which replaces the phrase “NERC class average” with the broader term “default derating factor.” The nature of the proposed revisions in Sections 5.10 and 5.11.4 are the same. The use of the newly proposed defined term “Adjusted Installed Capacity” is required to replace the phrase “DMNCs,” which only applies to a subset “Generators,” while the new term “Adjusted Installed Capacity values” is defined to apply to all of the different type of Resources participating in the Installed Capacity market. This change therefore correctly expands the provision to apply to Aggregations without modifying the application of the provision vis-à-vis “Generators.” Also, in Section 5.11.4, the NYISO proposal replaces the term “generation” with the defined term “Installed Capacity

Suppliers.” This change reflects the application of Installed Capacity market mitigation measures to Aggregations that bring new Resources that request CRIS in a Mitigated Capacity Zone.

In Section 5.11.1 the NYISO proposes to add language in two places to ensure a broad application of a current requirement. In this instance the changes reflect the need for the NYISO to properly account for Demand Reduction caused by Distributed Energy Resources participating in Aggregations when the NYISO determines the Adjusted Actual Load as part of its Load forecasting calculations to ensure that it sets appropriate LSE Unforced Capacity Obligations.

A similar conforming change is proposed in the first sentence of Section 5.12.1 where the additional language “or be part of an Aggregation that is qualified as an Installed Capacity Supplier” clarifies that individual Resource types can continue to participate directly as an Installed Capacity Supplier or potentially may participate as part of an Aggregation that qualifies as an Installed Capacity Supplier. The NYISO also is proposing to add the phrase “and Distributed Energy Resources that have the ability to inject Energy” to this sentence to reflect that the proposal will treat these injection Resources (*i.e.*, Generators, including Energy Storage Resources, etc.) that participate in an Aggregation comparably with regards to the requirement to obtain CRIS in order for those injection-based Distributed Energy Resource megawatts to participate in the NYISO’s Installed Capacity market. In addition, the NYISO is proposing to apply a minimum megawatt level to all Resources seeking to participate as Installed Capacity Suppliers. The NYISO has added language in Section 5.12.1 that prescribes a 0.1 MW or greater threshold to apply to Aggregations, which is comparable to the threshold directed by the Commission and filed by the NYISO for Energy Storage Resources pursuant to Order No. 841.

The proposed tariff language added to Section 5.12.1.6 ensures that the requirement for Installed Capacity Suppliers to submit Bids into the Day-Ahead Market applies to Aggregations while providing comparable exceptions from this requirement that currently exist for Generators, Energy Limited Resources, Limited Control Run-of-River Hydro, and System Resources. These proposed revisions also clarify that the exception that currently applies to Intermittent Power Resources that depend on wind or solar as their fuel should also be extended to Aggregations that are wholly comprised of Intermittent Power Resources depending wholly on either wind or solar energy as their fuel source.

Another set of proposed revisions in Section 5.12.5.1 of the Services Tariff represents conforming changes to the operating data reporting requirements of Installed Capacity Suppliers. In this section, the revisions modify the heading of the sections to include Distributed Energy Resources and add Energy Storage Resources and Distributed Energy Resources to the list required “to submit GADS Data, or data equivalent to GADS and/or other Operating Data to the ISO in accordance with ISO Procedures.” There are many occasions outlined in the ISO Procedures that require Installed Capacity Suppliers to submit such data that indicates the availability or performance of the Resources. These procedures have been established by the NYISO and its stakeholders to reflect the different operational attributes and data reporting paradigms across the varied spectrum of Resource types in order that the NYISO can comparably administer, account for, and measure the performance of these Resources in its Installed

Capacity market. This Section and the subsequent Sections in 5.12.5 *et seq.* effectuates the comparable performance and availability (*i.e.*, outage) data reporting requirements of the various comparable types of data required to be submitted by the different types of the Installed Capacity Suppliers (*e.g.*, Generator, Energy Limited Resource, Energy Storage Resource, etc.). Section 5.12.5.12 of the Services Tariff revisions include comparable data reporting requirements for Distributed Energy Resources that participate as Installed Capacity Suppliers via an Aggregation. The current reporting requirements that apply to existing Installed Capacity Suppliers continue to apply and these revisions require comparable reporting requirements for Distributed Energy Resources and Aggregations that elect to participate in the NYISO's Installed Capacity market.

Conforming revisions are being proposed for Section 5.12.6.2 of the Services Tariff to outline the general calculation used to calculate Unforced Capacity. As modified, this section describes the general formula to calculate *any* Resource's Unforced Capacity as "the applicable Adjusted Installed Capacity multiplied by the quantity of 1 minus the Resource's derating factor." While this revision does not change the calculation for any existing Resources eligible and qualified to participate in the Installed Capacity market that do not have daily energy limits, it is required to broadly address the calculation for Resources with Energy Duration Limitations and Aggregations. It does so by introducing the newly proposed defined term "Adjusted Installed Capacity." This section is also modified to describe, in general, the basis of the derating factors as applied in this formula pursuant to ISO Procedures for Aggregations that are comprised entirely of Energy Storage Resources (such a homogeneous Aggregation will be treated like a single Energy Storage Resource under this proposal) and those comprised solely of Demand Side Resources or of a mix of different categories of Resources (*e.g.*, Demand Side Resources and Energy Storage Resources, Energy Storage Resources and Intermittent Power Resources, etc.). For these two categories of Aggregations the derating factors are developed based upon "the availability of the Aggregation in the Real-Time Market."<sup>208</sup> As is the case with the derating factors for all other categories of Installed Capacity Suppliers, the details of these calculations, which are extremely detailed and complex, will be included as part of ISO Procedures.

The proposal also adds language to this Section 5.12.6.2 of the Service Tariff to clarify that the existing application of the performance-based derating factors that apply to individual Intermittent Power Resources that rely solely on wind energy (*e.g.*, wind facilities) and Intermittent Power Resources that rely solely on solar energy (*e.g.*, solar facilities) will also extend to any Aggregations that are comprised entirely of Intermittent Power Resources that are powered solely by wind energy and Aggregations comprised entirely of Intermittent Power Resources that are powered solely by solar energy, respectively. Again, these performance-based derating factors are complex and detailed and as such are currently provided in ISO Procedures. The NYISO does not expect that these procedures will require any significant modification to apply to homogeneous Aggregations of wind and solar facilities. In addition, the proposed revisions to this Section provide that this performance-based derating factor

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<sup>208</sup> Sections 5.12.7 and 5.12.11 of the Services Tariff also contain proposed revisions necessary to delineate the underlying participation requirements for an Installed Capacity Supplier with an Energy Duration Limitation that apply to the Day-Ahead Market. These are commonly referred to as the "Bid, Schedule, Notify" requirements.

“...calculation shall not apply to any Aggregation that is entirely comprised of Intermittent Power Resources that depend on the same type of fuel that was in an outage state that started on or after May 1, 2015 and that precluded its eligibility to participate in the Installed Capacity market.” This language is added to ensure any existing individual Intermittent Power Resources will not lose this exclusionary treatment of hours from the calculation should they join together with other similarly fueled Intermittent Power Resources as part of an Aggregation.

The final conforming change in Section 5.12.6.2 of the Services Tariff adds the language “and individual Distributed Energy Resources” to the following sentence: “The ISO shall calculate separate Summer and Winter Capability Period Unforced Capacity values for Energy Storage Resources and individual Distributed Energy Resources and update them seasonally as described in ISO Procedures.” This change treats Energy Storage Resources and Distributed Energy Resources comparably whether they are participating as standalone suppliers or as part of an Aggregation. This requirement allows the ISO to effectuate the potential for these Resources to move in and out of an Aggregation or between Aggregations and the ISO will be able to attribute the appropriate Unforced Capacity gain or loss to the Aggregation.

The phrase “and/or Demand Reduction capabilities” is proposed to be added in two places within Section 5.12.8 of the Services Tariff. This change clarifies that the changes in the capability of a Distributed Energy Resource to measurably reduce its demand may be reflected in its Installed Capacity for each seasonal Capability Period.<sup>209</sup> This provides comparable treatment with Generators.<sup>210</sup> In addition, the language “or Aggregation” is added to Section 5.12.8 to allow the owner of the Aggregation to assign the bidding, scheduling, and notifying requirements to a third party that will be designated to the ISO by both the owner and the third party entity as the party responsible for complying with these requirements.

