

# Order No. 2222: Participation of Distributed Energy Resource Aggregations in Wholesale Markets

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# Presentation Outline

- Order No. 2222 Background and Compliance Directives
- Distributed Energy Resource (DERA) Participation Models
- DERA Registration Coordination
- Operational Coordination among ISO, DER Aggregator and Distribution Utility
- Next Steps



# ORDER NO. 2222

*Background and compliance directives*

# Background

- The FERC issued Order No. 2222 on September 17, 2020
  - Requires that ISOs/RTOs “allow distributed energy resources to provide all services that they are technically capable of providing through [an] aggregation” (*Id.* at P 130)
    - ISO/RTOs must revise their tariffs to be consistent with specific Order requirements, or
    - Demonstrate how current tariff provisions satisfy the intent and objectives of the Order
  - Compliance filings are due on **July 19, 2021**
- Compliance filings must address eleven directives

# Key compliance directives of Order No. 2222

- Order No. 2222 has eleven key compliance directives:
  1. Allow distributed energy resource aggregations (DERAs) to participate directly in RTO/ISO markets and establish DER aggregators as a type of market participant
  2. Allow DER aggregators to register DERAs under one or more participation models that accommodate the physical and operational characteristics of the DERA
  3. Address size requirements for DERAs and individual DERs
  4. Address locational requirements for DERAs
  5. Address distribution factors and bidding parameters for DERAs
  6. Address information and data requirements for DERAs



# Key compliance directives of Order No. 2222 (cont.)

7. Address metering and telemetry requirements for DERAs
8. Establish market rules on coordination between the RTO/ISO, DER aggregator, distribution utility, and *Relevant Electric Retail Regulatory Authorities (RERRAs)*
9. Address modifications to the list of DERs in a DERA
10. Address market participation agreements for DER aggregators
11. Implement opt-in provision for distribution companies with  $\leq 4$  million MWh of annual sales



# Available Background Materials

- A comprehensive summary of Order No. 2222 background, objectives, compliance requirements and design considerations:
  - [https://www.iso-ne.com/static-assets/documents/2020/12/a08\\_presentation\\_order\\_2222.pptx](https://www.iso-ne.com/static-assets/documents/2020/12/a08_presentation_order_2222.pptx)
- An overview of the stakeholder feedback on Order No. 2222, and the ISO's initial responses to a number of stakeholder questions:
  - [https://www.iso-ne.com/static-assets/documents/2021/01/a3\\_order\\_2222\\_presentation.pptx](https://www.iso-ne.com/static-assets/documents/2021/01/a3_order_2222_presentation.pptx)
- A comprehensive approach to Order No. 2222 compliance was posted on ISO New England's website for the February 2021 NEPOOL Markets Committee meeting
  - See: [https://www.iso-ne.com/static-assets/documents/2021/01/a0\\_order\\_2222\\_draft\\_high\\_level\\_market\\_design\\_approach.pptx](https://www.iso-ne.com/static-assets/documents/2021/01/a0_order_2222_draft_high_level_market_design_approach.pptx)
- Today's presentation is based on these postings

# First, a note on terminology...

- A Distributed Energy Resource Aggregation (DERA) may consist of one or more Distributed Energy Resources (DERs)
  - A DER is “any resource located on the distribution system, any subsystem thereof or behind a customer meter... [that] may include, but are not limited to, resources that are in front of and behind the customer meter, electric storage resources, intermittent generation, distributed generation, demand response, energy efficiency, thermal storage, and electric vehicles and their supply equipment...”
- A DER Aggregator is the market participant responsible for assembling a collection of DERs into a DERA and will be the central point of contact for all interactions with the ISO and the hosting distribution utility (DU)





# ORDER NO. 2222

*DERA participation models*

# The ISO administers five markets and offers eleven participation models

- The ISO currently administers five wholesale markets: Forward Capacity Market, Forward Reserve Market, Day-Ahead Energy Market, Real-Time Energy Market, and Regulation Market
- The ISO currently offers eleven participation models:
  1. Desired Dispatch Point (DDP) Dispatchable Generator
  2. Do-Not-Exceed (DNE) Dispatchable Generator
  3. Settlement Only Resource (SOR)
  4. Binary Storage Facility (BSF)
  5. Continuous Storage Facility (CSF)
  6. Alternative Technology Regulation Resource (ATRR)
  7. Dispatchable Asset Related Demand (DARD)
  8. Load Asset
  9. Demand Response Resource (DRR)
  10. On-Peak Demand Resource
  11. Seasonal Peak Demand Resource



