MIC Special Session on DER

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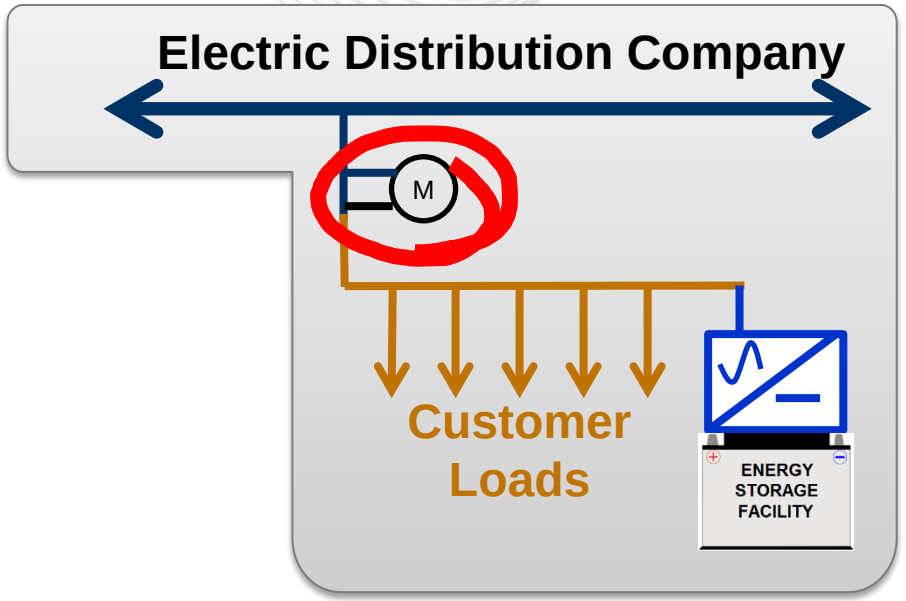
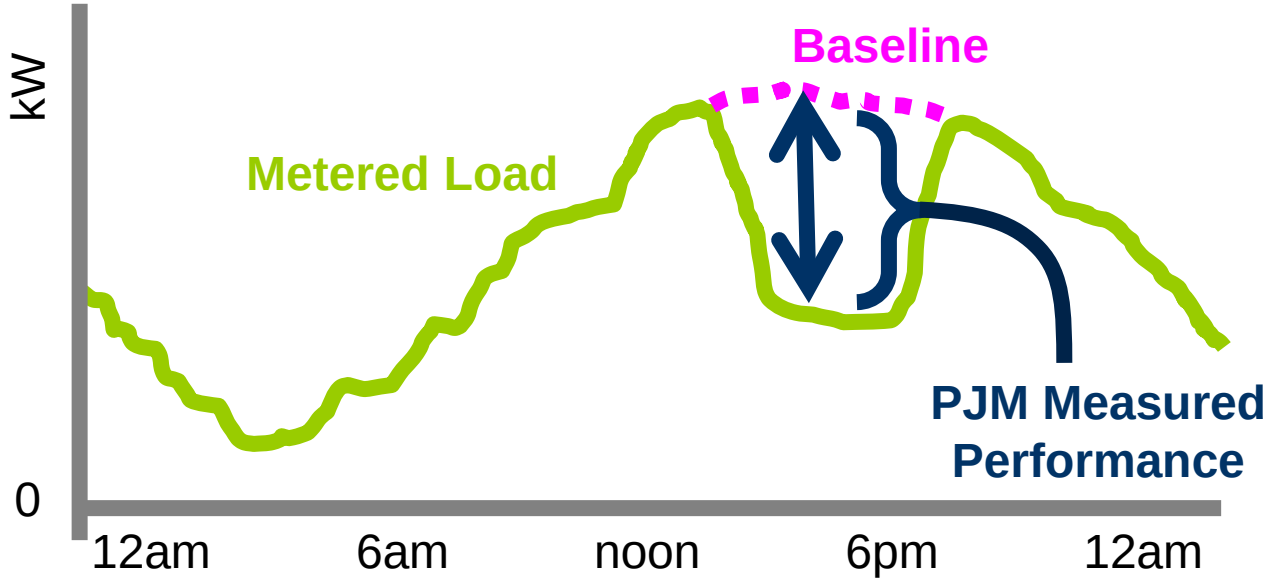
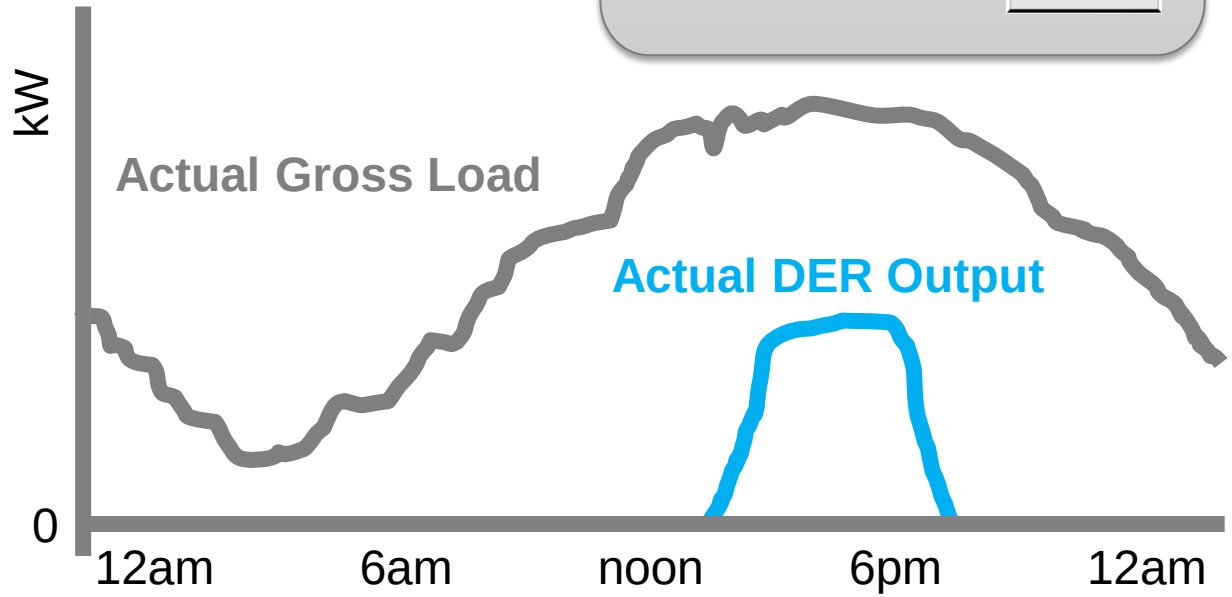
DR Measurement: Baseline for Synch, Energy, and Capacity

- 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.

