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Aggregation Manual

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Version	Effective Date	Revisions
1.0	04/16/2024	Initial Release
1.1	06/10/2026	Global ➢ Added Appendix C to provide scenarios of acceptable DER facility telemetry and metering configurations. Appendix C ➢ Included examples of standalone Generator DER facility, standalone ESR DER facility, DSR – Type C DER facility, DSR – Type G DER facility, DSR – Type B DER facility, DSR and injecting Generator – Type I DER facility.

1. Background & Overview

This manual describes the procedures by which a Market Participant may group individual facilities located on the New York State Transmission System and/or the distribution systems located in the New York Control Area ("NYCA") to form a single entity – an Aggregation – for the purpose of participating in the NYISO-administered Energy, Ancillary Services, and Installed Capacity markets. The Aggregation must satisfy all applicable eligibility and performance requirements necessary to participate in the NYISO-administered markets.

The procedures described in this manual apply to Aggregations and to each DER participating in an Aggregation. However, this document is not the sole source of information for Aggregations or a DER. Aggregations are subject to the rules generally applicable to all Resources except where noted. Market Participants should review all applicable market rules and corresponding manuals, guides, and technical bulletins as necessary.

1.1. Demand Side Resource Participation in NYISO Markets

Qualified Demand Side Resources may participate in a DER Aggregation. Demand Side Resources may alternatively participate in the NYISO's Emergency Demand Response Program ("EDRP") or the Special Case Resource ("SCR") program. A resource may not simultaneously participate as a DER in an Aggregation and as an EDRP Resource or an SCR. More information about the SCR program and EDRP is available in the NYISO Services Tariff (e.g., Sections 5.12.11 and 22, respectively) and ISO Procedures (e.g., Installed Capacity and Emergency Demand Response Program Manuals).

2. Distributed Energy Resources and Aggregations

This section includes the definitions of DER and Aggregations, as well as the basic characteristics that enable Aggregation participation in the NYISO-administered Energy, Ancillary Services, and Capacity markets.

2.1. Definitions

2.1.1. Distributed Energy Resource

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.

For purposes of the definition of a Distributed Energy Resource:

- An "individual facility" will be 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, that are (b) operated independently from other facilities at that physical location.

  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 facilities. The NYISO will work with Aggregators as needed to confirm appropriate designation of individual facilities.

- Distributed Energy Resources may be interconnected either to the NYCA Transmission system or a distribution system located in the NYCA.
- "Technology types" refers to any of the following categories of facilities: Demand Side Resources, Generators, Energy Storage Resources, Solar generation, Wind

generation, or Landfill Gas plants. Individual DER may also be eligible for certain classifications that otherwise apply to standalone Resources in the NYISO-administered markets including Energy Limited Resource, Capacity Limited Resource, or Limited Energy Storage Resource.

Demand Side Resource Participation

An individual DER that is a Demand Side Resource shall be designated as one of the following Demand Response types, based on how the DER facilitates its load reduction:

- Type C (Curtailment only),
- Type G (generation from a Local Generator only), or
- Type B (A combination of Curtailment and generation from a Local Generator)

As described above, an individual DER's Injection Limit may not exceed 20MW. An individual Demand Side Resource that participates as a DER has no maximum size limitation (e.g., a Demand Side Resource with 70 MW of load reduction capability is permitted).

A Demand Side Resource may not curtail Critical Electric System Infrastructure Load (as that term is defined in Section 2.3 of the Market Services Tariff) as part of participation in an Aggregation. See Market Administration and Control Area Services Tariff Section 2.3 and ICAP Manual Section 4.12 for further information.

Pursuant to Services Tariff Section 2.12 and Technical Bulletin 256, non-controllable generation such as rooftop solar does not qualify as a Local Generator. Demand Side Resources, including those utilizing a Local Generator, must be capable of controlling demand at the direction of the NYISO. Because rooftop solar and other non-controllable generation are not capable of controlling a Demand Side Resource's demand at the direction of the NYISO, they do not qualify to be a Local Generator. An Intermittent Power Resource (IPR) that is co-located with load behind a single net meter is not eligible to contribute to load curtailment as part of the DER's Load Reduction Plan.

DER with Injection and Load Curtailment

A DER may use a behind-the-meter generation source to facilitate load curtailment and inject excess generation to the grid. An individual DER capable of both load curtailment and injection shall be classified as a 'Type I' in the NYISO's Aggregation System, and its load curtailment and injection are enrolled as two separate assets. A DER capable of both load curtailment and injection will have an Economic Customer Baseline Load (ECBL) in accordance with Section 7.5 of this manual. An Aggregator is responsible for calculating the

ECBL reflective of the load curtailment MW capability of a 'Type I' DER. Additionally, the load curtailment MW capability of a 'Type I' DER is subject to the Monthly Net Benefit Threshold (MNBT) as outlined in Section 6.1.3 of this manual. A 'Type I' DER that facilitates load curtailment in response to a NYISO dispatch shall only be compensated for its Demand Reductions when the LBMP meets or exceeds the NYISO-defined MNBT.

Resource Type Eligibility

The following NYISO-defined resource types are ineligible to participate in an Aggregation:

- Facilities designated as PURPA units,
- Limited Control Run of River (LCRoR) units,
- Behind the Meter Net Generation (BTM:NG) Resources,
- Municipally owned Generators,
- System Resources, and
- Control Area System Resources.

A Resource designated as one of the above-identified Resource types may choose to forego the applicable classification, and instead be treated as a "Generator" for the purposes of its participation in an Aggregation. Please note that when such a Resource enters an Aggregation it will be subject to the rules applicable to DER Aggregations (for heterogeneous Aggregations) or a single resource type Generator Aggregation (a homogeneous Generator Aggregation).

DER Minimum Size Requirements

Pursuant to Services Tariff Section 4.1.10, each DER (including Demand Side Resources) must have a minimum capability of 10 kW. Where an individual facility includes multiple assets, which are defined by the NYISO as different technologies located at the facility, each individual asset must have a minimum capability of 10 kW.

Asset Requirements

Each asset is classified in the Aggregation System as one of the following types: Demand Side Resource, Generator, Energy Storage, Wind, Solar, Landfill Gas – any variance of one asset between these 'types' necessitates a new asset. Assets classified as Demand Side Resources, ESR, LESR, or IPRs may be reported as a single asset comprised of multiple energy producing/curtailing components.

All components of an asset must share the same generating technology and fuel type in order to enroll as a singular asset with an associated GADS submission record. Each Generator participating as an asset must be enrolled as a singular asset with an associated GADS submission record. Additionally, all components of an asset must be electrically connected and behind the same meter. For example, a DER site contains, behind the same net meter, one electrochemical battery and ten wind turbines. In the Aggregation System, the Aggregator must enroll this configuration as one energy storage asset and one wind asset – please refer to the Aggregation System User's Guide for the complete ruleset regarding asset enrollment.

There is no limit on the number of assets comprising an individual facility. The 10-kW minimum capability is applied to Demand Reduction, Injection, and Withdrawal capabilities separately, pursuant to Services Tariff Sections 4.1.10 and 2.5. Therefore, an individual DER with a combination of assets capable of Demand Reduction, Injection, and Withdrawal shall have the 10-kW minimum capability applied to each of the three response types.

A DER with Demand Reduction capability will only be permitted to have a single asset capable of Demand Reduction, given that there may only ever be one load associated with an individual DER (An 'individual DER' is characterized as such based on the uniqueness of its utility account and net meter – having two loads with unique utility accounts and net meters would automatically result in two individual DERs). As a result, the 10-kW minimum Demand Reduction capability for one hour pursuant to Services Tariff Section 4.1.10 shall be applied to the single asset capable of Demand Reduction within an individual DER.

Demand Reduction may be facilitated by load curtailment and/or a Local Generator. The NYISO permits a Local Generator used to facilitate Demand Reduction to be smaller than 10-kW, so long as that local supply source does not inject to the grid and is solely used to facilitate Demand Reductions. Importantly, the Total Demand Reduction Declared MW (*Refer to the Aggregation System User's Guide*) for the individual DER must be at least 10-kW, even if the single Demand Reduction-capable asset uses a combination of curtailment and local supply behind the meter smaller than 10-kW to facilitate the total load reduction capability.

If an individual DER contains injection-capable assets, the nameplate of each individual asset must be at least 10-kW. If an individual DER contains withdrawal-capable assets, then each individual asset must have a nameplate withdrawal capability must be at least 10-kW.

Please refer to Appendix B of this Aggregation Manual for illustrative examples of asset configurations.

2.1.2. Aggregations

An Aggregation is 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. An Aggregation may be comprised of DER interconnected to either the Transmission System or a distribution system in the NYCA – an Aggregation may include a mix of DER interconnected on the Transmission and distribution systems, but all DER must electrically map to the same Transmission Node. Figure 1 illustrates the various types of Aggregations – the NYISO permits heterogenous Aggregations, Aggregations of Demand Side Resources, and homogenous Aggregations of a single Resource Type.

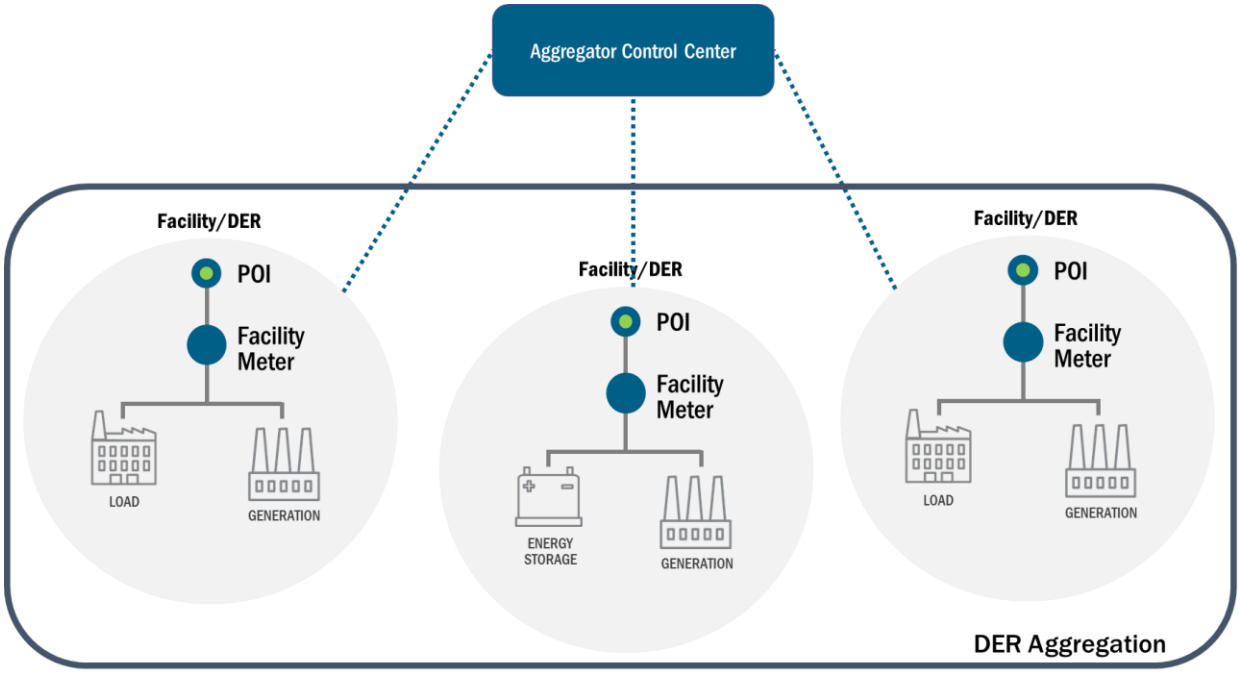
An Aggregation may be classified as an Energy Limited Resource (ELR), Capacity Limited Resource (CLR), or Limited Energy Storage Resource (LESR) if all DER within the Aggregation share the same energy or capacity-limiting characteristic. Where the DER in an Aggregation do not share the same energy or capacity-limiting characteristics, the Aggregation will be subject to the rules applicable to DER Aggregations and will not be treated as a single Resource type ELR or CLR Aggregation. An LESR Aggregation is subject to the same rules that apply to a standalone LESR, including but not limited to sustained operation of less than one hour, and the sole ability to provide Regulation service to the NYISO market – LESR Aggregations may not sell Energy, Operating Reserves, or Capacity. Like Aggregations of Energy and Capacity-limited Resources, an Aggregation of Intermittent Power Resources will only be considered a "single Resource type" when each DER in the Aggregation has the same intermittent characteristic. For example, an Aggregation of Intermittent Power Resources using solar energy as their fuel will be a single Resource type Intermittent Power Resource Aggregation, but an Aggregation where some DER use solar energy and others use wind energy as their fuel will be a DER Aggregation.

Figure 1: Illustration of Aggregation types

Aggregation Types	
DER	**Single Resource Type (Homogenous)**
1. Heterogenous 2. Demand Side Resource(s)	1. Generator 2. Energy Storage Resource (ESR) 3. Limited Energy Storage Resource (LESR) 4. Wind 5. Solar 6. Landfill Gas

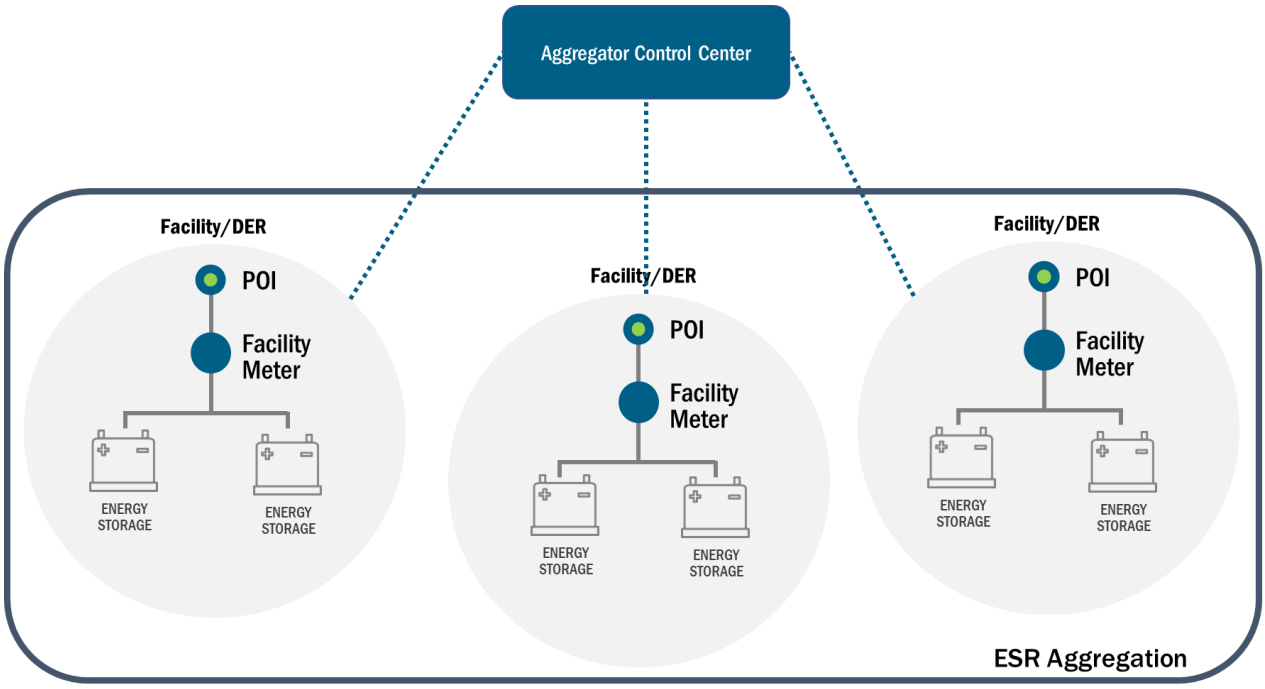
Aggregations comprised entirely of wind or entirely of solar should refer to the Wind and Solar Plant Data User's Guide for data reporting requirements (Manuals, Tech Bulletins & Guides - NYISO).

Figure 2: DER Aggregation



An Aggregation that includes more than one Resource type (heterogenous) or only Demand Side Resources is a "DER Aggregation."

Figure 3: Single Resource Type Aggregation



Single Resource type Aggregations, with the exception of Demand Side Resources (which participates as a DER Aggregation), will be subject to the market rules applicable to that Resource type. For example, an Aggregation comprised entirely of ESR facilities will be subject to the market rules that apply to an ESR.

2.2. Aggregations & Market Participation

Aggregations are eligible to qualify to participate in the NYISO-administered Energy, Ancillary Services, and Installed Capacity markets. Except for single Resource type LESR Aggregations, Aggregations that want to provide one or more Ancillary Services and/or Capacity must also participate in the Energy market. Aggregations are considered dispatch-only and will not receive a unit commitment from the NYISO. The Aggregation will offer Energy using a bid curve representing the continuous, fully dispatchable, operating range of the Aggregation, or bid curve representing a fixed amount. Bidding modes per Aggregation types are described in Figure 12. For more information on bidding modes rules please refer to the MPUG (Manuals, Tech Bulletins & Guides - NYISO).

2.2.1. Aggregations are Dispatch-Only

Aggregations will be treated as always available for dispatch, consistent with their Bids. The NYISO will not accept the submission of commitment parameters, nor will it evaluate those commitment parameters.

Aggregators must be able to operate its Aggregation(s) such that it can meet 5-minute basepoints from the NYISO in Real Time. Dispatch capability depends on the type of

Aggregation, and the NYISO will treat each Aggregation consistent with its 'type,' (*e.g.*, Single Resource Type Aggregation comprised of Solar only).

DER, Generator, and Energy Storage Resource Aggregations shall be expected to follow NYISO dispatch signals consistent with the Aggregation's bid-in operating range, including when the dispatch signal moves the basepoint of the Aggregation above or below its expected basepoint in Real-Time.

Intermittent Power Resource Aggregations using solar or wind as their fuel, and Landfill Gas Aggregations, just like individual Intermittent Power Resources using solar or wind as their fuel and Landfill Gas units, are not required to respond to NYISO dispatch signals that are above the expected basepoint of the Aggregation in Real-Time but shall respond to NYISO dispatch instructions when the basepoint is lower than the Aggregation's expected basepoint in Real-Time, and the clearing price is lower than the Aggregation's offer for the interval but still within the Aggregation's operating range.

LESR Aggregations do not offer Energy into the Day-Ahead or Real-Time markets, and instead only provide Regulation service – LESR Aggregations are required to follow basepoint changes in Real-Time. The ISO may reduce the Real-Time Regulation Capacity offered by an LESR Aggregation depending on the energy storage capacity of the Aggregation.

For details on the bidding requirements applicable to Aggregations, please also refer to the NYISO *Market Participant User's Guide*.

2.2.2. Aggregation Minimum Offer Requirement

The NYISO requires 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. 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 response type. Although each response type will be processed separately, the NYISO re-combines the separate pieces of the aggregate response and settles the Aggregation as a whole.

2.2.3. Energy Market Participation

Aggregation participation in the NYISO-administered Energy market is based on the dispatch-only nature of Aggregations. Aggregations may offer into the Day-Ahead and Real-Time Markets and are not committed in the NYISO's market software.

Energy market participation details are available in the NYISO's *Market Participant User's Guide, Day-Ahead Scheduling Manual, and Transmission & Dispatch Operations Manual*.

2.2.4. Ancillary Services Market Participation

Aggregation eligibility to provide one or more Ancillary Services products depends on the composition of the Aggregation. An Aggregation that seeks to provide any one of the following services must be comprised of DER facilities that are each individually capable of providing said service(s), based on the existing requirements of the NYISO Market Services Tariff and Ancillary Services Manual:

- Regulation
- Operating Reserve
  - Spinning Reserve
  - 10-Minute Non-Synchronized Reserve
  - 30-Minute Reserve

Aggregations are not eligible to provide the following Ancillary Services in the NYISO market:

- Voltage Support Service
- Black Start Capability Service

An Aggregator may enroll Aggregations of DER to begin providing Regulation or Operating Reserves at any time after beginning Energy market participation and adhering to the prerequisites and verification testing documented in the NYISO's Ancillary Services Manual– there are no annual deadlines or notification requirements associated with providing Regulation or Operating Reserves. For details regarding Aggregation participation in any of the aforementioned services, please refer to the NYISO's *Ancillary Services Manual*.

2.2.5. Installed Capacity Market Participation

Aggregators may qualify Aggregations as ICAP Suppliers in the NYISO market. ICAP Suppliers must comply with the requirements of Services Tariff Sec. 5.12, including, but not limited to, outage scheduling and reporting, meeting Day-Ahead Market bidding requirements, and performing applicable DMNC tests. Capacity market participation requirements are available in the NYISO's *ICAP Manual* and *ICAP AMS User's Guide*.

Aggregation participation in the NYISO-administered Capacity market is based on the capabilities of the individual facilities that comprise Aggregations. Aggregations may offer into the Strip, Monthly, and Spot market auctions.

Distributed Energy Resources may participate in an Aggregation with an Energy Duration Limitation (EDL) of 2, 4, 6, or 8 hours. Each individual DER seeking participation in the NYISO's Installed Capacity Market via Aggregation must have a minimum daily energy duration of 1

hour. DER may time stack their daily energy durations to meet the Energy Duration Limitation hourly designation for the Aggregation – more information regarding the ability for duration limited resources to Time Stack can be found in Services Tariff Section 5.12 and the ICAP Manual.

Please note that whenever an Aggregation is being updated, has been separated from the market by the NYISO or Aggregator, or has not yet been approved for market participation, capacity-related calculations displayed in the Aggregation System are forecasted values and may change.

Annual Election for Aggregations

Aggregations that are ICAP Suppliers are subject to certain obligations to notify the NYISO when making changes to their operating capability or their participation in the NYISO-administered markets. For example, an Aggregator is required to notify the NYISO when electing to change an Aggregation's Energy Duration Limitation or decides to end its ICAP market participation. As described further below, certain of the notifications must be made by August 1 of a calendar year to become effective for the following Capability Year (e.g., notifying the NYISO by August 1, 2023, for the 2024-2025 Capability Year). The August 1 notification requirement allows the NYISO to reflect accurate generation and load data in NYSRC and NYISO forecasts that determine the NYCA Installed Reserve Margin and the Locational Minimum Installed Capacity Requirements for a Capability Year.

This subsection addresses annual election requirements applicable to Aggregations. For additional requirements applicable to Aggregations and to other resource types, please refer to the ICAP Manual.

A facility that switches from participating as a retail load modifier to participating in the NYISO wholesale market must elect to do so by August 1 to effectuate the transition for the upcoming Capability Year. A facility seeking to end participation in the DER participation model to participate as a retail load modifier must comply with the requirements of ICAP Manual Section 4.1.2.

Annual election rules applicable to Behind-the-Meter ("BTM:NG") Resources are outlined in ICAP Manual Section 4.15. Please also refer to Section 4.3.3 of this Aggregation Manual for information regarding the transition to and from the DER participation model for BTM:NG Resources.

An Aggregator may enroll an Aggregation and begin Capacity market participation at any time. Some DER and Aggregation characteristics, which are identified in Services Tariff Section 5.12.13.1, may be updated on an annual basis only. For example, a DER facility whose capability has contributed to an Aggregation's UCAP in a given Capability Year may only switch from a DER Aggregation to a single Resource type ("SRT") Aggregation (and vice versa) on an annual basis. DER facilities that have contributed to an Aggregation's UCAP in a given Capability Year can elect to change to a new Aggregation of a different type on a Capability Year basis, by notifying the NYISO by August 1 and updating the Aggregation System accordingly. For example, a DER facility that participates in an SRT Generator Aggregation, in which the facility contributed to the SRT Generator Aggregation's UCAP, must submit an election by August 1 to transition to a DER Aggregation type for the upcoming Capability Year.

A DER facility, whose capability contributed to an Aggregation's UCAP within a Capability Year, that wants to transition from the DER participation model to participate in the NYISO markets via a different participation model must elect to cease participation as a DER by August 1, and provide notice to the NYISO and complete the update in the Aggregation System by removing the DER facility from the applicable Aggregation. For example, a DER facility whose capability contributed to an Aggregation's UCAP, starting in September 2023, must submit an annual election by August 1, 2024, in order to transition to a different participation model effective beginning in May 2025. Aggregations can elect to change an Energy Duration Limitation (EDL) on a Capability Year basis by notifying the NYISO by August 1 and completing the update in the Aggregation System for the upcoming Capability Year.

Pursuant to Services Tariff Section 5.12.13.1 and ICAP Manual Section 4.1.1, any time an annual election is not made by August 1, when applicable, the election will default to the current setting for the upcoming Capability Year. For example, for an Aggregation that has a 4-hour EDL, if no election is made by the August 1 deadline, the Aggregation will maintain a 4-hour EDL for the upcoming Capability Year.

DMNC Testing

ICAP Manual Section 4.2 describes the DMNC testing requirements for DER and Aggregations. The Aggregation System User's Guide describes the process of DMNC submission for Aggregations.

