MIC Special Session on DER

Andrew Levitt
Senior Market Strategist, Emerging Markets
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DR Measurement: Baseline for Synch, Energy, and Capacity

- Demand Response performance for Synch, Energy, and Capacity market measured at **load meter** by way of deviation from “Customer Baseline”.
- Baseline calculated based on analysis of load data from previous days with adjustments.
- Actual Customer Baseline calculation varies by market, diagrams are illustrative only.
• Demand Response performance for Regulation market can be measured directly with a submeter on the device as approved by PJM.
DR Measurement: Does Baseline Work with Injections?

- Can the PJM Demand Response Baseline accounting approach work with injections?
  - (Baseline is only used for Synch, Energy, and Capacity in DR.)
- How is PJM energy obligation impacted differently for load reductions vs. injections?
- How is PJM capacity obligation impacted differently for load reductions vs. injections?
- How to ensure no double counting of injections?
DR Measurement: Does Direct Metering with Injections Work?

- Direct metering at DER or at POI for Regulation
- Can the PJM Demand Response submetering accounting approach work with injections?
  - (Submetering is only used for Regulation in DR).
“Front of Meter” Generation/Storage Accounting

- For “Front of Meter” gen: meter readings at point of interconnection is standard approach for all markets.
- Meter data from POI is currently required for energy market.
- Diagram below: PJM “Front of Meter” measurement during similar output as Synch/Energy/Capacity example above:

![Diagram of PJM measured performance vs actual load](image-url)
• PJM “Front of Meter” measurement under similar DER output as Regulation example above:

Electric Distribution Company
Customer Loads

Metered Load
PJM Measured Performance

Actual Gross Load
Actual DER Output
• Example if DER output is controlled to provide good Reg fidelity at point of PJM Measurement (ie, the POI).
Front of Meter Accounting: Does Submetering Work?

- Can submetering at the device work in a Front of Meter context?
- Double counting impacts? Varies by market?
- State Estimator impacts?

![Diagram showing metered load and actual gross load comparison]

**PJM Measured Performance**

**Metered Load**

**Actual Gross Load**

**Actual DER Output**

**Energy Storage Facility**

**Customer Loads**

www.pjm.com
Other market contrasts DR vs. “Front of Meter” Gen

- DR provides for zonal aggregation to meet 100 kW market threshold
- DR: PJM often does not have a relationship with device owner
- In energy market: FERC 745 accounting principles for energy in DR are different than energy accounting principles for Gen
- In capacity market: must offer requirement for Gen, not for DR
- In capacity market: telemetry required for Gen, not for DR
- In ancillary services: energy produced while providing ancillary services is settled for Gen, not typically settled in DR
- In general, no Lost Opportunity Cost for DR
- Any NERC, FERC, state implications of being considered wholesale Gen
Decision on performance measurement framework as starting point

**DR-type**

**Pros**
- Aggregation
- Performance measurement behind a load meter

**Cons**
- Potentially unclear accounting for injected energy
- Terminology

**“Front of meter” gen type**

**Pros**
- Existing structure for exports

**Cons**
- No zonal aggregation currently
- Unclear structure for accounting behind a load meter
- Possible implications for retail account status? Other implications?

*Note: this is a starting point, opportunity to mix and match in Design Components and Options part of CBIR Matrix*