



Metering and Telemetry Requirements

Order 2222

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Generation
DER & Inverter-Based Resources
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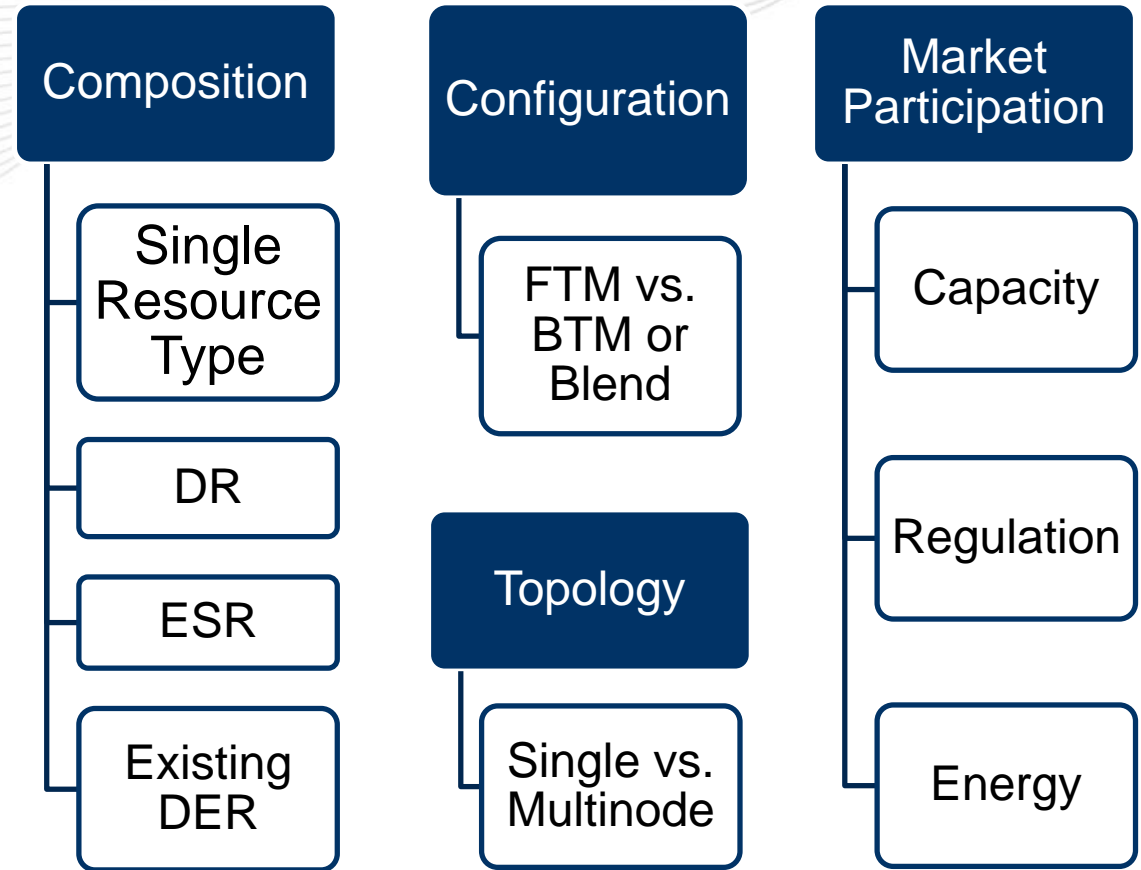
- All initial thoughts in this presentation are being provided to help facilitate discussion around certain topics and do not represent a formal PJM position at this time.
- Discussion and feedback from stakeholders on these topics will be used to help inform the PJM straw proposal, which will include PJM's initial positions on Order 2222 compliance.

Requirements developed on an RTO/ISO basis.

- Unique market service requirements
 - In line with existing rules
- Hardware or software requirements
 - Visibility and control of individual resources often tech-dependent
 - Technology capabilities vary by system
- Channels of communication
 - Direct to PJM: Internet-based SCADA link
 - Indirect to PJM: Existing channels via the appropriate utility

- Does the aggregation contain...
 - Single or multiple resource types?
 - DR? ESRs?
 - Existing DERs?

- Is the aggregation...
 - Single node? Multinodal?
 - FTM? BTM? Blend?



- Manual 14D Section 4.2.2: Metering Plan and Section 4.2.3 Metering for Individual Generators
 - “...a Generation Owner can negotiate data transmission to and from PJM through the local utility or transmission facilities owner. This allows the Generation Owner the flexibility to use already proven and acceptable methods of data transfer to **minimize initial startup costs and procedures, while meeting all of the current requirements** for providing data to PJM.”
 - “...can be supplemented with the use of the Internet-based PJM Tools such as inSchedule and Data Viewer, further expanding the data transfer capabilities between the customer and PJM without a direct connection to PJM.”
- Hourly data still necessary

Three paths discussed: require hourly metering data...

- **...at aggregate level only**
 - Market participant responsible for aggregate calculation
- **...at aggregate level and at individual DER level, for certain resources**
 - DR, ESR, and capacity resources have unique settlement needs
- **...at individual DER level, in all cases**
 - PJM responsible for aggregate calculation

- **Manual 1 Section 5: Metering System Requirements**
 - 10 second scan rate for general telemetry
 - Details on precision and accuracy requirements
- **Manual 14D Section 4.1.5: EMS Data Exchange**
 - 10 second scan rate for monitoring generation
 - Currently MW and MVAR both required for grid-connected resources
- **Section 4.2.2: Metering Plan**

- Aggregator will send telemetry values for **individual DERs** within an aggregate to PJM
 - **MW telemetry values** sent in all cases
 - Transmit through Internet-based SCADA (**Jetstream**)
- Frequency determined by chosen market participation
 - Regulation: 2 second (Reg-D), 10 second (Reg-A)
 - Energy only: 10 second **vs. 1 minute** scan rate

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