# Resources under the existing participation models will be unaffected

- The ISO does not plan to change the existing participation models with the Order No. 2222 compliance proposal
- Thousands of MWs of DERs are currently participating in the ISO's markets under the existing models. These DERs will be unaffected by the proposal, for example:
  - Settlement Only Resource (SOR) model for individual DERs less than 5 MW
  - Demand Response Resource (DRR) model for DR aggregations per FERC Order No. 745
  - On-Peak and Seasonal Peak Demand Resource models for energy efficiency to participate in the Forward Capacity Market
  - Alternative Technology Regulation Resources (ATRR) model for an aggregation of one or more resources providing regulation



# DERA physical and operational characteristics

- In ISO's view, a DERA comprises a wide range of distributed energy resources with different technologies and different use cases at different locations
- A DERA can:
  - Consist of a single DER or an aggregation of DERs, depending on the size and location of the DERs (*details later*)
  - Include one technology type or multiple technology types, i.e., *heterogeneous aggregation*
  - Participate in wholesale markets and retail programs
  - Be dispatchable or settlement-only



# The ISO proposes two new participation models

- Existing participation models do not allow aggregations of DERs that inject energy into the system with DERs that withdraw energy from the system
- To address this gap and ensure all forms of DERA can participate, the ISO proposes two new models
  - Settlement Only DERA (SODERA) participation model
    - If a DER Aggregator registers a SODERA, it may be able to inject and withdraw
  - Dispatchable DERA (DDERA) participation model
    - If a DER Aggregator registers a DDERA, it may be able to inject, withdraw, provide reserves and/or regulate



# Size Requirements

For a DERA:

- Minimum size is 100 kW
- No maximum size limit

For a DER:

- No minimum size requirement
- No maximum size limit for a DER, provided an individual DER with generation capability greater than 5 MW will be its own DDERA
  - A DER > 5 MW cannot be SODERA
  - This rule is consistent with the existing maximum size limit for a Settlement Only Resource and a Demand Response Asset
- Any DER greater than or equal to 100 kW is allowed to be its own DERA

# The ISO allows aggregation across a metering domain

- For a DDERA or a SODERA, all constituent DERs are required to be located within the same metering domain
  - This rule ensures Energy Market is settled accurately
- Metering domain generally follows a distribution utility's service territory within a single Load Zone
  - Supply and demand within each metering domain must balance to zero for each hour

More metering domain information on slide 92 -110 of:

<https://www.iso-ne.com/static-assets/documents/2020/09/20200914-09-wem101-energy-market-accounting.pdf>



# DDERA is required to be within the same DRR Aggregation Zone

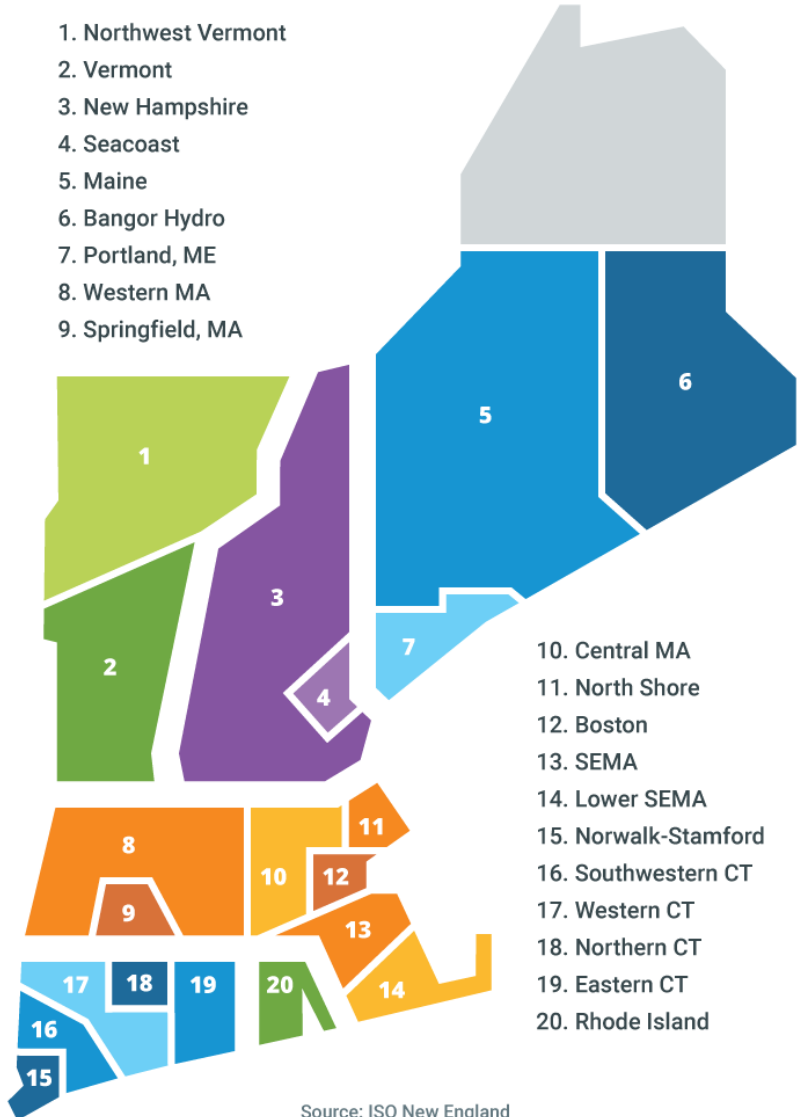
- For a DDERA, in addition to being within a metering domain, all constituent DERs must be located within the same DRR Aggregation Zone
  - Currently there are 20 DRR Aggregation Zones (map on next slide)
- DRR Aggregation Zones were defined to be the widest possible geographic area with minimal transmission constraints within the area
- Requiring all constituent DERs of a DDERA to be within an DRR Aggregation Zone reduces the likelihood that a dispatch of the DDERA will have an unknown impact on a transmission constraint