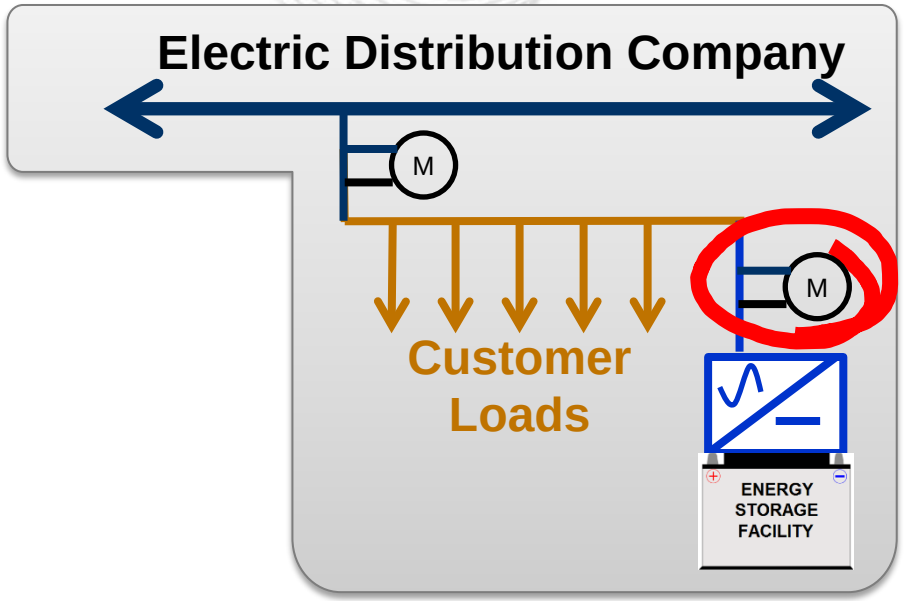


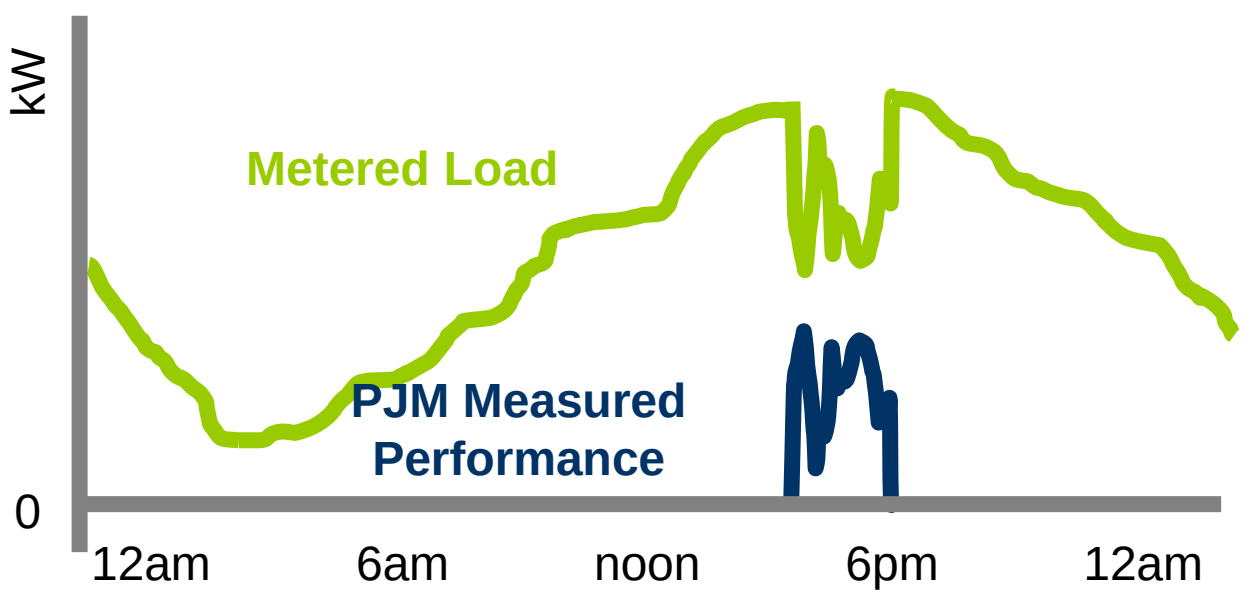


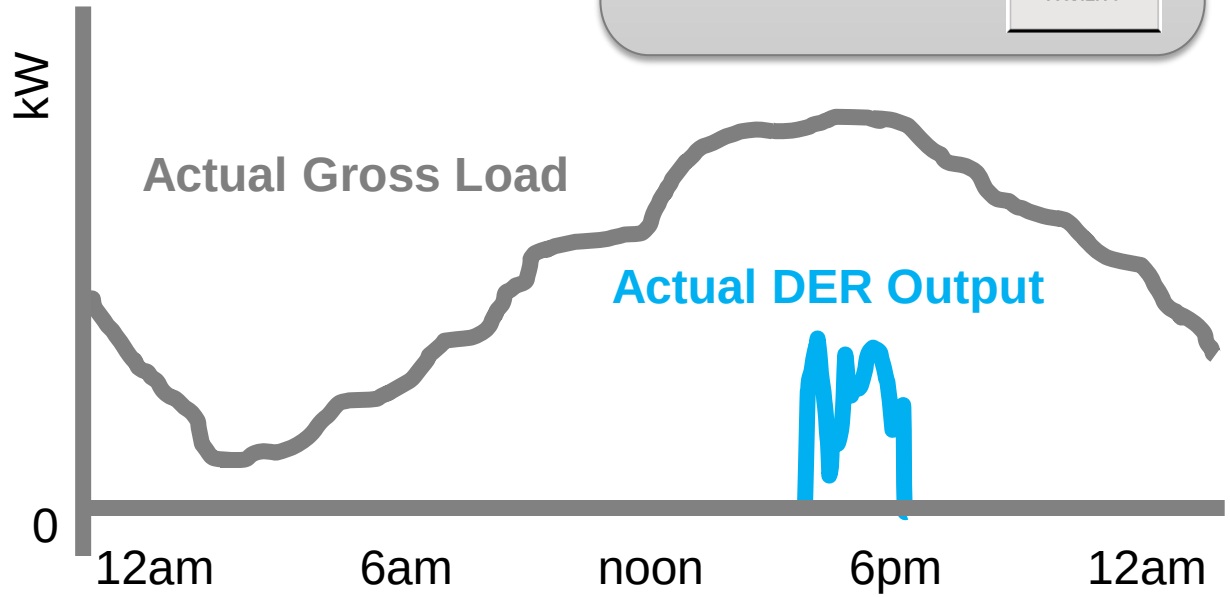


DR Measurement: Submetering for Regulation

- Demand Response performance for Regulation market can be measured directly with **a submeter on the device** as approved by PJM.

