



Opt-In, Opt-Out, Locational Requirements

PJM Staff

DISRS

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Small EDC Opt-In

- The only RERRA restriction is the small utility opt-in
 - PJM must accept bids from a DER aggregator if its aggregation includes DERs that are customers of utilities that distributed more than 4 million MWh in the previous fiscal year, and must not accept bids from DER aggregators if its aggregation includes DERs that are customers of utilities that distributed 4 million MWh or less in the previous fiscal year, unless the RERRA permits. (Order 2222)
- The opt-out (large utilities) and opt-in (small utilities) requirements of Order Nos. 719 and 719-A still apply to Demand Response resources.

- DR Opt-in/Opt-out process would apply to the following resources:
 - Demand Response (load curtailment) resources
 - Resources participating with load curtailment and Front of the Meter (“FTM”) injections in PJM Markets
 - Use existing DR process for aggregations that include Demand Response
 - See slide 12, 13 and 119 to 126 for more details [DR Training material](#)
- Order 2222 Opt-in process would apply to the following resources:
 - FTM generator/energy storage, and energy efficiency resources
- Transition period to be proposed for small utilities that transition to a large utility (utilities that grow and now distribute more than 4 million MWh and therefore should be classified at large utility).

The Office of the Interconnection shall permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model with a DER Aggregation Resource including Component DER that are end-use customers of an electric distribution company that distributed 4 million MWh or less in the previous fiscal year, as identified by the electric distribution company, if, during the course of the registration process described above in Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b), the electric distribution company presents any of the following evidence to PJM:

- i. an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation;
- ii. an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation; or
- iii. an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

- **Paragraph 32:** ...we find that PJM’s proposal partially complies with the requirement to explain how it will implement the small utility opt-in. While PJM’s proposed tariff permits only the electric distribution company to present evidence of a RERRA’s opt-in determination to PJM, PJM states in its Data Request Response that a DER Aggregator or RERRA may also provide to PJM evidence of a RERRA’s opt-in determination by coordinating with the electric distribution company. Moreover, PJM does not explain the process by which an electric distribution company, DER Aggregator, or RERRA may coordinate to present such evidence to PJM. Accordingly, we direct PJM to file, within 60 days of the date of the issuance of this order, a further compliance filing that **clarifies the entities that may present evidence of a RERRA’s opt-in determination to PJM and the manner in which such evidence may be presented to PJM.**

- In the transmittal letter, PJM will clarify the process as follows (tariff to remain unchanged):
 - The EDC is the entity that should provide evidence of the opt-in to PJM.
 - The EDC should email the evidence (or a public link to the evidence) to PJM
 - The DER Aggregator or RERRA may provide the evidence to the EDC and the EDC would then provide it to PJM.
 - If the DER Provider or RERRA do not see the RERRA opt in evidence posted on pjm.com, they should contact PJM and provide a copy of the communication sent to the EDC. PJM will contact the EDC and DER Provider or RERRA, as necessary, to resolve the issue.
 - This is an effective administrative process as demonstrated through DR resource participation in the wholesale market. Since the inception of Order 719A, DR resources have participated on a timely basis and we have not experienced any issues with this administrative process.



DR Opt-Out Rules

The Office of the Interconnection shall permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model if the applicable DER Aggregation Resource includes Component DER that are end-use customers of an electric distribution company that distributed more than 4 million MWh in the previous fiscal year, as identified by the electric distribution company, unless the DER Aggregation Resource includes one or more Component DER that are demand response and the Relevant Electric Retail Regulatory Authority has prohibited the participation of demand response in the DER Aggregator Participation Model.

- **Paragraph 38:** ...we find that PJM’s proposal does not clearly articulate the relationship between the demand response opt-out rules and their application to PJM’s DER Aggregator Participation Model. Accordingly, and consistent with PJM’s statement in its Data Request Response, we direct PJM to file, within 60 days of the date of the issuance of this order, a further compliance filing **clarifying that the demand response opt-out rules set forth in Tariff, Attachment K-Appendix, section 1.5A.3 (1)(a)(i) and Operating Agreement, Schedule 1, section 1.5A.3 (1)(a)(i) will be used to demonstrate that a RERRA has prohibited the participation of demand response in the DER Aggregator Participation Model.**