Market Participants are encouraged to contact DER@nyiso.com for support when unusual DMNC submission scenarios arise. In particular, please contact the NYISO if one or more of the following scenarios is applicable:

1. A DMNC record is being submitted for a single Resource type ESR Aggregation comprising only electrochemical batteries, and the ESR has a 1-hour DMNC duration testing requirement (see Section 4.2.2 of the ICAP Manual).
    a. Aggregators that have an Aggregation comprising only electrochemical batteries must contact the NYISO once the Aggregation is submitted to the Aggregation System. NYISO will review applicable information and support Market Participants regarding proper submission of 1-hour DMNC test data into the Aggregation System.
    b. If the Aggregation has an EDL, it is required to fulfill the applicable EDL testing requirement for its initial DMNC. See ICAP Manual Section 4.2.2.2
2. A DMNC record is being submitted for an existing stand-alone Generator (i) with an EDL that has a valid, approved, in-period DMNC test type, and (ii) the Aggregator plans to transition the existing stand-alone Generator to a SRT Aggregation with an EDL using the SRT Transfer DMNC.
    a. Aggregators must contact the NYISO once the Aggregation is submitted to the Aggregation System. NYISO will review the applicable information and provide guidance regarding proper submission of both the prior-approved DMNC record that established the EDL, as well as the currently approved in-period DMNC test into the Aggregation System.
    b. For additional information on using an SRT Transfer DMNC, refer to Sections 4.1.3 and 4.2 of the ICAP Manual.
3. A DER facility whose capability has contributed to an Aggregation's UCAP in a given Capability Year and is changing to another Aggregation in which the number of hours in the DER facility's former Aggregation's DMNC test is not the same as the number of hours in the new Aggregation's DMNC test.
    a. A DER facility may be eligible to carry over an existing DMNC value if: (1) the facility is changing to an Aggregation with an EDL that is less than or equal to its former Aggregation's EDL, or (2) the facility is changing to an Aggregation with a longer EDL and the Aggregation is time stacking.

b. If the DER facility meets one of the above criteria, then the Aggregator must contact the NYISO to initiate the Aggregation change to enable appropriate submission of a DMNC record that reflects Aggregation's EDL.

Provisional DMNC and Single Resource Type (SRT) Transfer DMNC

Pursuant to Services Tariff Section 5.12.13.1, a qualified ICAP Supplier that is an existing SCR or an existing Generator that (i) meets the requirements to participate in an Aggregation, and (ii) is currently participating in the ICAP market or participated in the Capacity market in the prior like Capability Period, may be eligible to offer its capacity as a DER through an Aggregation without missing a month of Capacity market participation. SCRs and Generators will utilize a provisional DMNC or Single Resource Type (SRT) Transfer DMNC, as appropriate.

A provisional DMNC (which is the upper limit of ICAP that an Aggregator can declare for a DER facility that previously participated in the NYISO-administered markets as a Special Case Resource (SCR) or Generator) will be used when a Generator or SCR enters a DER Aggregation. A stand-alone Generator may use a SRT Transfer DMNC (which is the upper limit of ICAP that an Aggregator can declare for a DER facility that previously participated in the NYISO-administered markets as a Generator) when a Generator is transitioning to an equivalent Single Resource Type Aggregation (e.g., when a stand-alone ESR seeks to enter an ESR Aggregation). The use of a provisional DMNC or SRT Transfer DMNC will be subject to NYISO review. A provisional DMNC or SRT Transfer DMNC is valid for the first Capability Period in which the DER facility participates in an Aggregation and will be end-dated to reflect the last day of that Capability Period. An Aggregator may only use a Provisional DMNC or SRT Transfer DMNC for a DER facility upon that DER facility's transition to the DER participation model and must declare the Provisional DMNC or SRT Transfer DMNC value when it enrolls the facility in an Aggregation. A Provisional DMNC or SRT Transfer DMNC value may be utilized for a DER facility until the Aggregation establishes its DMNC value for that Capability Period through an in-period DMNC test. An Aggregator is permitted to enroll in its Aggregation one or more DER facilities that utilize a provisional DMNC or SRT Transfer DMNC, provided that each DER facility utilizing a provisional DMNC or SRT Transfer DMNC is added to the Aggregation as of the first day of the same calendar month. An Aggregator may not further add any DER facilities to that Aggregation until the Aggregation completes an in-period DMNC test and the results of that test have been validated by the NYISO. For example, an Aggregation that adds two DER facilities with a provisional DMNC beginning June 1 and that takes its in-period DMNC test in August cannot add any additional DER facilities (either existing DER changing Aggregations or

new DER) until at least September 1, after its in-period DMNC test is complete and validated. Alternatively, an Aggregator can add two DER facilities with a provisional DMNC beginning June 1 and take its in-period DMNC test in June (depending on the in-period DMNC test window), and can add additional DER as early as July 1, after its in-period DMNC test is complete and validated. A DER facility that participates in an Aggregation that includes one or more DER facilities utilizing a provisional DMNC or SRT Transfer DMNC must remain in that Aggregation (or withdraw from the NYISO-administered markets) until the Aggregation completes its in-period DMNC test and the results of that test have been validated by the NYISO. Once the in-period DMNC test results have been validated, the DER facility may change to a new Aggregation.

If the amount of UCAP supplied by a DER facility using a provisional DMNC or SRT Transfer DMNC is greater than the amount of UCAP the DER facility is eligible to provide after completion of the Aggregation DMNC test, the Aggregation may be subject to financial penalties for an ICAP Shortfall. See Services Tariff Section 5.14.2.

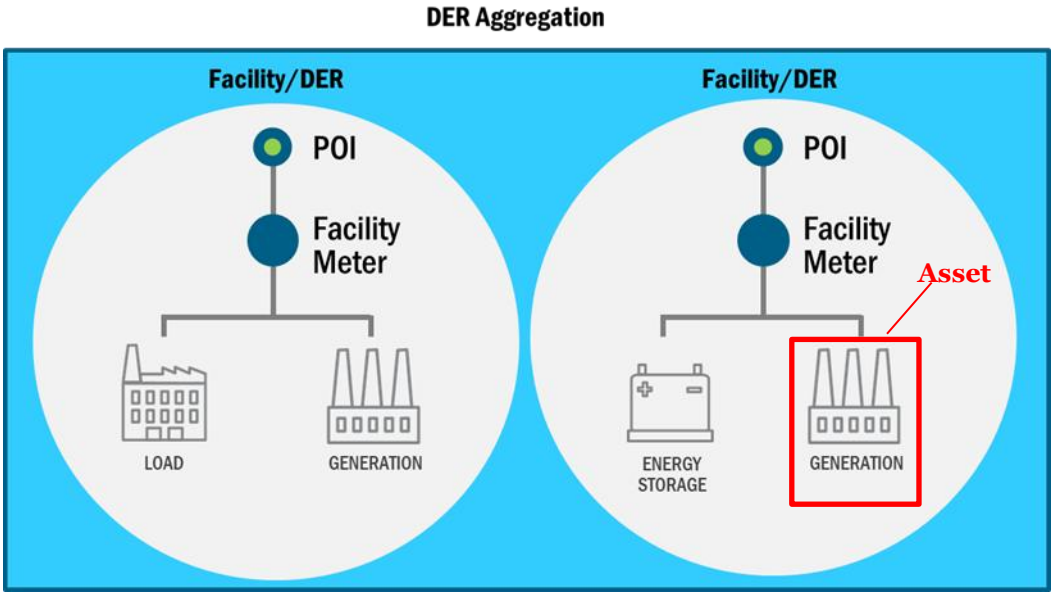
All DER facilities within an Aggregation must contribute to the Aggregation's UCAP for the Aggregation to be eligible to submit a provisional DMNC or SRT Transfer DMNC. Pursuant to this requirement, DER facilities that are eligible to utilize a Provisional DMNC or SRT Transfer DMNC and DER facilities that are already in an Aggregation, must each contribute to the Aggregation's UCAP. An Aggregation that includes one or more DER facility(ies) that is not currently contributing to an Aggregation's UCAP is not eligible to submit a provisional DMNC or SRT Transfer DMNC. An Aggregator with an Aggregation that may be eligible to utilize a provisional DMNC or SRT Transfer DMNC based on the Aggregation's composition should contact DER@nyiso.com to discuss the process requirements before submitting DER and Aggregation information for enrollment into the Aggregation System.

3. Interconnection

DER facility interconnection is permitted through either the NYISO Small Generator Interconnection Procedure (SGIP) or through an approved non-NYISO interconnection procedure (e.g., NYS Standardized Interconnection Requirements). The NYISO requires that interconnection studies be complete and approved prior to the submission of enrollment data for a DER in the Aggregation System – the enrollment process draws on the information provided by the interconnection study process for validation of DER physical and operating characteristics. To support the review for reliability and safety conducted for DER connected to a Distribution Utility's electrical facilities, the Aggregator must provide to the applicable Distribution Utility, upon request, any supplemental interconnection information beyond the requirements explicitly set forth in the NYISO's Aggregation System and Tariffs, including but not limited to injection and withdrawal limits for 24 hours of the operating day per Appendix K Attachment 1 of the NYS Standardized Interconnection Requirements (SIR). For further information on the NYS SIR, please see the information at the following link: https://dps.ny.gov/distributed-generation-information.

Interconnection requirements for DER focus on the facility level, not the asset level (an asset within a facility) or the Aggregation level (comprised of multiple facilities). In order to address CRIS and interconnection requirements applicable to DERs, additional information specific to Resources with Energy Duration Limitations and multiple assets must be submitted as part of the NYISO's interconnection process as set forth in in Attachments S, X and Z of the OATT. A DER facility that is comprised solely of Demand Side Resources is not required to complete interconnection studies under the NYISO OATT and need not have ERIS or CRIS.

Figure 4: Depiction of asset, DER Facility, and Aggregation.



3.1. Energy Resource Interconnection Service (ERIS) for DER

ERIS can be obtained through the NYISO's standard SGIP for individual DER upon the DER's acceptance of cost responsibility for any upgrades required to mitigate reliability issues posed by the interconnection. The ERIS value is memorialized in its Interconnection Agreement. Please refer to the NYISO's Transmission Expansion and Interconnection Manual for further details. A DER that is studied through a non-NYISO interconnection procedure (e.g., SIR) may still obtain an 'ERIS-equivalent' in the seasonal Max Net value provided by the SIR. For further information on this process, please refer to the Load Forecasting Manual and the Aggregation System User's Guide (Manuals, Tech Bulletins & Guides - NYISO).

3.2. Capacity Resource Interconnection Service (CRIS) for DER

CRIS can be obtained for individual DER via Attachment S of the OATT if the DER accepts cost responsibility for any upgrades required under a deliverability evaluation. A DER 2MW or less can obtain CRIS without going through a deliverability study. DER that are interconnected through a non-NYISO interconnection procedure must also be studied for deliverability by the NYISO in order to obtain CRIS unless the DER is smaller than 2MW. Please refer to the NYISO's Transmission Expansion and Interconnection Manual for further details (Manuals, Tech Bulletins & Guides - NYISO).

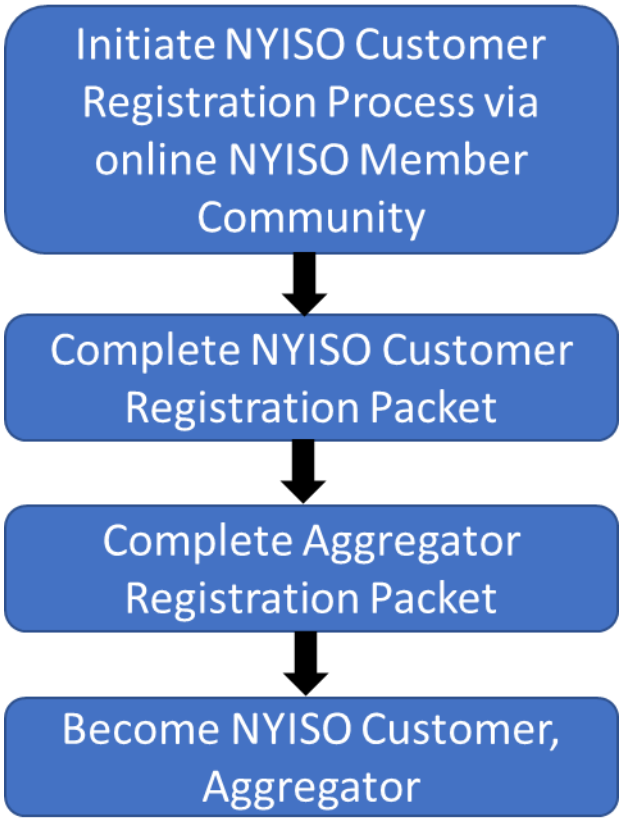
A Demand Side Resource seeking to participate in the Capacity market is not required to obtain CRIS – the ICAP of a Demand Side Resource is based on its demonstrated maximum output during a DMNC test, and the enrollment parameters detailed in the Aggregation System User's Guide, which include the MW demand reduction capability of a Demand Side Resource. When a single DER has multiple assets behind the point of interconnection, the ICAP value of the DER as a whole is the sum of the ICAP of each asset comprising the DER, which ICAP is calculated separately for each asset as described in the ICAP Manual. For more information, please refer to the ICAP Manual Sections 4.4.9 and 4.5 (Manuals, Tech Bulletins & Guides - NYISO).

For an Aggregation comprised of DER with an energy duration limitation, the maximum permissible CRIS that can be requested for each DER 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 DER (i.e., injection capability of the facility expressed in MW); or (c) the sum of DER's requested and existing ERIS, as applicable.

4. Registration & Enrollment

An Aggregator is 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 – an Aggregation. The Aggregator is required to register as a NYISO Market Participant (if not already registered as a Market Participant) in order to enroll Aggregations with the NYISO, and to enroll the individual facilities to form an Aggregation. The individual facilities are required to satisfy certain requirements to enter, exit, and switch Aggregations. A Distribution Utility will have the opportunity to review and approve each DER and Aggregation that is connected to the utility's electrical facilities.

Figure 5: Registration process flow



4.1. NYISO Aggregator Registration

The Aggregator is the party who represents one or more DER facilities as an Aggregation participating in the NYISO wholesale market. To become an Aggregator, an entity must first become a NYISO Customer, if not already registered. Aggregators must complete the NYISO Customer Registration packet and are subject to all of the general registration requirements

applicable to other Customers, including but not limited to submission of credit information, designation of MIS Administrator and users, and notification to the NYISO of corporate affiliations. Please refer to the Market Participant User's Guide for the complete list of responsibilities. Aggregators must also complete the NYISO Aggregator Registration Packet. The NYISO Customer Registration Packet and NYISO Aggregator Registration Packet must be summitted through the Salesforce NYISO Member Community: https://nyiso.force.com/MemberCommunity/s/

To request access to the NYISO Member Community, please submit your name, company name, email and phone number to the NYISO Registration Department.

4.1.1. NYISO Aggregator Registration Packet

In addition to mailing address and basic applicant contact information, the NYISO Aggregator Registration Packet requires applicant's 24/7/365 control center contact information for operational coordination activities, referred to as the 'Operational Contact.' The Operational Contact must be available 24/7/365 to respond to the NYISO and the interconnected utility. The contact information for a Secondary Operational Contact is required as well.

All Aggregators must communicate each Aggregation's operating status through the applicable Transmission Owner (TO) and are advised to contact the applicable TO business account representative for technical requirements associated with establishing TO telemetry. Aggregators opting to communicate with the NYISO solely through the Transmission Owner are not required to submit an Infrastructure and Technology Plan with the Registration Packet.

An Aggregator electing to communicate both to the TO and also directly with the NYSIO must submit an Infrastructure and Technology Plan with the Aggregator Registration Packet – the Infrastructure and Technology Plan requires information describing Aggregator control center configuration, system and communications architecture, and data management practices. An Aggregator will need to reference the Direct Communications Procedure in order to set up direct communications with the NYISO. Aggregators are required to complete a CEII (Critical Energy Infrastructure Information) form and an NDA (Nondisclosure Agreement) in order to obtain the Direct Communications Procedure. The CEII and NDA forms are available using the following link: https://nyiso.tfaforms.net/187.

A prospective Aggregator must successfully register as a NYISO Customer and Aggregator before enrolling facilities and Aggregations. Facility and Aggregation enrollment occurs in the

NYISO Aggregation System, to which Aggregators will receive access after successful registration as a NYISO Customer and Aggregator.

Aggregators planning to use a third party for communication services or scheduling and dispatch of DER facilities are advised to contact Customer Registration to understand how the third party may interact with the NYISO on behalf of the Aggregator. Third party service providers are required to register as NYISO Customers or Guests prior to providing services to an Aggregator. For more information on third party service provision related to scheduling of Aggregations and DER, please refer to the Scheduling Service Provider/Agency Agreement form of the NYISO Customer Registration Packet. For more information on third party service provision related to communication services and the details of the Direct Communications Service Provider Agreement, please contact NYISO Customer Registration at the following email address: customer_registration@nyiso.com.

An Aggregator who intends to use a qualified Meter Services Entity (MSE) to perform meter data services, as defined in the Revenue Metering Requirements Manual, for one or more Aggregations need not submit either the Scheduling Service Provider/Agency Agreement or the Direct Communications Service Provider Agreement. However, the MSE must be qualified to provide meter data services per the standards set forth in the NYISO Services Tariff and the Meter Services Entity Manual.

After successful completion of both the Customer Registration and Aggregator Registration procedures, an Aggregator will be established in the NYISO's Market Information System (MIS) based on the contact information provided by the Customer. Aggregation System privileges are granted to the Aggregator's Organization, which allows the MIS Administrator to assign the applicable privileges to designated users representing the Aggregator's Organization. The MIS Administrator for the Aggregator's Organization must enter the information to establish each user on behalf of the Organization before granting access privileges. Individual users with the appropriate Aggregation System access may commence enrollment of DER and Aggregations.

4.1.2. Pre-Enrollment Activity Checklist

In addition to successfully completing the NYISO Customer Registration and Aggregator Registration processes described in the previous section, Aggregators must ensure that the following tasks are successfully completed prior to attempting to enroll Aggregations of DER in the Aggregation System:

- Interconnection Agreement – All individual DER must have a signed interconnection

agreement either through the NYISO's SGIP or an acceptable non-NYISO interconnection procedure (*e.g.*, NYS SIR). For guidance on this process, please review the NYISO's Transmission Expansion and Interconnection Manual (Manuals, Tech Bulletins & Guides - NYISO).

- Telemetry communications – An Aggregator must successfully establish telemetry infrastructure connection with the applicable Transmission Owner prior to submitting an Aggregation in the Aggregation System. The Aggregator to TO connection is a prerequisite to the enrollment processes. The NYISO's Distributed Resources Operations group will work with the NYISO Power System Applications Engineering group, TO, and Aggregator to test communications using the uniquely assigned telemetry point identifiers for each Aggregation. For further information on this process, please see telemetry testing information for Aggregators, outlined in Section 7.3. The Aggregator should be able to successfully receive and transmit telemetry to the applicable TO over their required protocols (*e.g.*, DNP, ICCP, etc.) prior to enrollment of any DER or Aggregation. The telemetry communications testing procedure for individual Aggregations is detailed in Section 7.3.1 of this Manual.

4.2. NYISO Aggregation Enrollment

An Aggregator that has successfully completed the NYISO Customer Registration and DER Aggregator Registration processes and has contracted with DER facilities that have successfully interconnected to the NYCA may enroll those facilities in an Aggregation. Enrollment of DER and Aggregations, and subsequent changes to enrollments, is completed using the NYISO's Aggregation System.

4.2.1. Aggregation Enrollment Data

Aggregation enrollments may be submitted on a monthly basis. Aggregation enrollment data is obtained through a combination of methods: 1) provided by the Aggregator manually during import, or 2) auto calculated based on the data for all facility enrollments in the given Aggregation, Please note: A DER Aggregation must contain at least one facility in order to be submitted, while a Single Resource Type Aggregation must contain at least two facilities in order to be submitted (Please refer to Section 2.1.2 Aggregations).

The Aggregation enrollment process begins with the request for an Aggregation ID in the Aggregation System. The Aggregation ID is a unique identifier in the Aggregation System, which the Aggregator will use to associate DER facilities in the Aggregation; in order to request

an Aggregation ID, the Aggregator must have identified the Transmission Node to which the Aggregation and all comprising facilities will electrically map. The requisite data and all instructions describing how to enroll an Aggregation are included in the *Aggregation System User's Guide*.

4.2.1.1. Required Aggregation Documentation

An Aggregator is responsible for submitting documentation to support the enrollment data provided to the NYISO for each Aggregation. All documentation (Refer to the Appendix of the Aggregation System User's Guide) must be submitted to the NYISO at DER@nyiso.com on or before the same date that the Aggregation enrollment record is imported into the Aggregation System. If the Aggregation's physical or operational characteristics change such that any of the required documentation also changes, the Aggregator is responsible for submitting a new version of the applicable document(s) to the NYISO on or before the date that the updated Aggregation enrollment record is imported into the Aggregation System.

Please note: The NYISO does not provide standard templates for any of the required documents – the Aggregator should submit a document that appropriately communicates the required information. The NYISO reserves the right to request additional documentation to support the enrollment review process as needed. Up-front documentation required for each Aggregation is detailed in the NYISO Aggregation System User's Guide.

4.3. NYISO DER Facility Enrollment

An Aggregator is responsible for enrolling each individual DER facility, including all composite assets, in the NYISO Aggregation System. The Aggregator may assign a DER facility to an Aggregation by providing the Aggregation ID of the desired Aggregation on the facility enrollment record.

4.3.1. DER Facility Enrollment Data

DER facility enrollment data is submitted to the NYISO for review as part of an Aggregation. That is, each DER facility must be associated with/assigned to an Aggregation when the enrollment data is submitted. The NYISO will review individual DER facilities as part of a holistic Aggregation review workflow, completed each month.

Facility enrollment data is either 1) provided by the Aggregator manually, or 2) auto-calculated based on the data for all assets in the given facility.

The facility enrollment process may commence at any point after an Aggregation ID has been assigned to the Aggregator. The Aggregator is not required to create an Aggregation

enrollment record before creating facility enrollment records, however the facilities must be assigned to an Aggregation enrollment in order for all validations to successfully occur. Each facility will receive a unique Facility ID, assigned by NYISO, used to identify the DER facility throughout the NYISO Aggregation System. The requisite data and all instructions describing how to enroll a facility are included in the *Aggregation System User's Guide*.

Required DER Facility Documentation

An Aggregator is responsible for submitting documentation to support the enrollment data provided to the NYISO for each DER facility. All documentation (Refer to the Appendix of the Aggregation System User's Guide) must be submitted to the NYISO at DER@nyiso.com on or before the same date that the DER facility enrollment record is imported into the Aggregation System. If the DER facility's physical or operational characteristics change such that any of the required documentation also changes, the Aggregator is responsible for submitting a new version of the applicable document(s) to the NYISO on or before the date that the updated DER facility enrollment record is imported into the Aggregation System.

Please note: The NYISO does not provide standard templates for any of the required documents – the Aggregator should submit a document that appropriately communicates the required information. The NYISO reserves the right to request additional documentation to support the enrollment review process as needed. Up-front documentation required for each Aggregation is detailed in the NYISO Aggregation System User's Guide.

4.3.2. Duplicate DER Facility Enrollments

There must only be one active enrollment for a given DER facility in the Aggregation System. The same DER facility may not be enrolled in two Aggregations at once, by the same or different Aggregators. Additionally, a DER may not participate simultaneously in other NYISO programs, *e.g.,* SCR. If an Aggregator is found to be attempting to enroll a facility that is already enrolled as part of the portfolio of a different Aggregator, or if multiple Aggregators attempt to enroll the same facility for a given month, then the NYISO will review the information submitted by the Aggregator for the applicable facility.

A duplicate enrollment attempt may result in a temporary separation of the DER facility from the market until the issue can be resolved by NYISO staff.

4.3.3. Participation Model Transitions to and from DER

Generators and Demand Side Resources are permitted to transition to the DER participation model and will be added to an Aggregation on a monthly basis – please note that the

requirements and important deadlines vary depending on the participation model that the resource currently uses, and when it intends to transition to the DER participation model. Several exemplary scenarios are detailed in the following sections.

Existing Market Participants must register as an Aggregator prior to beginning the DER transition process. Successful DER Aggregator registration will grant access to the NYISO's Aggregation System, which is used for DER enrollment and Aggregation management – more information on DER Aggregator registration can be found in Section 4.1. The Aggregator is responsible for providing notice to the NYISO and the applicable Transmission Owner expressing intent to transition a resource into or out of the DER participation model.

Special Case Resources (SCR)

Resources that are active participants in the SCR program may initiate the transition to the DER participation model on a monthly basis. If a market participant intends to transition an SCR to the DER participation model during same or current Capability Period, the SCR must be Separated in DRIS prior to the close of certification for the applicable auction month, which must occur prior to the month in which they intend to begin participation as a DER. The SCR should be separated in DRIS by the RIP if the DER is approved prior to enrollment close, as further outlined below.