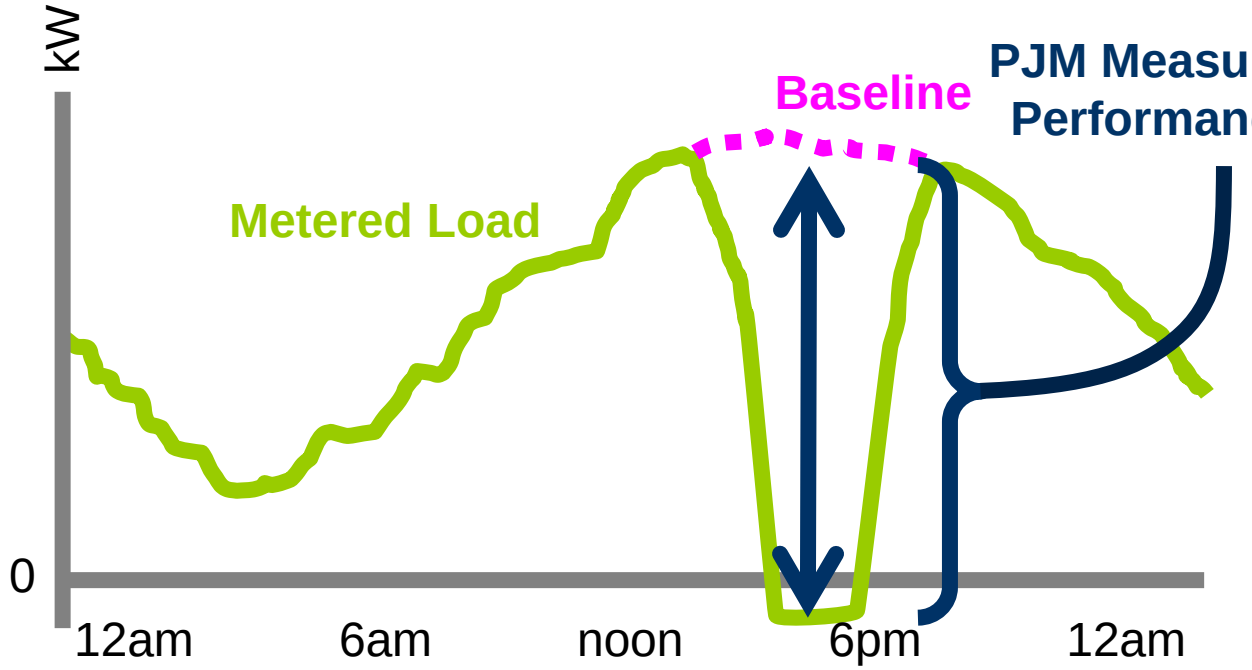


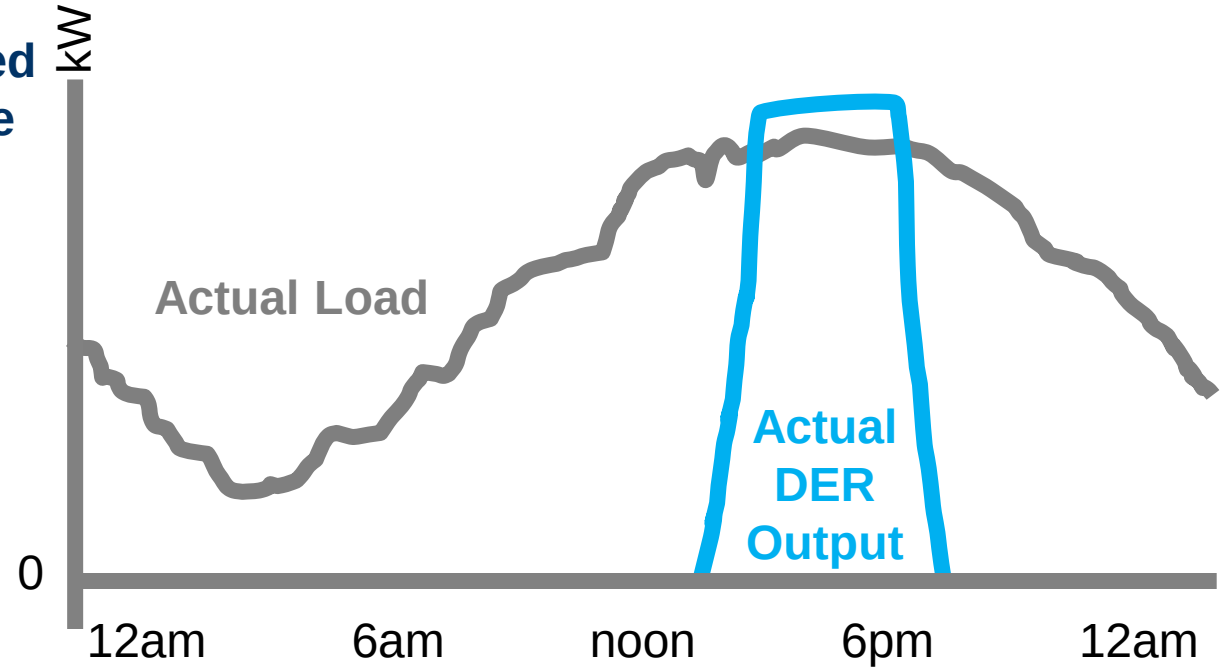




DR Measurement: Does Baseline Work with Injections?