# New England Aggregation Zones

- 1. Northwest Vermont
- 2. Vermont
- 3. New Hampshire
- 4. Seacoast
- 5. Maine
- 6. Bangor Hydro
- 7. Portland, ME
- 8. Western MA
- 9. Springfield, MA



- 10. Central MA
- 11. North Shore
- 12. Boston
- 13. SEMA
- 14. Lower SEMA
- 15. Norwalk-Stamford
- 16. Southwestern CT
- 17. Western CT
- 18. Northern CT
- 19. Eastern CT
- 20. Rhode Island

Source: ISO New England

# ORDER NO. 2222

*DERA Registration Coordination*

# Asset registration – general features required by Order No. 2222

- Provides the ISO and the DU with information necessary to evaluate:
  - Eligibility of the individual DERs to participate in ISO markets through a DERA
  - Impacts, if any, on safe and reliable operation of the distribution and transmission systems
  - This will include information describing the DERA and constituent DER facilities, including:
    - Geographic and electrical location
    - Performance capabilities
    - Technology types
- Process must provide a timely, transparent review and not create barriers to entry
  - Provides adequate and reasonable time for DU review
  - Specific review criteria
  - Up to a maximum of 60 days allowed
- Appropriate coordination with state and local regulatory authorities
- Flexibility for DER Aggregators to add or remove DERs from a DERA
  - Notification of changes provided to ISO and DU without re-registering the entire aggregation
- Dispute resolution procedures

# Eligibility confirmation by a “small” DU

- By default, Order No. 2222 prohibits the participation of DERAs located in small DU territories ( $\leq 4$  million kWh/year) in wholesale markets
- However, a small DU may opt to allow DERA participation
- In addition to the details discussed above, the eligibility review by a small DU must confirm that the small DU:
  - Has opted to allow DERA participation
  - Is configured as its own metering domain