An SCR must satisfy all performance testing obligations during and after its transition to the DER participation model per Services Tariff Section 5.12. An SCR that receives a Day-Ahead performance test notice during the month in which its DER enrollment submission is Pending NYISO Review must respond to the test notice either through performance during the test window, or by submitting performance data that reflects a 4-hour Event performance within that Capability Period. SCR performance test activity will not impact the DER enrollment submission status – the Resource will remain submitted for review to begin DER participation, while satisfying the obligation of SCR performance testing as required. A former SCR that successfully transitions to the DER participation model and is active in an Aggregation is still required to fulfill applicable SCR test requirements by either submitting SCR Event data or participating in a SCR performance test. Once a former SCR has transitioned to the DER participation model, performance during an SCR test is not compensable through the SCR program. A DER must appropriately schedule to fulfill any SCR program testing obligations and will be compensated as a DER for such schedules consistent with NYISO market rules.

The SCR that has transitioned to a DER must conduct its performance test in the same manner as its previous SCR characteristics, including metering configuration and response type – such requirement is applicable for the duration of a Capability Period in which the DER previously participated as a SCR, after which point, the DER is no longer required to respond to SCR performance tests.

An existing SCR may transition to become a DER and participate in an Aggregation. An Aggregator may claim the capacity associated with the former SCR, now DER, for the first month in which the DER participates in its Aggregation. That is, a former SCR is not required to "sit out" of the Capacity market for a period of time due to its transition to the DER participation model. An Aggregator transitioning an SCR to the DER participation model, seeking to continue uninterrupted capacity market participation, must submit a provisional DMNC to the NYISO that will be used to establish the amount of capacity the resource will be able to sell as a DER. See Services Tariff Section 5.12.13.1.

The Aggregator shall submit the provisional DMNC value to the NYISO through the Aggregation System – please refer to the Aggregation System User's Guide for details. The maximum ICAP that an Aggregator can declare for a DER that transitions from being a SCR shall be the upper limit of ICAP of the SCR (which is the SCR's former Average Coincident Load) for the current Capability Period. When an SCR enters an Aggregation and becomes a DER at the beginning of a Capability Period (i.e., begins participating as a DER on May 1 or November 1), the maximum Installed Capacity that an Aggregator can declare for that Distributed Energy Resource shall be the ACL of the Special Case Resource for the immediately prior like Capability Period. After completion of a DMNC test, typically within the first month of participation, the Aggregation will be subject to penalties for any amount of oversold capacity.

The NYISO and applicable Distribution Utility will process all enrollment submissions through the workflow on a best effort basis. After DU review, NYISO 30-day review takes place. If the NYISO approves the DER prior to enrollment close for the SCR program, then the RIP should separate the resource in DRIS to ensure the SCR enrollment does not overlap with the DER enrollment. The SCR must have an End Effective Date in DRIS for the resource that is no later than the first day of the Resource's participation as a DER. If the NYISO is able to approve the DER after enrollment close for the SCR program, but prior to certification close, then, if appropriate, the NYISO may separate the SCR to allow DER program participation. If the resource is not enrolled as an SCR in the current Capability Period, then no action is required in DRIS. It is important to note that the DER facility cannot participate in the DER participation

model until the resource's SCR record has been Separated in DRIS. Please refer to the DRIS Event Calendar for enrollment close and certification close dates.

In the event of an attempted duplicate enrollment in the DER and SCR programs by different Market Participants, the NYISO will follow its procedure for duplicate facility enrollments outlined above. If the NYISO determines that it is appropriate to move forward with DER program participation, then the SCR must be separated in DRIS prior to DER program participation, as outlined above. If the NYISO determines that it is appropriate to maintain SCR program participation, then the DER enrollment will be rejected.

After NYISO approval, the DER that has transitioned from the SCR program is eligible for Energy market participation in the following month. An SCR providing a provisional DMNC value would be able to begin selling ICAP. Otherwise, the transitioning SCR will DMNC test as part of a DER Aggregation during the first month of participation as a DER. An SCR transitioning to DER that is not providing a provisional DMNC would be eligible for Capacity market participation after it has successfully completed its DMNC test.

Emergency Demand Response Program (EDRP)

EDRP Resources do not participate in the Capacity market, and so do not have the testing obligations applicable to SCRs transition to the DER program. An EDRP intending to transition to DER must unenroll and set an end effective date in DRIS that is prior to its intended start date as a DER. An EDRP may initiate the transition to the DER participation model during a given month, provided that it is Separated in DRIS prior to participation as a DER. An Aggregator providing Capacity in the NYISO markets for the first time, such as by enrolling EDRP resources that will begin participating in the Capacity market in an Aggregation as a DER facility, should review requirements applicable to Capacity suppliers prior to participation, including, but not limited to requirements outlined in the NYISO tariffs and the ICAP Manual.

Demand Side Ancillary Services Program (DSASP) and Day Ahead Demand Response Program (DADRP)

Resources that are active participants in the DSASP or DADRP may initiate the transition to the DER participation model on a monthly basis. The DSASP Provider or Demand Reduction Provider (DRP) for the Resource must coordinate with NYISO Customer Registration to remove the DSASP or DADRP Resource from the NYISO markets prior to participation in the NYISO markets as a DER. The DSASP Provider or DRP is responsible to coordinate the removal any bids submitted to NYISO that are not already being evaluated for the Day Ahead or Real-Time market prior to participation as a DER.

A DSASP or DADRP Resource transitioning to the DER participation model that is also participating as an SCR or EDRP must additionally follow the transitioning steps for SCRs or EDRP resources, as applicable, outlined above.

Behind-the-Meter Net Generation (BTM:NG) Resources

BTM:NG Resources may initiate the transition to the DER participation model on a Capability year basis, and the BTM:NG must notify the NYISO by August 1 that it intends to transition to DER for the upcoming capability year. Upon deciding to transition and prior to August 1, the market participant must notify the NYISO as described in the ICAP Manual. Once the NYISO has received and approved the end effective date notice for the BTM:NG Resource, and the Market Participant has successfully registered as a DER Aggregator, the Aggregator may begin the process of enrolling the Resource as a DER. Note that once the facility ends its participation as a BTM:NG Resource, the BTM:NG Resource market rules will no longer apply to the facility or its component assets.

A BTM:NG Resource may be comprised either of a single generating unit that serves a host load, or an aggregated unit that serves a host load. Regardless of the configuration of generating units, when the Resource enrolls as a DER that reflects any load reduction capability, injection capability, or withdrawal capability that will be provided through an Aggregation as a DER. A BTM:NG Resource routinely serves its host load with the on-site Generation source; this is a defining characteristic of the BTM:NG Resource model and precludes a BTM:NG Resource from the DER participation model. A BTM:NG Resource that transitions to become a DER must thereafter routinely serve its host load by withdrawing from the grid, rather than primarily from the on-site generation source. Further, the DER enrollment should reflect the number of generating units as assets within a single DER – for example, if an existing BTM:NG Resource facilitates serves its Host Load through the use of two gas turbines, , it may enroll as one (or more) DER with (i) Demand Reduction capability (either through curtailment, Local Generation, or both) and (ii) Generation.

A BTM:NG Resource that provides Voltage Support Service (VSS) will become ineligible to do so upon enrollment as a DER in an Aggregation.

If the resource will offer Capacity market via its Aggregation, please consult all applicable requirements in the NYISO tariffs and the ICAP Manual.

Existing Non-Demand Side Resources

Resources that are enrolled in the NYISO markets in any of the following participation models may transition to the DER participation model: Generator, Energy Storage Resource (ESR), Limited Energy Storage Resource (LESR), Solar, Wind, Landfill Gas, Energy Limited Resource (ELR), or Capacity Limited Resource (CLR). Some resource types may need to submit an annual election prior to transitioning to becoming a DER, including retail load modifiers. For more information regarding annual election requirements, please refer to Section 2.2.5 of this manual and the ICAP Manual.

If a Resource seeks transition into the DER participation model, it must be enrolled by a Market Participant who is a qualified NYISO Customer and registered DER Aggregator. For more information about registering as a DER Aggregator, see section 4.1.

Upon deciding to transition, the market participant must submit a notice to NYISO Customer Registration of the end effective date for the current Resource. The market participant shall submit a notice, in the form of an email, to NYISO Customer Registration (customer_registration@NYISO.com) and DRO (DER@nyiso.com). Notice must be provided prior to the import of enrollment data in the Aggregation System for the applicable Resource seeking to transition to DER – in other words, before the Aggregator can submit data to enroll a Resource that is transitioning to become a DER, the NYISO must acknowledge and approve its end effective date notice as a standalone unit. Once the NYISO has received and approved the end effective date notice for the current Resource enrollment, and the Market Participant has successfully become a DER Aggregator (or associated the unit with another Aggregator), the unit may begin the process of enrolling as a DER.

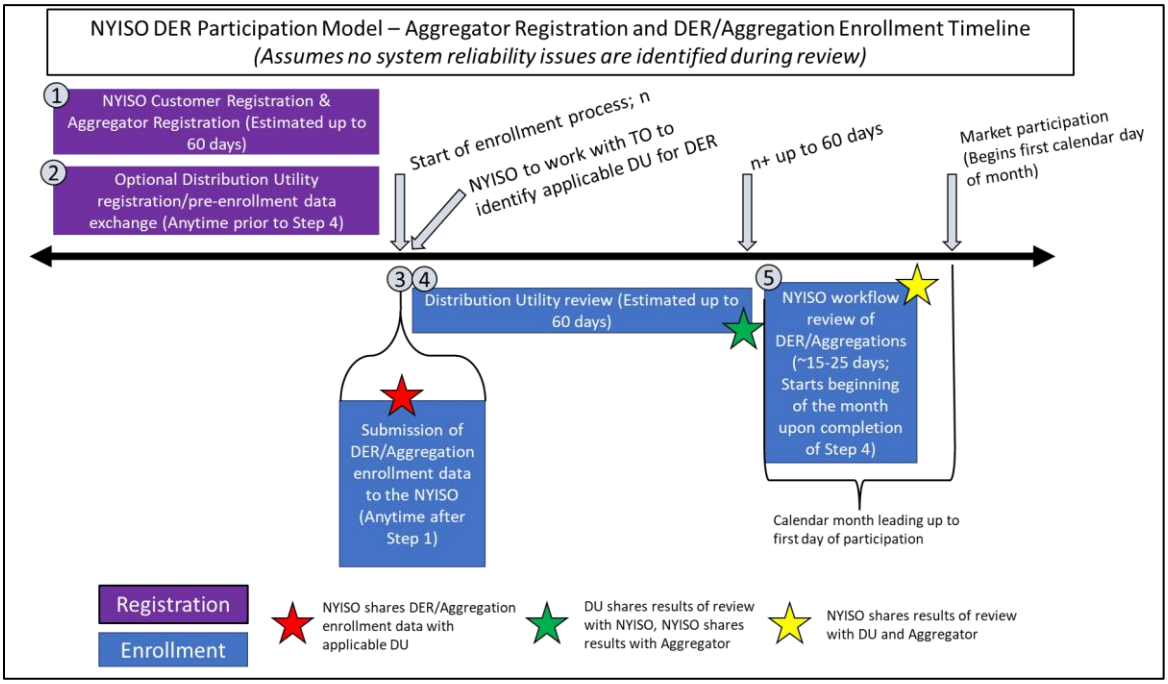
An existing Generator that is an ICAP Supplier may transition to the DER program without missing a month of Capacity market participation, provided that the applicable Generator must have an approved in-period DMNC rating. When a Generator with an approved in-period DMNC rating enters an Aggregation to become a Distributed Energy Resource, the maximum ICAP that an Aggregator can declare for the Distributed Energy Resource shall be the minimum of the Generator's approved in-period DMNC rating and the Generator's Capacity Resource Interconnection Service ("CRIS"). After completion of an in-period DMNC test, typically within the first month of participation, the Aggregation may be subject to penalties for any amount of oversold capacity. See Services Tariff Section 5.12.13.1.

Transitioning out of the DER participation model

Resources that are enrolled in the DER participation model and actively participating in an Aggregation may elect to separate from the DER model to participate as a stand-alone Resource. It is important to note that all applicable rules must be followed, including a minimum size of 1 MW for injection-only generators and 100 kW for ESRs and SCRs. The Aggregator is required to notify NYISO Customer Registration of the intent to transition from the DER program to another program prior to initiating the removal process. After the NYISO has been notified, the Resource will be able to proceed with registering for the new program, consistent with existing processes.

4.4. Enrollment Review of DER

Figure 6: Registration and Enrollment timeline



4.4.1. Optional Distribution Utility Registration/Pre-Enrollment Data Exchange

Prior to engaging in the NYISO's enrollment and registration process, Aggregators may exchange information and data with a DER's applicable Distribution Utility (DU) in order to support its enrollment of DER with the NYISO. This pre-enrollment process is not required. During this process an Aggregator may seek to verify the data contained in an Interconnection Agreement (if applicable) based on the DU's records. This pre-enrollment communication can aid in expediting the NYISO enrollment process. The Aggregator must submit Transmission

Owner confirmation of the Transmission Node for each DER upon import to the Aggregation System, as described in the Aggregation System User's Guide - the applicable Transmission Owner to whose Transmission Node the DER electrically maps shall confirm that the DER is connected to the correct Transmission Node, pursuant to Services Tariff Section 4.1.10.2. For details on what potential system access or information may be available, please contact the applicable DU. A list of contacts for select Distribution Utilities are available on the NYISO's public website at the following: (Distributed Energy Resources (DER) - NYISO).

4.4.2. Distribution Utility DER Review

Distribution Utilities will have the opportunity to evaluate the safety and reliability impact(s) each DER and group of DERs may have on the utility's electric facilities. See Services Tariff Section 4.1.10. As described in this section, Aggregators will be responsible for submitting all requested DER and Aggregation physical and operational data to the NYISO, which will verify that all required information has been provided. The NYISO and Aggregator will consult with the applicable Member System, if necessary, to identify the DU(s) (including municipal electric utilities) responsible for reviewing the DER in an Aggregation. The NYISO will provide the Member System and identified DU(s) with all DER and Aggregation physical and operational enrollment data supplied by the Aggregator. Once the appropriate DU(s) is identified for each individual DER within an Aggregation, the DU will be responsible for evaluating the reliability and safety impacts of DER directly connected to its electric facilities. Aggregator, Transmission Owner, DU, and NYISO responsibilities related to the DU review process are described below.

Aggregator Responsibilities

An Aggregator must provide to the NYISO all Aggregation-specific, and individual DER-specific information identified in the Aggregation System User Guide prior to each DER's enrollment. The Aggregator must receive written confirmation of each DER's applicable Transmission Node, which shall be submitted to the NYISO contemporaneously with the DER's enrollment materials. The NYISO requires any change to DER or Aggregation-specific enrollment data to be submitted to the NYISO Aggregation System, however only "material" changes shall be subject to review by the applicable DU. NYISO will share updated non-material enrollment data with the applicable DU for administrative visibility. When there is a material change to a DER or Aggregation's physical or operational characteristics, the applicable DU will review the safety and reliability impact(s) of the change, if any. This will enable the applicable DU to evaluate the safety and reliability impact of individual DER and Aggregations on its distribution system as individual DER and Aggregations evolve.

A 'material change' to a DER or Aggregation is any change to the physical and operating characteristics as identified in the Aggregation System User's Guide. A comprehensive list of all data attributes that, when modified, require a supplemental DU review can be found in the Aggregation System User's Guide. Non-material changes, such as changing a phone number, are administrative in nature and are not expected to have operational impacts. The NYISO will review non-material changes to DER and Aggregations and share the updated enrollment data with the applicable DU for administrative visibility. An Aggregator must always ensure that changes submitted to the enrollment information for a particular DER are in compliance with the applicable interconnection agreement, pursuant to Services Tariff Section 4.1.10.

The Aggregator must upload enrollment information using the import instructions described in the Aggregation System User's Guide. All imports to the NYISO's Aggregation System must be in Microsoft Excel (.xlsx) file format, using the template provided by the NYISO available within the Aggregation System. The Aggregator shall submit changes to DER enrollment data to the NYISO's Aggregation System based on the results of the DU review as soon as practicable after receipt of DU review results from the NYISO.

During the DU review, the Aggregator may be required to provide additional supplemental information to the DU to support the review process and must provide the requested information as necessary. Services Tariff Section 11 contains the NYISO's Dispute Resolution Procedures. These procedures, both formal and informal, are available to parties having a dispute under the ISO's Services Tariff and OATT, the ISO Procedures, or any Agreement entered into under either Tariff. Entities that seek to enroll a DER or Aggregation for participation in the NYISO's participation model will be able to utilize these procedures to resolve related concerns arising under the market rules under the Services Tariff and OATT.

Transmission Owner Responsibilities

The Transmission Owner shall confirm the Transmission Node for each DER and provide written documentation to the Aggregator upon request. To the extent that an Aggregator identifies the incorrect Transmission Node for a particular DER, the TO shall inform the Aggregator of the discrepancy, as defined above in Section 4.4.1 detailing the "Optional Distribution Utility registration/pre-enrollment data exchange."

The TO shall communicate with the NYISO to aid in identification of the appropriate DU for each DER upon request by the NYISO. The NYISO will not share DER enrollment data with a DU

until the identity of the correct Distribution Utility to whose facilities the DER electrically maps is known.

A Distribution Utility may coordinate with the applicable Transmission Owner to support the reliability and safety review of DER, which may impact the Transmission system. The TO does not have review authority of DER, nor will the TO communicate with the NYISO regarding review results, as this remains the responsibility of the applicable DU.

NYISO Responsibilities

Once the Aggregator's data upload is complete, the NYISO will confirm completeness of the enrollment data in the Aggregation System – this validation occurs automatically upon import to the System and returns error messages to the extent that a given data attribute is incorrectly formatted, inappropriate characters are used, data length fields are exceeded, or the information is otherwise incomplete. The NYISO's evaluation does not ensure accuracy of all data provided. Upon successful submission to the Aggregation System of all enrollment information, the NYISO will conduct a manual export of the data provided by the Aggregator to produce a Microsoft Excel (.xlsx) file that will be provided to the applicable DU. The NYISO's export and sharing of enrollment data will occur upon successful import and completeness confirmation. The DU will receive notification that the information has been shared.

The NYISO will send the results of each DU review to the applicable Aggregator. The Aggregator and DU shall coordinate as necessary to resolve safety and/or reliability concerns identified by the DU's review. The Aggregator shall submit any DER or Aggregation physical and operating data changes to the NYISO's Aggregation System, which shall remain the official data repository and must always reflect changes or modifications as a result of the deliberations between the Aggregator and DU. Aggregators must re-submit DER enrollment data to the NYISO's Aggregation System after resolving safety and/or reliability concerns, which will initiate the review process again.

Distribution Utility Responsibilities

The DU to whose electric facilities a DER maps will receive the Aggregator's submitted data, including the physical and operational data identified in the Appendix of the Aggregation System User's Guide that is applicable to a given Aggregation and the DER facilities within that Aggregation. The DU is expected to begin its safety and reliability review once the data has been transmitted by the NYISO. The DU may require the Aggregator to provide additional

information during this time to supplement the information gathered in the NYISO's Aggregation System.

The DU is responsible for communicating the outcome of the review to the NYISO using a standard attestation template, which will require the DU to articulate the results of the review, either in the form of an approval, or a denial accompanied by the reason for denial and required mitigation to resolve the safety or reliability issue(s) identified. The DU's review shall verify that the operating characteristics of the DER and Aggregations comply with NYISO and/or Distribution Utility metering configurations, do not violate existing interconnection agreements, and otherwise do not cause safety and reliability concerns. Please refer to Services Tariff Section 4.1.10 for the NYISO requirements associated with the DU review process. It is anticipated that Distribution Utilities will complete their safety and reliability review and provide the results of that review to the NYISO within 60 calendar days, but the 60-day review period is a recommended maximum amount of time, and DU review may take longer in practice. If the DU finds DER/Aggregation information to be incomplete or inaccurate, it will notify the NYISO as soon as practicable, which notification will terminate the review period. A new review period will begin when the Aggregator resubmits the enrollment data to the NYISO's Aggregation System.

If the DU does not identify any safety or reliability issues, the DER and Aggregation will move on to a final review by NYISO staff before beginning market participation on the first day of the month following completion of the NYISO's review. However, if one or more safety or reliability issues is identified during the DU review period, the DU is responsible for notifying the NYISO via the applicable form, which the NYISO would then provide to the Aggregator. The Aggregator is responsible for initiating communications with the DU to resolve the identified concerns and resubmitting its application as appropriate through the NYISO. Upon learning that safety and reliability issues have been identified by the DU, the NYISO will perform the 'unsubmit' function, as described in the Aggregation System User's Guide, for the Aggregation in the Aggregation System. Unsubmitting a DER and/or Aggregation removes the DER/Aggregation from its previous status of 'Submitted,' allowing the Aggregator to make adjustments to the enrollment data to mitigate the concerns identified by the DU as needed. It is the responsibility of the Aggregator to then resubmit all DER physical and operating data, including changes where necessary, to the Aggregation System.

If the Aggregator wishes to proceed with enrollment of the Aggregation, then the Aggregator must 1) correct the issues identified by the DU, and 2) re-submit to the Aggregation System the

enrollment data record for each Aggregation for which a safety and/or reliability issue was identified by the DU. The review process of the revised Aggregation will begin at that time, with the NYISO transmitting revised data to the applicable DU for re-review. As noted above, the subsequent review restarts the 60-day timeline; however, the DU will make a best effort to expedite the subsequent review process. This process may iterate, if necessary, but a DER, or if necessary, an Aggregation will not be permitted to begin operating in the NYISO-administered wholesale market until the DU verifies that the operation of that Aggregation would not cause any safety or reliability issues.

4.4.3. NYISO Enrollment Process

The DER enrollment process includes a 30-day NYISO review period immediately preceding the targeted month of DER participation. This process starts after all safety and reliability issues identified by the DU are resolved. The NYISO will review several aspects of each DER and Aggregation, including but not limited to:

a. Evaluation of Energy/Capacity Limitations (ELR/CLR Resources)
b. Telemetry communication establishment for individual Aggregations
c. Review of proposed market services (Energy, Ancillary Services, etc.)
d. MW declarations – Injection, Withdrawal, and Demand Reduction
e. Load reduction plan, if applicable
f. Proposed alternative telemetry mechanism(s)
g. Ancillary services verification test preparations
h. Documentation of DU review of DER

The NYISO will complete 1) review and approvals of each DER and the total Aggregation to operate in the market, and 2) configuration and testing of the telemetry communication channels necessary from the Aggregator to the TO to the NYISO, and directly between the Aggregator and the NYISO if the Aggregator chooses parallel communications to the TO and NYISO. At the conclusion of this enrollment review period, assuming the review is successful, the Aggregation and all associated DER will be successfully enrolled in the NYISO market, with the DER effective start date being the first of the month following the month in which the NYISO concludes its review. Aggregators will receive a notification that the status of the DER and Aggregation will become 'Enrolled' effective on the applicable date. The DU will also receive notice from the NYISO of enrollments for the coming month at the end of the review period.

4.5. Aggregation and DER Facility Management

After an Aggregation and DER are enrolled in the NYISO market, an Aggregator may modify the characteristics of the Aggregation or DER. Such modifications may include but are not limited to: increasing or decreasing MW capabilities, modifying the Ancillary Service(s) the Aggregation is eligible to provide, entering into or withdrawing from capacity market participation. Fundamentally, these types of modifications are completed through the 'Update' of the Aggregation or facility enrollment records as described in the Aggregation System User's Guide.

An Aggregation may not change participation model type in the Aggregation System. An Aggregator must instead create a new Aggregation and move the applicable DER facilities to that new Aggregation. The functionality that supports this process is featured in the Aggregation System User's Guide.

An Aggregator may also change the composition of an Aggregation. An Aggregator may add a new DER facility to an Aggregation by associating the applicable Aggregation ID with the DER facility enrollment record in the Aggregation System. An Aggregator may remove a DER facility from an Aggregation by removing the Aggregation ID from the DER facility enrollment record, thereby disassociating the Aggregation and DER data. The Aggregator may remove a DER facility from one Aggregation, and then add the DER facility to a different Aggregation.

Modifications to DER or Aggregation data attributes that are considered 'material' (see Appendix to the Aggregation System User's Guide) are subject to a safety and reliability review by the applicable DU. Attributes that are considered to be 'non-material' can be updated and changed as needed without going through a DU safety and reliability review. Please refer to the Aggregation System User's Guide for further details.

The Aggregator also has the ability to separate an Aggregation from the markets, which withdraws the Aggregation from all market participation effective at the beginning of the next calendar month. Aggregation separation is not subject to review and approval by the NYISO or DU. Aggregators will be responsible for all existing obligations of its Aggregations such as penalties, existing bids, or schedules. The NYISO may separate an individual DER or an Aggregation from market participation when, among other reasons, necessary to maintain reliability, remedy enrollment errors, and when the NYISO identifies noncompliance with its tariffs. The NYISO will communicate with the applicable Aggregator in advance of separation. Changes to the composition of an Aggregation will become effective at the beginning of a calendar month. Pursuant to Services Tariff section 5.12, a DER may switch from one

Aggregation to a different Aggregation on a monthly basis. DER facilities whose capability has contributed to an Aggregation's UCAP in a given Capability Year are subject to additional Aggregation switching requirements. Please refer to the ICAP Manual section 4.1.3 for detailed requirements for DER switching between Aggregations.