### 3. *Clarifying and Clean-up Changes to the ISO’s SCR Program*

Section 5.12.11.1 *et seq.* and Section 5.14.2.3 *et seq.* of the Services Tariff contain the bulk of the eligibility, qualification, and participation rules that apply to Responsible Interface Parties and their participation as Installed Capacity Suppliers with Special Case Resources in the NYISO’s Installed Capacity market. As indicated above, this Distributed Energy Resource and Aggregation market design did not attempt to substantively modify the eligibility, qualification, and participation rules that applied to this category of Installed Capacity Supplier. There were, however, two notable conforming changes that were required to ensure Responsible Interface Parties that participated with one or more SCRs are required to meet the 4-hour per day energy

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<sup>209</sup> Such a change, if reported to the NYISO, will increase the amount of UCAP that the Distributed Energy Resource or Aggregation using the resource will be eligible to offer into the Installed Capacity market for that season. In many instances, Demand Side Resources have significant difference in load during summer and winter periods. It is also important to note that should the load materially decrease, the Distributed Energy Resource must report a loss in capability to avoid incurring a shortfall of Installed Capacity pursuant to Section 5.14 of the Services Tariff for the megawatts that it is not capable of providing.

<sup>210</sup> Unlike Generators, however, Demand Side Resources will not have to satisfy any eligibility requirements associated with deliverability or CRIS that apply to injection based resources and are found in applicable provisions of Attachments S, X and Z of the OATT.

duration limitation.<sup>211</sup> First, the NYISO proposes to delete the existing exception to the minimum threshold of Load reduction capability that requires the SCR “to be available four (4) consecutive hours each day.” . Further, the NYSIO has no record or recollection of any Responsible Interface Party or SCR requesting an exception from the minimum 4-hour daily operation requirement since the inception of this program. The second change to note is that due to the change in the Installed Capacity Payment structure to pay Resources with Energy Duration Limitations commensurate with their contribution to meet the resource adequacy criterion as discussed above, a Responsible Interface Party should only be valued, and subsequently paid as any other Installed Capacity Supplier participating with a 4-hour daily Energy Duration Limitation.

The NYISO also made certain revisions to Section 5.12.11.1 of the Services Tariff to remove language related to Special Case Resources that also participate in the DADRP or DSASP. As discussed in this filing, the NYISO proposes to terminate these two programs, and therefore the removal of certain language in Section 5.12.11.1 of the Services Tariff is necessary. Specifically, the NYISO proposes to delete language that describes (i) the settlement treatment for SCRs scheduled in the Day-Ahead Market to provide Energy or Operating Reserves,<sup>212</sup> and (ii) the calculation of a SCR’s Average Coincident Load (“ACL”), Provisional ACL, and Incremental ACL baselines when the Resource was dispatched for Energy during the applicable baseline measurement period.<sup>213</sup>

#### *4. Installed Capacity Suppliers with Daily Energy Duration Limitations*

Section 5.12.11 of the Services Tariff currently contains the unique distinctions associated with the eligibility, qualification, and participation rules of Installed Capacity Suppliers that are Responsible Interface Parties, Municipally-Owned Generation, Energy Limited Resources and Intermittent Power Resources. This proposal for the Distributed Energy Resource and Aggregation Installed Capacity participation model modifies each of these sections as described herein and adds a fifth category – “Installed Capacity Suppliers with Energy Duration Limitations.” While this fifth category requires the creation of a new Section 5.12.11.5 within Section 5.12.11 and the addition of an entirely new Section 5.12.14, proposed herein and discussed below, the revisions in Sections 5.12.11.3 and 5.12.11.4 reflect distinct design changes that expand the eligibility, qualification, and participation rules that are unique to each category, respectively. A new generic category of Installed Capacity Suppliers with Energy Duration Limitations was also created and is a catch all for Energy Storage Resources, Distributed Energy Resources, or an Aggregation. Thus, Sections 5.12.11.3, 5.12.11.4 and 5.12.11.5 describe the

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<sup>211</sup> Section 5.12.11.1 of the Services Tariff expressly provides that “Responsible Interface Parties may qualify as Installed Capacity Suppliers, without having to comply with the daily bidding, scheduling and notification requirements set forth in Section 5.12.7 of this Tariff, if their special Case Resources are available to operate at the direction of the ISO in order to reduce Load from the NYS Transmission System and or the distribution system for a minimum of four (4) consecutive hours each day....”

<sup>212</sup> Proposed revisions to Services Tariff Section 5.12.11.1.

<sup>213</sup> Proposed revisions to Services Tariff Sections 2.1, 5.12.11.1.1, 5.12.11.1.2, 5.12.11.1.5.



requirements for the categories of Resources with Energy Duration Limitations, including Aggregations.

a. Modifications that Expand Eligibility for Energy Limited Resources

The foundational element of this market design is to expand participation in the Installed Capacity market and value capacity based upon its Energy Duration Limitation on the basis of its contribution to meeting the resource adequacy. The expansion of the Installed Capacity Supplier category to include Aggregations necessitates conforming changes that expand the sections addressing Energy Limited Resources and Intermittent Power Resources. However, these changes are not uniform throughout Sections 5.12.11.3 through 5.12.11.5. The proposed modification to Energy Limited Resources in Section 5.12.11.3 now requires an Energy Limited Resource to participate as an Installed Capacity Supplier with a daily Energy Duration Limitation. This participation and its commensurate valuation will be governed by the general requirements proposed herein of an Installed Capacity Supplier with an Energy Duration Limitation as described in the newly proposed Sections 5.12.11.5 and 5.12.14 *et seq.* and subject to the scheduling, bidding, and notification requirements proposed to be added to Section 5.12.12.2 of the Services Tariff. In addition this Section is expanded to allow for an Aggregation that is comprised solely of Energy Limited Resources. Such an Aggregation of Energy Limited Resources would be subject to the additional applicable eligibility, qualification, and participation requirements found in the wholly new Section 5.12.13 entitled “Aggregations” as well as the requirements proposed herein for an Installed Capacity Supplier with an Energy Duration Limitation as described in the newly proposed Sections 5.12.11.5 and 5.12.14 *et seq.* and subject to the proposed scheduling, bidding, and notification requirements applicable to Installed Capacity Suppliers with Energy Duration Limitations now found in the revised Section 5.12.12.2 of the Services Tariff discussed below.

b. Modifications that Expand Eligibility for Intermittent Power Resources

The proposal also modifies Section 5.12.11.4 to expand the eligibility, qualification, and participation requirements for Intermittent Power Resources by allowing these Resources to participate in an Aggregation of similarly fueled Intermittent Power Resources. These wind and solar facilities and Aggregations of wind or solar facilities will participate in the Installed Capacity market as they do today—as Installed Capacity Suppliers with *no* Energy Duration Limitation. An Aggregation comprised solely of wind facilities or an Aggregation comprised solely of solar facilities will also be subject to the applicable new provisions found in Section 5.12.13 of the Services Tariff, which provides the detailed provisions that apply to an Aggregation seeking to qualify and participate as an Installed Capacity Supplier. Based upon stakeholder discussion and the fact that Intermittent Power Resources are by definition variable supply with performance-based derating factors, they are not eligible to participate as a Resource with an Energy Duration Limitation.

c. Rules that Generally Apply for Installed Capacity Suppliers with Energy Duration Limitations

Section 5.12.11.5 is being proposed to describe the general requirements that are applicable to Installed Capacity Suppliers with Energy Duration Limitations and will generally apply to Energy Storage Resources and Distributed Energy Resources. This language sets forth general rules that apply to Resources with Energy Duration Limitations that are comparable to rules that broadly apply to all Installed Capacity Suppliers. For example, the first sentence in this section sets forth the rule that certain injection based Resources with Energy Duration Limitations will be subject to Attachments X and S of the OATT, which requires that they obtain CRIS (as discussed below). This new language also specifies the bidding requirements for all such Resources. An Installed Capacity Supplier with an Energy Duration Limitation must bid the Installed Capacity Equivalent of its UCAP sold into the Day-Ahead Market each day. The bidding must be done each day for the consecutive number of hours associated with its Energy Duration Limitation. This new section also specifies how these Resources shall Bid with respect to their Normal or Emergency Upper Operating Limits and that these Resources may be called upon to operate in real-time at levels that account for the Resource's specific energy limitations. These rules lay the foundation for comparable bid/schedule/notify requirements as well as comparable availability-based derating factor calculations that are conducted by the NYISO for all Installed Capacity Suppliers.

