

Aggregation Manual Updates

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Agenda

- **Background & Overview**
- **Updates to Existing Content**
- **Key Concepts & Manual Language**
- **Next Steps and DER Deployment Status**

Background & Overview

- **The NYISO's June 27, 2019, DER Filing established tariff requirements applicable to DER and Aggregations, addressing:**
 - Interconnection for individual DER
 - Revenue metering requirements
 - Real-Time telemetry requirements
- **In the NYISO's forthcoming FPA 205 filing, tariff requirements address the following:**
 - Distribution Utility review of DER
 - Meter data service roles & responsibilities
- **This presentation describes the concepts and language to be included in the draft Aggregation Manual in support of the aforementioned tariff requirements.**
 - Language that was previously reviewed by the ICAPWG is included in today's meeting materials:
 - Operational Coordination (covered throughout 2022)
 - Aggregator Registration (covered at the 2/28/23 ICAPWG)
 - All three Aggregation Manual 'parts' will be combined into a single document for final stakeholder approval and publication

Background & Overview

- The Aggregation Manual Parts 2 and 3 with incremental redlines reflecting the contents of today's presentation is posted with the meeting materials and also under the DER portlet section of the NYISO website:

<https://www.nyiso.com/manuals-tech-bulletins-user-guides>

Updates to Existing Content

Aggregation Manual Part 1

■ Background & Overview

- Ministerial language updates to address Demand Side Critical Electric System Infrastructure Load in an Aggregation

■ Operational Coordination

- Section 2.1.10 – Aggregations are expected to respond to corrective actions (e.g., RPU), reference to Transmission & Dispatch Operations Manual
- Section 2.2.1. – Removed language requiring Aggregator to share Real-Time telemetry with the applicable Distribution Utility
- Section 2.2.2.
 - Clarified TO actions to address Transmission-level reliability concerns due to an Aggregation (i.e., OOM)
 - Included TO requirement to communicate with Aggregator during NYISO Generator Performance Audit of an Aggregation, pursuant to NYSIO Technical Bulletin 142
- Section 2.2.3 – Included TO requirement to communicate with NYISO during NYISO Generator Performance Audit of an Aggregation, pursuant to NYSIO Technical Bulletin 142
- Ministerial language updates to:
 - 2.1.1.; 2.1.3.2.; 2.1.6.; 2.1.7.

■ Transmission Nodes

- Final list published on the NYISO website – List includes nine additional Transmission Nodes (Zones A, B, C, D, F) added since initial publication on February 24, 2022
 - (Energy Market & Operational Data → Reports & Info → General Information → Transmission Nodes List)
- Ministerial language updates

Aggregation Manual Part 2

■ Aggregator Registration

- The NYISO included ministerial updates to the content presented at the February 28, 2023, ICAPWG
 - Language to reference Distribution Utility review concept
 - NYISO will share Aggregator Operational Contact information with the applicable Distribution Utility
- These updates are marked as revisions in the Aggregation Manual Part 2 draft posted with today's meeting materials