A DER that switches from one Aggregation to a different Aggregation must be removed from the original Aggregation and enrolled in the new Aggregation by the respective Aggregator(s). If a DER moves from one Aggregation to another Aggregation, and both Aggregations are managed by the same Aggregator, the Aggregator can complete this update for each Aggregation in the Aggregation System. If the two Aggregations are managed by different Aggregators, the Aggregators must coordinate this update with the resource to ensure that the DER is not added to the new Aggregation prior to being removed from the original Aggregation.

A DER whose capability has not contributed to an Aggregation's UCAP in a given Capability Year may switch Aggregations monthly, subject to DU review and NYISO enrollment review as detailed in Section 4.4 of this Aggregation Manual and Services Tariff Section 4.1.10.3. When the transition of a DER from one Aggregation to another necessitates a change in the 'type' of one or both Aggregations (e.g., a Demand Side Resource joins a Generator Aggregation, which must then become a DER Aggregation), the Aggregator is responsible for submitting a new Aggregation with a new Aggregation ID to effectuate this change. If a DER's transition does not change the type of an Aggregation (e.g., a battery moving from one ESR Aggregation to a different ESR Aggregation), the Aggregator is not required to create a new Aggregation under a new Aggregation ID. For further details regarding the enrollment process and applicable attributes, please refer to the Aggregation System User's Guide.

5. Transmission Nodes

A Transmission Node is a point on the NYS Transmission System at which Locational Based Marginal Prices ("LBMP") will be calculated for Aggregations. Transmission Nodes reflect a collection of designated load buses on which individual DERs are located and may participate together in an Aggregation. The NYISO DER and Aggregation participation model requires that individual DERs be mapped to a Transmission Node. The NYISO's Security Constrained Unit Commitment, Real-Time Commitment and Real-Time Dispatch software will calculate a LBMP for each Transmission Node. Each Aggregation located at a Transmission Node will be settled at the applicable Transmission Node LBMP. The Transmission Node LBMP shall be calculated consistent with the Services Tariff Section 17 bus calculation method.

Transmission nodes will also facilitate securing the transmission system by providing points at which dispatch may provide relief from a constraint.

Each DER shall be assigned to a single Transmission Node. An Aggregation may only comprise DERs assigned to the same Transmission Node.

5.1. Identification

The NYISO shall identify each Transmission Node in consultation with the Member System in whose service territory the Transmission Node is located within the NYCA.

Transmission Nodes are selected from the NYCA Load Nodes modeled by the NYISO. Transmission Nodes are selected such that all Load Nodes of an associated Member System can be associated to a Transmission Node of the same Member System. The NYISO, in consultation with each Member System, shall consider the transmission and distribution system topology and distribution load characteristics of the Member System service territories when identifying each Transmission Node. Each Member System service territory shall have at least one identified Transmission Node within each Load Zone that is partially or wholly contained within its service territory.

5.1.1. Member System Topology Considerations

The distribution system topology considerations identified below, along with each Member System's use of good utility practices, will guide Transmission Node identification. The topology of each Member System is unique and therefore not all factors may apply. Additional factors may also be considered as distribution systems change.

1. Transmission and/or distribution load pockets
2. Thermal limits of lines and protective equipment

3. Boundaries between Transmission Districts
4. Concentration of load relative to total average system load
5. Distribution area substation topology

Transmission Nodes shall be named for the substation of the identified Load bus along with the voltage class of the station.

5.1.2. Active Transmission Node List

The list of Transmission Nodes is publicly posted under "General Information" at https://www.nyiso.com/reports-information.

5.2. Transmission Node Changes

The NYISO and Member Systems will evaluate the factors identified in Section 3.1.1 above to determine whether the set of Transmission Nodes should be modified. The NYISO may add Transmission Nodes when there is a change in the underlying system topology within the electrical area that requires dividing the electrical facilities behind a single Transmission Node into two (or more) Transmission Nodes. Additional Transmission Nodes will be identified if DER penetration impacts either transmission or distribution grid operations. Two or more Transmission Nodes may be consolidated to a single Transmission Node when the NYISO and applicable Member System determine that underlying system conditions have changed such that the existing Transmission Nodes are no longer needed to represent the system's electrical characteristics.

The NYISO shall publicly post all changes to the list of Transmission Nodes and provide stakeholders with an explanation of all such changes.

5.2.1. Transmission Node Change Timeline

The NYISO will annually review the identified Transmission Nodes with each Member System to determine whether changes are necessary. The results of the annual review will be published at least 90 days prior to the beginning of the Capability Year and effective on the first day of the capability year.

As mentioned above, the NYISO will publicly post all changes to the identified Transmission Nodes. Affected Aggregators shall also be notified as described in the Aggregation System User Guide. In the event of any change to a Transmission Node, affected DER will be separated from the applicable Aggregation(s).

5.3. DER Designation to a Transmission Node

The applicable Member System for the territory to which the DER is interconnected will designate the appropriate Transmission Node for the DER.

The Member System will designate a Transmission Node for a DER where, based on the best electrical engineering judgement available to the Member System, the DER's impact to the Bulk Electric System is most apparent during an analysis under Normal Operating conditions as determined by the Member System. A DER will be assigned to a Transmission Node in the Load Zone to which it is electrically connected.

Aggregators should request any additional information regarding the mapping of Transmission Nodes from the applicable Member System.

5.3.1. DER Transmission Node Designation Changes

Changes to system topology or operational practices may impact the analysis of the Transmission Node to which a DER is designated. The Member System and the NYISO may redesignate a DER to a new Transmission Node during the Transmission Node change timeline described in section 3.2.1.

The Member System and Aggregator may also work to designate a DER to a different Transmission Node outside of the Transmission Node change timeline.

5.4. Transmission Node Operations

Aggregators must reflect Distribution system changes and outages, and Transmission System outages in their Bids. Aggregation schedules produced by SCUC, RTC, and RTD will not automatically account for Distribution system changes and outages, or Transmission system outages of facilities. Aggregators shall also adjust the Aggregation's operating plans to reflect the impact of each DER affected by electrical outages as a derate on the capability of the Aggregation as described in Section 6: Operational Coordination.

The NYISO's market software will continuously calculate an LBMP for each Transmission Node regardless of the operating status of the substation to which the Transmission Node is associated.

The Aggregator shall reflect their Aggregation's availability through market bids/offers based on the current conditions of the Distribution/Transmission system.

5.5. Aggregator Responsibilities

Aggregators will work with the applicable Member System to determine the ISO-identified Transmission Node to which each individual DER is connected. The Aggregator will initiate this process with the applicable Transmission Owner and the Aggregator is responsible for certifying their Aggregations and each associated DER are designated to the correct Transmission Node.

After the ISO modifies the list of Transmission Nodes, the Aggregator may re-enroll affected DERs in a new Aggregation utilizing the applicable Transmission Node. Aggregations assigned at an inactive Transmission Node will be retired and the Aggregator shall buy-out of any existing market obligations.

Any disputes arising out of the designation of a DER to a Transmission Node shall be resolved pursuant to Services Tariff Section 11.

6. Operational Coordination

The NYISO, Aggregator, applicable Transmission Owner and Distribution Utility shall coordinate scheduling and dispatch for all Distributed Energy Resources participating in the NYISO-administered markets as part of an Aggregation. Aggregations are 'dispatch-only', meaning they do not submit commitment parameters (e.g., minimum run-time and start-up costs) and will be treated as always available for dispatch, consistent with their Bids. The coordination protocols established in this Section 2 describe required data exchanges, roles and responsibilities of the parties, and the coordination processes applicable to Aggregation participation in the Day-Ahead Market and Real-Time Market. An Aggregator should contact the applicable utility representative for further information on Distribution Utility and Transmission Owner communications and coordination.

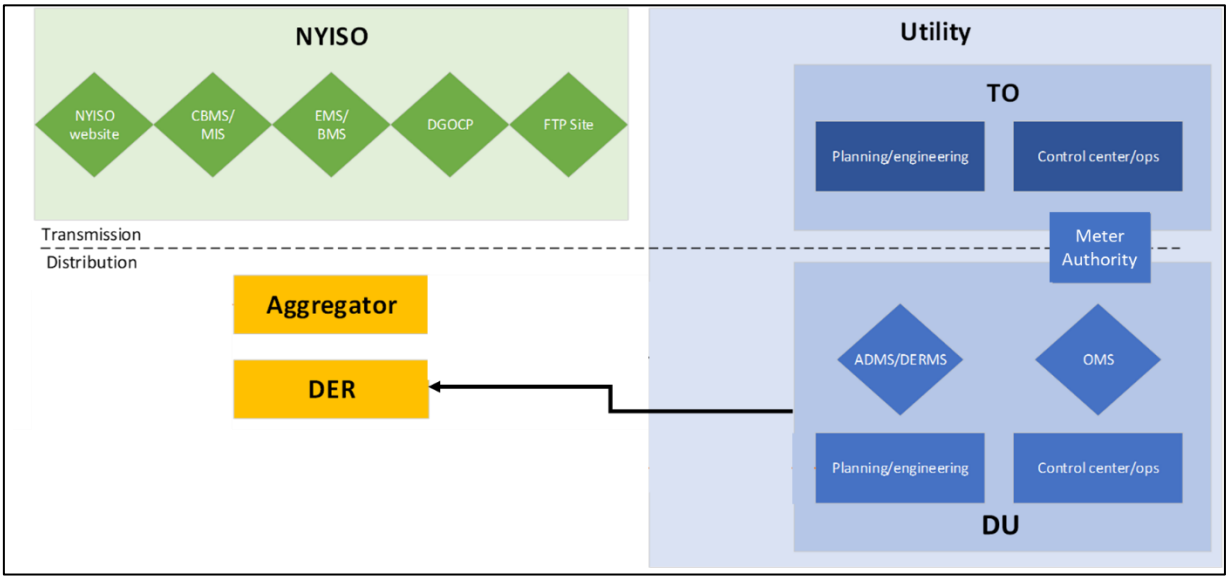
Note: For the Purposes of this Aggregation Manual, the term 'distribution utility' means the electric utility that owns and operates a distribution system in the NYCA (including municipalities, LIPA, and electric cooperatives) connecting the NYS Transmission System to retail customers.

6.1. Operating Data Exchange

6.1.1. Planned Distribution System Maintenance

The Distribution Utility shall notify a DER when planned distribution system changes are expected to affect the DER's operation. The Distribution Utility may also notify the Aggregator associated with each affected DER but is not obligated to do so. This combination of notified parties is referred to as "DER/Aggregator" through the remainder of this Aggregation Manual. Planned distribution system changes are defined as any activity that results in an abnormal distribution circuit configuration. Changes may also include distribution system derates or outages due to routine maintenance, scheduled repairs, or other anticipated events that impact the operation or deliverability of an individual DER. The Distribution Utility must notify the DER/Aggregator of all planned distribution system changes that the Distribution Utility anticipates could impact the operation or deliverability of an individual DER or an Aggregation by 3PM two days prior to the day of dispatch (Figure 7). Day-Ahead Market bids for Aggregations shall reflect distribution system conditions.

Figure 7: Planned distribution system maintenance communication

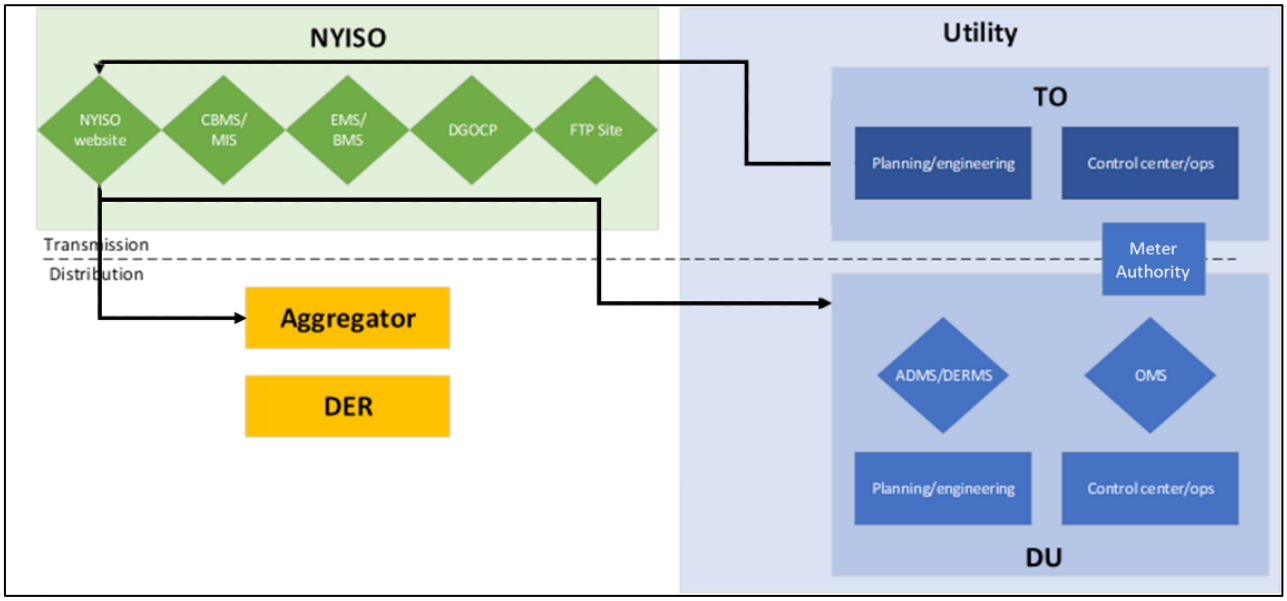


If a planned distribution system change causes a full or partial derate to a DER that will be included within an Aggregation's operating plans, the Aggregator shall reflect the impact of that derate in the Aggregation's Day-Ahead and Real-Time Market bids and shall adjust the Aggregation's operating plans to reflect the impact of each DER affected by such a derate on the capability of the Aggregation.

6.1.2. Planned Transmission System Maintenance

All Transmission System outage information that are approved by the NYISO are publicly available at https://www.nyiso.com/power-grid-data under the 'Outage Schedule' page (Figure 8).

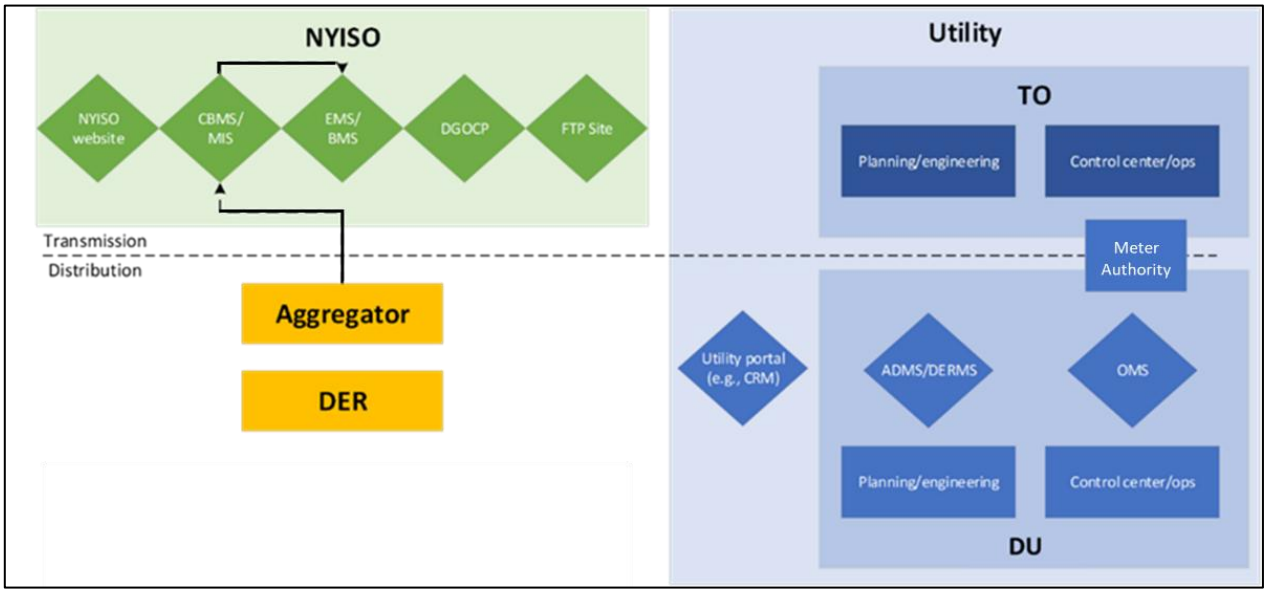
Figure 8: Transmission System outage information availability



6.1.3. Day-Ahead and Real-Time Market Bids

An Aggregation is a type of Resource, and all bidding obligations apply to the Aggregator and Aggregation, not to the individual facilities comprising the Aggregation. Aggregators and Aggregations will be subject to the NYISO's bidding and scheduling rules applicable to all Resources except where noted (Figure 9).

Figure 9: Aggregator Day-Ahead and Real-Time bid submission



This subsection identifies certain bidding and scheduling requirements specifically applicable to Aggregators and Aggregations. Aggregators are not required to disclose their Bids to a Transmission Owner or Distribution Utility.

Aggregations will be scheduled consistent with their Bids and capabilities, consistent with the treatment of other Resources in the NYISO markets. Aggregations will be eligible to set prices for the services for which they are scheduled and subsequently dispatched. Both Day-Ahead and Real-Time Market Locational-Based Marginal Price (LBMP) will be calculated for each Transmission Node (See Section 5 of this Aggregation Manual for additional information about Transmission Nodes).

If an Aggregation contains at least one Withdrawal-Eligible Generator (WEG) (e.g., a battery) and seeks to use another Generator in the Aggregation to self-supply some or all of the energy for charging of the WEG(s), each point of the Aggregation's Bid Curve (or, for a Self-Committed Fixed Bid, the Aggregation's Bid) must reflect the net of Energy injections and Energy withdrawals for the bidding increment. Therefore, when an Aggregation's fixed Bid reflects a net injection, the Aggregator shall Bid to supply Energy only for the net MWs it intends to inject onto the grid. Conversely, when an Aggregation's fixed Bid reflects a net withdrawal, the Aggregator shall Bid to withdraw Energy only for the net MWs it intends to withdraw from the grid (Refer to Figure 10). An Aggregation that is offering flexibly may offer an incremental bid curve that reflects the total capabilities of the Aggregation, including the range of withdrawal and injection (Figure 11).

Aggregators are permitted to balance the response of each DER within an Aggregation to meet the NYISO dispatch signal. For example, an Aggregation containing one 5 MW battery and one 4 MW generator offers into the NYISO energy market and is scheduled to withdraw 1 MW in a given interval. The battery may withdraw 5 MW while the generator injects 4 MW, resulting in a net response of -1MW. In this example the Aggregation would be settled as 1 MW of energy withdrawal during the interval (Figure 10).

Figure 10: Aggregation Fixed Bidding Example

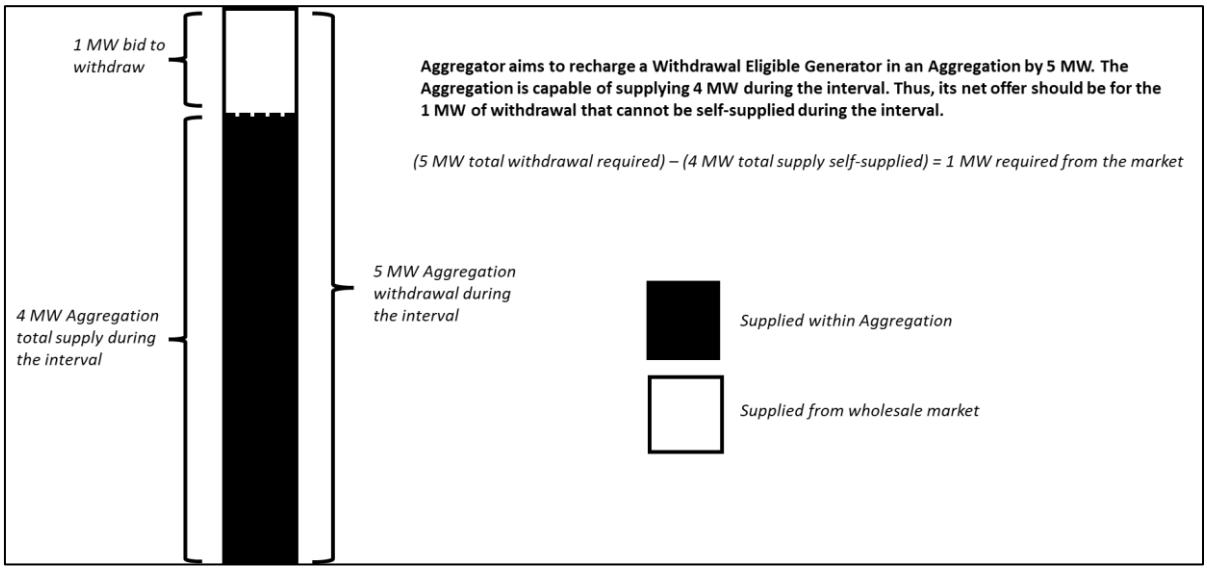
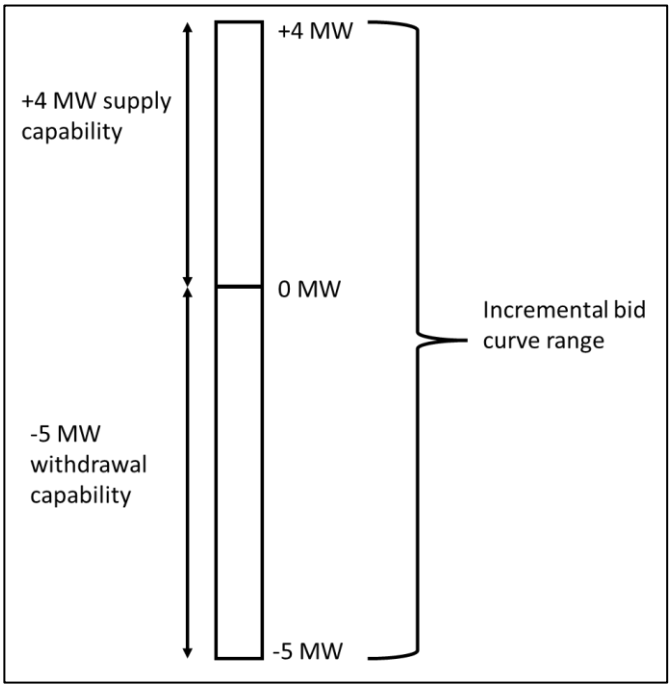


Figure 11: Aggregation Flexible Bidding Example



Aggregators must select a bid mode for each Bid. Certain bid modes are only available to specific Aggregation types, consistent with the rules applicable to the participation model of the Aggregation, as described in Figure 12.

Figure 12: Available Aggregation Bid Modes

Aggregation Type	Bid Mode(s) Available
DER	Self-Committed-Fixed/Flexible
ESR	ISO-Committed-Flexible, Self-Committed-Fixed/Flexible
LESR	ISO-Committed-Flexible
Generator	Self-Committed-Fixed/Flexible
Wind	Self-Committed-Fixed/Flexible
Solar	Self-Committed-Fixed/Flexible
Landfill Gas	Self-Committed-Fixed/Flexible

A homogeneous, single Resource type Aggregation shall comply with the bidding requirements of that particular Resource type, per existing NYISO tariffs and procedures. For example, an Aggregation comprising only of Energy Storage Resources must submit Bids consistent with the rules applicable to Energy Storage Resources (see NYISO's Market Participant User's Guide).

Day-Ahead Market Bids

Aggregators submitting Day-Ahead Market bids for an Aggregation shall submit Bids in accordance with Section 4 of the Market Services Tariff and the Day-Ahead Scheduling Manual. An Aggregation that is an Installed Capacity Supplier must also comply with the scheduling, bidding, or notification requirements identified in Market Services Tariff Sections 5.12.1.6, 5.12.1.10, and 5.12.7.

Real-Time Market Bids

Aggregators submitting Real-Time Market Bids for an Aggregation shall submit Bids in accordance with Section 4 of the Market Services Tariff and the Market Participant User's Guide. Real-Time Market Bids for an Aggregation that includes Demand Reductions are subject to the Monthly Net Benefit Threshold (see Market Services Tariff Sections 4.4.1.2 and 4.5.7.).