5. *External Resources with Energy Duration Limitations are Not Eligible to be Installed Capacity Suppliers and are Not Eligible to Participate within an Aggregation*

The existing Installed Capacity market rules generally allow all Resources in neighboring External Control Areas to qualify as Installed Capacity Suppliers with the exception of Intermittent Power Resources, Limited Control Run-of-River Hydro Resources, and Special Case Resources. With the proposed revisions to Section 5.7 of the Service Tariff, this proposal expressly clarifies the general rule and extends the preclusion for Resources with Energy Duration Limitations and Aggregations. The proposed revisions to Section 5.7 clarify and expand the existing Installed Capacity Supplier preclusion of individual Resources located in an External Control Area that are Intermittent Power Resources, Limited Control Run-of-River Hydro Resources, Energy Storage Resources or any other Resource that has an Energy Duration Limitation. Further, an Aggregation that is seeking to qualify as an Installed Capacity Supplier cannot include any Resources that are not electrically interconnected in the NYCA. Duration limited Resources in an External Control Area cannot be relied upon to provide Installed Capacity because the NYISO will not have visibility and primary control of these resources in-day.

**D. Installed Capacity Market Rules for Managing Resources Participating Collectively as an Installed Capacity Supplier Through an Aggregation**

This proposal expressly creates a new ruleset that applies to Aggregations participating in the NYISO-administered markets. A general eligibility rule for nearly all Resources seeking to

qualify as Installed Capacity Suppliers, other than Responsible Interface Parties,<sup>214</sup> is that they must be able to participate in the NYISO's Energy market and be able to respond to and perform in a manner consistent with the directions and control of the NYISO. As such, only Aggregations that satisfy all the proposed requirements found in Sections 2, 4, and 5 of the Services Tariff are eligible to participate as Installed Capacity Suppliers. Proposed new Section 5.12.13 *et seq.* of the Services Tariff addresses the qualification and participation rules for an Aggregation participating in the NYISO's Installed Capacity market. These rules are generally applicable to a DER Aggregation (*i.e.*, and Aggregation of one or more Demand Side Resources or an Aggregation of more than one Resource type) as well as an Aggregation consisting of a single Resource type (*e.g.*, Energy Limited Resource or Energy Storage Resource). The new tariff language being proposed in Section 5.12.13 *et seq.* creates the tariff rule that governs the Installed Capacity market implications and restrictions for Resources changing Aggregations that are provided in Section 5.12.13.1. as well as the rules related to time-stacking Resources in an Aggregation, which are described in Section 5.12.13.2.

### *1. Resources Changing Aggregations*

In addition to the rules found in Section 4.1.10.3 of the Services Tariff, the general rule for Distributed Energy Resources entering one Aggregation and leaving another are provided in the first paragraph of proposed Section 5.12.13.1. This rule provides that when a new Resource enters an Aggregation, the Installed Capacity associated with the new Resource will be assigned to the Aggregation on the first day of the month the Resource enters the Aggregation (*i.e.*, is registered, pursuant to ISO Procedures, to participate within the Aggregation). For example, when an eligible Resource is enrolled and registered as part of an Aggregation for the first time, the increased Installed Capacity value associated with that Resource's addition to the Aggregation will be reflected for the first day of the upcoming capability month. Likewise, if the Resource has left an Aggregation, either to discontinue participating in the Installed Capacity market, act as a single Resource, or participate in the Installed Capacity market as part of another Aggregation, this Resource's Installed Capacity will be removed from the Aggregation's Installed Capacity on the last day of the capability month for which the Resource had been registered to participate with that Aggregation. This rule generally allows a Resource participating in a DER Aggregation to switch Aggregations on a monthly basis. Similarly, an Energy Storage Resource participating in a homogeneous Aggregation of Energy Storage Resources can switch its participation to another homogeneous Aggregation of Energy Storage Resources on a monthly basis.

A Resource from a DER Aggregation seeking to switch its participation to become part of a homogeneous Aggregation cannot do so on a monthly basis. A Resource changing from an Aggregation using a specific participation model to an Aggregation using a different

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<sup>214</sup> Responsible Interface Parties have participated in the Installed Capacity market as Installed Capacity Suppliers with an aggregation of one or more Special Case Resources since 1999. As discussed above, the proposed market design for Distributed Energy Resources and Aggregations that are the subject of this filing do not seek to substantively modify the applicable rules for aggregation of Special Case Resources.

participation model can only do so prior to the start of the Capability Year (*i.e.*, May 1 each year) and requires that the Aggregation seeking to participate with this Resource going forward notify the NYISO of such a change prior to August 1 of the year prior to the beginning of the Capability Year. In addition, this Section requires that a Resource, which has previously acted as a retail load modifier outside of the ISO-administered Installed Capacity market, may only register as an Installed Capacity Supplier for the upcoming Capability Year if it notifies the ISO of its intention to participate as an Installed Capacity Supplier (or within an Aggregation) prior to August 1<sup>215</sup> of the year prior to the start of the Capability Year and provides the necessary operating data required for its participation in accordance with ISO Procedures.

## *2. Homogeneous Aggregations Consisting of a Single Resource Type*

As discussed above an Aggregation consisting of a single Resource type (*e.g.*, a homogeneous Aggregation of two or more Energy Storage Resources or a homogeneous Aggregation of two or more wind facilities, etc.) can participate as an Installed Capacity Supplier. Under such circumstances this homogeneous Aggregation will largely be treated under Section 5 of the Services Tariff as if it were an individual Resource, except as provided in Sections 5.12.13.1 and 5.12.13.2. For example, an Aggregation of Intermittent Power Resources that are solely comprised of solar energy facilities will be treated as if it were a solar energy facility, however, the individual facilities are free to switch to a different homogeneous Aggregation of solar energy facilities on a monthly basis.<sup>216</sup> Similarly, an Aggregation comprised solely of batteries will be treated as a single Energy Storage Resource. Section 5.13.1, however, would prohibit the transformation of a DER Aggregation to a single Resource type Aggregation (and vice versa) due to monthly facility migration. If the Aggregator wishes to change a homogeneous Aggregation into a DER Aggregation, they may do so for the next Capability Year provided the Aggregation notifies the ISO of this change to the Aggregation prior to August 1 of the year prior to the beginning of that Capability Year, in order to accurately model the Aggregation in the IRM process.

## *3. DER Aggregations*

The rules for a DER Aggregation apply to an Aggregation of one or more Demand Side Resources or any combination of different Resource types (*e.g.*, both a 1 MW Demand Side Resource combined with a 5 MW wind plant as well as a 5 MW wind plant combined with a 5 MW solar plant are examples of a DER Aggregation).

## *4. Exception from Outage States Rules for Resources in Aggregations*

The NYISO proposes minor revisions in Section 5.18 of the Services Tariff that generally requires Generators to notify the NYISO of the Generator's operating status if it falls into the

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<sup>215</sup> The proposed rules also require a Resource that wants to change its duration limitation to notify the NYISO prior to the August 1 date.

<sup>216</sup> *See, e.g.*, proposed revisions to Section 5.8.1 of the Services Tariff (explaining the treatment of homogeneous Aggregations of wind units versus a DER Aggregation containing wind units).

following categories: Forced Outage, Installed Capacity Ineligible Forced Outage, Mothball or Retired. The NYISO proposes the revisions to Section 5.18 to except Generators participating in an Aggregation from the requirements found in Section 5.18 *et seq.* while it is in an Aggregation. This would be too cumbersome a reporting requirement for the NYISO to manage the various outage states for these smaller generating facilities participating in an Aggregation. Further, the Aggregation would necessarily need to recognize the facility's inability to meet its Installed Capacity market obligations by notifying the NYISO of a derating of the Aggregation's capability. This is similar to the treatment that currently applies to the grouping of several small Limited Control Run-of-River Hydro facilities that are grouped as a single PTID. The proposed revisions make it clear, however, that a generating facility participating outside of an Aggregation is fully subject to the outage state reporting requirements found in Section 5.18 *et seq.* and cannot escape the applicability of these provisions by subsequently joining an Aggregation.

#### **E. Time-Stacking Requirements For DER Aggregations, Energy Storage Resource Aggregations, and Energy Limited Resource Aggregations**

Section 5.12.13.2 of the Services Tariff details the rules that will allow the sequential time-stacking of facilities participating in an Aggregation with an Energy Duration Limitation of 2, 4, or 6-hours as well as facilities with the capability to produce energy consecutively for only one hour in order for the Aggregation to qualify to participate as an Installed Capacity Supplier with a 2, 4, 6, or 8-hour Energy Duration Limitation and the corresponding Duration Adjustment Factors discussed above and outlined in Section 5.12.14. Time-stacking is only available to an Aggregation with an Energy Duration Limitation.