Key Concepts & Manual Language

Aggregation Manual

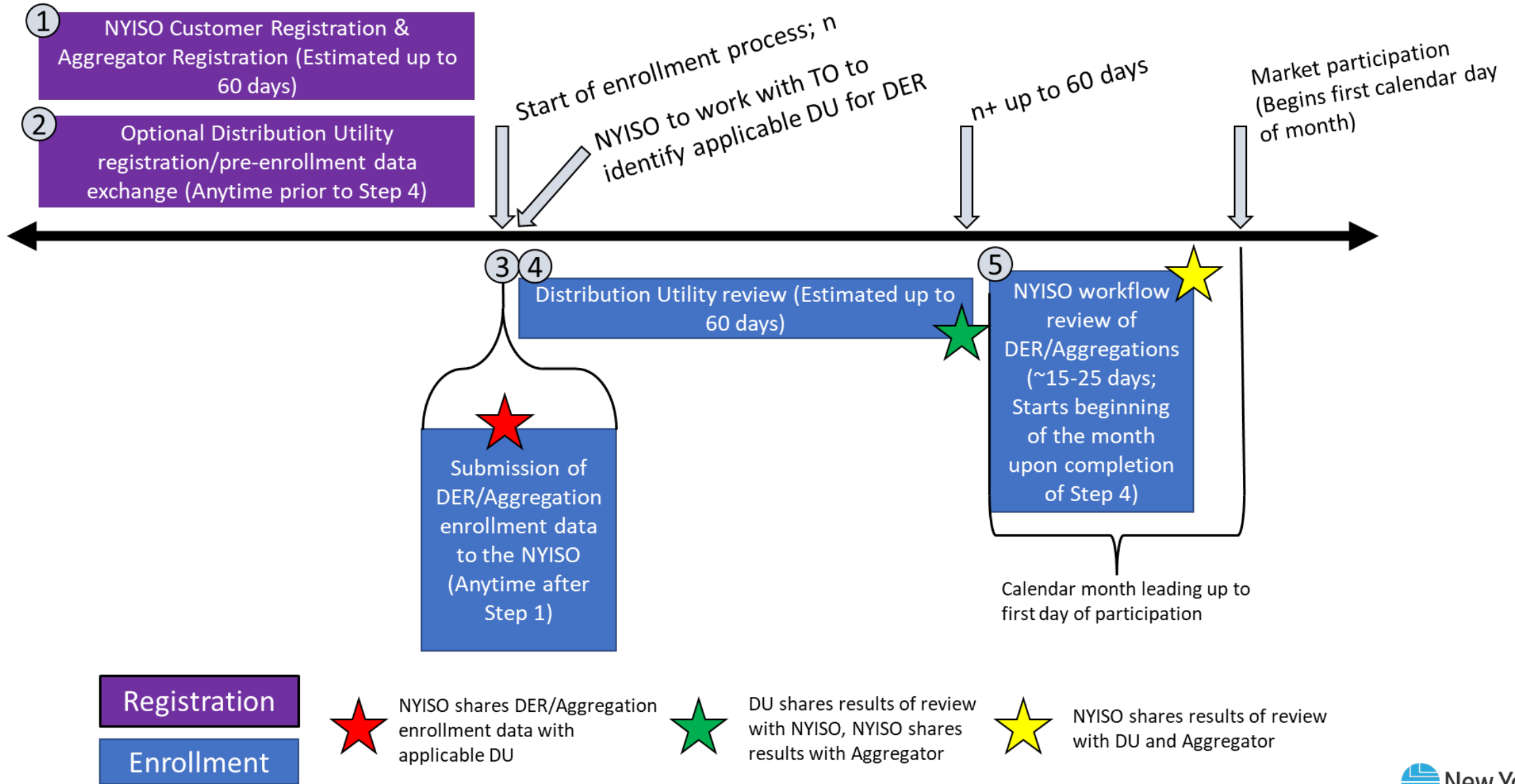
Part 2

DER Interconnection

- **DER facility interconnection to the NYS Transmission System and portions of the distribution system on which wholesale generation is already interconnected is subject to the NYISO Small Generator Interconnection Procedures (SGIP); DER interconnection to a distribution system for the sole purpose of participation in an Aggregation is subject to utility (non-NYISO) interconnection procedures (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.
 - Interconnection requirements apply to the individual DER
 - DER that are Demand Side Resources (and therefore do not inject to the distribution or transmission systems) are not required to have an interconnection agreement
- **ERIS for DER**
 - ERIS or ERIS equivalent may be obtained either through the NYISO Small Generator Interconnection Procedure (SGIP) or through a qualified non-NYISO interconnection procedure (e.g., New York State Standardized Interconnection Requirements)
- **CRIS for DER**
 - DER seeking CRIS must meet the NYISO’s Deliverability Interconnection Standard unless the DER is 2 MW or less
 - All DER seeking to enter the NYISO-administered Installed Capacity market – even if as part of an Aggregation – are required to obtain CRIS

NYISO DER Participation Model – Aggregator Registration and DER/Aggregation Enrollment Timeline

(Assumes no system reliability issues are identified during review)



Distribution Utility Review

- **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.
 - 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 written 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.
- **The NYISO intends to post a list of applicable contacts from Distribution Utilities who provide such information on its public website prior to deployment.**

Distribution Utility Review

- **When the NYISO and Aggregator are unable to identify the applicable DU for a given Aggregation, or for one or more individual DER within an Aggregation, the NYISO will consult with the Member System in whose subzone the Aggregation and/or DER is located to identify the DU.**
 - The NYISO may share DER identifying information (e.g., physical address, meter number, Utility Account Number, one-line diagrams) with the Member System in order to facilitate DU identification.
 - When a DER's enrollment data identifies that the DER receives service from a Municipal Electric Utility the NYISO may also share DER identifying information with the Municipal Electric Utility to determine the appropriate DU.
- **Once the appropriate DU 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.**
- **The NYISO will review the Aggregator's enrollment documentation and work with the Transmission Owner to whose Transmission Node the applicable DER electrically maps in order to identify the appropriate DU.**
 - The Transmission Owner and the NYISO will work together, along with the utility to whose electrical system a DER connects, to identify the appropriate DU, for each DER, who is responsible for the reliable and safe operation of the applicable system.