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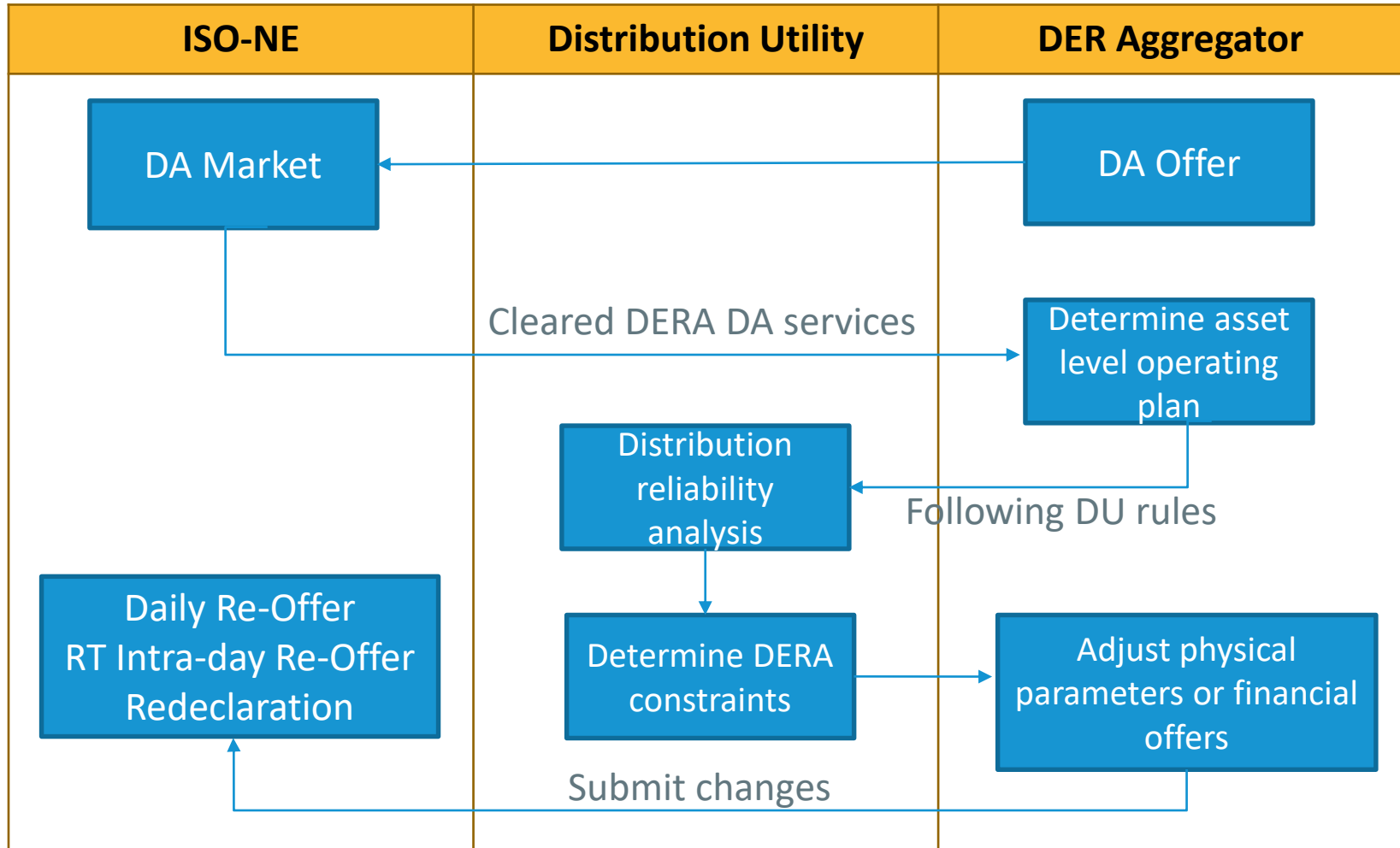
*Operational Coordination among ISO, DER Aggregator and Distribution Utility*