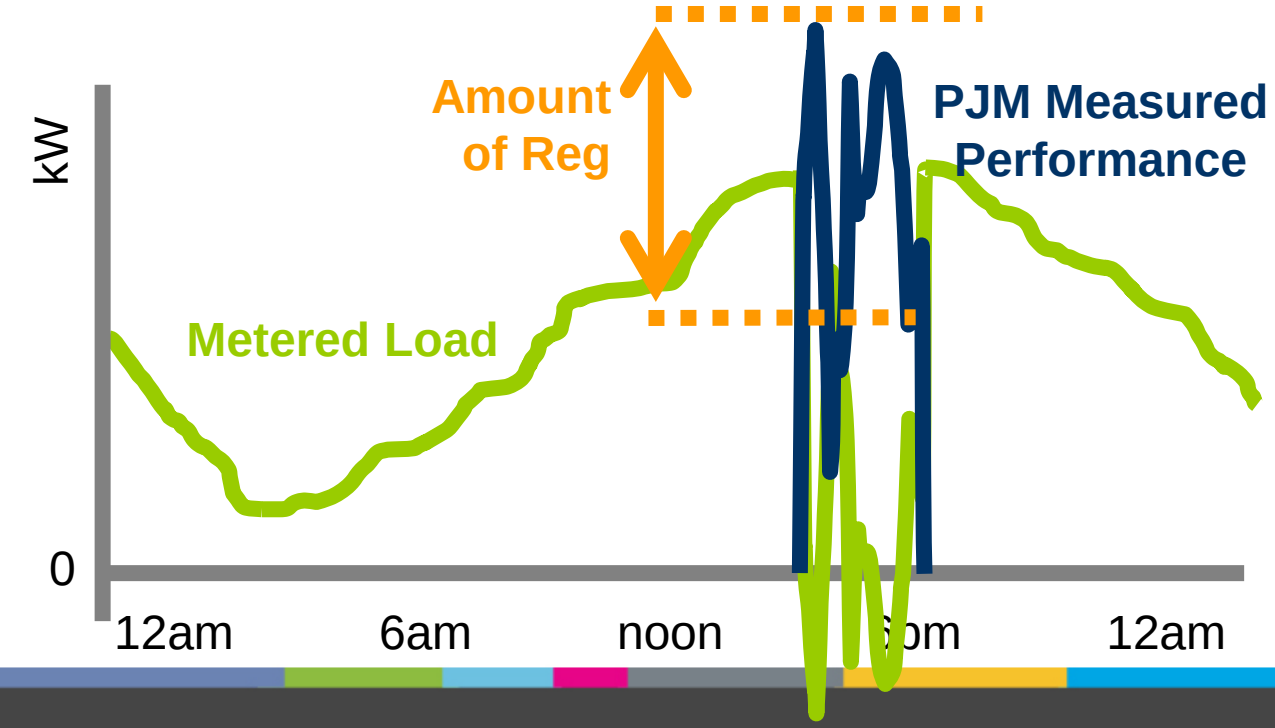
- Can the PJM Demand Response Baseline accounting approach work with injections?
  - (Baseline is only used for Synch, Energy, and Capacity in DR.)
- How is PJM energy obligation impacted differently for load reductions vs. injections?
- How is PJM capacity obligation impacted differently for load reductions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

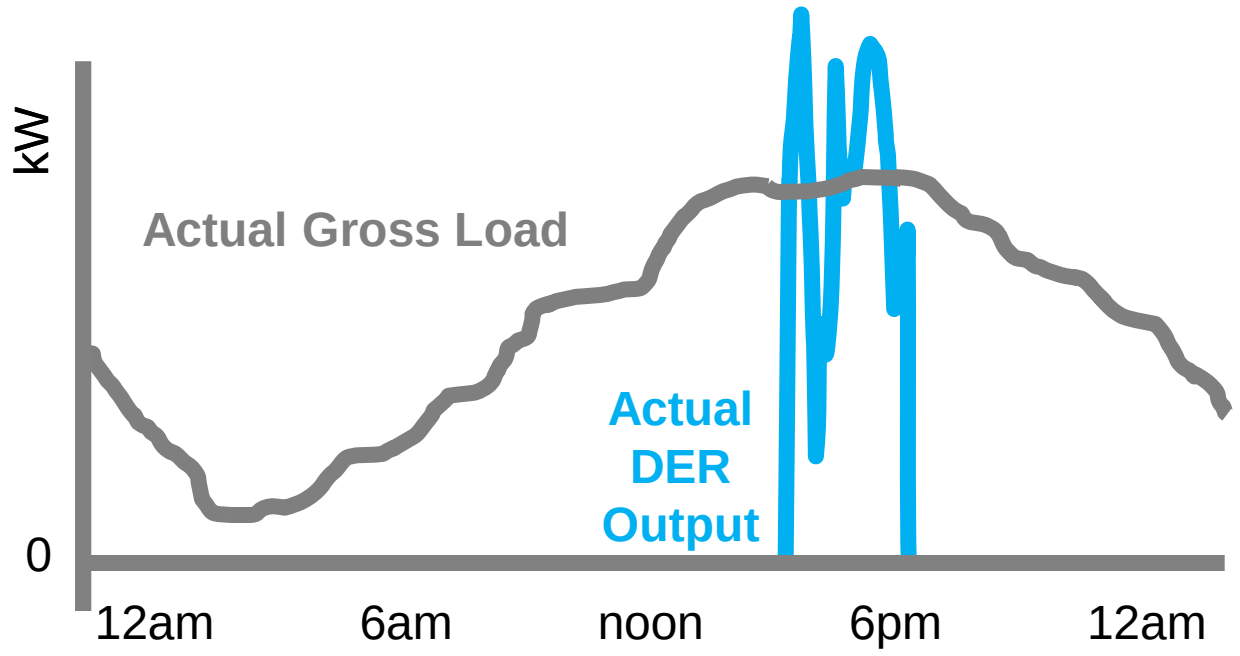




DR Measurement: Does Direct Metering with Injections Work?

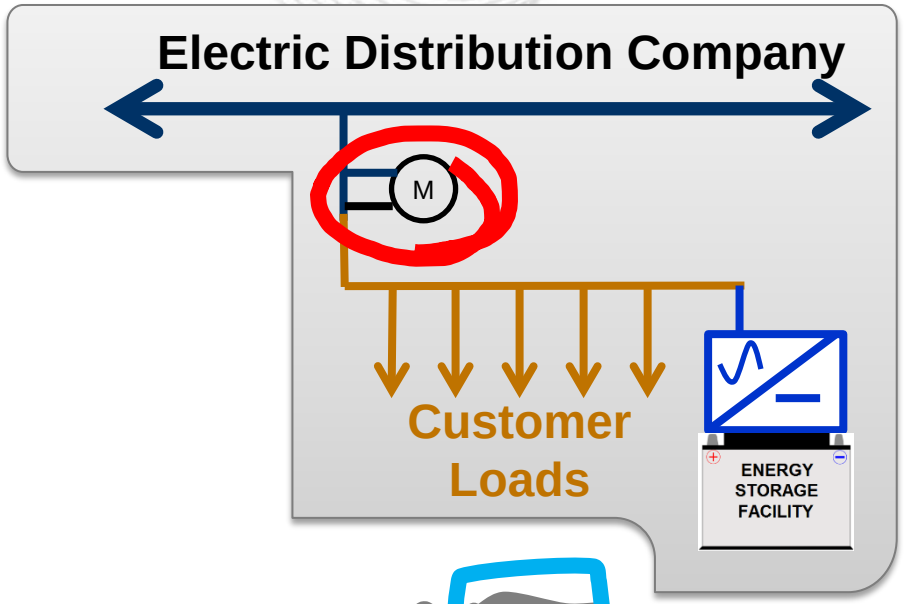
- Direct metering at DER or at POI for Regulation
- Can the PJM Demand Response submetering accounting approach work with injections?
  - (Submetering is only used for Regulation in DR).