Each eligible facility that is applying to be time-stacked shall be able to provide energy daily for a minimum consecutive period of 1 hour and such capability will be rounded down to the nearest whole-hour increment for the sequential time-stacking. Section 5.12.13.2.3 further provides that time-stacked Distributed Energy Resource, Energy Storage Resource, or Energy Limited Resource Aggregations will qualify the amount of Installed Capacity it can sustain over the run-time requirement associated with the Energy Duration Limitation. The ISO Procedures will contain the DMNC-like tests that such an Aggregation will have to perform each Capability Period.

#### **F. Installed Capacity Mitigation Measures**

Attachment H of the Services Tariff contains the market mitigation measures administered by the NYISO.<sup>217</sup> The NYISO does not propose to make any substantive changes to its Installed Capacity market mitigation measures found in Section 23.4.5 of Attachment H of the Services Tariff. After reviewing the proposed Distributed Energy Resource market design and discussions with stakeholders, the NYISO has not identified a need for any additional market mitigation measures that would apply only to Distributed Energy Resources or are required for

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<sup>217</sup> The NYISO administers the provisions of Attachment H of the Services Tariff consistent with the Market Monitoring Plan set forth in Attachment O of the Services Tariff.

the Distributed Energy Resource participation model and the expanded eligibility that is anticipated through the use of the Aggregation participation model. This filing, however, does include limited adjustments to both the supplier side and buyer side mitigation provisions of Attachment H to reflect the characteristics of Distributed Energy Resources and Aggregations. The proposed clarifying changes will ensure that individual Distributed Energy Resources, Aggregations, Aggregators, and Market Participant portfolios containing Distributed Energy Resources will be subject to existing mitigation measures to the same extent as comparable Installed Capacity Suppliers. As a general rule, Distributed Energy Resource injection based facilities will be fully subject to both supplier side and buyer side mitigation measures.<sup>218</sup> Demand Side Resources participating in a DER Aggregation will be subject to limited aspects of supplier side mitigation, but will not be subject to the buyer side mitigation measures. These changes are discussed in detail below.

### *1. Supplier Side Mitigation*

The NYISO proposes to include Aggregations of all types in the Pivotal Supplier must offer mitigation measures. Section 5.12.1 requires Aggregations to identify Affiliated Entities, as defined in Section 23.2.1. All Aggregations, including DER Aggregations comprised of a single Demand Side Resource, will be subject to the Pivotal Supplier must offer rule. The rule described in Section 23.4.5.2 of the Services Tariff requires that “[o]ffers to sell Mitigated UCAP in an ICAP Spot Market Auction shall not be higher than the higher of (a) the UCAP Offer Reference Level for the applicable ICAP Spot Market Auction or (b) the Going-Forward Costs of the Installed Capacity Supplier supplying the Mitigated UCAP.” However, since a Going-Forward Cost determination would not reflect a Resource’s true avoidable costs when it is part of an Aggregation, the NYISO proposes to revise Section 23.4.5.3 of its Services Tariff such that neither facilities that are participating in the Installed Capacity market through an Aggregation nor Aggregations themselves will be able to request a Going-Forward Cost determination.

The NYISO also proposes to exclude the decision of Demand Side Resources that are participating in the Installed Capacity market as part of a DER Aggregation from the audit and review for Physical Withholding. The NYISO is proposing a new Section 23.4.5.6.1.1 of the Services Tariff that clarifies that the decision to retire, or otherwise discontinue the participation in the Installed Capacity market of either a Demand Side Resource and/or DER Aggregation is not subject to audit or review. The proposed exclusion is consistent with the current treatment of Special Case Resources. Distributed Energy Resources with the capability to inject Energy onto the grid (*i.e.*, Generators), will continue to be fully subject to all supplier side mitigation measures and therefore will be evaluated for physical withholding if the Resource is seeking to retire or cease participating in the Installed Capacity market.

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<sup>218</sup> The NYISO’s Order No. 841 Compliance Filing proposed revisions to reinstate buyer side market mitigation measures applicable to “Category III” Examined Facilities that plan to provide capacity. The Commission has not yet acted on that filing.

## *2. Buyer Side Mitigation*

As described below, only Distributed Energy Resources that have the capability to inject Energy onto the grid will be required to obtain CRIS and therefore be subject to the buyer side mitigation measures found in Section 23.4.5.7 of the Services Tariff.<sup>219</sup> These mitigation measures will remain substantively unchanged. The NYISO is proposing clarifying changes to Sections 23.4.5.7, 23.4.5.7.1, 23.4.5.7.2, and 23.4.5.7.3 to ensure that Generators interconnected to the system, or seeking to interconnect, within a Mitigated Capacity Zone (*i.e.*, New York City or the G – J Locality) will continue to be subject to the buyer side mitigation measures and subject to applicable offer floors unless exempt, regardless of whether the Generator is participating in the Installed Capacity market directly as an Installed Capacity Supplier or as part of an Aggregation.

## *3. Market Monitoring Unit Responsibilities*

The NYISO is also proposing minor modifications regarding monitoring of Installed Capacity market activities under Section 30, Attachment O of the Services Tariff, which contains the NYISO's Market Monitoring Plan. Section 30.4.6.3 establishes the independent Market Monitoring Unit's responsibilities related to Section 5 of the Services Tariff. The NYISO proposes to add a new Section 30.4.6.3.3 that would make the Market Monitoring Unit responsible for reviewing and commenting on several aspects of the periodic Capacity Value Study described in proposed Section 5.12.14.3. The Market Monitor will have the opportunity to review and comment on the draft request for the proposals prepared by the NYISO, the consultant's report, and, if applicable, the NYISO's proposed revisions to Energy Duration Limitations, the associated Duration Adjustment Factors, and Peak Load Windows for Resources with Energy Duration Limitations.

## **X. CRIS and Interconnection Requirements for Distributed Energy Resources**

Attachments X and Z of the OATT contain the procedures for processing interconnections of Large Facilities and Small Generating Facilities, respectively. In addition, Attachment S of the OATT contains the procedures for the Class Year Interconnection Facilities Study ("Class Year Study"), in which a project must participate to obtain CRIS with limited exceptions. The NYISO proposes revisions to provisions in these OATT attachments to address the CRIS and interconnection requirements applicable to Distributed Energy Resources. These

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<sup>219</sup> In 2017, the Commission directed the NYISO to create a blanket exemption from buyer-side capacity market mitigation for SCRs to be prospectively effective from February 3, 2017.

requirements focus on the facility level, not the asset level (a unit or an asset within facility) or at the Aggregation level (comprised of multiple Distributed Energy Resource facilities).

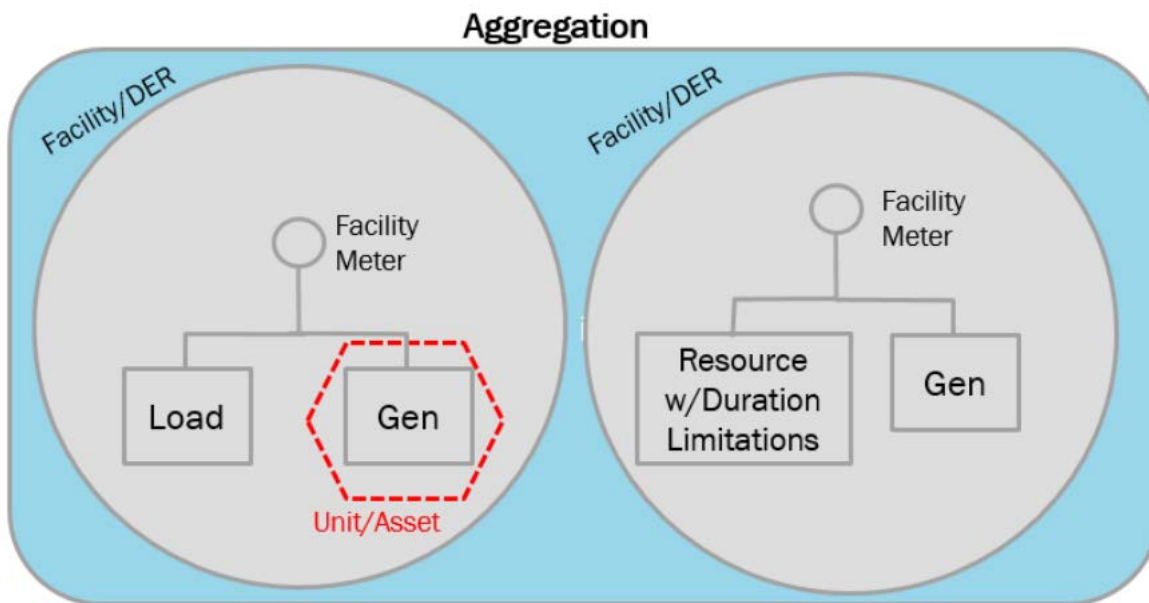


Figure 13: Depiction of Asset, Facility, and Aggregation

Distributed Energy Resources may include Resources with Energy Duration Limitations and/or be comprised of multiple units (of the same or different technology type). Whether they are Distributed Energy Resources depends on whether they intend to participate in an Aggregation and is not determinative of how Resources with Energy Duration Limitations and multi-unit facilities will be evaluated in the interconnection process or how the CRIS requirements and rules will apply.