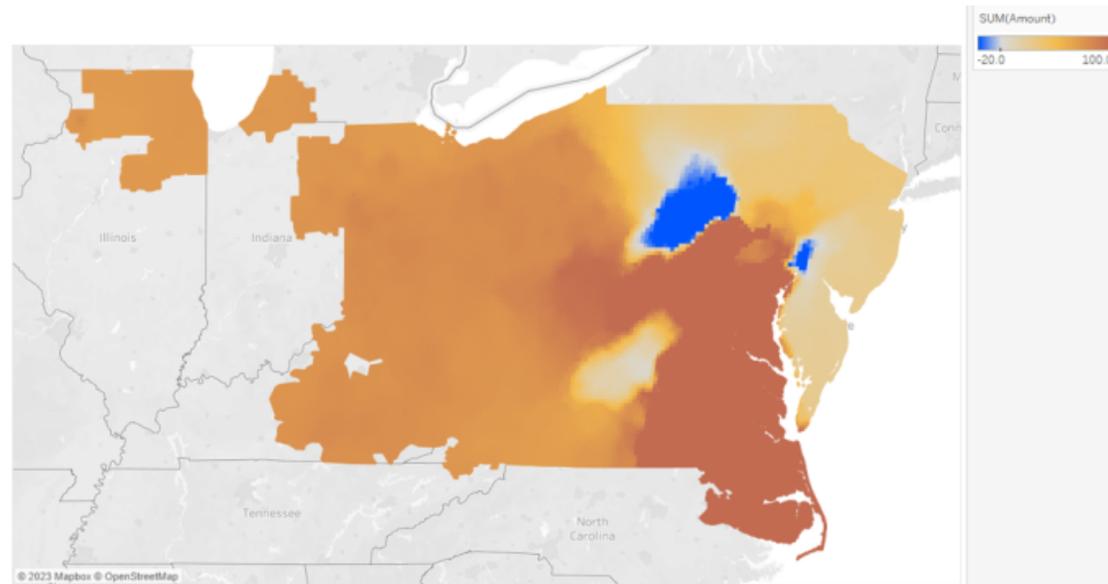
The Office of the Interconnection shall permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model if the applicable DER Aggregation Resource includes Component DER that are end-use customers of an electric distribution company that distributed more than 4 million MWh in the previous fiscal year, as identified by the electric distribution company, unless the DER Aggregation Resource includes one or more Component DER that are demand response and the Relevant Electric Retail Regulatory Authority has prohibited the participation of demand response in the DER Aggregator Participation Model, **pursuant to the rules set forth in Tariff, Attachment K-Appendix, section 1.5A.3 (1)(a)(i) and Operating Agreement, Schedule 1, section 1.5A.3 (1)(a)(i).**



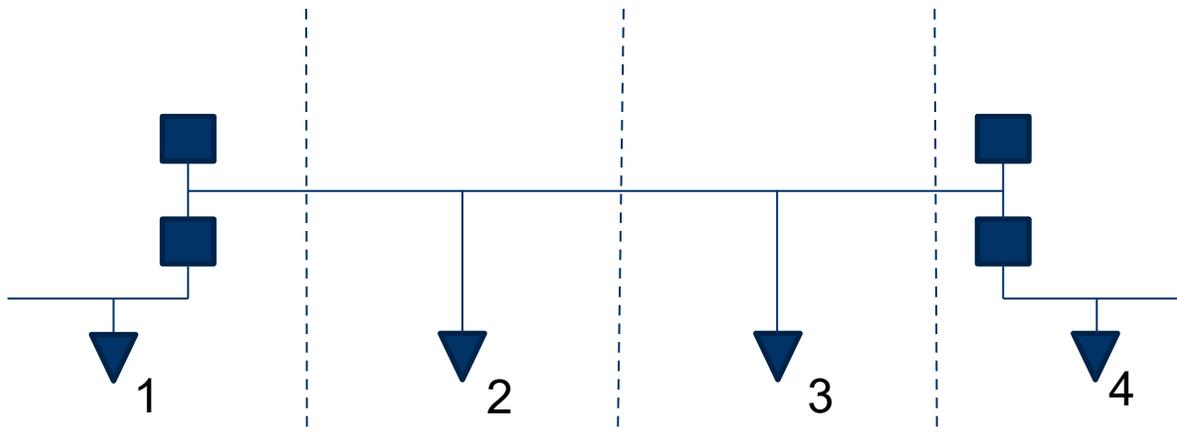
Locational Requirements

- The nodal approach is the **only workable option for larger Component DER** and for this resource **regardless of size at scale.**
- Supply is more than just negative MW's of demand, it must respond nodally to LMP in order to control constraints
- Constraint control without nodally dispatchable resources would not just be inefficient, it could become infeasible from generation alone ultimately requiring load shed.

