FERC Order No. 2222:

Participation of DER Aggregations in Wholesale Markets

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Snapshot of DER in PJM Today

**Wholesale DER**

**1 GW Demand Response**
- Customer-sited generation: Offers into capacity, energy and/or ancillary services markets
  - 84% Diesel
  - 15% Natural Gas
  - 1% Other
- Remaining ~8 GW of DR is load modification without any generation (e.g., industrial process management)

**~2 GW Generator**
- Front-of-the-meter generation: Offers into capacity, energy and/or ancillary services markets
  - Can be sited at customers
  - Mostly solar but also other fuels

**Non-Wholeale DER**

**~10 GW DER**
- Solar PV DER: Retail/rooftop solar
- Municipal DER: Municipal electric company distribution-level generators
- Process DER: Industrial generators, combined heat and power
- Resilience DER: Emergency backup
- Qualified Facilities: Direct sales to distribution utilities
Estimated Implementation Timeline

- **2022**
  - Compliance filing submission

- **2023**
  - DER Sell Offer Plans accepted (Q1)

- **2024**
  - Market Readiness Testing/Training

- **2025**
  - Energy / Ancillary Services market participation (Q1)

- **2026**
  - 2026/2027 Delivery Year
  - DER Capacity Aggregation Resources’ obligations begin

- **2023**
  - Base Residual Auction for 26/27 Delivery Year (July)

- **2024**
  - Estimated FERC Order (Q4)
# Extremely Broad Rulemaking - PJM’s Compliance Filing

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How broad to allow aggregation?

<table>
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<th>Locational Requirements</th>
<th>Energy</th>
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<td>Aggregate DER up to primary transmission load bus (~10,000 in PJM)</td>
<td>Aggregate DER up to capacity zone (~25 zones in PJM)</td>
<td>Aggregate DER up to transmission zone level (~20 zones)</td>
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<td>Nodal aggregation</td>
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Transmission *constraint control and pricing* for each market product were key considerations
Coordination Framework


Utility/State Process

PJM Order 2222 Framework
1. **Registration / Utility Review Process**: Prior to approving an aggregation for market participation, Utility reviews and approves a dispatchable range for the proposed aggregation.
   – Aggregations submitting ranges the Utility cannot reliably integrate on a “normal” basis should be denied (or modified).

2. **Day-Ahead**: Prior to day-ahead submittal, Utilities and Aggregators should coordinate an agreed upon range of MW dispatch per hour for Aggregator to submit to market.

3. **Real-Time**: For reliability concerns, any action the Utility deems necessary shall be executed by the Aggregator.
   – Utility should provide explanation *after the fact* as to the reliability concern

*Aggregations are not eligible for lost opportunity costs or performance excusals due to Utility override and will be subject to any applicable charges/penalties.*
Net Energy Metering Participation

• Net Energy Metering Participation
  – PJM’s proposal is to allow A/S participation and disallow Capacity and Energy participation by default. PJM has built in a release value to evaluate specific use cases for a change to participation
  – Important checks are (1) ensure no double counting for retail <> wholesale compensation and (2) ensure all PJM participation requirements are met

• PJM has observed some diversity in net energy metering tariffs among states and believe the release value will be able to support the flexibility for NEM tariff differences and evolution