The proposed revisions to Attachments S, X, and Z of the OATT distinguish between Resources with Energy Duration Limitations and facilities comprised of multiple units (of the same or different technology type). While both of the above may be a type of Distributed Energy Resource, their differences (primarily multi-unit versus single unit) necessitate separate tariff provisions. The proposed tariff revisions described below establish the interconnection-related data requirements applicable to each type of facility, the manner in which they will be evaluated in the interconnection process, the level of CRIS they may request, the manner in which their CRIS requests will be evaluated, and the manner in which proposed modifications and CRIS transfers will be processed.

**A. Independent Entity Variations**

A number of the NYISO’s proposed revisions to Attachments S, X, and Z would modify tariff language that the Commission adopted in Order Nos. 2003 and 2006 or their successors as part of the *pro forma* interconnection procedures. The NYISO’s interconnection procedures have long included numerous independent entity variations specifically tailored to New York’s



unique circumstances, and the existence of previously accepted variations has prompted the NYISO to obtain additional independent entity variations in revisions to Attachments S, X and Z. All of the NYISO's independent entity variations have been and continue to be necessary to align the interconnection procedures with the NYISO's existing OATT and current practices. Importantly, these procedures are fundamentally and inextricably integrated with the NYISO's market and planning rules.

The independent entity variation standard provides ISOs/RTOs with flexibility in adopting or maintaining the Commission's *pro forma* language because ISOs/RTOs have different operating characteristics, depending on their geographic size and location, and are less likely to act in an unduly discriminatory manner than non-independent transmission providers.<sup>220</sup> The Commission has explained that under this standard, "the Commission will review the proposed variations to ensure they do not provide an unwarranted opportunity for undue discrimination or produce an interconnection process that is unjust and unreasonable."<sup>221</sup> It has recognized that where changes to interconnection procedures "are clarifying and/or ministerial in nature and/or NYISO has supplied sufficient justification," such modifications are acceptable under the independent entity variation standard.<sup>222</sup>

The revisions to Attachments S, X, and Z that are proposed herein are fully justified under the Commission's "independent entity variation" standard. As discussed in detail below, the proposed tariff revisions to Attachments S, X, and Z establish just and reasonable enhancements, revisions, and clarifications to the NYISO's current interconnection process that are required to accommodate Distributed Energy Resources. In addition, the proposed revisions have been approved by the NYISO's stakeholders after an extensive and open process. The tariff revisions proposed in this filing were the product of discussions with stakeholders in the NYISO's governance process and culminated in proposed tariff revisions approved by the NYISO's Management Committee on April 24, 2019. The NYISO's Board of Directors also approved the filing of these proposed changes.

## **B. Interconnection Process Revisions**

### *1. Expanded Definition of Small Generating Facility*

To accommodate Distributed Energy Resources, the NYISO proposes to expand the definition of Small Generating Facility to include all assets (*i.e.*, units) behind a single facility meter.

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<sup>220</sup> *New York Indep. Sys. Operator, Inc.*, 108 FERC ¶ 61,159, at P 4 (2004); Order No. 2003 at P 827.

<sup>221</sup> *New York Indep. Sys. Operator, Inc.*, 124 FERC ¶ 61,238, at P 17 (2008).

<sup>222</sup> *Id.* at PP 17-18.

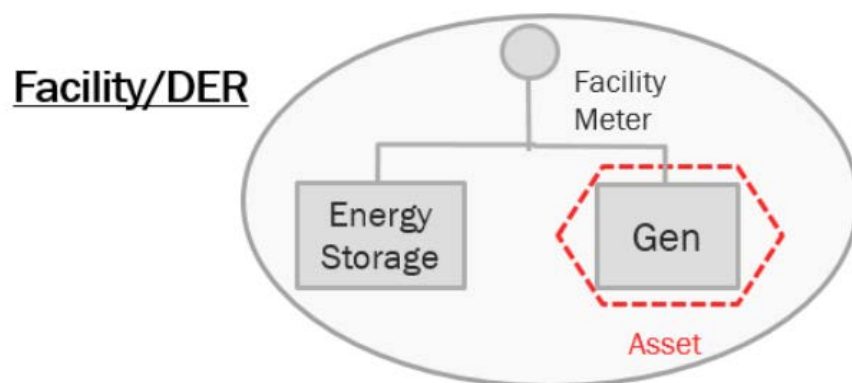


Figure 14: Depiction of Individual Facility

Through the proposed revisions to Attachment Z of the OATT, a multi-unit facility such as that depicted above may be included in one Interconnection Request and treated as a single facility with a single queue position in the interconnections study process. The proposed tariff revisions will allow this even if the assets behind the same facility meter are different technologies (*e.g.*, energy storage and solar).

## 2. Data Requirements

In order to evaluate Distributed Energy Resources, the NYISO proposes to require additional information specific to Resources with Duration Limitations and multi-unit facilities. Specifically, the NYISO proposes to revise the Large Facility Interconnection Request form in Section 30.14, Appendix 1, the data form for the Interconnection Facilities Study Agreement in Section 30.14, Appendix 2, the Small Generator Interconnection Request form in Section 32.5, Appendix 2, and the data form appended to the Facilities Study Agreement in Section 32.5, Appendix 6 of Attachment Z. With these revisions, the following information is required:

For Resources with Energy Duration Limitations:

- Energy storage capability (MWh);
- Minimum Duration for full discharge (*i.e.*, injection) (Hours);
- Minimum Duration for full charge (*i.e.*, withdrawal) (Hours);
- Maximum withdrawal from the system (*i.e.*, when charging) (MW);
- Inverter manufacturer, model name, number, and version;
- Maximum sustained one-hour injection (in MW) hours over the Developer-selected duration;
- Primary frequency response operating range for electric storage resource;

- Minimum State of Charge (%) and Maximum State of Charge (%); and
- If requesting CRIS, the maximum injection capability over the selected duration (*e.g.*, 2.5 MW over 4 hours for a total of 10 MWh).

For Small Generating Facilities comprised of multiple units of the same or different technology type:

- Description of the composition of assets (including MW level) within the Small Generating Facility, including load reduction assets (*e.g.*, 5 MW wind facility, 2 MW Energy Storage Resource, and a load reduction resource with a maximum of 1 MW of load reduction);
- Maximum Injection Capability of entire Small Generating Facility over 1 hour;
- If the Small Generating Facility includes a Resource with Energy Duration Limitations and is requesting CRIS, the maximum injection capability for the entire Small Generating Facility over the selected duration (*e.g.*, 10 MWh over 4 hours);
- The following information for each unit within the Small Generating Facility:
  - Energy source;
  - Prime Mover;
  - Type of Generator (*e.g.*, synchronous, induction or inverter);
  - Generator Nameplate Rating;
  - If solar array, whether it is fixed, 1-axis, 2-axis, 2-axis flat panel, 2-axis CPV, CSP, etc.;
  - Interconnection Customer or customer-Site Load, if any, and details regarding same (*e.g.*, if existing load, coincident Summer peak load values or estimated coincident Summer peak load, together with supporting documentation);
  - Typical Reactive Load (if known);
  - Maximum Physical Export Capability Requested;
  - Components of the Small Generating Facility equipment package that are currently certified and certifying entity; and
  - Compatibility of the prime mover with the certified protective relay package;

- Generator (or solar collector) manufacturer, model name, number and version;
- Nameplate Output Power Rating (in kW and kVA for summer and winter);
- Individual Generator Reactive Capability in kVAR;
- If wind, total number of generators in wind farm to be interconnected and generator height; and
- If a Resource with Energy Duration Limitations:
  - Inverter manufacturer, model name, number, and version;
  - Energy storage capability (MWh);
  - Minimum Duration for full discharge (*i.e.*, injection) (Hours);
  - Minimum Duration for full charge (*i.e.*, withdrawal) (Hours);
  - Maximum withdrawal from the system (*i.e.*, when charging) (MW);
  - Maximum sustained one-hour injection in MW hours;
  - Primary frequency response operating range; and
  - Minimum State of Charge (%) and Maximum State of Charge (%).