Multi-nodal aggregations will not scale. It would displace dispatchable generation in the market



- PJM did a deeper dive into LMP similarities across a zone over a longer time period.
- Although loads sometimes shared LMPs with loads at the same substation, the vast majority outside the substation showed significant price variations.
- Pricing variations implies different constraint response expectations.
- Loads #2 and #3 showed they could be aggregated, but none can be aggregated with #1 or #4.



Threshold	# Total Active Nodes	# Nodes with No Similar Nodes	# Nodes with 1 or More Similar Nodes (Excluding Nodes at its own Station)
Max Diff < \$1	286	111	14
Max Diff < \$2	286	103	18
Max Diff < \$5	286	95	26

- The grid must have nodally dispatchable resources.
- Even with sufficient supply and demand, even if they balance, power cannot be delivered safely from supply to demand without dispatch.
- Dispatchability is central to the concept of LMP. Someone, supply or demand, must respond to Price at a Location (where and how much).
- Out of market manual dispatch or manual load shed still works to keep the grid reliable, but LMP will not.

- PJM appreciates the concerns raised by stakeholders regarding the difficulty of aggregating to 100 kW at a single node, especially while the market is immature.
- The DER model should foster innovation and facilitate entry of small Component DER while experience is gained and the market is able to mature.
- As such, PJM proposes permitting **limited** multi-nodal aggregations as outlined below.

Component DER can aggregate across nodes in a transmission area (EDC) under the following rules:

- (1) No single Component DER may be >100kW.
- (2) The total MWs of **all** multi-nodal aggregations in a transmission area must not exceed 0.1% its peak load,
- (3) If a group of Component DER in a DERA reach 100 kW in a single node, these component DER must be split off as a separate resource.
- (4) Settlement must still be nodal for all Component DER in a DERA.

PJM would request a reporting requirement 3 years after implementation or once the peak load limit is reached across majority of PJM.

- Zonal aggregations displace other capacity resources that are dispatchable, so the total of such resources must be capped.
- Zonal aggregations are infeasible for constraint control, so the constraint component of LMP is not valid.

Therefore...

- Zonal DERAs will be able to participate in capacity, energy and ancillary services to a limited penetration.
- Zonal DERAs will be unable to set price in the energy market.

EDC Definition

- FERC directed PJM to file a further compliance filing to revise its tariff to include a definition of electric distribution company.
- Utilities proposed definition in FO2222 Docket:
 - For purposes of Attachment K-Appendix, section 1.4C and OA Schedule 1, section 1.4C, “Electric Distribution Company” or “EDC” shall mean the entity that owns and operates the portion of the electric grid that delivers electric power to end-use consumers under rates and tariffs approved or authorized by the applicable Relevant Electric Retail Regulatory Authority.
- PJM proposed utilizing existing definition for “Electric Distributor” at May 8 DISRS
 - Electric Distributor shall mean a Member that: (1) owns or leases with rights equivalent to ownership electric distribution facilities that are used to provide electric distribution service to electric load within the PJM Region; or (2) is a generation and transmission cooperative or a joint municipal agency that has a member that owns electric distribution facilities used to provide electric distribution service to electric load within the PJM Region
- Stakeholders expressed preference for a narrowly-applicable new definition.

- Define “Electric Distribution Company” as follows:
 - “Electric Distribution Company” shall mean, exclusively for purposes of the Tariff, Attachment K-Appendix, section 1.4B and Operating Agreement Schedule 1, section 1.4B, a PJM Member, or an entity that authorizes a PJM Member to represent them and act on their behalf, that owns or leases with rights equivalent to ownership electric distribution facilities that are used to provide electric distribution service to electric load within the PJM Region.

SMEs/Presenters:

Peter Langbein - Peter.Langbein@pjm.com

Daniel Moscovitz - Daniel.Moscovitz@pjm.com

Maria Belenky - Maria.Belenky@pjm.com

Facilitator:

Ilyana Dropkin - Ilyana.Dropkin@pjm.com

Secretary:

Luke Zinszer - Luke.Zinszer@pjm.com



Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com

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