Monthly Net Benefit Threshold

The NYISO shall perform the Net Benefits Test for each month in accordance with Section 4.5.7.1 of the Services Tariff and post the Monthly Net Benefit Threshold ("MNBT") by the 15th of the preceding month. The MNBT prices and a detailed stepwise description of the Net

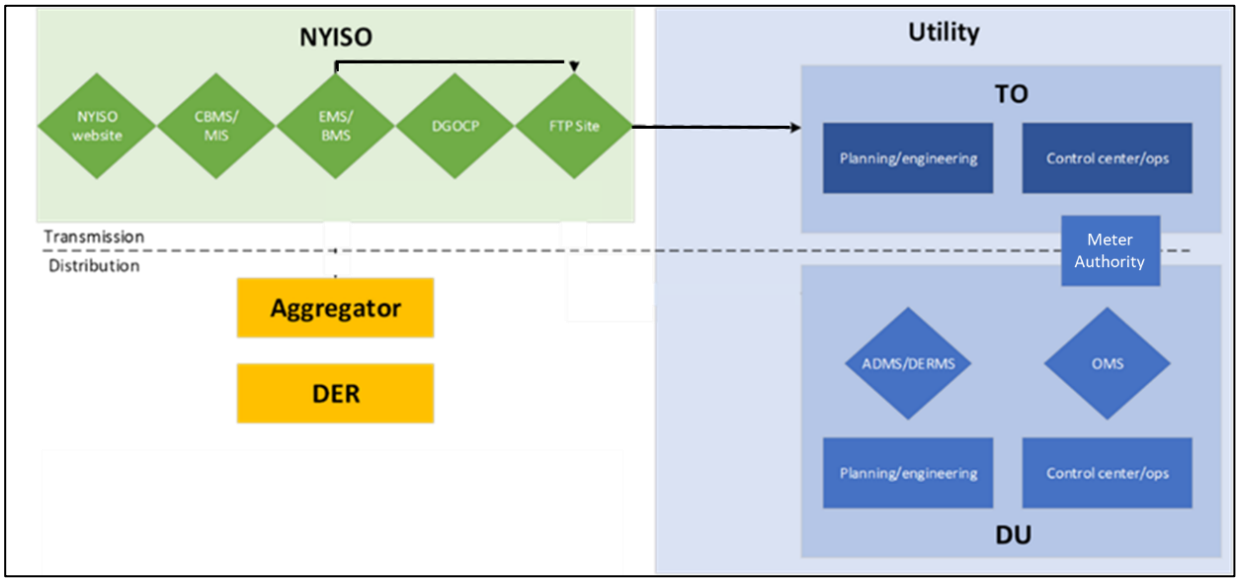
Benefits Test is available on the NYISO's website at: https://www.nyiso.com/demand-response.

Demand reductions by Demand Side Resources within an Aggregation are compensable when the Real-Time LBMP exceeds the MNBT, except where otherwise noted in Services Tariff Section 4.5.2.1. An Aggregation may offer into the Day-Ahead Market or Real-Time Market below the MNBT, however any Demand Reductions performed when the applicable LBMP is below the MNBT shall not be compensated, except where otherwise noted in Services Tariff Section 4.5.2.1.

6.1.4. Day-Ahead Operating Plan

Per existing market processes, the NYISO shall issue the Day-Ahead Operating Plan (DAOP) reflecting the schedules of Aggregations (not each DER). The DAOP shall be made available to the Transmission Owner via existing NYISO procedures (Figure 13).

Figure 13: Day-Ahead Operating Plan communication

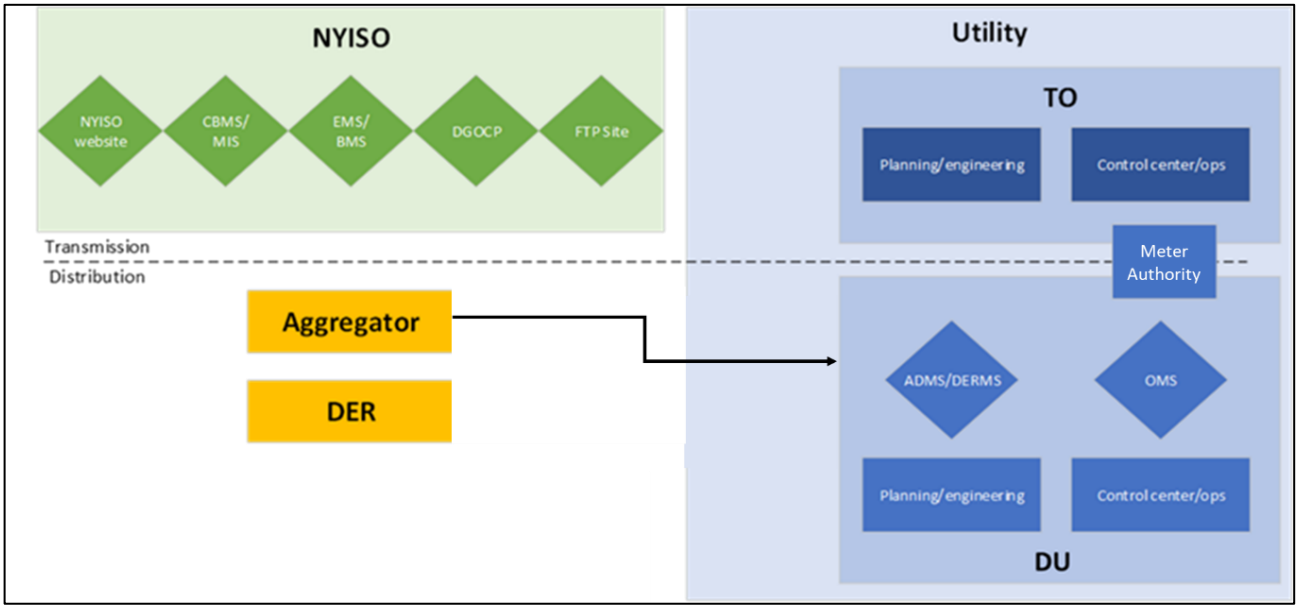


Transmission Owner users are required to obtain the necessary privileges and access to request the DAOP through an encrypted web-based API, as the information is classified as CEII – Please contact NYISO Stakeholder Services for details on obtaining access at the following link: https://www.nyiso.com/support. Aggregators and Distribution Utilities will not have access to the DAOP.

6.1.5. Individual DER Schedule Review and Notice

The Aggregator shall provide the planned schedules for each DER within its portfolio to the applicable Distribution Utility so that the Distribution Utility can verify that each DER or Aggregation's schedules do not impact the safety and reliability of the distribution system (Figure 14).

Figure 14: Individual DER schedules communication to the applicable DU

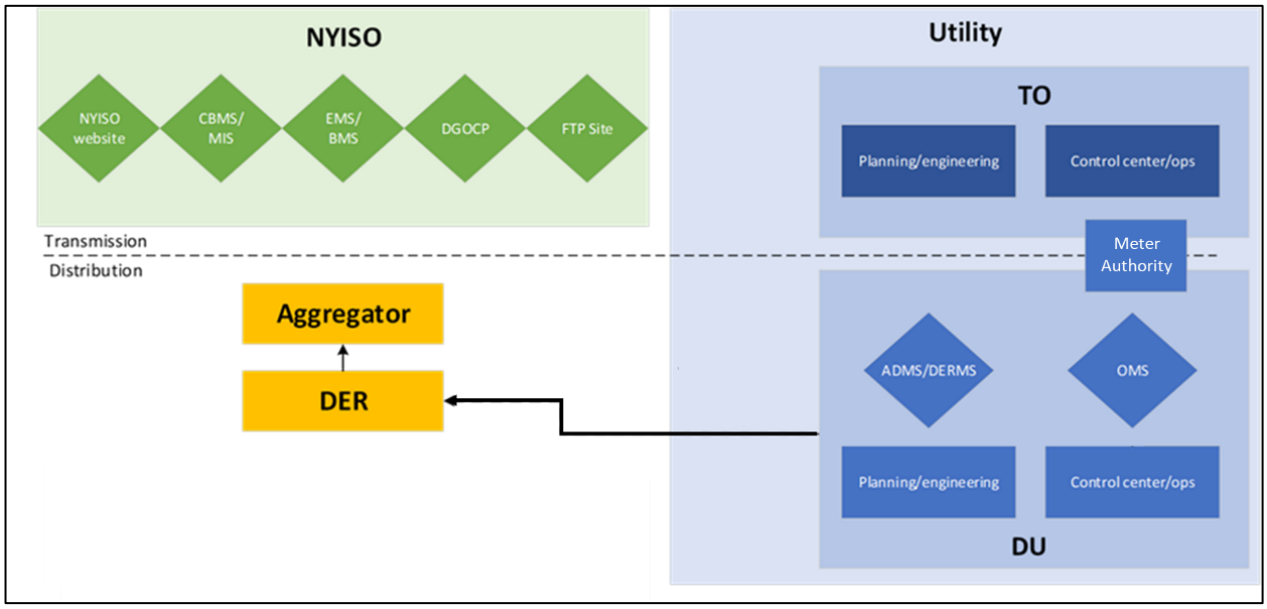


The Distribution Utilities shall communicate any identified reliability or safety concerns to the DER/Aggregator consistent with Section 2.2.1. Communication Between Distribution Utility and Aggregator.

6.1.6. Unplanned Distribution System Conditions

On an ongoing basis, the Distribution Utility will provide notification (utilizing existing communication practices) to the DER/Aggregator of any unforeseen conditions on its distribution facilities, actual or anticipated, that the Distribution Utility determines would impact the operation or deliverability of each DER (Figure 15).

Figure 15: Unplanned Distribution system conditions communication

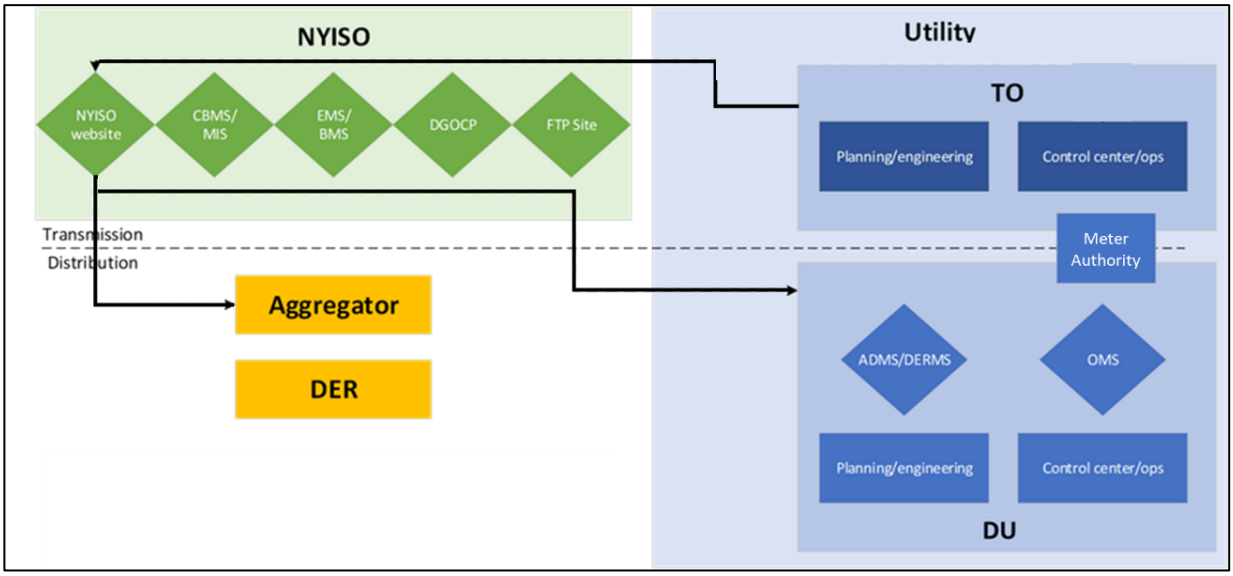


Distribution system conditions are not required to be reported to the NYISO; rather, the Aggregator should adjust bids/offers for Aggregations to appropriately respond to any service interruptions when possible. If adjustment is not feasible based on the conditions, the Aggregator must report a full or partial outage for the Aggregation using the NYISO's Grid Operations Coordination Portal (GOCP).

6.1.7. Unplanned Transmission System Conditions

On an ongoing basis, the Transmission Owner will provide notification (utilizing existing communication practices) to the Aggregator, NYISO, and applicable Distribution Utility of any emerging conditions on the transmission system, actual or anticipated, that would impact the operation or deliverability of each DER (Figure 16).

Figure 16: Unplanned Transmission system conditions communication

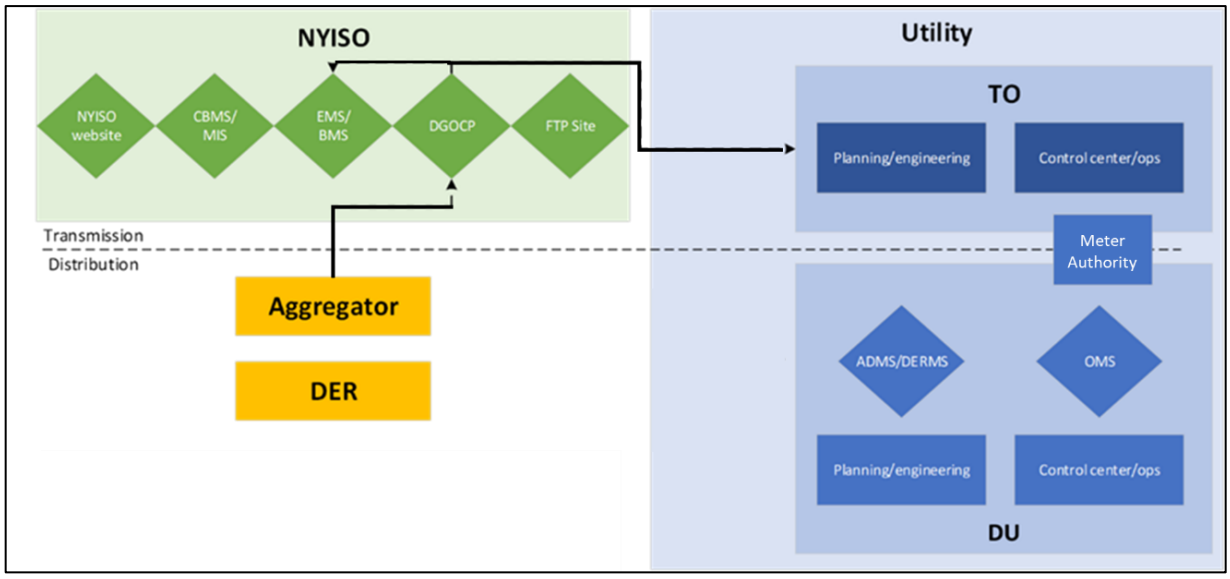


All Transmission System outage information is publicly available at https://www.nyiso.com/power-grid-data under the 'Outage Schedule' page.

6.1.8. Outage Reporting

On an ongoing basis, the Aggregator will submit forced outage and planned outage notifications to the NYISO. The Aggregator is responsible for submitting outage information, both planned and unplanned, for all Aggregations in its portfolio (Figure 17).

Figure 17: Outage reporting communication



Individual DER outages should not be reported to the NYISO. As described in Outage Scheduling Manual Section 3.2.1, planned outages must be reported to the NYISO as soon as practicable. The submission of outage data to the NYISO does not automatically modify Bids or offers that may be impacted by those outages; the Aggregator is responsible for modifying Bids and offers based on outage information separately.

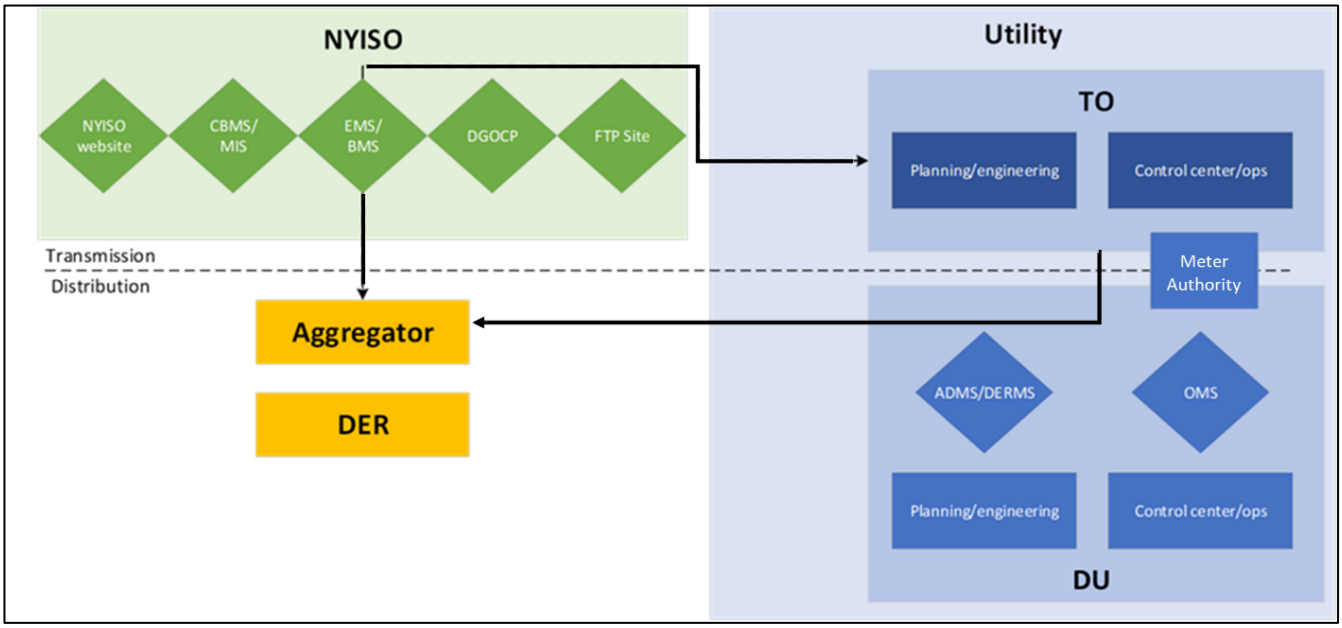
An Aggregator must notify the NYISO of Forced Outages that affect an Aggregation's ability to meet its schedule. See Section 3.2.4 Forced Generator Outages (Full or Partial) of the Outage Scheduling Manual. To the extent that an Aggregation can utilize one or more DERs not included in its operating plan as replacement for any one or more DERs that are fully or partially derated, the Aggregator is not required to report a Forced Outage.

Aggregation Forced Outages must be submitted to the NYISO Grid Operations Coordination Portal (GOCP) in the event that the Aggregation cannot meet its dispatch. Please refer to the NYISO Grid Operations Coordination Portal (GOCP) User's Guide for more information.

6.1.9. Real-Time Dispatch Instructions

The NYISO shall issue dispatch instructions to Aggregators as described in the Transmission and Dispatch Manual. Dispatch instructions for Aggregations will be issued via the applicable Transmission Owner when an Aggregation communicates with the NYISO through the Transmission Owner. Dispatch instructions for Aggregations communicating with the NYISO and Transmission Owner in parallel shall be issued by the NYISO to the Aggregation and Transmission Owner simultaneously (Figure 18).

Figure 18: Dispatch instructions communication

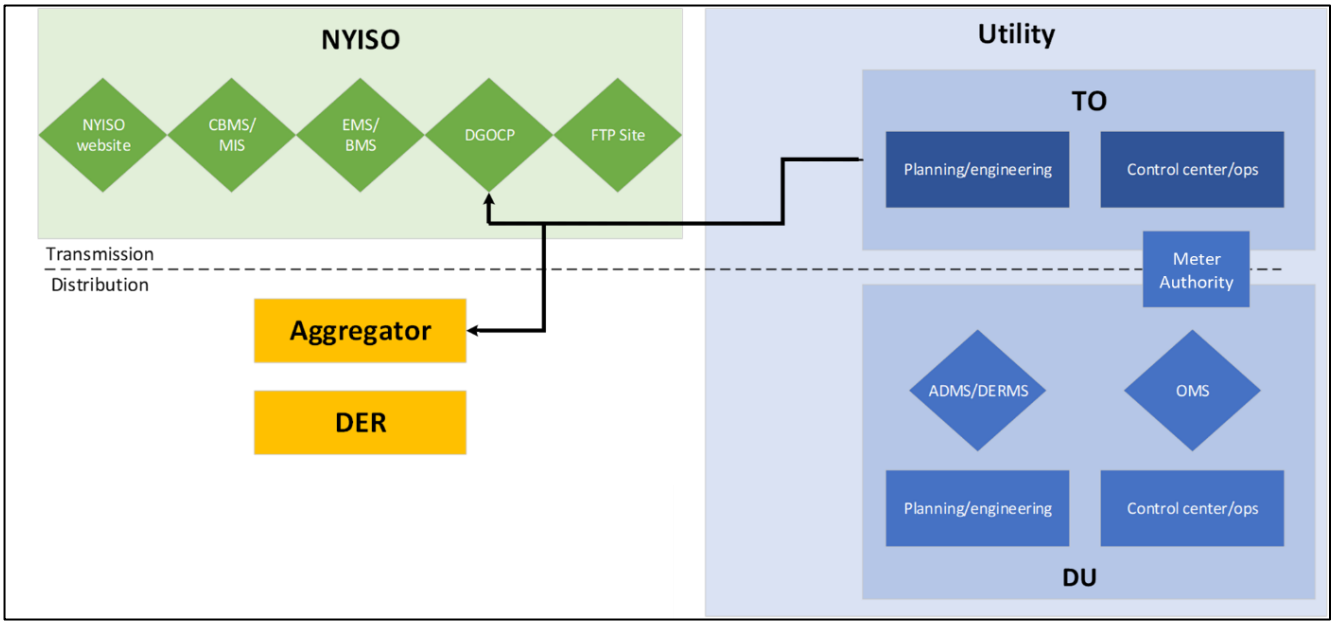


These processes are further detailed in the NYISO Direct Communications Manual and NYISO Direct Communications Procedure, and the Control Center Requirements Manual. The manuals are available at the following link: https://www.nyiso.com/manuals-tech-bulletins-user-guides (Please contact NYISO Stakeholder Services for details on obtaining the Direct Communications Procedure at the following link: https://www.nyiso.com/support).

6.1.10. Supplemental Resource Evaluation for Aggregations (Supplemental Resource Availability) for Distribution or Transmission System Reliability

Aggregations are dispatch-only Resources and cannot be committed using the conventional SRE processes. However, the NYISO, Transmission Owner (TO) or Distribution Utility may need an Aggregation to provide more Energy than was scheduled as part of the Day Ahead evaluation to reliably operate the electric system. The Supplemental Resource Availability, (SRA) process is a type of SRE logic that is adapted to the dispatch-only nature of Aggregations and is used to make Aggregation capability (above the Day-Ahead schedule) available for NYISO, TO or DU operators to address reliability issues. The SRA process enables NYISO operators to reserve available dispatch range of dispatch-only resources requiring an Aggregation to have a bid in place for the specified interval. SRA requests may be made after the close of the Day-Ahead market, and before the Real-Time dispatch interval (Figure 19).

Figure 19: SRA request communication example



To evaluate SRA requests, the NYISO will follow a process similar to the procedures outlined in the Transmission & Dispatch Operations Manual Section 6.7.9 to process TO or DU requests for SRE. A TO or DU may not request supplemental availability of an individual DER. Any request for an individual DER must be communicated to the Aggregator directly. The NYISO will not communicate SRA request results to Distribution Utilities.

Transmission Owners are responsible for notifying Distribution Utilities of Aggregations reserved via the SRA process. If a Distribution Utility identifies a distribution system reliability need, the request for an SRA by the NYISO must be submitted via the applicable Transmission Owner. The process for requesting an SRA is detailed in the NYISO's Grid Operations Coordination Portal (GOCP) User's Guide.

An Aggregation containing one or more DER that participate in programs or markets operated to meet the needs of distribution systems located in the NYCA is required to notify the NYISO of its dual participation upon enrollment pursuant to the Market Participant User's Guide, and the Aggregation's offers in the NYISO-administered markets must be made in such a way that the Aggregation is scheduled by the NYISO when it operates to meet any non-wholesale commitments, pursuant to Services Tariff Section 4.1.11. A TO need not request an SRA for an Aggregation in order for that Aggregation to satisfy its non-wholesale commitment(s).

Aggregations are expected to respond to corrective actions taken by the NYISO, including but not limited to reserve pick up events – please refer to the NYISO Transmission & Dispatch Operations Manual for details.

6.2. Roles & Responsibilities

DER/Aggregators, Distribution Utilities, and Transmission Owners must be available for real-time operation verbal communication twenty-four hours a day, seven days a week, to maintain distribution and transmission system safety and reliability. Aggregators are responsible for evaluating current NERC definitions and guidance to ensure compliance with, for example, Generator Operator classification.

6.2.1. Communication Between Distribution Utility and DER/Aggregator

- The Distribution Utility shall report emerging distribution system issues (*e.g.*, feeder reconfigurations) to the DER/Aggregator as soon as practicable.
    - Distribution system issues may require individual DER full or partial derates.
- If a DER or Aggregation creates or exacerbates Distribution System issues, the Distribution Utility shall direct the DER and/or Aggregator to curtail or disconnect any individual DERs, when necessary, to preserve reliability and safety.
- All DER curtailment directions to preserve distribution system safety will be communicated to the Aggregator as soon as practical. The Aggregator may operate one or more other DERs in its Aggregation to meet its NYISO schedule provided that the Distribution Utility authorizes the Aggregator's revised operating plan. The DU review of Aggregator operating plans shall only occur for Day Ahead schedules and will not be required for adjustments to schedules in Real Time.