In addition, in the Pre-Application form provisions in Sections 32.1.2.2.4 and 32.1.2.2.5 of Attachment Z, the NYISO proposes the following revisions for facilities with multiple units:

- Generator type for “all technology types within the facility (*i.e.*, the assets behind the single facility meter that comprise the facility); and
- Total Size of the facility and size of each individual unit behind the single facility meter.

### **C. CRIS Requirements**

To qualify as an Installed Capacity Supplier, a Resource must possess CRIS,<sup>223</sup> which is obtained in accordance with Attachment S of the OATT.<sup>224</sup> Attachment S provides the

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<sup>223</sup> CRIS is interconnection service that allows a Developer to interconnect its facility to the New York State Transmission System or Distribution System in accordance with the NYISO Deliverability Interconnection Standard, which allows participation in the NYISO’s Installed Capacity market to the extent of the facility’s deliverable capacity.

<sup>224</sup> Services Tariff Section 5.12.1.

procedures for the Class Year Study,<sup>225</sup> which includes a deliverability analysis that evaluates project's requested MW of CRIS for facilities larger than 2 MW. CRIS requests are evaluated under the NYISO Deliverability Interconnection Standard to determine whether the requested MW of CRIS are deliverable and to identify and cost allocate any required System Deliverability Upgrades required for a project's requested MW of CRIS to be fully deliverable.

The Class Year Study's deliverability evaluation is based on the MW level of CRIS requested by the Class Year Project. Currently, Attachment S limits CRIS requests as follows:

- A BTM:NG Resource cannot request CRIS in excess of its Net-ICAP;
- A Class Year Transmission Project requesting CRIS in the form of External-to-ROS Deliverability Rights ("EDRs") cannot request CRIS in excess of the increase in transfer capability created by its project; and
- Other generation and Class Year Transmission Projects cannot request CRIS in excess of their nameplate.<sup>226</sup>

*1. CRIS Requests for Resources with Energy Duration Limitations and Multi-Technology Resources*

The NYISO has previously developed, and the Commission has approved, Resource-specific requirements for the maximum CRIS amounts that certain specific Resource types can request in a Class Year Study.<sup>227</sup> These Resource-specific requirements are necessary in light of the unique physical and operational characteristics of such facilities.

As noted above, Distributed Energy Resources may include Resources with Energy Duration Limitations and/or be comprised of multiple units (of the same or different technology type). Such facilities have unique characteristics from other generation Resources. Resources with Energy Duration Limitations will have an expected maximum injection capability for the Developer-selected duration. Multi-unit facilities will have a nameplate that is the collective injection capability of all units within the facility. Multi-unit facilities that include Resources with Energy Duration Limitations have not only collective injection characteristics, but also duration-specific injection capabilities that impact the facility of which they are a part. These characteristics distinguish these types of facilities from other Generators and necessitate tariff revisions to establish the level of CRIS they may request, the manner in which their CRIS

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<sup>225</sup> Attachment X details the obligations related to execution of a Class Year Study Agreement and provides a high level scope of the Class Year Study and Class Year Study procedures, but it incorporates by reference the terms of Attachment S, which provide more detailed Class Year Study procedures.

<sup>226</sup> See OATT Attachment S, Section 25.8.1.

<sup>227</sup> See, e.g., *New York Indep. Sys. Operator, Inc.*, 155 FERC ¶ 61,166 (2016); *New York Indep. Sys. Operator, Inc.*, 124 FERC ¶ 61,238 (2008) (accepting tariff revisions providing for a maximum requested CRIS level for BTM:NG Resources); *New York Indep. System Operator, Inc.*; Letter Order, Docket No. ER118-1668-000 (July 13, 2018) (accepting tariff revisions providing for a maximum requested CRIS level for Class Year Transmission Projects requesting EDRs).

requests will be evaluated, and the manner in which proposed modifications and CRIS transfers will be processed.

With respect to maximum permissible CRIS that can be requested, the NYISO proposes to revise Section 25.8.1 of Attachment S of the OATT to provide that, if the Class Year Project is a Resource with Energy Duration Limitations,<sup>228</sup> “the requested MW level of CRIS cannot exceed the minimum of the following: (a) its expected maximum injection capability in MW for the Developer-selected duration; (b) the nameplate capacity of the facility (*i.e.*, injection capability of the facility expressed in MW); or (c) the sum of facility’s requested and existing ERIS, as applicable....”

The NYISO proposes to further revise Section 25.8.1 to clarify how a CRIS request would be treated for a multi-unit facility (a Distributed Energy Resource if part of an aggregation). For CRIS requests by facilities comprised of multiple units (of the same or different technology type), the NYISO proposes the following two requirements:

- 1) The requested MW level of CRIS must be requested at the facility level.
  - CRIS cannot be requested at the unit/asset level for each unit behind the same facility meter (*i.e.*, for each unit that makes up one Small Generating Facility).
  - CRIS cannot be requested at an Aggregation level; Aggregations are not evaluated as a single facility in the Small Generator Interconnection Procedures; rather, it is a facility (which may ultimately join an Aggregation) that is evaluated for CRIS.
- 2) The MW level of CRIS requested by the Developer cannot exceed the minimum of the following: (a) its expected maximum injection capability in MW for the Developer-selected duration (only applicable if the facility includes a Resource with Energy Duration Limitations); (b) the nameplate capacity of the facility (*i.e.*, collective injection capability of all units within the facility expressed in MW); or (c) the sum of facility’s requested and existing ERIS, as applicable.

The proposed tariff revisions limiting the amount of CRIS that can be requested by a Resource with Energy Duration Limitations or a facility composed of multiple units serve the following purpose:

- The “expected maximum injection capability in MW for the Developer-selected duration” prong captures the amount of capacity that a facility would be able to provide under the duration requirements to be an Installed Capacity Supplier (as described above in Part IX);

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<sup>228</sup> “Energy Duration Limitations” are defined in Part IX of this filing letter.

- The “nameplate capacity” prong captures the facility’s maximum injection capability; and
- The “sum of facility’s requested and existing ERIS” prong captures the maximum amount of energy the facility is permitted to inject into the system in accordance with the facility’s ERIS level determined in the applicable interconnection studies.

These proposed limitations are consistent with limits placed on other facilities’ CRIS requests, all of which have been designed to align a facility’s maximum CRIS level as close as possible to the facility’s maximum possible Capacity market contribution. In this instance, the lowest value determined by the three prongs best reflects the above Resource type’s maximum possible Capacity market contribution.

In addition to the above revisions to Section 25.8.1, the NYISO proposes the following related revisions in Attachments S, X, and Z of the OATT:

- Revisions to Section 32.1.1.7 of Attachment Z that refer back to Section 25.8.1 of Attachment S with regard to the maximum MW levels of CRIS that may be requested by a Small Generating Facility;
- Revisions requiring information sufficient to determine the MW levels for each of the above limitations, specifically revisions to the Interconnection Request forms in Section 30.14, Appendix 1 of Attachment X, Section 32.5 of Attachment Z, and the data form appended to the Interconnection Facilities Study Agreement (“Class Year Study Agreement”) in Section 30.14, Appendix 2 of Attachment X; and
- Revisions to Sections 25.9.3.1 and 25.9.4 of Attachment S to clarify that CRIS obtained by a multi-unit facility cannot be split up into CRIS for each unit. A unit within a multi-unit facility that elects to reconfigure its interconnection such that it becomes part of another facility (*i.e.*, an alternative composition) cannot take with it a pro-rated portion of the multi-unit facility’s CRIS. A multi-unit facility’s CRIS can only be transferred in whole, regardless of whether the facility modifies its original composition.