Distribution Utility Review

■ **Aggregator responsibilities:**

- 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.
- 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 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.

Distribution Utility Review

■ Aggregator responsibilities (cont'd):

- 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.
 - The NYISO will identify all material physical and operating characteristics in the Aggregation System User's Guide.
 - Examples of material changes include modified injection limits, dual participation status, and Transmission Node
 - Examples of non-material changes include modified phone numbers, mailing addresses, and Meter Authority

Distribution Utility Review

■ 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.
- The TO shall communicate with the NYISO to identify 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.

Distribution Utility Review

■ NYISO responsibilities:

- Once the Aggregator's data upload is complete, the NYISO will confirm completeness of the enrollment data in the Aggregation System
 - The NYISO's evaluation does not ensure accuracy of all data provided.
- Upon successful import 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 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.

Distribution Utility Review

■ Distribution Utility responsibilities:

- 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 do not violate existing interconnection agreements, comply with NYISO and/or Distribution Utility metering configurations, or 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.
- Distribution Utilities should complete their safety and reliability review and provide the results of that review to the NYISO within 60 calendar days. 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 60-day review period. A new 60-day review period will begin when the Aggregator resubmits the enrollment data to the NYISO's Aggregation System. It is important to note that the 60-day DU review period is a recommended maximum amount of time. DU review may take longer in practice.
 - This iterative process will continue until the DU verifies that no safety or reliability issues would exist if the Aggregation began operating in the NYISO-administered wholesale market.

Aggregation Manual

Part 3

DER Metering

- **Revenue Quality Meter (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.**
- **Aggregators must obtain wholesale metering and/or meter data services from a Meter Authority.**
 - For 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.

DER Metering

- **Consistent with Services Tariff Section 13.2, 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.**
 - 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.
- **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.**