6.2.2. Communication Between Transmission Owner and Aggregator

- The Transmission Owner will report emerging transmission system issues to affected Aggregators as soon as practicable.
    - Transmission system issues may require full or partial derates of one or more individual DERs.
- If a DER or Aggregation creates or exacerbates Transmission System issues, the TO must request an Out of Merit (OOM) for the Aggregation in the NYISO's GOCP – the TO should follow the procedures outlined in the *Transmission & Dispatch Operations Manual* Section 6.7.4.

- All metering and telemetry must be provided to the Transmission Owner consistent with NYISO and TO requirements.
- All curtailments to preserve transmission system safety will be communicated to the Aggregator and NYISO as soon as practical.
- The TO shall communicate with the Aggregator during a NYISO-initiated audit of an Aggregation pursuant to the procedures defined in NYISO Technical Bulletin 142: Generator Performance Audits.

6.2.3. Communication Between Transmission Owner and NYISO

- When an Aggregation communicates to the NYISO and TO in parallel, telemetry to and from Aggregations must be sent simultaneously to/from the TO and NYISO. These processes are further detailed in the *NYISO Direct Communications Manual* and *NYISO Direct Communications Procedure*, and the *Control Center Requirements Manual*.
- Real-time communications regarding Aggregation operations shall be communicated between the Transmission Owner's designated operating desk and the NYISO control room.
- The Transmission Owner and NYISO shall notify each other as necessary to initiate a Supplemental Resource Availability (SRA) for reliability purposes.
- If a curtailment of an Aggregation by the Transmission Owner becomes necessary to maintain transmission system security, the Transmission Owner shall notify the NYISO by phone, or other agreed upon means.
- The TO shall communicate with the NYISO during a NYISO-initiated audit of an Aggregation pursuant to the procedures defined in NYISO Technical Bulletin 142: Generator Performance Audits.

6.2.4. Communication Between Aggregator and NYISO

- If an Aggregation is dispatched under the NYISO's SRA rules, the Aggregator will receive an updated schedule and dispatch instructions from the NYISO to reflect the SRA, through the applicable TO, or in parallel through the applicable TO and directly to the NYISO, depending on the telemetry communication configuration established.
- Aggregators are responsible for submitting offers to the NYISO market software reflective of composite Aggregation capabilities and performance, report outages of Aggregations to NYISO market applications and receive/respond to NYISO dispatch signals.

6.3. Coordination Timeline

6.3.1. Until 3:00 PM Two Days Before Dispatch

The Distribution Utility and/or Transmission owner shall notify the DER/Aggregator of planned distribution and/or transmission system maintenance that may impact operations. This information will allow the Aggregator to bid in a manner consistent with distribution and transmission system conditions.

6.3.2. Up to 14 Days Prior and Until 5:00 AM on the Day Before Dispatch

Aggregator may submit and update Day-Ahead Market bids through the NYISO's Market Information System.

6.3.3. By 11:00 AM on the Day Before Dispatch

NYISO will provide Aggregators with Day-Ahead schedules for its Aggregation(s). Per existing processes, the NYISO shall also provide each Transmission Owner with its Day-Ahead Operating Plan.

6.3.4. By 12:00 PM on the Day Before Dispatch

An Aggregator shall communicate the schedules of the individual DERs it intends to dispatch to meet its Day-Ahead Market schedule to the Distribution Utility. The Distribution Utility will use this information to verify that the Aggregator's dispatch plan reflects applicable distribution system conditions. Examples of information that the Aggregator may be required to provide to the applicable DU include (i) the applicable Transmission Node, (ii) feeder used for each DER, (iii) unique identifier (*e.g.*, utility account number and meter number) for each DER being dispatched, (iv) minimum and maximum operating limits for each DER being dispatched, and (v) the timing of the dispatch, or (vi) the MW amount of a given service. For additional information on this process, the applicable Distribution Utility should be consulted. The Distribution Utilities will use this data to analyze the injections and reductions to understand conditions such as station or feeder issues, equipment loading, voltage profiles, outages and impacts on reconfigured or rerated circuits, compliance with NWA calls, etc.

6.3.5. After 12:00 PM and No Later than 10:00 PM on the Day Before Dispatch

The Distribution Utility may review each Aggregator's submitted dispatch plan. If the Distribution Utility determines an Aggregator's planned dispatch is inconsistent with distribution system conditions, the Distribution Utility shall advise the Aggregator as soon as practical. If the Distribution Utility requires the Aggregator to modify its dispatch plan, the Aggregator may need

to notify the NYISO of a de-rate and submit Real-Time Market Bids that account for the changed condition.

6.3.6. Day After Dispatch

The Aggregation's Meter Authority will send revenue meter data for each hour of the Dispatch Day to the NYISO, according to existing NYISO processes described in the NYISO's Revenue Metering Requirements Manual.

7. Metering & Telemetry

Aggregations participating in the NYISO-administered wholesale markets must comply with the telemetry and metering standards identified in Services Tariff Sections 4 and 13, including but not limited to the provision of six-second Real-Time telemetry and hourly Revenue Quality Meter Data to the NYISO. Complying with the applicable metering and telemetry standards provides the NYISO with both the real-time operational data and after-the-fact settlement data are needed for accurate real-time situational awareness and accurate settlements.

7.1. Background

Revenue grade metering systems are necessary to provide hourly, Revenue Quality meter data used for settlement and billing must meet the reliability and accuracy standards described in the Revenue Metering Requirements manual (Manuals, Tech Bulletins & Guides - NYISO). Six-second telemetry data is required for real-time operations, pursuant to Services Tariff Section 13.2. More information on telemetry data can be found in the NYISO Control Center Requirements Manual and Direct Communications Manual (Manuals, Tech Bulletins & Guides - NYISO).

7.2. Metering Requirements

Aggregators must obtain wholesale metering and/or meter data services from a Meter Authority. For an Aggregator of a DER Aggregation the Meter Authority may be: (i) an authorized Meter Services Entity that the ISO has determined complies with the eligibility requirements pursuant to Services Tariff Section 13.3.2.1, (ii) the municipal electric utility for the municipality in which the DER within the Aggregation is electrically located, and/or (iii) the Member System in which Transmission District the Aggregation is located. An Aggregator may be its own Meter Services Entity if it meets the qualifications identified in Services Tariff Section 13.3.2. Single Resource Type (SRT) Aggregations may only obtain wholesale metering and/or meter data services from the applicable municipal electric utility or Member System. The Aggregator is ultimately responsible for the settlement data provided to the NYISO on their behalf by the Meter Authority and shall be subject to any applicable penalties.

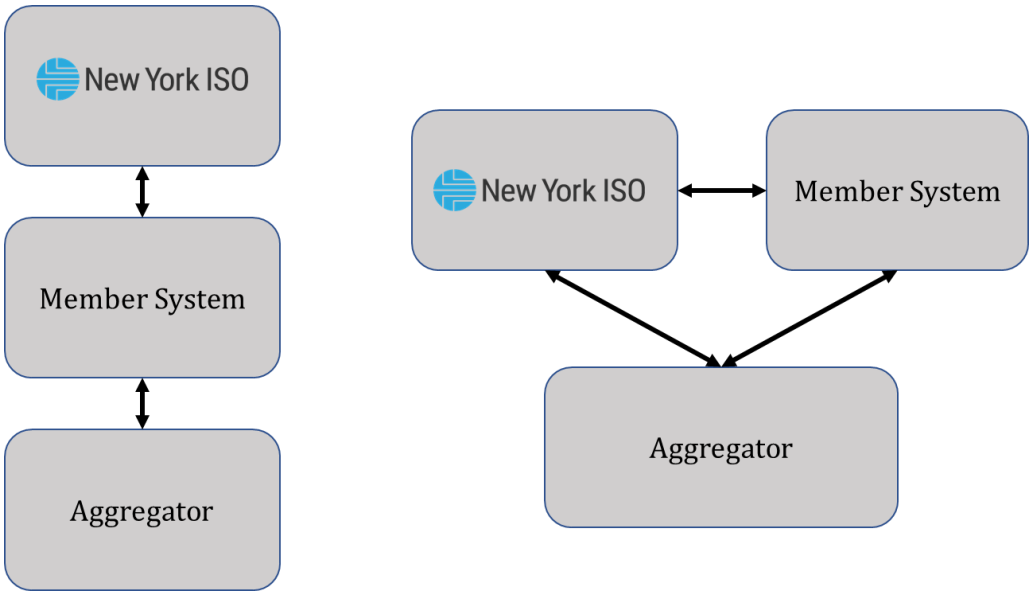
For more detailed information about the Meter Services Entity framework, requirements, and obligations, please refer to MSE Manual (Manuals, Tech Bulletins & Guides - NYISO). For a list of NYISO-authorized Meter Services Entities, please see the following link: https://www.nyiso.com/documents/20142/11268336/Approved-Meter-Services-Entities-MSE.pdf/2bafa41b-9bc5-4b10-e133-50aa2c5a8d14.

All Revenue Quality Meter (RQM) data shall reflect the Energy injections, Energy withdrawals, and Demand Reductions of all individual DER facilities in the Aggregation. RQM data required by the ISO for settlement includes the following channels: Energy Injections, Energy Withdrawals (when the Aggregation contains at least one Withdrawal-Eligible Generator), and Demand Reductions. RQM data at the individual DER facility level may be requested by the NYISO for auditing and verification purposes – Aggregators should verify that the applicable Meter Authority responsible for sharing RQM data with the ISO has access to the RQM data for each individual DER facility. Aggregators should configure RQM infrastructure for individual DER facilities within Aggregations based on the guiding examples provided in the Revenue Metering Requirements Manual. All RQM Data must be provided to the NYISO by the Aggregation's Meter Authority in accordance with the procedures outlined in the Revenue Metering Requirements Manual.

7.3. Telemetry Requirements

Six-second telemetry is required for each Aggregation. Aggregators must receive real-time communication from each individual DER, which real-time data must be aggregated and sent to the TO and NYISO in one of two possible configurations as further discussed below. Each DER must have the infrastructure to produce a 6-second telemetry signal to inform the Aggregation level signal to meet the NYISO's dispatch, except for DER smaller than 100 kW, which are permitted to employ a NYISO-approved alternative telemetry mechanism as described in Section 7.3.4. Aggregators are responsible for measuring four streams (channels) of telemetry data: Energy injections, Energy withdrawals (when the Aggregation contains at least one Withdrawal-Eligible Generator), Demand Reductions, and the sum of Energy injections and Demand Reductions, minus the Energy withdrawals. The NYISO will send Base Point Signals for the Aggregation, and not for the individual facilities. This two-way communication of operational data will be established between the Aggregator's control center and the NYISO through the applicable Member System, or alternatively between the Aggregator and the NYISO and Member System in parallel (Figure 20).

Figure 20: Acceptable telemetry communication data pathways between the NYISO, Aggregator, and applicable Member System



The Aggregator is required to establish communications with the applicable Member System that meets the Member System's requirements, including installation, configuration, and testing of any necessary hardware.

Aggregators opting to directly communicate with the NYISO shall communicate via Multiprotocol Label Switching (MPLS) or use Software-Defined Wide Area Network (SD-WAN) networks, pursuant to the requirements described in the Control Center Requirements Manual. Aggregators shall communicate with the NYISO via ICCP as the data protocol for two-way communication over MPLS. Aggregators shall communicate with the NYISO via ICCP or DNP3 as the data protocol for two-way communication over SD-WAN. Aggregators directly communicating with the NYISO shall also maintain a parallel communication connection with the applicable Member System that meets the Member System's requirements as described above.

7.3.1. NYISO-Member System-Aggregator Telemetry Testing Procedure

NYISO staff will initiate the telemetry communications test after enrollment data has been (i) submitted by the Aggregator and (ii) approved by the applicable DU. The testing procedure can begin one month prior to the first month of DER participation in the market (e.g., Testing can begin on July 1 for August 1 market participation). The communications connection between the Aggregator and the applicable Member System must be in place before beginning the enrollment process or import of data to the NYISO's Aggregation System.

The NYISO, Aggregator, and applicable Member System shall adhere to the following procedural steps to initiate and complete the end-to-end testing of Aggregation telemetry communications:

1. NYISO power system applications engineering group will predefine telemetry Object ID blocks in Power Systems Explorer/Data Engineering (PSE/DE), per Member System – these blocks will include a range of points to be assigned to Aggregations that enroll in the applicable Member System's territory.
2. When an Aggregator enrolls an Aggregation in the NYISO's Aggregation System, one or more telemetry Object IDs from one of the applicable Member System's predefined Object ID blocks will be assigned by NYISO DER enrollment staff. Each Aggregation will be assigned a set of unique telemetry Object IDs in the NYISO's Aggregation System.
    a. A complete list of Object IDs that will apply to Aggregations can be found in the NYISO Direct Communications Procedure – this document is CEII and must be requested through the NYISO's Stakeholder Services department.
3. NYISO Distributed Resources Operations (DRO) will email the Aggregator, NYISO power system applications engineering group (PSAE) and the applicable Member System after approval from the applicable DU for each Aggregation and include the Aggregation's preset telemetry Object IDs. For each Aggregation, DRO will send NYISO power system applications engineering group, Aggregator, and Member System:
    a. Organizational contact(s) (Name, email, phone) of the applicable Aggregator responsible for the Aggregation(s)
    b. Aggregation ID(s)
    c. Applicable Telemetry Object ID(s) for each Aggregation
    d. Transmission Node PTID(s)
    e. Aggregation Type(s)

    The Member Systems must configure the Aggregation(s) received in collaboration with the applicable Aggregator, and successfully test communication between the Aggregator control center and Member System control center – it is the responsibility of the Aggregator to reach out to the Member System to schedule this test. Member System contact information is located at the following link (Distributed Energy Resources (DER) - NYISO). It is highly

recommended that this test be completed within the first 5 days of the calendar month, leaving ample time for Step 5. Market entry may be delayed if the Aggregator fails to reach out for communications testing in a timely manner.

4. Upon successful completion of the communications test with the Member System, the Aggregator will email the PSAE shared inbox (DER_Communication_Testing@nyiso.com), and CC the Member System and DRO shared inbox (DER@nyiso.com), to schedule the end-to-end communications test.

5. Testing duration depends on the volume of Aggregations and complexity – NYISO power system applications engineering group staff will work collaboratively with Member System and Aggregator personnel to successfully test communications prior to an Aggregation beginning market participation.

6. NYISO power system applications engineering group then emails DRO indicating that the Aggregation has passed communications testing.

7.3.2. Demand Reductions

Actual Demand Reductions for each Aggregation shall be submitted to the NYISO. Actual Demand Reductions for an Aggregation are the aggregate sum of all Demand Reductions provided by DER facilities and/or Demand Side Resources within an Aggregation. This calculation is the greater of: (i) the Distributed Energy Resource's adjusted Economic Customer Baseline Load or Regulation Baseline if dispatched for Regulation service for each five-minute interval minus the actual metered load for each six-second interval, and (ii) zero. Demand Reduction response for a DER facility is only calculated when the Aggregation is dispatched by the NYISO, and the DER facility is responding to meet the dispatch within the Aggregation. Otherwise, the Demand Reduction response of a DER facility is zero, regardless of baseline or metered Load of the facility. For more information on DER Aggregation and Single Resource Type Aggregation telemetry data please see Appendix A Figures 2-5.

An Aggregator must identify to the NYISO the party (i.e., the Aggregator, or the respective MA (whether a Member System, municipal electric utility or MSE)) will calculate ECBLs and calculating Actual Demand Reductions. Such identification must be the result of mutual agreement and provided to the NYISO in writing contemporaneously with the Aggregation's enrollment materials, and updated as necessary when responsibilities change. The Aggregator is responsible for coordinating such procedure, and ultimately responsible for the accuracy of the data submitted to

the NYISO. For more information on metering roles and responsibilities please see Appendix Figure 1.

7.3.3. Meter Data Services – Aggregator, DU, and Member System responsibilities

Aggregators must procure, or provide for itself as a qualified MSE, meter data services (as defined in Section 1.1 of the Meter Services Entity Manual) for each Aggregation it enrolls in the NYISO-administered markets. During the enrollment process, the Aggregator shall notify the NYISO of the entity (e.g., Member System or Meter Services Entity) that will provide meter data services for the Aggregation. If more than one entity will perform meter data services, the Aggregator shall identify which services will be performed by each entity. The Aggregator is responsible for ensuring NYISO's receipt of all real-time telemetry and Revenue Quality Meter (RQM) data in accordance with Services Tariff Section 13 and the standards established in the Control Center Requirements Manual, Direct Communications Procedure, Revenue Metering Requirements Manual and Accounting and Billing Manual.

An Aggregator may enter into an agreement with an MSE, municipal electric utility, or Member System to provide hourly RQM data to the NYISO for settlement purposes. The Aggregator is responsible for the purchase, installation, and maintenance of infrastructure that supports six-second real-time telemetry, which may be completed by the Aggregator directly or by a third party with whom the Aggregator has contracted to provide such services. Aggregators are responsible for certain meter data services, such as gathering and summation of DER-level hourly RQM data and six-second real-time telemetry to reflect Aggregation-level performance, and the calculation of the ECBL. An Aggregator may contract for the Meter Authority (Member System, municipal electric utility, or MSE) to provide these services. When a Meter Authority has agreed to provide these services for an Aggregator, the Aggregator must submit Meter Authority confirmation identifying the Meter Authority providing meter data services for the applicable Aggregation upon submission of enrollment data for the Aggregation.

Figure 1 in Appendix A of this Aggregation Manual depicts the various metering and meter data service requirements and the responsible entities. Please note that the Aggregator is responsible for all supporting infrastructure and communication of telemetry data with the NYISO, through the applicable TO.

7.3.4. Alternative Telemetry

The Aggregator must ensure 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. The real-time six-second status of an individual facility may be calculated through a NYISO-approved methodology for facilities that are smaller than 100 kW. The use of an alternative methodology to measure the 6 second output of facilities smaller than 100 kW is subject to review and approval by the NYISO during enrollment. An Aggregator must submit a description of the proposed alternative telemetry methodology to the NYISO prior to entry of enrollment data for a DER facility in the Aggregation System. The use of an alternative methodology to measure the 6 second output of a facility must include the measured output of the facility from a meter at a periodicity of 5-minutes or less. The Aggregator is required to submit a description of the methodology to be reviewed by NYISO for approval.

7.4. Meter Data Audit

The NYISO may request meter data for each DER facility from the DER's Aggregator, consistent with Services Tariff Section 13.2. The NYISO will use the data to validate the accuracy of the Aggregator-submitted data used for telemetry and settlements, including applicable ECBL calculations. Meter data should be retained consistent with Services Tariff Section 30.6.3.

7.5. Economic Customer Baseline Load (ECBL)

This section details the calculation of the Economic Customer Baseline Load (ECBL) for individual Demand Side Resources participating in an Aggregation when dispatched for Energy and Operating Reserves only.

The ECBL represents the Load of a DER facility and is used to determine a DER facility's Demand Reduction. The ECBL uses a combination of historical data from the same time on similar days and a near-term adjustment used to incorporate the conditions of the specific operating day (as described below).

The ECBL is calculated for a DER facility for a given NYISO 5-minute interval. NYISO RTD intervals are typically 5 minutes in duration. For example, when a DER facility provides energy as part of an Aggregation's response to a NYISO dispatch at 11:00, an ECBL is calculated for the DER facility from 11:00-11:05. A new ECBL is calculated for the next 5-minute interval, typically 11:05-11:10. All ECBL calculations will be on the 5-minute interval.

There are two components of the ECBL calculation: the unadjusted ECBL and the in-day adjustment. The unadjusted ECBL calculates a value for the DER facility's baseline using the Load of the DER facility at the same time interval during a window of similar days. For example, when a DER facility provides energy as part of an Aggregation's response to a NYISO dispatch at 11:00, the

unadjusted ECBL reviews the load of the DER facility at 11:00 on similar days before the dispatch day.

The in-day adjustment modifies the unadjusted ECBL based on the in-day conditions one hour before the Aggregation's dispatch. For example, when a DER facility provides energy as part of an Aggregation's response to a NYISO dispatch at 11:00, the in-day adjustment reviews the load of the DER facility at 10:00 on the dispatch day. The in-day adjustment is limited to ±20% of the unadjusted ECBL.

The adjusted ECBL is calculated as the sum of the in-day adjustment and the unadjusted ECBL and represents the baseline load used to determine the DER facility's demand reduction.

7.5.1. Unadjusted ECBL Calculation

The unadjusted ECBL calculation is dependent on whether the day of dispatch is a weekday or a weekend/NERC designated holiday. All "NERC Additional Off-Peak Holidays" for the Eastern Interconnection may be found on NERCs public website.

Weekday Unadjusted ECBL Calculation

Weekday Unadjusted ECBL Window

The Aggregator or its designee shall select the ten previous like weekdays to calculate the weekday unadjusted ECBL. NERC designated holidays are skipped. Please refer to Figure 21 for an example of selecting the ten previous weekdays.

Figure 21: Example of selecting the 10 previous weekdays for the Weekday Unadjusted ECBL Window

July 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun Day 1	1
2	3 Day 2	4 Holiday	5 Day 3	6 Day 4	7 Day 5	8
9	10 Day 6	11 Day 7	12 Day 8	13 Day 9	14 Day 10	15
16	17 Dispatch Day	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Key	Normal Day	Dispatch Day	Day Used in Calculation	Holiday

Once the days are selected, the aggregator or its designee will take the average of the 6-second telemetry values of the 5-minute interval on each day. For example, for the 11:00-11:05 interval the aggregator or its designee will average the 6-second telemetry values on each day of the weekday unadjusted ECBL window from 11:00-11:05. If the DER facility had been dispatched as part of an Aggregation in response to a NYISO dispatch, the proxy load shall be used in accordance with Section 7.5.4 of this Aggregation Manual. If a Demand Side Resource's telemetry indicates a net injection to the grid during any 6-second interval (due to, for example, behind-the-meter solar output), zero kW shall be substituted for the telemetered value.

The Aggregator or its designee will sort the 10, 5-minute intervals as calculated above in MW value order from lowest to highest. The unadjusted weekday ECBL is then calculated as the average of the 5th and 6th values. For an example, please refer to Figure 22 below.

Figure 22: Example calculating the unadjusted weekday ECBL

Week Day	Load 11:00-11:05 Interval
30-Jun	1.2
3-Jul	1.8
5-Jul	1.2
6-Jul	2.5
7-Jul	2.4
10-Jul	3.3
11-Jul	4.8
12-Jul	1
13-Jul	1
14-Jul	1.1

Value	Sort
1	1
2	1
3	1.1
4	1.2
5	**1.2**
6	**1.8**
7	2.4
8	2.5
9	3.3
10	4.8

Unadjusted ECBL	1.5

Weekend/Holiday Unadjusted ECBL Calculation

Weekend/Holiday Unadjusted ECBL Window

The Aggregator or its designee shall select the previous three weekend days of the same type (Saturdays will be used for dispatches on a Saturday and Sundays will be used for dispatches on a Sunday) to calculate the weekend unadjusted ECBL. For example, the weekend window for a NYISO dispatch on a Saturday shall include data from the previous three Saturdays. The window for a weekday that is a NERC holiday will consist of the previous three Sundays.

Please refer to Figure 23 for an example of selecting the three previous weekend days.

Figure 23: Example selecting the three previous weekend days for the unadjusted weekend ECBL window

July 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	1 Day 1
2	3	4 Holiday	5	6	7	8 Day 2
9	10	11	12	13	14	15 Day 3
16	17	18	19	20	21	22 Dispatch Day
23	24	25	26	27	28	29
30	31					

Key	Normal Day	Dispatch Day	Day Used in Calculation	Holiday

Once the days are selected, the aggregator or its designee will take the average of the 6-second telemetry values of the 5-minute interval on each day. For example, for the 11:00-11:05 interval the aggregator or its designee will average the 6-second telemetry values on each day of the weekend/holiday unadjusted ECBL window from 11:00-11:05. If the DER facility had been dispatched as part of an Aggregation in response to a NYISO dispatch, the Proxy Load shall be used in accordance with Section 7.5.4 of this Aggregation Manual. If a Demand Side Resource's telemetry indicates a net injection to the grid during any 6-second interval (due to, for example, behind-the-meter solar output), zero kW shall be substituted for the telemetered value.

The unadjusted weekend/Holiday ECBL is then calculated as the average of the three values. For an example, please refer to Figure 24 below.