## *2. Deliverability Methodology Applied to Resources with Energy Duration Limitations and Multi-Technology Resources*

To clarify the manner in which the Class Year Study deliverability evaluation will study Resources with Energy Duration Limitations and facilities comprised of units of different technologies, the NYISO proposes revisions to Section 25.7.8.2.3 of Attachment S of the OATT. This Section of Attachment S sets forth the methodology for the deliverability evaluation of the requested MW of CRIS. Pursuant to Section 25.7.8.2.3, the MW of CRIS requested by a Class

Year Project represent Installed Capacity and are derated to a UCAP value used for the deliverability analysis.<sup>229</sup>

The deration factor used in the deliverability study is a derated generator capacity incorporating availability and is based on the unforced capacity or “UCAP” or Net-UCAP, as applicable, of the facility. This factor, unique to the deliverability study, is referred to as the UCAP Deration Factor (“UCDF”). Section 25.7.8.2.3 of Attachment S of the OATT provides that the UCDF used for the deliverability study is the average from historic ICAP to UCAP translations on a Capacity Region basis, as determined in accordance with ISO Procedures. Section 25.7.8.2.3 of Attachment S further provides that the UCDF used will be the average Equivalent Forced Outage Rate on Demand, which will be used for all ICAP providers that are not Intermittent Power Resources. The UCDF for Intermittent Power Resources is calculated based on their Resource type in accordance with ISO Procedures.

The NYISO proposes to clarify that the MW of CRIS requested by a Resource with an Energy Duration Limitation will represent Installed Capacity based on the Developer-selected duration (*i.e.*, its expected maximum injection capability in MW hours for the Developer-selected duration) and will also be derated for the deliverability analysis. The NYISO further proposes to revise Section 25.7.8.2.3 of Attachment S to specify the manner in which Resources with Energy Duration Limitations and multi-technology facilities will be derated in the deliverability study. These revisions propose to derate Resources with Energy Duration Limitations to reflect the Developer’s selected duration. For multi-technology facilities (facilities comprised of units of different technologies), the applicable derate will be determined using a blended UCDF that combines the UCDF of the individual units within the facility. However, if the facility includes load reduction, the load reduction would not impact the UCDF of the facility.

#### **D. Additional Interconnection-Related Tariff Revisions**

The NYISO proposes to revise the Interconnection Request forms and the data forms in Section 30.14 of Attachment X and in Section 32.5 of Attachment Z of the OATT to request information unique to Resources with Energy Duration Limitations and facilities comprised of multiple units.

The NYISO also proposes the following additional tariff revisions to streamline, clarify or make ministerial edits:

- Revision of the term “Merchant Transmission Facilities” in the heading of Section 30 of Attachment X to the Commission-accepted term “Class Year Transmission Facilities;”

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<sup>229</sup> At the conclusion of the analysis, the NYISO will reconvert only the deliverable MW and report them in terms of MW of Installed Capacity using the same derating factor utilized at the beginning of the deliverability analysis.



- Insertion of language in Section 32.1.1.3 of Attachment Z to make clear that the effective date referenced in that Section relates to Order No. 2006 compliance revisions , in order to avoid confusion as to which effective date that section is referring:

Neither these procedures nor the requirements included hereunder apply to Small Generating Facilities interconnected or approved for interconnection prior to (60 Business Days after the effective date of these procedures accepted by the Federal Energy Regulatory Commission in compliance with Order No. 2006), provided, however, that requests to interconnect Small Generating Facilities submitted after that effective date must be made pursuant to these procedures, as amended. These procedures shall apply to any existing interconnected Small Generating Facility to the extent that there is a material modification to the facility or the Interconnection Facility, if that facility as modified remains a Small Generating Facility.

- Addition of subheadings in Section 32.1.4 of Attachment Z regarding modifications of Small Generating Facilities to distinguish between modifications of proposed Small Generating Facilities in the interconnection queue (new subsection 32.1.4.1) and modifications of existing Small Generating Facilities (Section 32.1.4.2);
- Clarification, in Section 32.1.4.1 of Attachment Z, that proposed modifications to Small Generating Facilities under evaluation in the interconnection queue are material unless deemed non-material and if deemed material, the modification request can be withdrawn;
- Modification of the language requiring that an Interconnection Customer “cures the problems created by the changes in a reasonable period of time” to clarify that the Interconnection Customer cures the problem if it “proposes further modifications or mitigation to ameliorate the material impact of the proposed modification in a reasonable period of time;”
- Relocation of the modification provisions in Section 32.1.3 of Attachment Z to Section 32.1.4.2.1;
- Addition of language in Section 32.4.11.1 of Attachment Z to provide that increases in capacity will be evaluated pursuant to Section 32.1.4.2.1; however, if the proposed increase will make the Small Generating Facility’s total capacity exceed 20 MW, the incremental increase must be evaluated under the Large Facility Interconnection Procedures in Attachment X because the modified facility will be a Large Generating Facility;

- Clarification in Section 32.4.11.1 of Attachment Z that a reliability analysis under the NYISO Minimum Interconnection Standard is only required for *material* increases in capacity that require a new Interconnection Request;
- Replacement of the term “capacity” with “Capacity Resource Interconnection Service” in Section 32.4.11.1 of Attachment Z;
- Clarification that the Interconnection Request referenced in Section 32.4.11.2 of Attachment Z, for a Small Generating Facility that includes multiple energy production devices interconnecting at one Point of Interconnection, applies to multiple energy production devices *behind a single facility meter*;
- Ministerial edit to the definition of Small Generating Facility in Section 32.5, Appendices 1 and 6, to add the missing term “interconnect to” in the following clause: “...(ii) facilities proposing to interconnect to the New York State Transmission System or the Distribution System made solely for the purpose of generation with no wholesale sale for resale nor to net metering; ...”
- Replacement of the term “assets” with “units” in the following clause in the definition of Small Generating Facility in Section 32.5, Appendices 1 and 6: “A facility will be treated as a single Small Generating Facility if all ~~assets~~units within the facility are behind a single facility meter, even if such ~~assets~~units are different technology types;”
- Addition of a heading identifier “D” for the Interconnection Customer Information section of the Interconnection Request form in Section 32.5, Appendix 2 of Attachment Z;
- Addition of subheadings under Section 5 of the Interconnection Request form in Section 32.5, Appendix 2 of Attachment Z to distinguish between information required for a Small Generating Facility comprised of a single unit (Section F.1) and a Small Generating Facility comprised of multiple units of the same or different technology type (Section F.2); and
- Ministerial edit to correct the following typographical error in the definition of Small Generating Facility in Section 32.5, Appendix 6 of Attachment Z: revising “dfacility” to “facility.”

## **XI. Other Matters**

### **A. Evaluation of Failed Transactions**

The NYISO proposes to remove references to its Market Mitigation and Analysis Department from Sections 4.5.2.2 and 4.5.3.2 of the Services Tariff. These sections require the NYISO to evaluate energy injections and withdrawals at a Proxy Generator Bus that are

scheduled by RTC but fail the NYISO’s checkout process. The NYISO must determine whether the failure occurred for reasons within the Market Participant’s control. Transactions that fail for reasons within a Market Participant’s control are subject to a Financial Impact Charge. In 2014, the NYISO shifted the responsibility to evaluate failed transactions from its Market Mitigation and Analysis Department to its Settlements Department. Since the transition in 2014, the NYISO Settlements Department has carried out this function consistent with the tariff. However, the Services Tariff was not updated to reflect this change in responsibility. The proposed revisions continue to require the NYISO to perform the necessary evaluation.

**B. Miscellaneous**

The NYISO proposes to make additional clarifications and clean-up revisions to the Services Tariff, as described in Table 1, and the OATT, as described in Table 2. The NYISO also made several non-substantive changes, such as correcting spacing.

**Table 1**

<b>Services Tariff Section</b>	<b>Reason for Modification</b>
Section 2.1	Inserted “Resources” to clarify “EDRP Resources” in definition of Adjusted Actual Load.
Section 2.4	Clarified that Transmission Owners make a request “to the ISO” in definition of Day-Ahead Reliability Unit.
Section 2.15	Clarified that the applicable requirements of NERC, NPCC, and the New York State Reliability Council apply to provision of Operating Reserves.
Section 2.17	Revised definition of Qualified Non-Generator Voltage Support Resource to exclude Distributed Energy Resources.
Section 2.18	Capitalized first word in definition of “RMR Agreement”
Section 2.18	Revised definitions of “Regulation Revenue Adjustment Charge” and “Regulation Revenue Adjustment Payment” to reflect that all Regulation Service providers, not just Generators, will be subject to the charge and eligible for payment, respectively.
Section 2.19	Revised definition of “Station Power” to clarify that the Load of a DER Aggregation is not considered Station Power.
Section 4.1.4	Clarified language concerning the scheduling of Transactions above one (1) megawatt.

