



PJM Straw Proposal for DER Ruleset and Aggregation



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Today's proposal does not apply to DER sited at wholesale customers—i.e. DER at most munis and coops.

Muni/coop proposal to follow.

- This proposal is designed to consider all previously discussed stakeholder principles.
- In particular, the EDC has primary responsibility for maintaining safe and reliable distribution.
- Therefore, this aggregation proposal recognizes the central role the EDC plays in DER activity:
 - The EDC is central to the interconnection process for each DER under applicable regulatory oversight.
 - The EDC plays an important role at each step of the aggregation process.
 - The importance of operational coordination with the EDC.

Ancillary Services + Energy + Aggregation = first draft of a standalone package. Consider this package a starting point for discussion.

1. Not Demand Response, not Generation: proposal is for 3rd ruleset for DER.
 - DER can choose to participate as either Gen, or DR, or under new DER rules. Participation under new DER rules is voluntary.
2. Individual DER and aggregated DER can participate under new DER rules.
3. All DER sites must have interconnection approval from the EDC and come through the PJM queue.
4. DER wired w/ load must also be approved by EDC for wholesale participation.
5. Unless otherwise specified, DER rules (e.g., for telemetry) = Generation rules.
6. Individual DER & aggregations are managed through electronic DER Hub.
7. Option for “Marketer” intermediary as per Generation status quo.
8. Strawman for discussion: DER day-ahead schedules are shared with EDC upon request.

10 MW standalone “front-of-meter” distribution-connected:

1. Solar farm selling energy.
2. Battery storage selling Regulation.
3. Microturbine selling energy, Regulation, and Synchronous Reserves.
4. 4 MW gas engine wired with 3 MW load.
5. 500 kW coal combined heat and power at a 200 - 500 kW load.
6. 2MW of solar and 2MW of battery storage wired with 3MW load.
7. 200 kW of solar wired with 100 kW of load.
8. 20 separate DER Unit, each with 2-12 kW of load and 5 kW of battery storage.

(Note: Capacity to be treated in subsequent stages of discussions)

Note: aggregation here does not mean “DER market participation”. It means “bringing together multiple separate units into one resource”.

1. Purpose of aggregation: **allow small DER to meet 100 kW min size threshold***.
2. Multiple DER units may aggregate in order to reach 100 kW minimum size.
3. DER aggregates on same or adjacent feeders must be approved by EDC.
4. DER cannot aggregate beyond a single EDC.
5. Aggregates implemented as aggregate-nodal (like composite combined cycle units today), not zonal.
6. Maximum aggregate size limit of 1 MW.
 - No more than a single “anchor” DER > 100 kW per aggregate.
7. Key discussion point: rules for cost-based offers and offer parameters.
 - Should all DER in aggregate share the same injected energy settlement track (wholesale vs. retail)?

**PJM position: aggregation for managing risk in complying w/ performance requirements should be identical for DER & Generators.*

- Managing initial DER set up and updates.
- **“DER Unit” vs “DER Market Resource”**.
- **DER Unit** details:
 - Physical: address, owner, etc.
 - Retail: account number, compatibility with wholesale energy settlement.
 - Interconnection approval and reference.
- **DER Market Resource** details:
 - List of one or more associated DER Units (aggregated or individual).
 - Wholesale market-related details.
- Initial set-up is subject to approval process.
- Parameters can be updated in DER Hub subject to (possibly different) approval process.

- DER Unit:
 - EDC interconnection approval required, either via WMPA (under state jurisdiction) or ISA (under FERC jurisdiction). Note PJM queue study of transmission impacts also required for either case.
 - EDC to confirm correct retail account number and other basic details.
 - For wholesale energy settlements coordination: EDC to confirm whether retail load metering is unidirectional—only measures consumption (or not).
- DER Market Resource:
 - If resource is aggregated, and if any DER units in the aggregate are on the same or adjacent feeders: EDC to confirm no reliability impacts from coordinated activity of DER units.



Selection of pending ruleset and aggregation items for discussion

1. Details of approval process for initial set up & for updates of DER Unit and DER Market Resource.
2. Sharing of DER DA schedule with EDC.
 - If the EDC does not already have DER telemetry, should this also be shared?
3. Intraday Unit Commitment: automatic (like Economic DR) or manual (like Gen?)
4. For aggregates:
 - a) Is telemetry for the entire aggregate or per-unit?
 - b) Is the MW weighting across the aggregate: fixed, or adjustable per interval, or based on historical values, or something else?
 - c) Rules for cost-based offers and offer parameters.
 - d) No Lost Opportunity Cost for aggregates?
 - e) Is nodal weighting for energy settlement based on ex post actual or on ex ante schedule? What if component nodal LMPs diverge widely?
5. Rules for DER at wholesale customers (e.g., most munis and coops).
6. Multiple wholesale DER at a single site.
7. Interaction (if any) with load reductions/demand response rules. E.g., DER co-located with grid-interactive water heaters.
8. Who has the responsibility to establish that retail energy metering only records withdrawals?