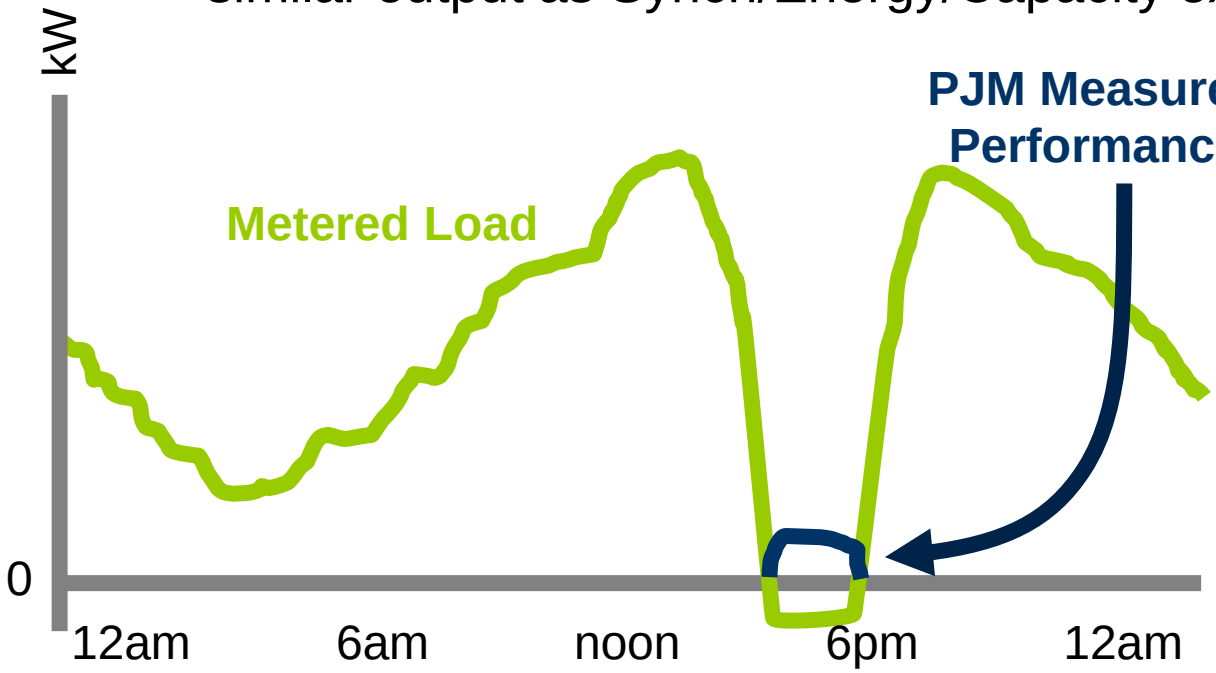


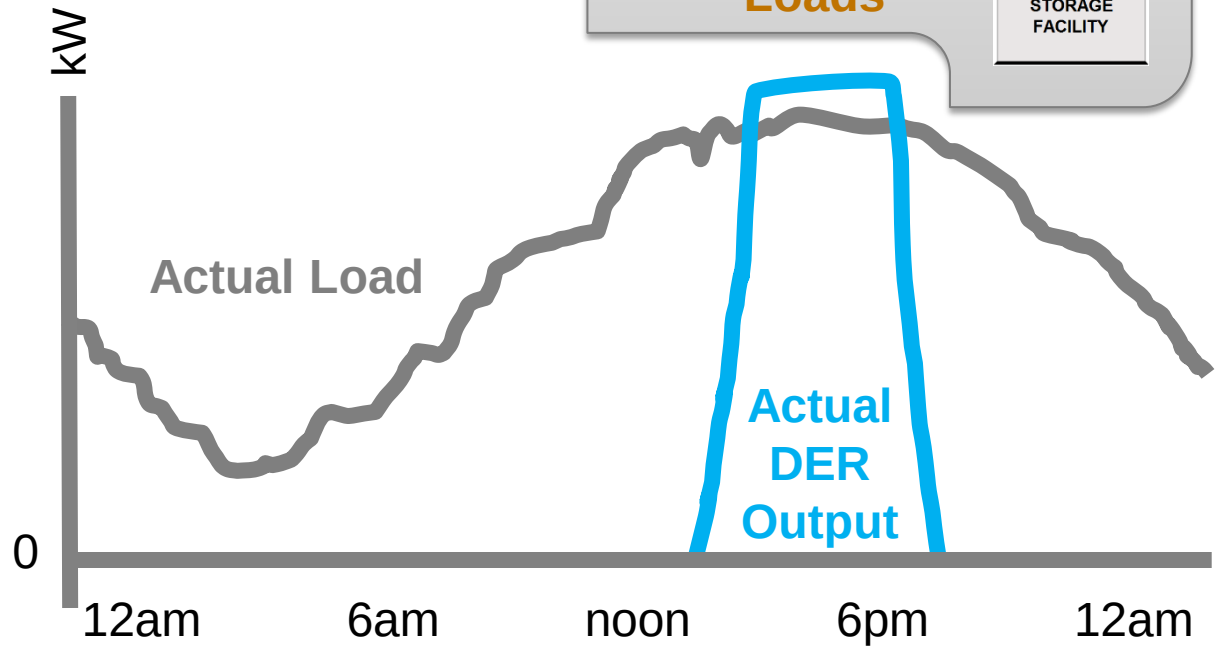


“Front of Meter” Generation/Storage Accounting

- 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:

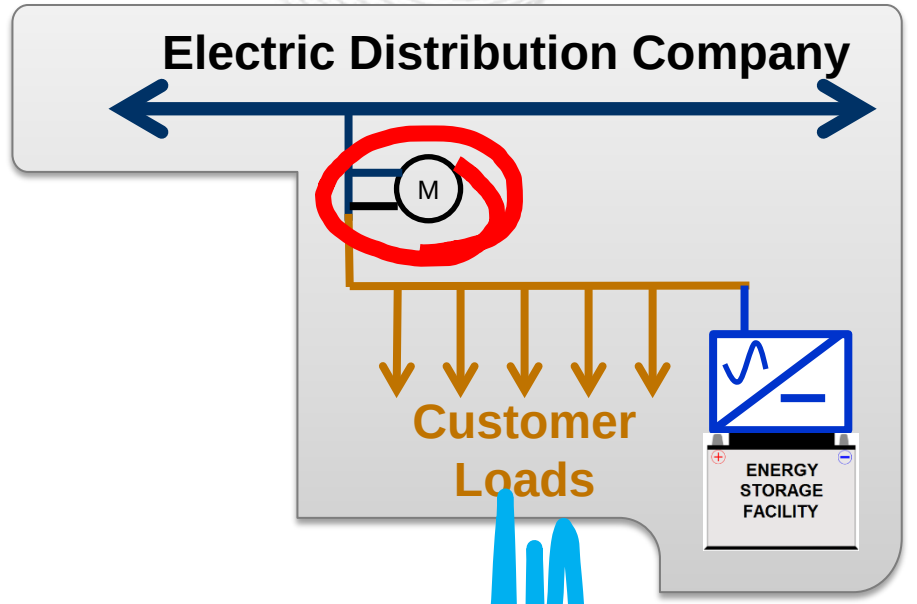


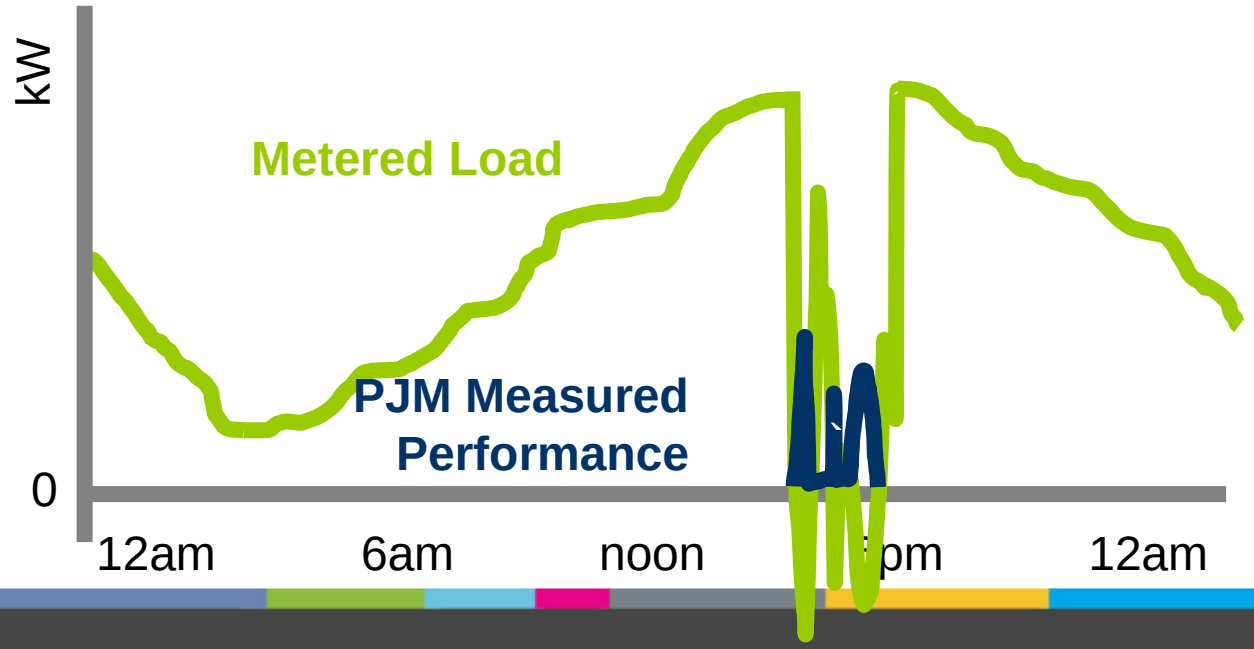


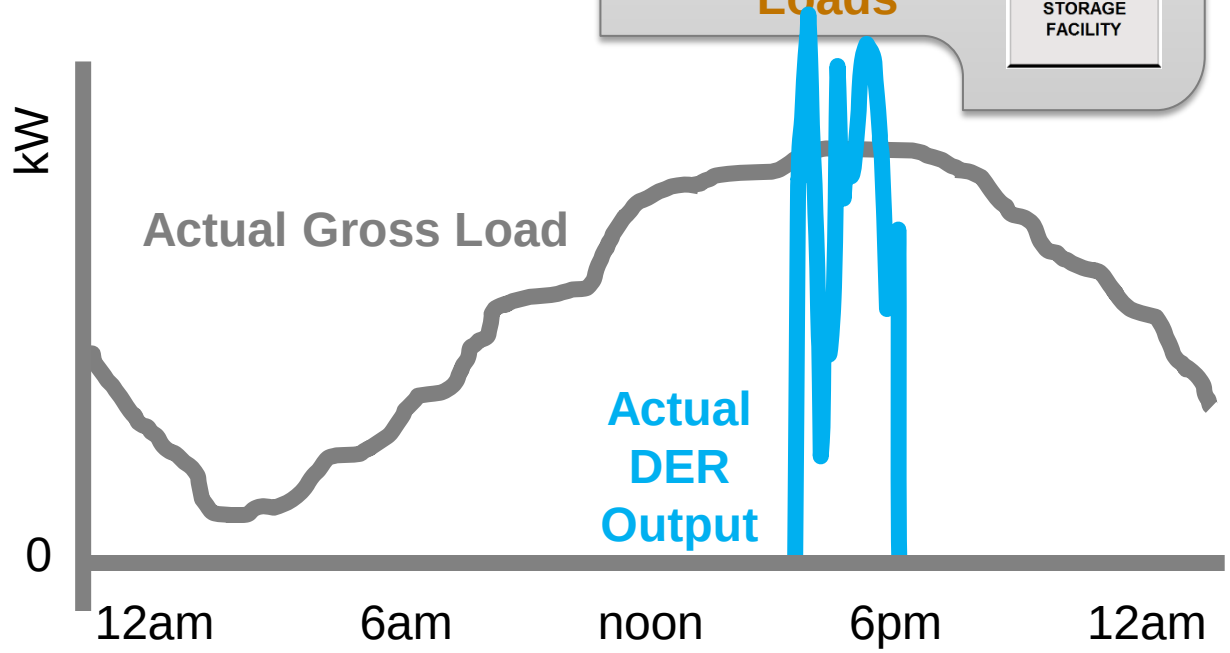


“Front of Meter” Generation/Storage Accounting

- PJM “Front of Meter” measurement under similar DER output as Regulation example above:

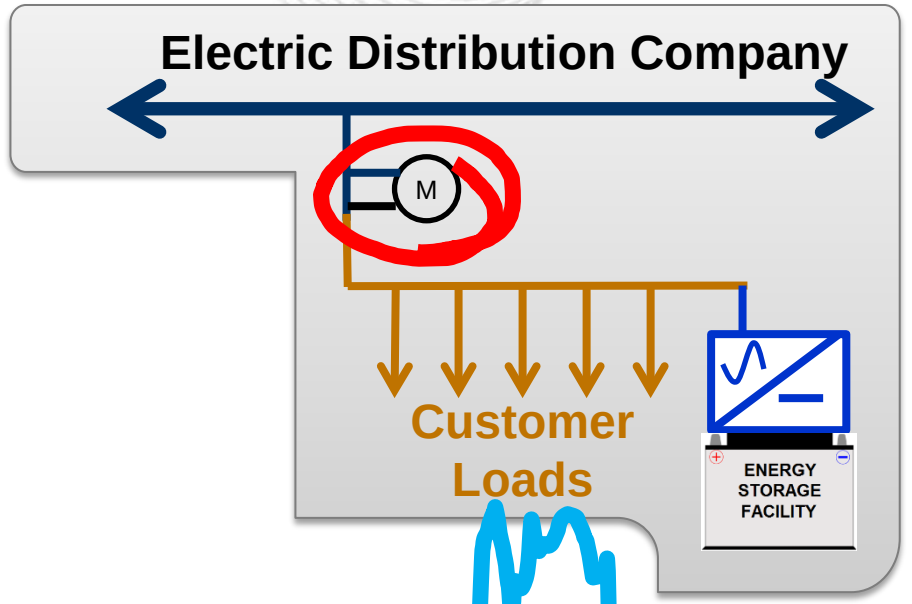


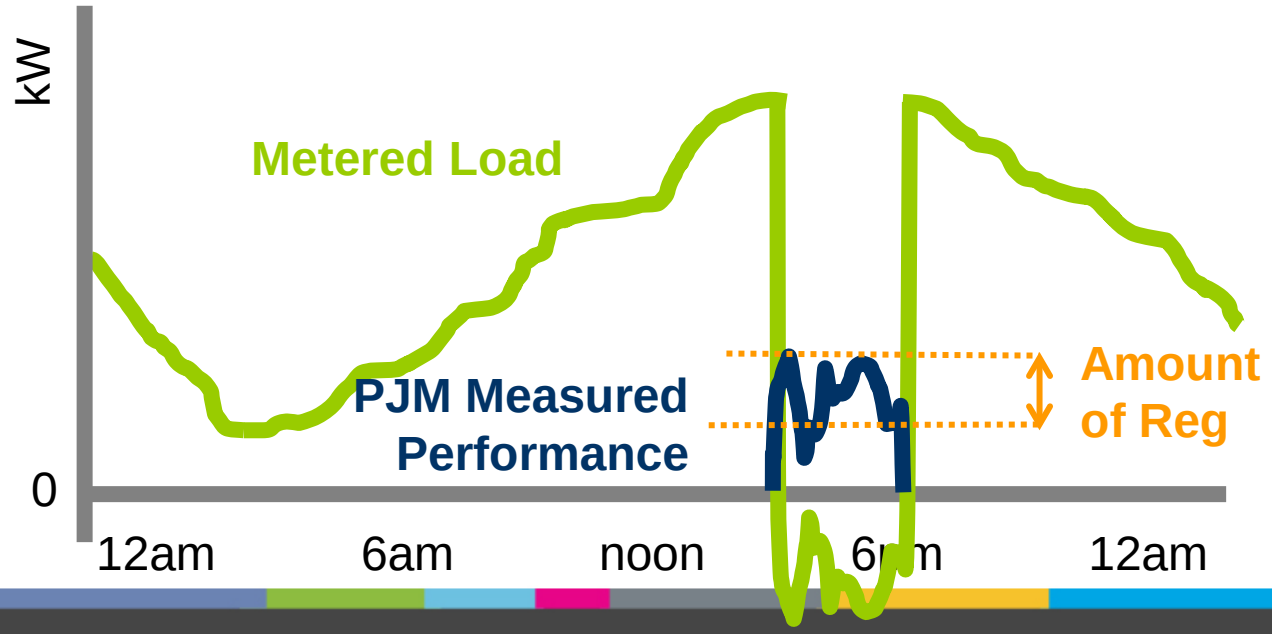


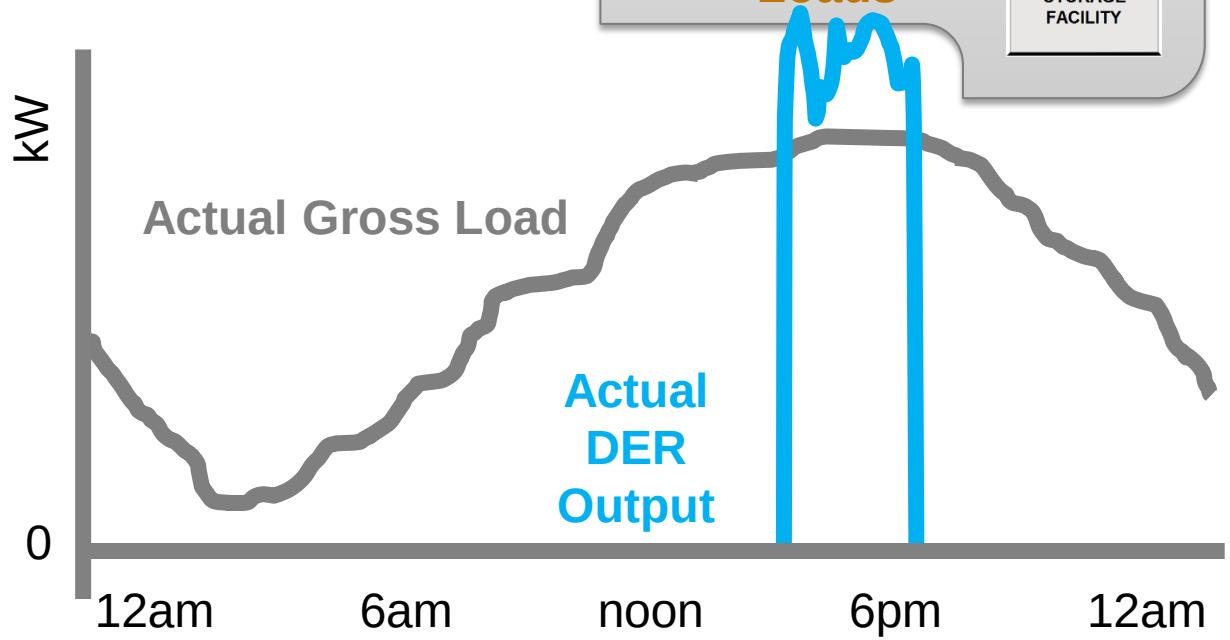


“Front of Meter” Generation/Storage Accounting

- Example if DER output is controlled to provide good Reg fidelity at point of PJM Measurement (ie, the POI).