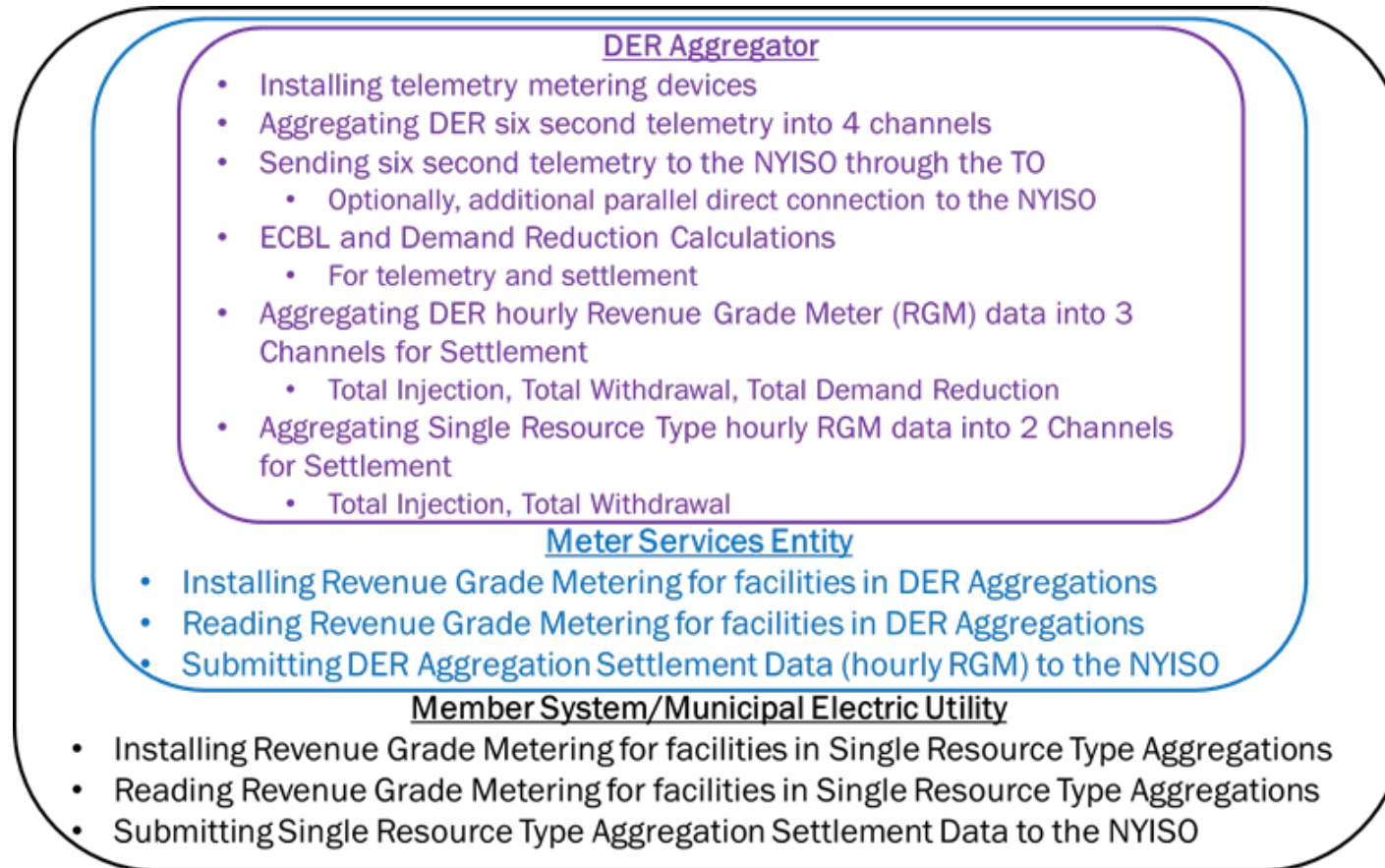
DER Telemetry

- **Six-second telemetry is required for each Aggregation.**
 - 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.
- **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.**

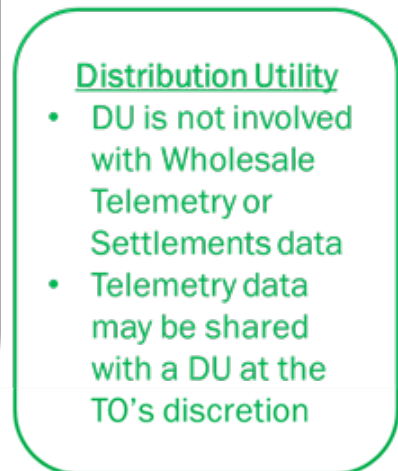
DER Telemetry

- **Aggregators must procure, or provide for itself as a qualified MSE, meter data services (as defined in 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., Meter Services Entity, Municipal Electric Utility, Member System) 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.

DER Telemetry – Metering & Telemetry Responsibilities



The entity in the larger box may provide all the services of entities within its box when the Aggregator and its Meter Authority have a written agreement to provide those services.