Section 4.2.1.7	Clarified that a DER Aggregation that includes Demand Side Resources cannot be the source of a Bilateral Transaction.
Section 4.2.3.1	Replaced “units” with “Resources.”
Section 4.5.2.1.3	Clarified that formula concerns Supplier payments for Imports.
Section 4.5.2.2	Replace reference to “ISO’s Market Mitigation and Analysis Department” with more general reference to “ISO.”
Section 4.5.3.1.1	Clarified that formula concerns Customer charges for Exports.
Section 4.5.2.3	Replace reference to “ISO’s Market Mitigation and Analysis Department” with more general reference to “ISO.”
Section 5.8	Clarified the obligations of Installed Capacity Suppliers with multiple units at a single physical location in order to differentiate from Aggregations.
Section 23.3.3.3.2.1.4	Removed unnecessary “and.”

**Table 2**

<b>OATT Section</b>	<b>Reason for Modification</b>
Section 1.4	Clarified that Transmission Owners make a request “to the ISO” in definition of Day-Ahead Reliability Unit.
Section 1.17	Revised definition of Qualified Non-Generator Voltage Support Resource to exclude Distributed Energy Resources.

**XII. Effective Dates**

The NYISO respectfully requests Commission action within the standard notice period under Section 205 which is sixty (60) days of the date of this filing; *i.e.*, by August 26, 2019, accepting the tariff revisions proposed in this filing. Commission action will provide the NYISO and all stakeholders with timely notice that the changes proposed herein have been accepted, and of the timing of the implementation of the various components described herein. In addition, Commission action within sixty-one days will allow the NYISO: (i) to develop and deploy the software changes necessary to timely implement the participation model described in this filing; (ii) to implement certain aspects of the proposed revisions in the near-term to the benefit of Market Participants, and (iii) to achieve the desired effective dates for all aspects of this proposal. The NYISO also respectfully requests that the discrete revisions proposed in Sections 4.5.2.2 and 4.5.3.2 of the Services Tariff, as described in Part XI.A of this filing letter, become

effective on August 27, 2019 (*i.e.*, the day following the end of the statutory 60-day notice period). These revisions are attached as Attachments I (clean) and II (blackline).

The NYISO proposes that the bulk of the Aggregation and Distributed Energy Resource market rules become effective in the 4<sup>th</sup> Quarter of 2021. However, as detailed below, the NYISO proposes four (4) staggered effective dates because certain of the NYISO's proposed tariff revisions can and should be implemented prior to that time. The NYISO also requests a waiver of the Commission's regulations to allow the NYISO to make this filing more than 120 days prior to the date on which the proposed tariff revisions are to become operational.<sup>230</sup> No Market Participant will be prejudiced by this request because the proposed implementation timeframe was developed in consultation with the NYISO's Market Participants. As such, Market Participants have known for some time the planned implementation schedule for the rules related to Aggregations and Distributed Energy Resources. Furthermore, as noted below, the NYISO will provide at least two weeks prior notice to its Market Participants and the Commission before implementation of the rules for which the NYISO requests a flexible effective date.

**A. Requested Effective Date for Tariff Revisions Concerning Meter Services Entities for Demand Side Resources**

The NYISO requests an effective date of November 1, 2019 for the tariff revisions related to Demand Side Resources' use of Meter Services Entities to provide metering and meter data services, which provisions are located in Sections 2.13, 13.2.3, 13.3 and 15.10 of the Services Tariff. These revisions are attached as Attachments III (clean) and IV (blackline). This effective date will allow the NYISO to replace in the near term its existing Meter Services Provider and Meter Data Services Provider requirements that are at issue in Docket No. EL18-188. The effective date will also allow the NYISO to implement the new rules at the beginning of a Capability Period to minimize the potential for meter data accuracy issues associated with changing physical metering infrastructure or meter data infrastructure mid-Capability Period. The metering-related tariff revisions that the NYISO proposes to become effective on November 1, 2019 will apply only to the existing demand response programs. Tariff revisions concerning metering for DER Aggregations will become effective as part of the NYISO's 2021 implementation (described below) to account for the Aggregation and Distributed Energy Resource market rules.

**B. Requested Effective Date for Tariff Revisions Concerning Dual Participation**

The NYISO requests an effective date of May 1, 2020, for the dual participation rules located in Sections 2.2 and 4.1.11 of the Services Tariff. These revisions are attached as Attachments V (clean) and VI (blackline). The requested effective date will allow the NYISO to make dual participation available to all existing Resources in the near term, including making dual participation available to Energy Storage Resources upon the NYISO's implementation of its Order No. 841 compliance filing, anticipated to be the Summer 2020 Capability Period.

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<sup>230</sup> See 18 C.F.R. § 35.3(a)(1).

**C. Requested Effective Date for Tariff Revisions Concerning Interconnection Procedures**

The NYISO requests an effective date of May 1, 2020, for the revised interconnection procedures located in Sections 25, 30, and 32 (Attachments S, X, and Z) of the OATT. The revisions are attached as Attachments VII (clean) and VIII (blackline). The proposed effective date will permit entities interested in using the Aggregation and Distributed Energy Rules to begin the interconnection process in time to be positioned to use the new market rules once they become effective.

**D. Requested Effective Date for Tariff Revisions Concerning Installed Capacity Market Requirements**

The NYISO requests an effective date of March 1, 2021, for the tariff revisions related to Resources with Energy Duration Limitations, including the corresponding tariff revisions for the SCR program, located in Sections 5.1, 5.2, 5.3, 5.7, 5.9, 5.10, 5.11, 5.12, 5.13, and 5.14 of the Service Tariff.<sup>231</sup> These revisions are attached as Attachments IX (clean) and X (blackline). As described above, the rules related to Resources with Energy Duration Limitations will be applied market-wide, not just for Aggregations and Distributed Energy Resources. The requested effective date will ensure that Installed Capacity Suppliers are operating under the same set of market rules for the entire Capability Year. Specifically, the NYISO proposes to make the revisions applicable to the Installed Capacity market auctions beginning with the 2021-2022 Capability Year, which runs from May 1, 2021, through April 30, 2022.

**E. Requested Flexible Effective Date for Aggregation and Distributed Energy Resource Market Rules and All Remaining Tariff Revisions**

For the Aggregation and Distributed Energy Resource market rules and all of the remaining Tariff revisions, the NYISO requests a flexible effective date of no earlier than October 1, 2021. The remaining revisions to the Services Tariff are attached as Attachments XI (clean) and XII (blackline), and the remaining revisions to the OATT are attached as Attachments XIII (clean) and XIV (blackline). The NYISO is unable to propose a precise effective date until the development and testing of the software changes necessary to implement the Aggregation participation model and related rules is completed and the software is ready for deployment. The NYISO proposes to submit a compliance filing at least two weeks prior to the proposed effective date that will specify the date on which the revisions will take effect. Consistent with Commission precedent, the compliance filing will provide adequate notice to the

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<sup>231</sup> These tariff revisions will become effective March 1, 2021, and will apply to the Strip, Monthly, and Spot ICAP market auctions that run in March and April 2021 for the May 2021 delivery month. The tariff revisions proposed in this filing to be effective on March 1, 2021 will not apply to the Monthly and Spot Market auctions for the April 2021 delivery month, which auctions take place in March, 2021.

Honorable Kimberly D. Bose

June 27, 2019

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Commission and Market Participants of the implementation date for integration of Aggregations and Distributed Energy Resources.<sup>232</sup>

### **XIII. Service**

This filing will be posted on the NYISO's website at [www.nyiso.com](http://www.nyiso.com). In addition, the NYISO will e-mail an electronic link to this filing to each of its customers, to each participant on its stakeholder committees, to the New York Public Service Commission, and to the New Jersey Board of Public Utilities.

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<sup>232</sup> See, e.g., *New York Indep. Sys. Operator, Inc.*, 106 FERC ¶ 61,111 at P 10 (2004); Docket No. ER 11-2544-000, *New York Indep. Sys. Operator, Inc.*, Letter Order at 1 (February 10, 2011); Docket No. ER15-485-000, *New York Indep. Sys. Operator, Inc.*, Letter Order at 2 (January 15, 2015); *New York Indep. Sys. Operator, Inc.*, 151 FERC ¶ 61,057 at P 20 (2015).

#### **XIV. Communications**

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#### **XV. Conclusion**

For the foregoing reasons, the New York Independent System Operator, Inc. respectfully requests that the Commission accept the proposed tariff changes identified in this filing. They are just and reasonable and not unduly discriminatory. They are also consistent with or superior to, and serve the broad policy objective, of the November 2016 NOPR. The Commission should accept the NYISO's proposed tariff revisions without modification or requiring additional proceedings and grant the effective dates requested herein.

Respectfully submitted,

/s/ Gregory J. Campbell

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