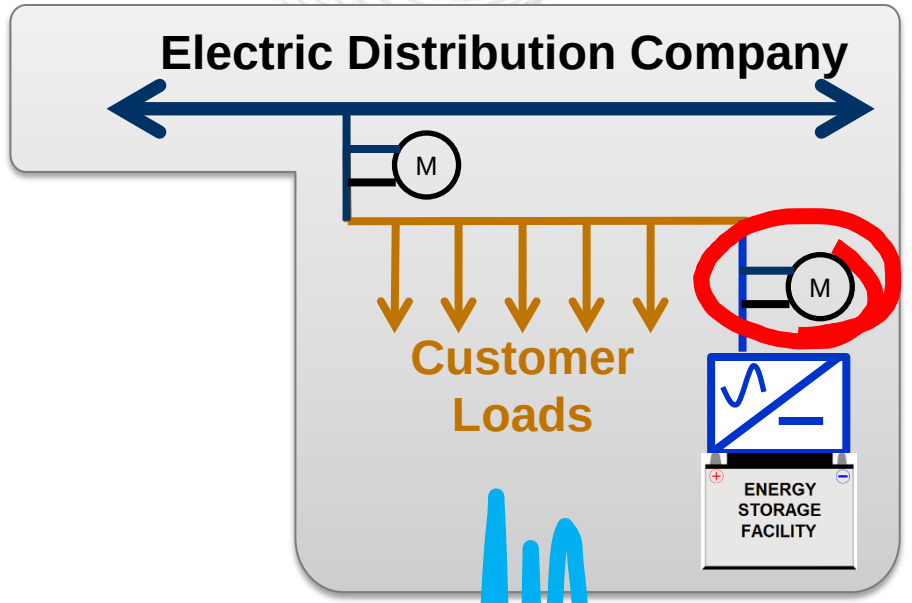


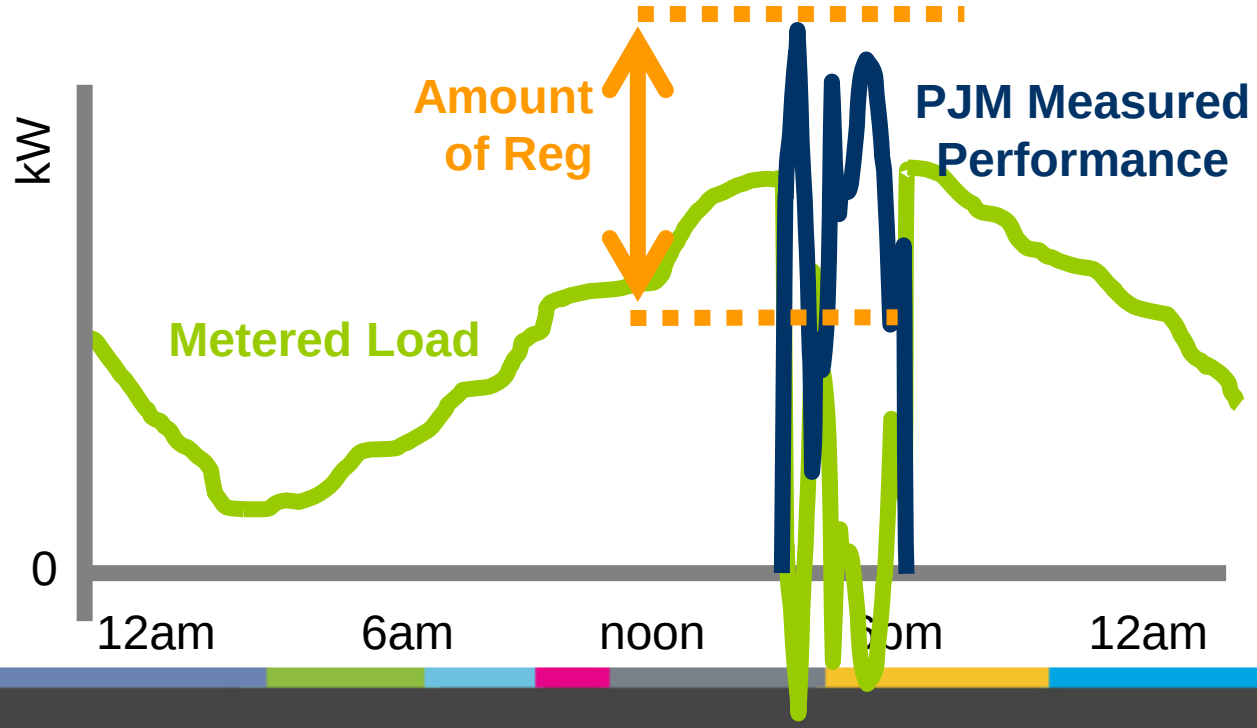


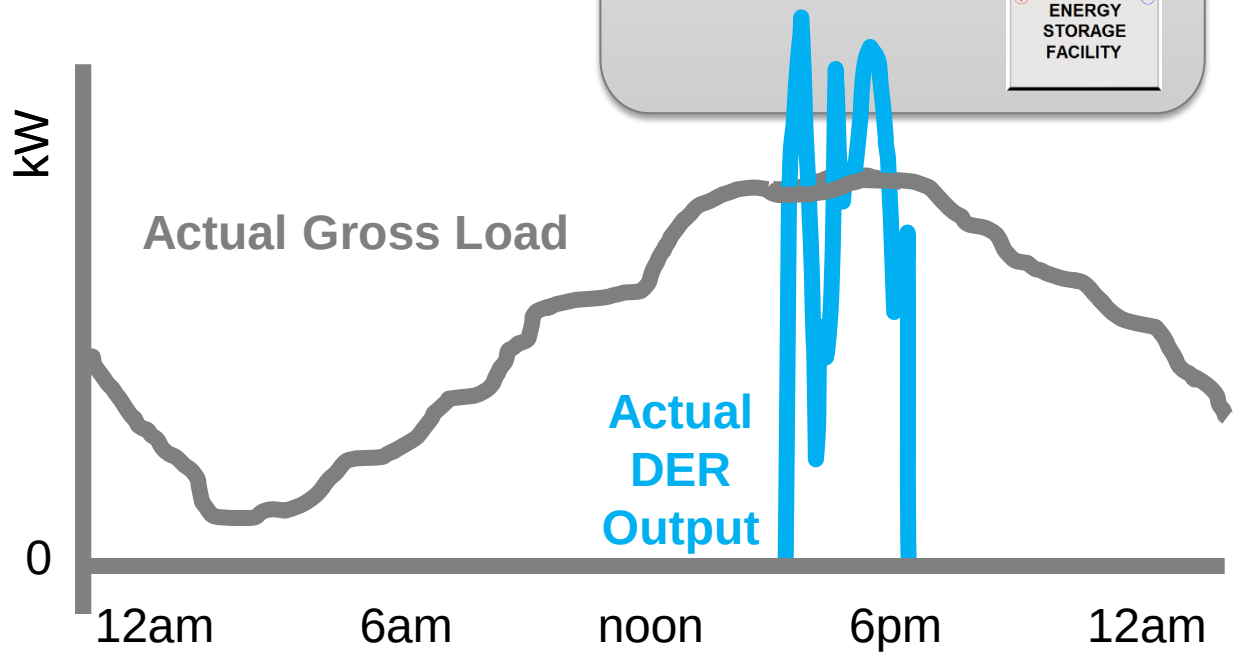


Front of Meter Accounting: Does Submetering Work?

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







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