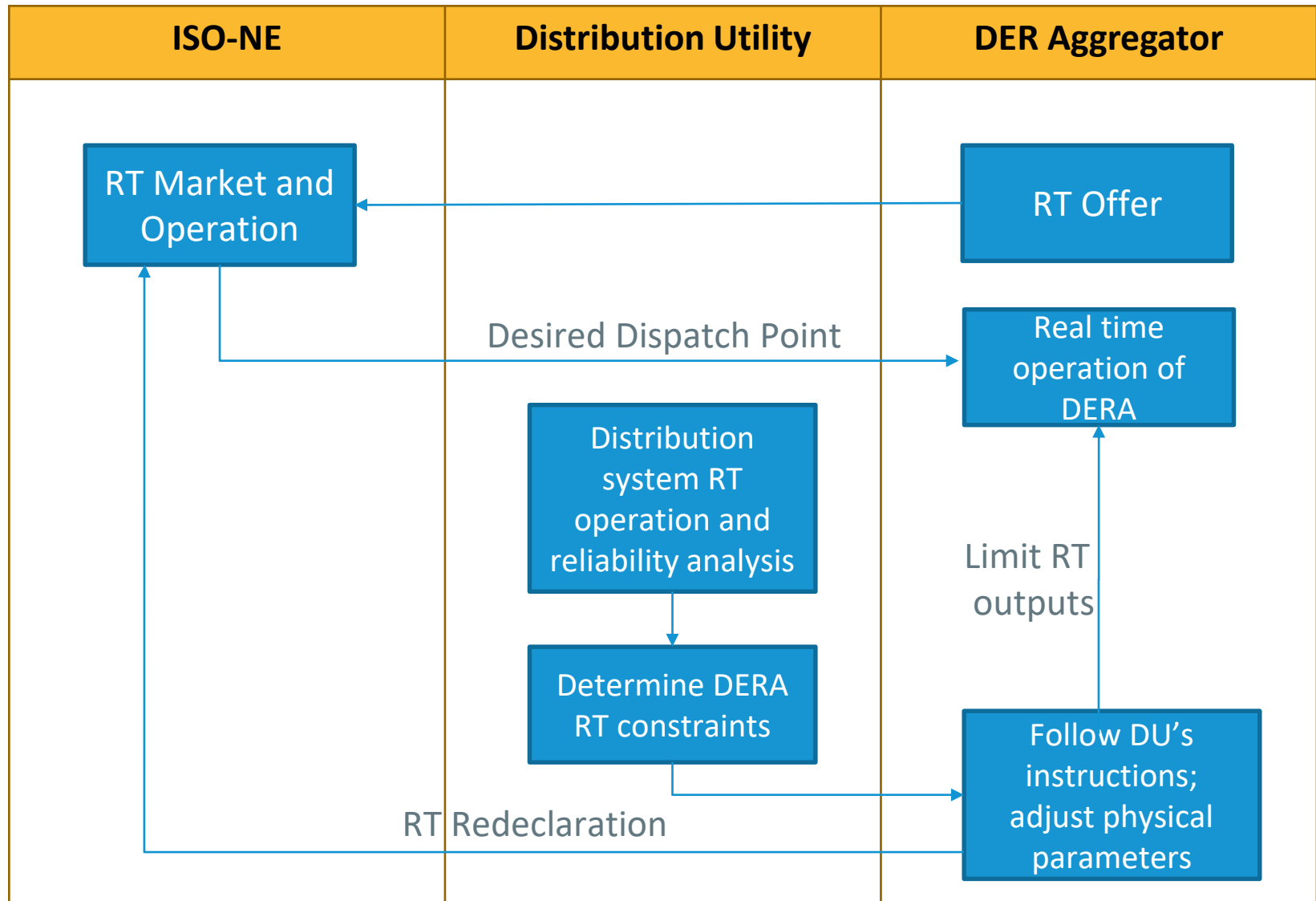
# Operational coordination among the ISO, DER Aggregator, and Distribution Utility

- Order 2222 requires establishment of market rules on coordination among the RTO/ISO, DER Aggregator, and Distribution Utilities (DUs)
- The proposed process of ongoing operational coordination mainly includes data flow and communications in
  - Day-Ahead
  - Real-Time
- For purposes of real-time operational coordination, ISO does not typically interact with DUs
- It is not anticipated that ISO will require interaction with DUs for the purposes of coordinating real-time DER dispatch
  - Verbal communications regarding DERA dispatch with ISO are anticipated to be via the DER Aggregator (or Designated Entity) or the LCC, when necessary

# Day-Ahead operational coordination



# Real-Time operational coordination





# ORDER NO. 2222

*Next steps*

# High-level process schedule

- **Dec 2020:** Kick-off discussion on Order No. 2222 compliance
- **Dec 2020-Feb 2021:** ISO discussions with affected entities (e.g. potential DER aggregators, TOs, EDCs, retail regulators, etc.) under the order
- **Jan 2021:** Continue discussions on Order No. 2222 focusing on preliminary stakeholder questions
- **Feb 2021:** High-level design approach reviewed with the NEPOOL Technical Committees—MC, RC, TC—as appropriate
- **Mar 2021:** More detailed presentation to NEPOOL Technical Committees
- **Apr 2021:** Continued discussion with NEPOOL; draft Tariff changes released, initial discussion of any conceptual amendment proposals
- **May 2021:** Continued discussion of draft Tariff changes with NEPOOL, continued discussion of any amendment proposals
- **Jun 2021:** Technical committee vote on Tariff changes including any proposed amendments
- **Late Jun 2021:** Participants Committee vote on Tariff changes including any proposed amendments
- **July 19, 2021:** Filing with FERC

# Q&A AND DISCUSSION