Figure 24: Example calculating the unadjusted weekend ECBL

Weekend Day	Load 11:00-11:05 Interval
1-Jul	1.5
8-Jul	1.4
15-Jul	1.9

Unadjusted ECBL	1.6

7.5.2. ECBL In-Day Adjustment

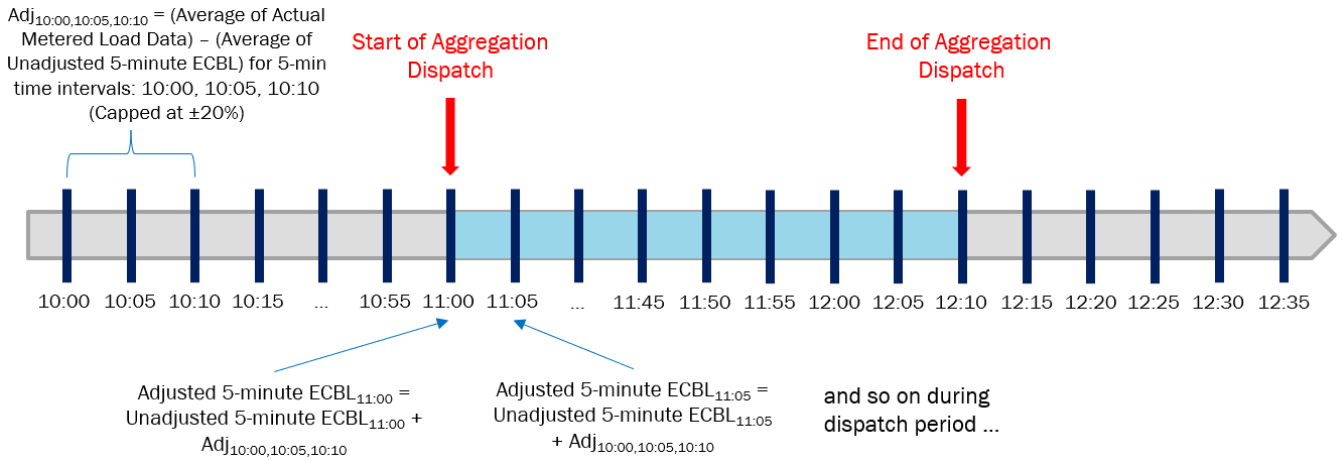
In-Day Adjustment Window

The in-day adjustment window begins one hour prior to the beginning of the five-minute dispatch interval. The intervals used in the in-day adjustment window shall be the three consecutive five-minute intervals starting 60 minutes prior to the first operating interval of dispatch and ending with the five-minute interval ending 45 minutes prior to the operating interval of dispatch. For example, if the beginning of the Aggregation's dispatch is at 11:00 the in-day adjustment window shall be the meter data from the intervals beginning at 10:00, 10:05, and 10:10.

Once the intervals are selected, the Aggregator or its designee will calculate the average of the 6-second telemetry values for the three separate 5-minute intervals. If a Demand Side Resource's telemetry indicates a net injection to the grid during any 6-second interval (due to, for example, behind-the-meter solar output), zero kW shall be substituted for the telemetered value.

The in-day adjustment is then calculated as the difference between (i) the average of the three intervals metered values of the in-day adjustment window and (ii) the average of the three intervals unadjusted ECBLs of the in-day adjustment window. For example, when a DER facility provides energy as part of an Aggregation's response to a NYISO dispatch at 11:00 the Aggregator or its designee will subtract (i) the average of the three unadjusted ECBLs at 10:00, 10:05, and 10:10 from (ii) the average of the 6-second telemetry values of the intervals starting 10:00, 10:05, and 10:10. Please refer to Figure 25 below as an example. The in-day adjustment is capped as ±20% of the unadjusted ECBL as calculated above in Section 7.5.1.

Figure 25: Example calculating the ECBL in-day adjustment



Time	July 17 10:00-10:05	July 17 10:05-10:10	July 17 10:10-10:15	Average
Load	1.2	1.1	1	1.1
ECBL	1.95	1.1	1.6	1.55

Average Load	Average ECBL	Difference	Unadjusted ECBL July 17 11:00-11:05	In-Day Adjustment for Duration of Dispatch*
1.1	1.55	-0.45	1.5	-0.3

*(Capped at ±20% Unadjusted ECBL)

The in-day adjustment window shall be recalculated for every interval of dispatch which is preceded by an interval of at least two hours of non-dispatch. The same in-day adjustment will be used for each interval until it needs to be recalculated after two hours of no dispatches from the NYISO.

7.5.3. Adjusted ECBL Calculation

The adjusted ECBL calculation is calculated as the sum of the unadjusted ECBL and the in-day adjustment. Please refer to Figure 26 below as an example. For use in settlements, the hourly ECBL is calculated as the weighted average of all 5-minute intervals' adjusted ECBL for the length of the hour. The 1-hour ECBL is used for calculating the hourly Demand Reduction of a DER facility.

Figure 26: Adjusted ECBL Calculation

Unadjusted ECBL July 17 11:00-11:05	In-Day Adjustment for Duration of Dispatch	Adjusted ECBL July 17 11:00-11:05
1.5	-0.3	1.2

7.5.4. ECBL Proxy Load

During an interval in which a DER is curtailing Load in response to its Aggregation being dispatched by the NYISO, and when the LBMP is greater than or equal to the Monthly Net Benefit Threshold (MNBT), the average of the Proxy Load calculated every six seconds during that interval shall be used in the calculation of the ECBL for that interval instead of the average of the DER's telemetered Load every six seconds during that interval. The applicable MNBT is posted on the NYISO website at the following link: https://www.nyiso.com/demand-response. The Proxy Load calculated every six seconds is the telemetered Load plus measured Demand Reductions of a DER facility. During intervals when the LBMP is less than the MNBT the load reduction is not added back. Please refer to Figure 27 below as an example.

Figure 27: Example Proxy Load Calculation

Week Day	Load 11:00-11:05 Interval	Prior Measured Demand Reductions	LBMP≥MNBT?	Proxy Load/Load
30-Jun	1.2			1.2
3-Jul	1.3	0.5	YES	1.8
5-Jul	1.2			1.2
6-Jul	2.5			2.5
7-Jul	2.4			2.4
10-Jul	2.8	0.5	YES	3.3
11-Jul	4.8			4.8
12-Jul	1	1.5	NO	1
13-Jul	1	2	NO	1
14-Jul	1.1			1.1

Value	Sort
1	1
2	1
3	1.1
4	1.2
5	**1.2**
6	**1.8**
7	2.4
8	2.5
9	3.3
10	4.8

Unadjusted ECBL	1.5

7.6. Baseline for DER providing Regulation Service

The baseline is calculated differently for DER facilities that operate when the Aggregation is dispatched for Regulation Service. The baseline for DER facility Demand Reductions providing Regulation Service as part of a DER Aggregation is calculated as the Load of the DER facility six seconds prior to the Aggregation receiving a Regulation dispatch. If the DER had been dispatched for Energy prior to a Regulation dispatch, the baseline is calculated as the sum of the measured Demand Reduction and the load six seconds prior to the Aggregation receiving a Regulation dispatch. The baseline calculated for the six seconds prior to receiving a Regulation Service Dispatch is the baseline that will be used for duration of the Regulation Service dispatch. All Demand Reduction measured for the applicable DER facility is calculated as the difference between the Regulation baseline and the metered Load of the DER facility for each six second interval. For example, for a Regulation dispatch beginning at 11:05:00 the baseline is calculated as the Load of the DER facility at 11:04:54. Please refer to Figure 28 and Figure 29 below as an example.

Figure 28: Response Calculation for DER within an Aggregation – Regulation Only Example

	10:59:48	10:59:54	11:00:00	11:00:06	11:00:12
Aggregation Scheduled for Energy	N	N	N	N	N
Aggregation Scheduled for Regulation	N	N	Y	Y	Y
DER Facility Load	1.3	1.1	1	1.1	0.5
DER Facility Load Prior to Regulation Dispatch*			1.1	1.1	1.1
Unadjusted 5-min ECBL	2	2	1.5	1.5	1.5
In-Day Adjustment			-0.3	-0.3	-0.3
Adjusted 5-min ECBL			1.2	1.2	1.2
Demand Reduction Response	0	0	0.1	0	0.6

*This value is the baseline value and is persisted for the duration of the DER facility providing Regulation Service as part of the Aggregation's Regulation Service response. It is equal to the DER Facility Load at 10:59:54.

Values for Unadjusted 5-min ECBL, In-Day Adjustment and Adjusted 5-min ECBL beginning at the time that the DER begins to provide regulation are grayed out because they are not considered in the determination of the DER facility's demand reduction response at those times

Figure 29: Response Calculation for DER within an Aggregation – Regulation and Energy Example

	11:04:48	11:04:54	11:05:00	11:05:06	11:05:12
Aggregation Scheduled for Energy	Y	Y	Y	Y	Y
Aggregation Scheduled for Regulation	N	N	Y	Y	Y
DER Facility Load	1	0.8	0.9	0.5	1
DER Facility Load Prior to Regulation Dispatch*			1.2	1.2	1.2
Unadjusted 5-min ECBL	1.5	1.5	1.8	1.8	1.8
In-Day Adjustment	-0.3	-0.3	-0.3	-0.3	-0.3
Adjusted 5-min ECBL	1.2	1.2	1.5	1.5	1.5
Demand Reduction Response	0.2	0.4	0.3	0.7	0.2

*This value is the baseline value and is persisted for the duration of the DER facility providing Regulation Service as part of the Aggregation's Regulation Service response. It is equal to the sum of the 0.8 MW DER facility load and the 0.4 MW demand reduction response at 11:04:54.

Values for Unadjusted 5-min ECBL, In-Day Adjustment and Adjusted 5-min ECBL beginning at the time that the DER begins to provide regulation are grayed out because they are not considered in the determination of the DER facility's demand reduction response at those times

8. Settlements

Aggregations are subject to the Energy and Ancillary Services market settlement rules described in Services Tariff Sections 4.2.6, 4.5, 4.6, 15.3, 15.3A and 15.4. To facilitate accurate settlements, Aggregators are required to separately provide, for each Aggregation, Energy injections, Energy withdrawals, and Demand Reductions. Aggregation performance and settlement are administered at the Aggregation-level – the NYISO does not settle Energy injections, withdrawals, or Demand Reductions of the individual DER facilities comprising an Aggregation.

The Monthly Net Benefit Threshold is applied to Demand Side Resources participating in Aggregations; for further information, please see Market Services Tariff 4.5.2.

8.1. DAM and RTM Energy Settlement

Aggregations, like Generators (including Energy Storage Resources), are paid, or pay, for Energy injections and withdrawals in the same way that Generators and ESRs are paid, or pay, for Energy injections and withdrawals. Therefore, the NYISO has expanded 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 for Energy Storage Resources, Aggregations that include one or more Withdrawal-Eligible Generators 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.

For more information on DER Aggregation and Single-Resource Type Aggregation settlement data flows please see Appendix A Figures 2-5.

8.2. DAM and RTM Ancillary Services Settlement

An Aggregation that provides Ancillary Services will be settled according to the settlement rules applicable to the particular service.

Settlements for provision of Regulation Service will be calculated in accordance with Section 15.3 of the Services Tariff, as further described in Accounting and Billing Manual Section 5.2.

Settlements for provision of Operating Reserves will be calculated pursuant to Services Tariff Section 15.4. More information can be found in Section 5.3 of the Accounting and Billing Manual.

8.3. Real-Time Performance Charges and Penalties

Aggregations shall be subject to all relevant performance penalties in real-time. An Aggregation's failure to meet its NYISO-issued dispatch due to the action of the applicable Distribution Utility shall not exempt said Aggregation from applicable penalties. Please refer to the Accounting and Billing Manual for more information regarding Persistent Undergeneration Charges, Persistent Over-withdrawal Charges, and associated exemptions.

8.4. DAM and RTM Make-Whole Payments

Aggregations may be eligible for Bid Production Cost Guarantee Payments, and Day-Ahead Marginal Assurance Payments (DAMAP). For more information regarding eligibility for Day-Ahead and Real-Time BPCG, see Services Tariff Section 18. For more information regarding eligibility for DAMAP see MST section 25.

9. Mitigation & Market Monitoring

9.1. Energy Market Mitigation

Aggregations are subject to the market mitigation measures contained in Services Tariff Sections 23 and 30. The mitigation rules that apply to an existing resource type, such as an ESR, shall apply to an Aggregation of the same type, e.g., an ESR Aggregation. An Aggregator may not use Aggregations to avoid the application of mitigation or financial sanctions under the NYISO's Market Mitigation Measures. The NYISO shall monitor for conduct that may be used by an Aggregator to avoid the application of mitigation, including but not limited to creating or dissolving Aggregations or moving facilities between Aggregations.

9.1.1. Aggregation Reference Levels

Aggregators may only use cost-based reference levels for Aggregations – bid-based, LBMP-based, and new unit reference levels are prohibited for use by Aggregators. For more information, please refer to the Reference Level Manual (Manuals, Tech Bulletins & Guides - NYISO).

9.2. Capacity Market Mitigation

Aggregations are subject to the market mitigation measures contained in Services Tariff sections 23 and 30.

9.2.1. Buyer Side Mitigation

Injection-capable facilities, that are not Excluded Facilities, participating in an Aggregation are subject to the NYISO's Buyer-Side Mitigation (BSM) rules, pursuant to Services Tariff section 23. Demand Side Resources participating in an Aggregation are not subject to the NYISO's BSM rules. Proposed new generators seeking to participate in an Aggregation or additional CRIS for an injection-capable facility participating in an Aggregation are examined in a two-part test to determine whether an Offer Floor is applicable.

All individual injection-capable facilities participating as DER in an Aggregation, and that are not Excluded Facilities, are evaluated as independent 'Examined Facilities' – only revenue streams and costs associated with each individual facility are evaluated. Revenue streams may include those earned by providing energy services to another entity, such as a utility, if the facility is engaged in dual participation pursuant to Services Tariff section 4.1.11.

Competitive Entry, Renewable, and Self-Supply exemptions are available to injection-capable facilities participating in an Aggregation. If a facility is not exempt, an Offer Floor is applied upon enrollment to the accepted CRIS value associated with that individual facility.

Please note that an Aggregation in a Mitigated Capacity Zone that is subject to Buyer Side Mitigation (BSM), having non-exempt MW greater than zero, that is (1) new to the market, or (2) is undergoing a change to the Aggregation and is thus under review, will not be able to allocate sales from the Aggregation in the Strip or Monthly auctions and will only be able to offer any applicable MW into the Spot auction.

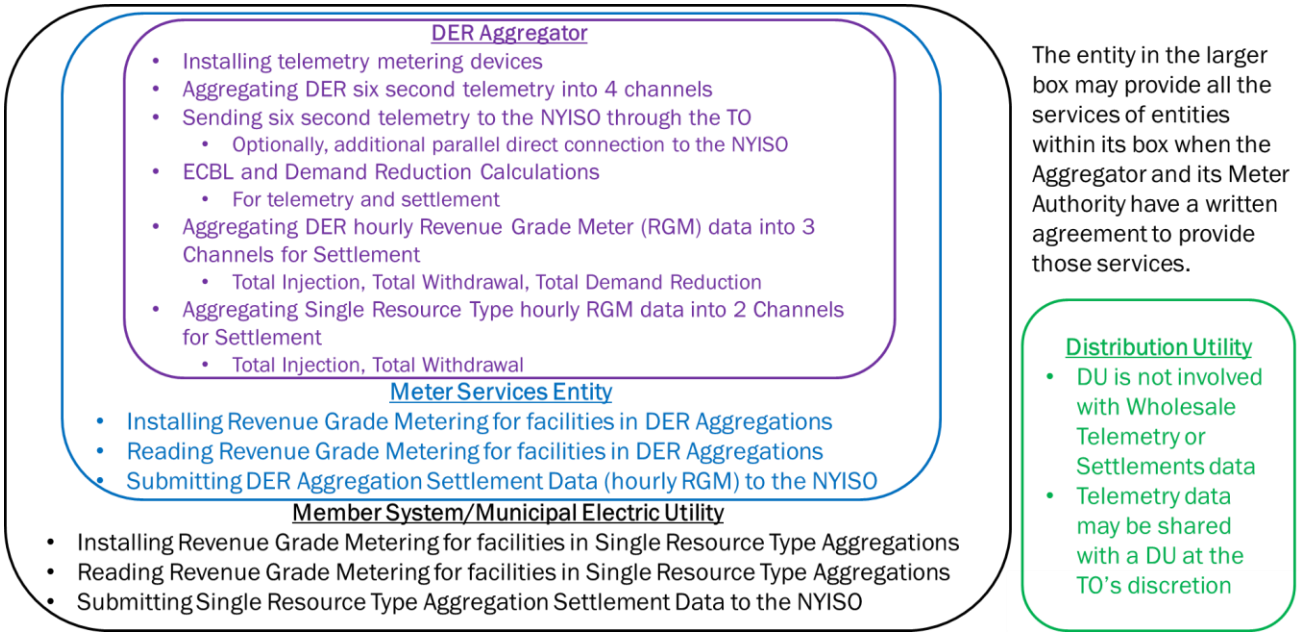
9.2.2. Supply Side Mitigation

All injection-capable facilities participating in Aggregations that are ICAP Suppliers are subject to the Physical Withholding rules relating to the audit of removal of capacity from Mitigated Capacity Zones. Demand Side Resources participating in an Aggregation are not subject to the NYISO's Physical Withholding rules.

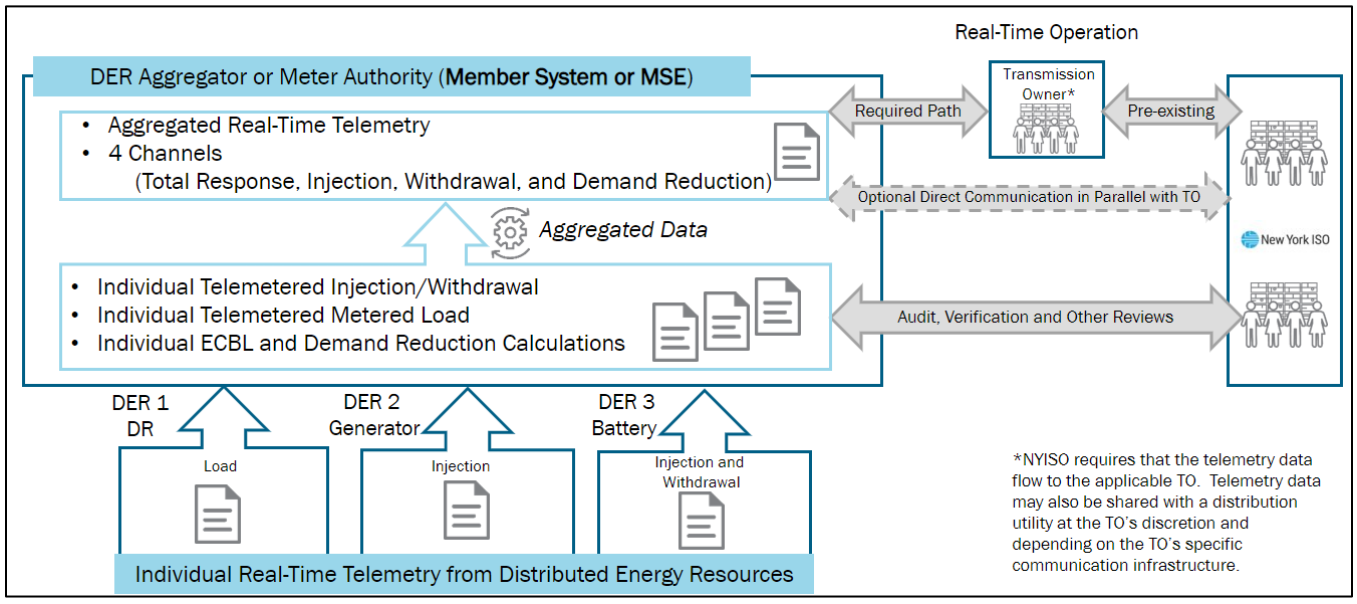
Aggregations that are capacity Suppliers are subject to the Pivotal Supplier 'must-offer' rule. Aggregators must identify Affiliated Entities as defined in Services Tariff section 23.2.1, pursuant to Services Tariff section 5.12.1. Aggregations are not permitted to request a Going Forward Cost.

Appendix A

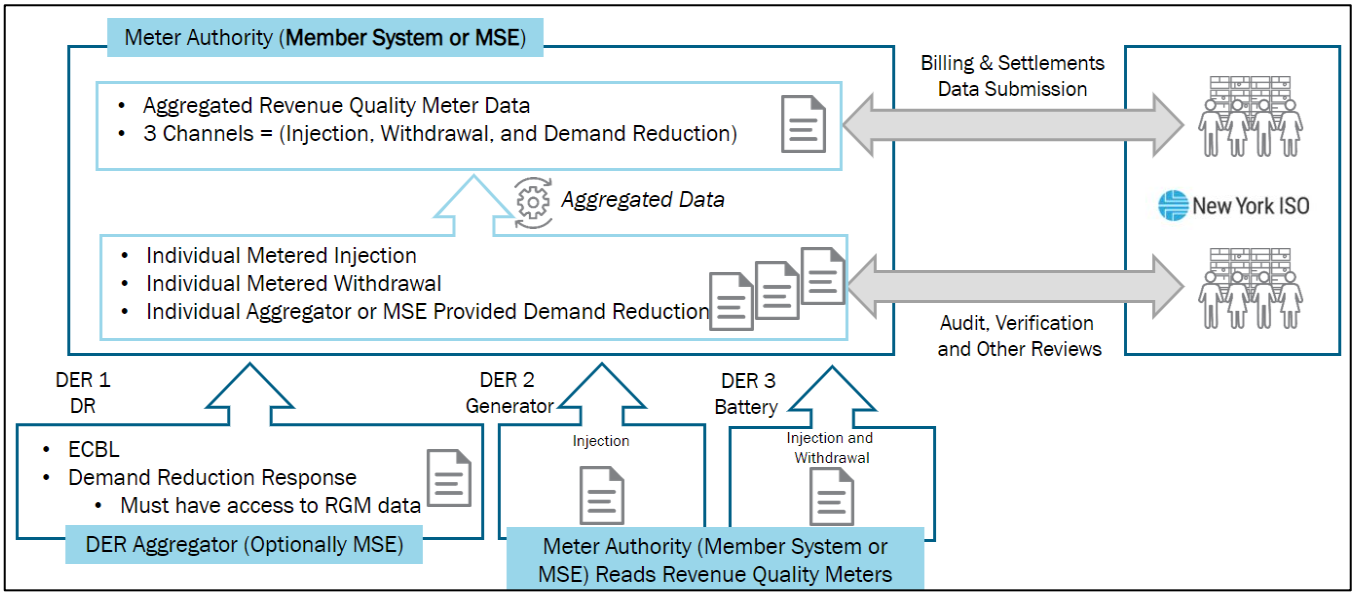
Appendix A Figure 1: Metering & Telemetry Data Responsibilities



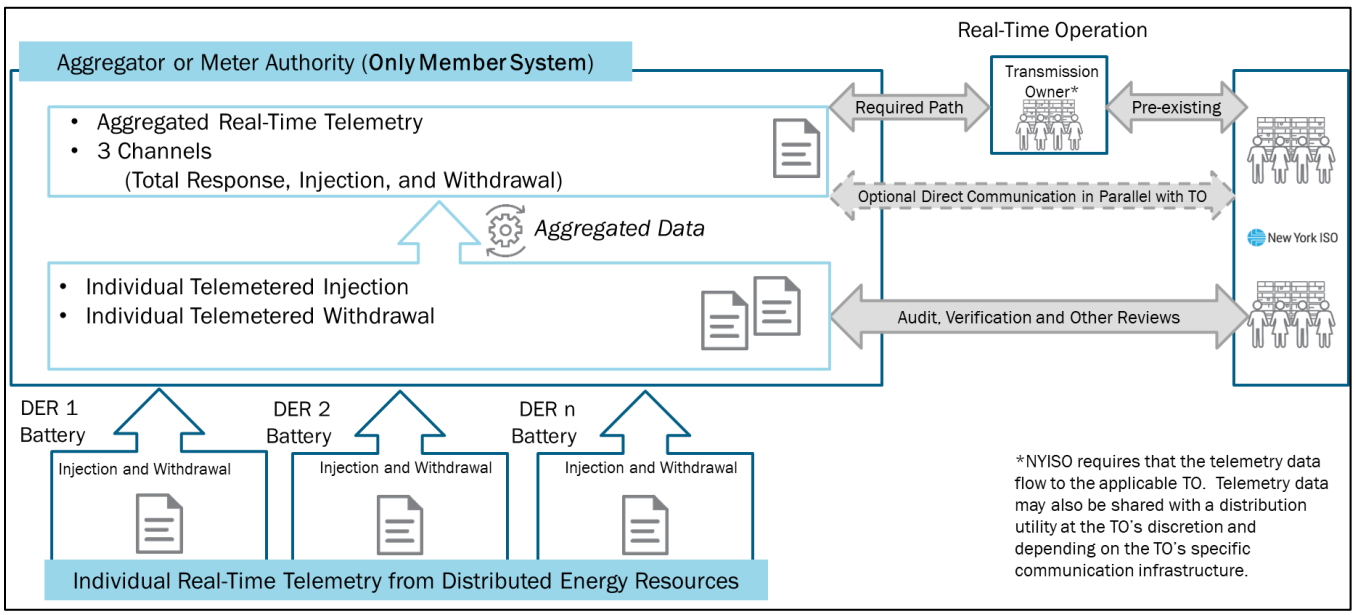
Appendix A Figure 2: DER Aggregation Telemetry Data Flow