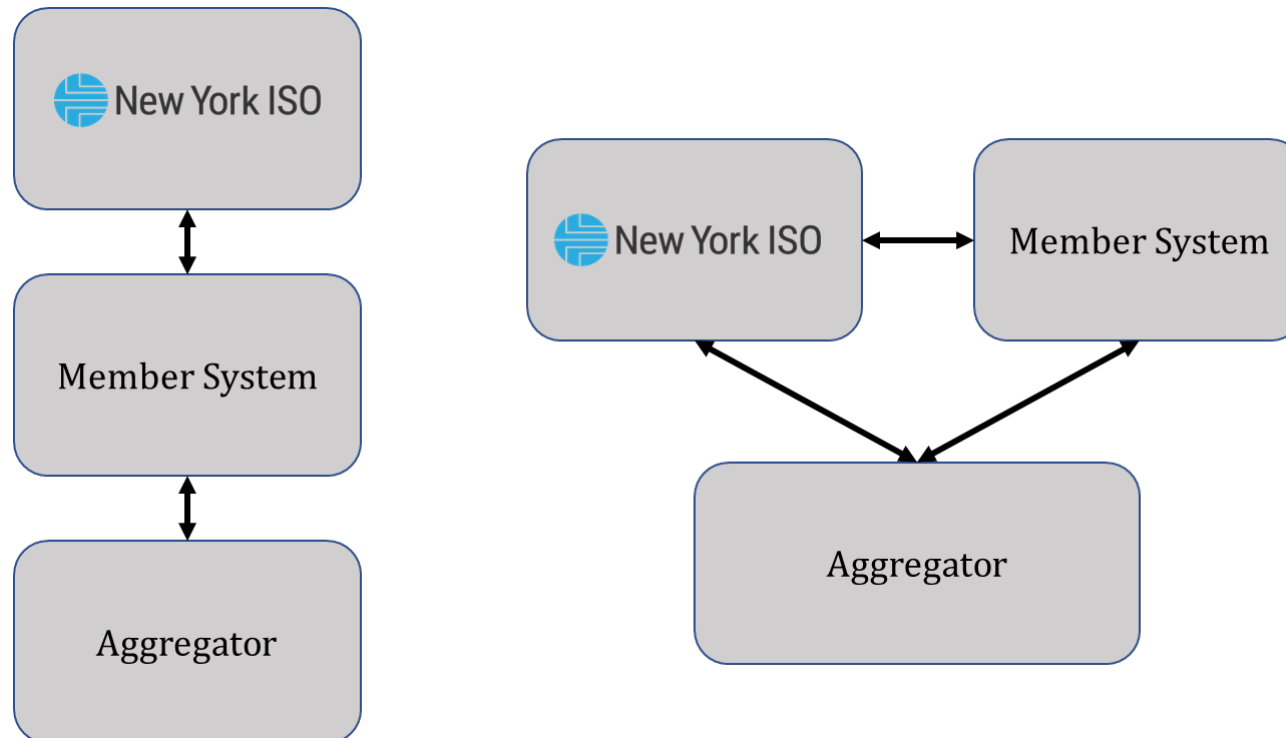


DER Telemetry

- **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.**
- **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.**

DER Telemetry Configurations

- Acceptable telemetry communication data pathways between the NYISO, Aggregator, and applicable Member System



DER Telemetry Testing

- **The testing procedure is a collaborative process by which NYISO power system modeling and DER enrollment staff will work with the Aggregator and applicable Member System to conduct an ‘end to end’ test of Aggregation telemetry.**
- **NYISO-Member System-Aggregator 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.
- **For detailed procedural steps, please refer to the manual draft.**

DER 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.

DER Settlements

- 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.
- An Aggregation that provides Ancillary Services will be settled according to the settlement rules applicable to the particular service.
- Aggregations shall be subject to all relevant performance penalties in real-time.
- 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.
- For details addressing settlement of Aggregations, please also refer to the Accounting & Billing Manual.

Next Steps

Next Steps

- **The NYISO will consider stakeholder feedback on the draft redlines in the Aggregation Manual included with today's meeting materials submitted any time until close of business April 7.**
- **Please send any questions that were not addressed during this presentation to: DER_Feedback@nyiso.com**

DER Deployment Status

2023 DER Deployment Milestones

- **By April 28: NYISO expects to begin accepting Customer Registration for Aggregators.**
- **Tariff is expected to become effective after June 30 – enrollment of DER and Aggregations begins**
- **Date of Enrollment + Workflow Reviews: Distribution Utility review and NYISO workflow begins upon submission of Aggregation and DER enrollment data to the Aggregation System; expected to take approximately 90 days.**

Manuals and Guides

- **The NYISO will return to present the following remaining manuals throughout Q2 in preparation for DER deployment:**
 - Aggregation Manual – remaining content: ECBL, enrollment; DER/Aggregation definitions & program information
 - Reference Level Manual
 - Accounting and Billing Manual – Covered at the 3/24 BACWG
 - Revenue Metering Requirements Manual – Covered at the 3/24 BACWG
 - ICAP Manual
 - *DADRP Manual – Not to be updated until retirement of DSASP and DADRP*
- **User's Guides are not reviewed in Working Groups.**
 - The NYISO intends to publish the following User's Guides throughout Q2:
 - Aggregation System User's Guide
 - Market Participant User's Guide
 - GOCP User's Guide
 - Wind and Solar Plant Data User's Guide
 - RLS User's Guide
 - AMS Automated Market User's Guide
 - DRIS User's Guide – Not to be updated until retirement of DSASP and DADRP
- **The Direct Communications Procedure (CEII) is updated to reflect the DER participation model and is available for stakeholder request via stakeholder services online form request:**
 - <https://nyiso.tfaforms.net/187>

Our Mission & Vision



Mission

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



Vision

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

Questions?