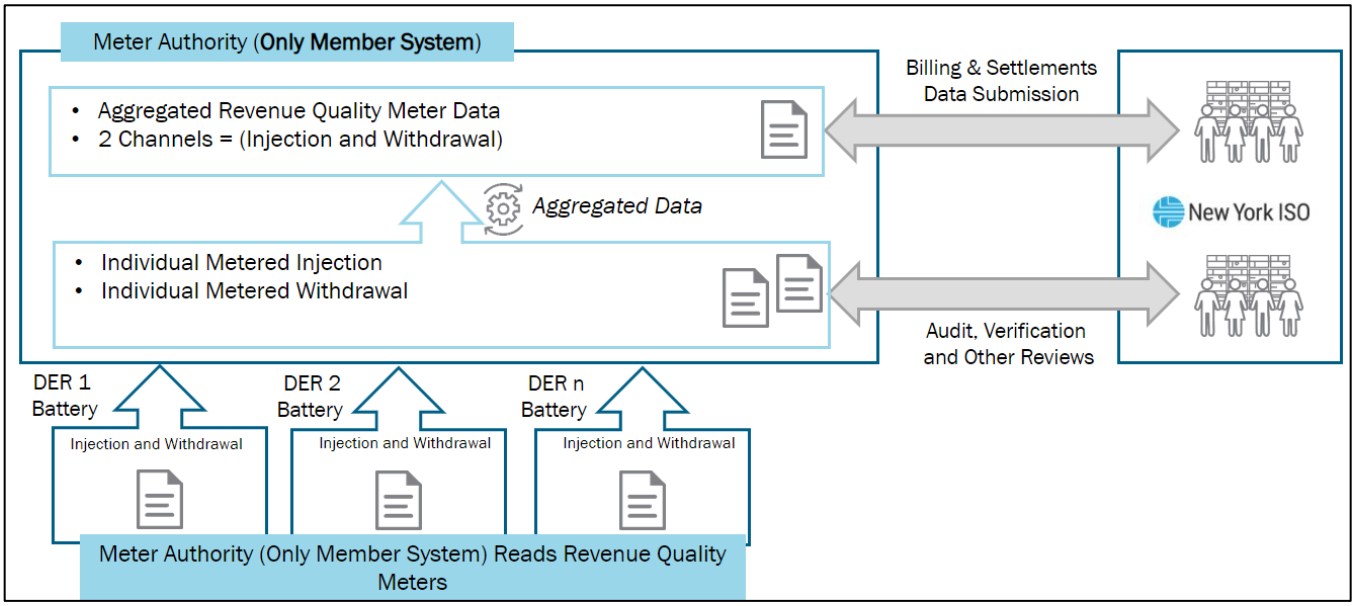
Appendix A Figure 3: DER Aggregation Settlement Data Flow



Appendix A Figure 4: Single Resource Aggregation Telemetry Data Flow



Appendix A Figure 5: Single Resource Aggregation Settlement Data Flow



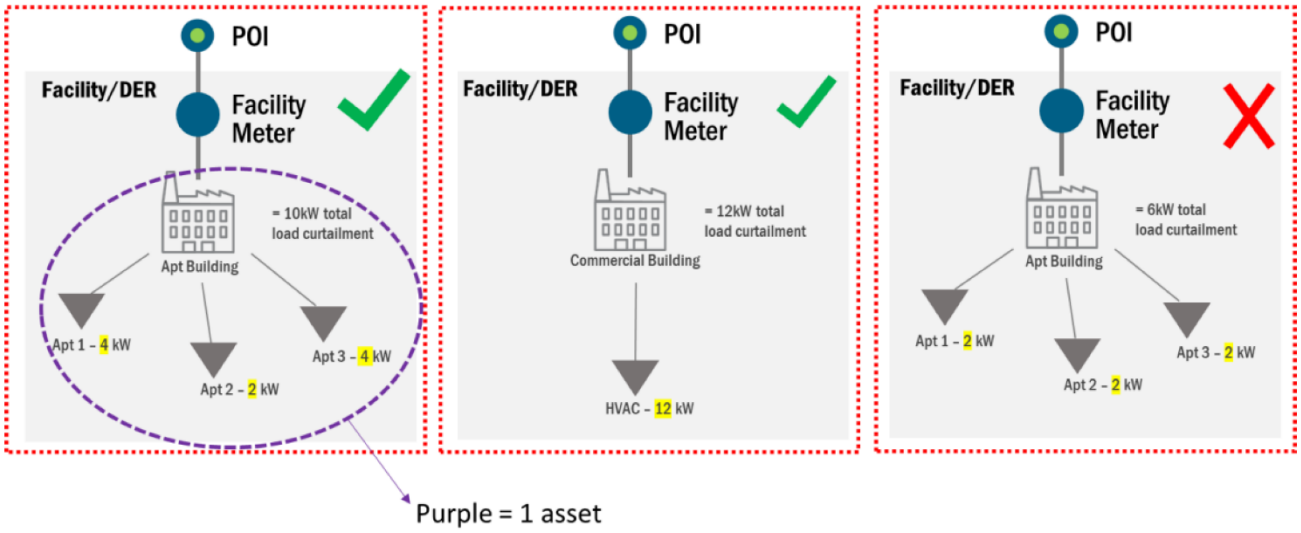
Appendix B

Examples contained in this appendix are not intended to be a comprehensive set of all viable DER and asset configurations. Please contact DER@nyiso.com for further clarification if necessary.

Please note: Baseline load values are not captured in examples; all loads represent the curtailable kW capability of a given asset.

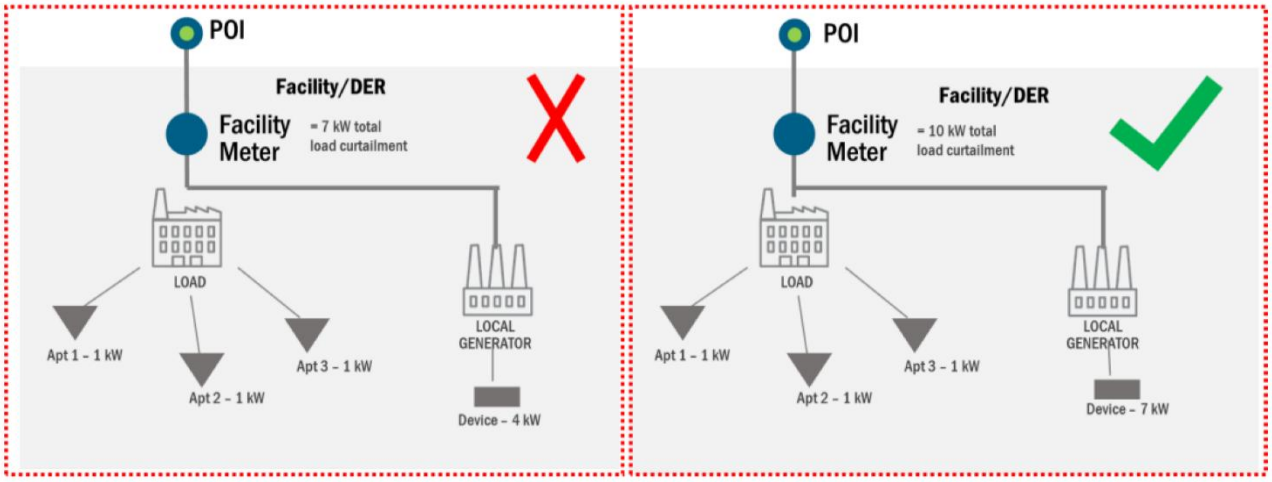
Graphics marked with a green check are acceptable pursuant to the requirements set forth in this Aggregation Manual and in Services Tariff Section 4.1.10. Graphics marked with a red 'X' are not compliant with the NYISO's rules.

Appendix B Figure 1: Site with load curtailment capability only



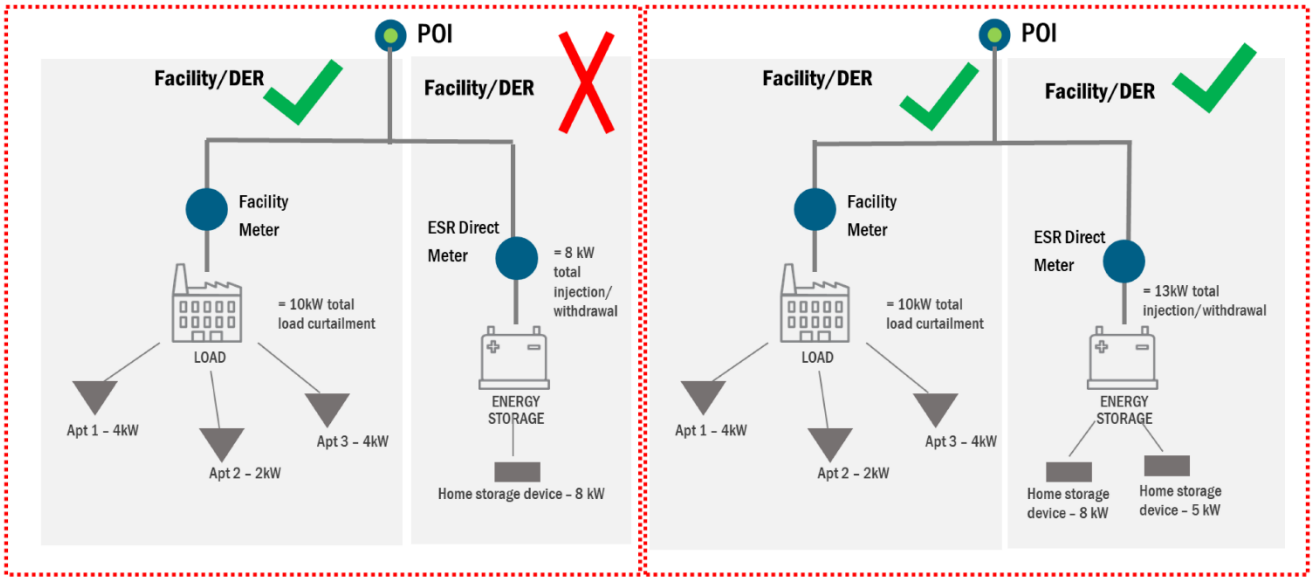
The configuration on the right is not acceptable because the total load curtailment capability is not at least 10 kW.

Appendix B Figure 2: Site with load curtailment capability supported by local supply (e.g., BTM generator)



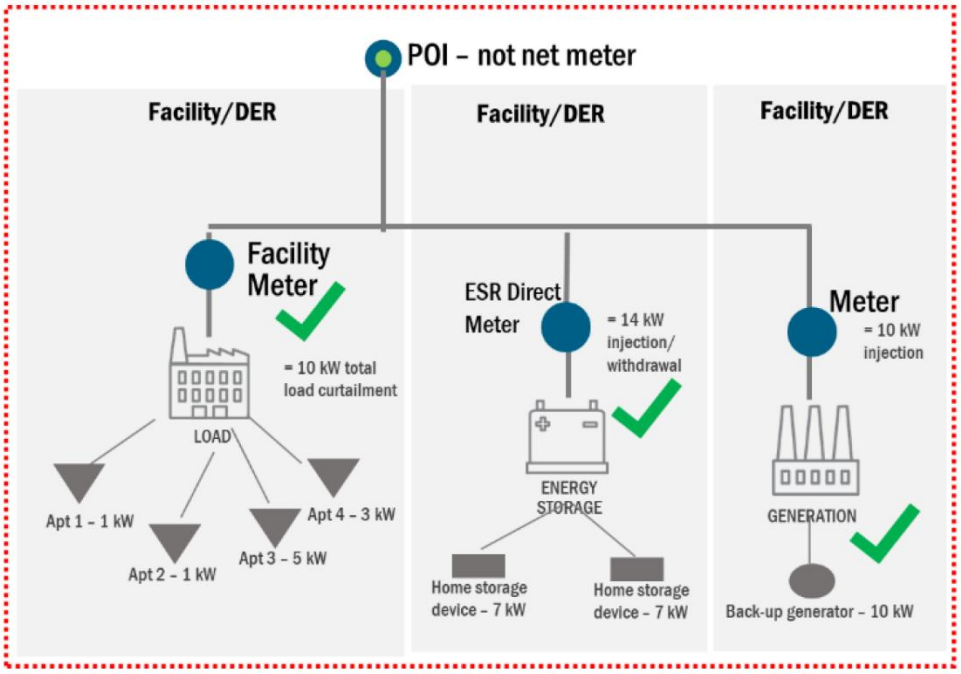
The configuration on the left is not acceptable because the total load curtailment capability, comprised of curtailment and a Local Generator, is not at least 10kW.

Appendix B Figure 3: Site with load curtailment capability and an energy storage asset



The configuration on the left is not acceptable because the storage asset is incapable of at least 10 kW of injection and withdrawal.

Appendix B Figure 4: Site with load curtailment capability, an energy storage asset, and a generator asset



All configurations are acceptable because each asset is capable of at least 10 kW of a given service.

Appendix C

This appendix provides scenarios of acceptable DER facility telemetry and metering configurations. The examples herein are intended to provide guidance to Aggregators for common configurations. The examples that follow are illustrative and are not a complete, exhaustive list of all configurations that may be deemed acceptable. All DER Aggregations must comply with the applicable market rules, including the relevant manuals and tariff provisions.

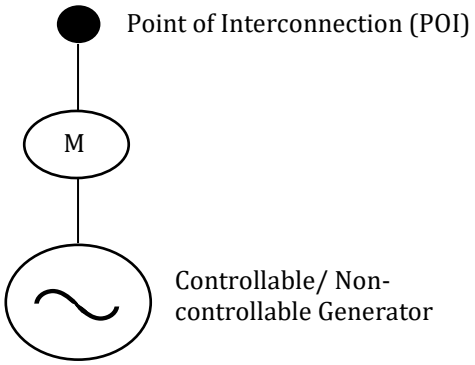
Non-Participating, Non-Controllable Generation

In each of the scenarios outlined below, a Demand Side Resource (DSR) may be co-located with non-controllable generation (e.g., solar) that is not participating in the program, provided the following conditions are met:

- The non-participating co-located non-controllable generation must not contribute to Load curtailment as part of the DER's Load Reduction Plan ("LRP")[1].
- If the DSR's telemetry indicates a net injection to the grid during any six-second interval, zero MW shall be substituted for the telemetered value used in the Economic Customer Baseline Load (ECBL) calculation[2].

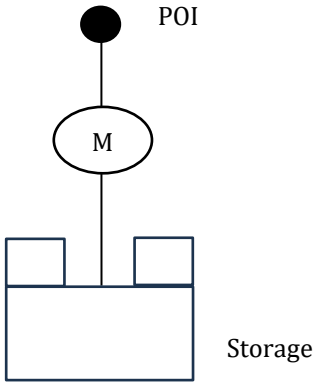
A non-participating, non-controllable Generator on a DER facility site refers to a device for the production of electricity that is characterized by an Energy source with output that cannot be changed by the facility owner or operator for purposes of following a basepoint and that will not be enrolled as part of the DER facility site. Non-controllable generation may include, but is not limited to, solar generation and wind generation. At the request of the NYISO, Aggregators must justify why a given technology on a DER facility site is non-controllable.

Appendix C Figure 1: Standalone Generator DER Facility



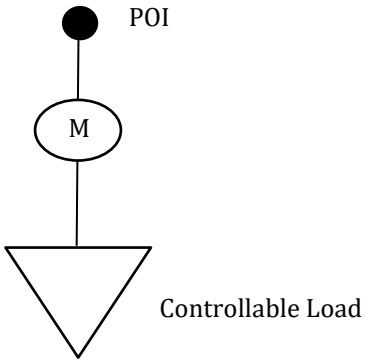
The diagram in Figure 1 above shows a Generator DER facility where an injection-capable controllable or non-controllable Generator is connected to a meter ("M") at the point of interconnection. This meter will be used for the injection telemetry channel output of this DER facility's contribution toward the Aggregation[3]. Demand reduction and withdrawal telemetry channel values would be zero for a DER facility in this configuration. Since there is no Demand Side Resource (DSR), demand reduction values would be zero and no ECBL calculations are necessary in this configuration.

Appendix C Figure 2: Standalone Energy Storage Resource (ESR) DER Facility



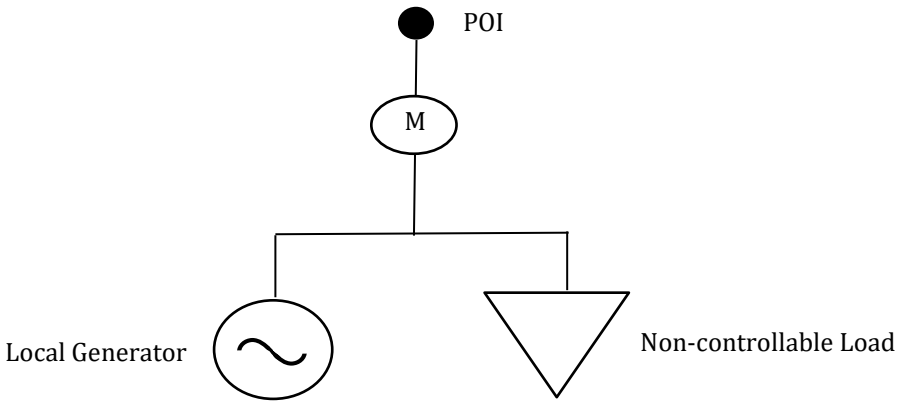
The diagram in Figure 2 above shows an ESR DER facility where an ESR capable of both injection and withdrawal is connected to a meter ("M") at the point of interconnection. This meter must measure energy injections to and withdrawals from the grid in accordance with the NYISO MST section 13.2.4.1. and FERC Order 841. This meter will be used for the injection telemetry channel and the withdrawal telemetry channel output of this DER facility's contribution toward the Aggregation[3]. Since there is no Demand Side Resource (DSR), demand reduction values would be zero and no ECBL calculations are necessary in this configuration.

Appendix C Figure 3: Demand Side Resource – Type C (Curtailment Only) DER Facility



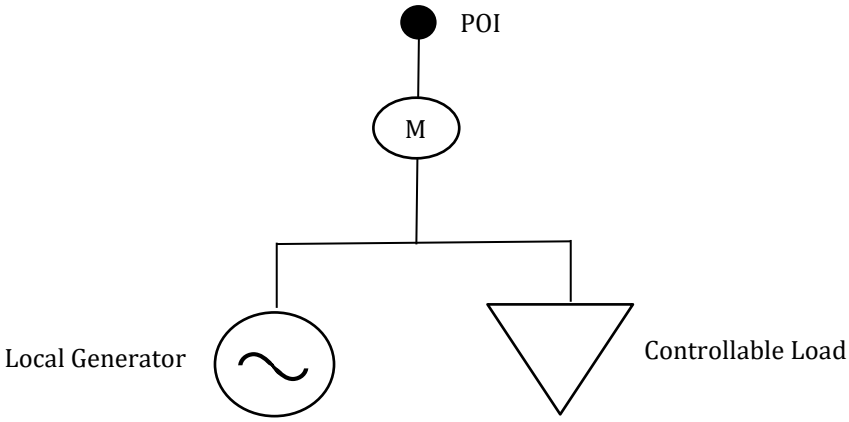
A Type C Demand Side Resource facilitates Load reduction through curtailment only. The diagram above in Figure 3 shows a controllable Load with no injection capability connected to a meter ("M") at the point of interconnection. This meter must measure actual Load at the site and must be used by the Aggregator to calculate the ECBL. This meter will be used for the demand response telemetry channel of this DER facility's contribution toward the Aggregation[3]. Injection and withdrawal telemetry channel values would be zero for a DER facility in this configuration.

Appendix C Figure 4: Demand Side Resource – Type G (Local Generator Only) DER Facility



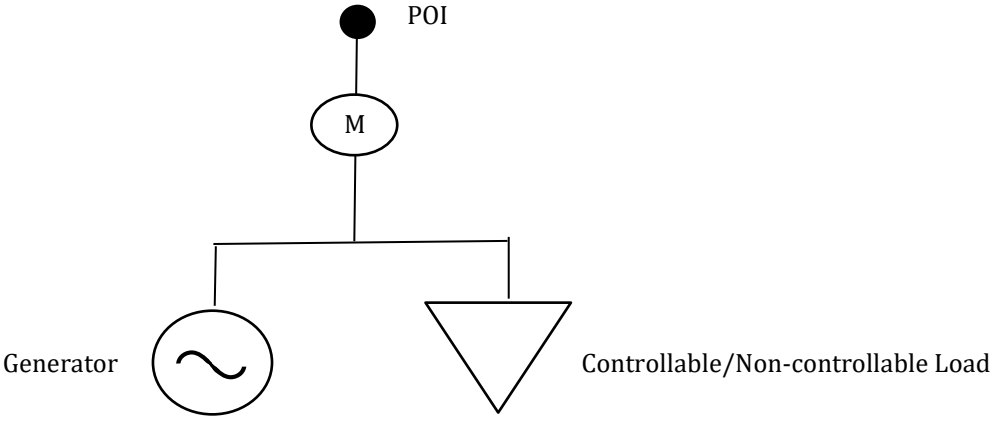
A Type G Demand Side Resource facilitates Load reduction through generation from a Local Generator only. Local Generators do not inject energy onto the grid[5]. The diagram above in Figure 4 shows a Local Generator and non-controllable Load connected to a net meter ("M") at the point of interconnection. This net meter must measure actual Load at the site and must be used by the Aggregator to calculate the ECBL. This meter will be used for the demand response telemetry channel of this DER facility's contribution toward the Aggregation[3]. If telemetry indicates a net injection to the grid during any six-second interval, a value of zero MW shall be substituted for the telemetered value used in the ECBL calculation[2]. The Local Generator must not be an Intermittent Power Resource (IPR) because DSRs must be capable of controlling demand at the direction of the NYISO[1]. The Local Generator may be energy storage. The Local Generator may operate continuously or be normally off.

Appendix C Figure 5: Demand Side Resource – Type B (Curtailment and Local Generator) DER Facility



A Type B Demand Side Resource facilitates Load reduction using a combination of curtailment and generation from a Local Generator. Local Generators do not inject energy onto the grid[5]. The diagram above in Figure 5 shows a controllable Load and Local Generator connected to a net meter ("M") at the point of interconnection. This net meter must measure actual Load at the site and must be used by the Aggregator to calculate the ECBL. This meter will be used for the demand response telemetry channel of this DER facility's contribution toward the Aggregation[3]. If telemetry indicates a net injection to the grid during any six-second interval, a value of zero MW shall be substituted for the telemetered value used in the ECBL calculation[2]. The Local Generator must not be an IPR because DSRs must be capable of controlling demand at the direction of the NYISO[1]. The Local Generator may be energy storage. The Local Generator may operate continuously or be normally off.

Appendix C Figure 6: Demand Side Resource and Injecting Generator (Type I) DER Facility



A Type I DER facility facilitates Load reduction using injection-capable generation and may inject excess generation to the grid, with the Load curtailment and injection capability enrolled as separate assets. The diagram above in Figure 6 shows a controllable or non-controllable Load and injection-capable Generator connected to a net meter ("M") at the point of interconnection. This net meter must measure actual Load at the site and net injection to the grid and must be used by the Aggregator to calculate the ECBL. This meter will be used for the demand response telemetry channel and injection telemetry channel of this DER facility's contribution toward Aggregation[3]. If telemetry indicates a net injection to the grid during any six-second interval, a value of zero MW shall be substituted for the telemetered value used in the ECBL calculation[2]. If the Generator is controllable, it must be normally off unless responding to NYISO dispatch; a generator that is normally on may be considered Behind-the-Meter Net Generation (BTM:NG) Resource, which is not eligible to participate in the DER participation model[4]. In this configuration, a non-controllable Generator may not be paired with a non-controllable Load, as such a configuration cannot follow NYISO basepoints.

Appendix C References:

1. **Aggregation Manual Section 2.1.1** An Intermittent Power Resource (IPR) that is co-located with load behind a single net meter is not eligible to contribute to load curtailment as part of the DER's Load Reduction Plan.
2. **Aggregation Manual Section 7.5.1** If a Demand Side Resource's telemetry indicates a net injection to the grid during any 6-second interval (due to, for example, behind-the-meter solar output), zero kW shall be substituted for the telemetered value.
3. **Aggregation Manual Section 7.3** Aggregators are responsible for measuring four streams (channels) of telemetry data: Energy injections, Energy withdrawals (when the Aggregation contains at least one Withdrawal-Eligible Generator), Demand Reductions, and the sum of Energy injections and Demand Reductions, minus the Energy withdrawals
4. **Aggregation Manual Section 4.3.3** A BTM:NG Resource that transitions to become a DER must thereafter routinely serve its host load by withdrawing from the grid, rather than primarily from the on-site generation source
5. **NYISO MST Section 2.12** Local Generator: A resource operated by or on behalf of a Load that is either: (i) not synchronized to a local distribution system; or (ii) synchronized to a local distribution system solely in order to support a Load that is equal to or in excess of the resource's

Capacity. Local Generators supply Energy only to the Load they are being operated to serve and do not supply Energy to the distribution system.