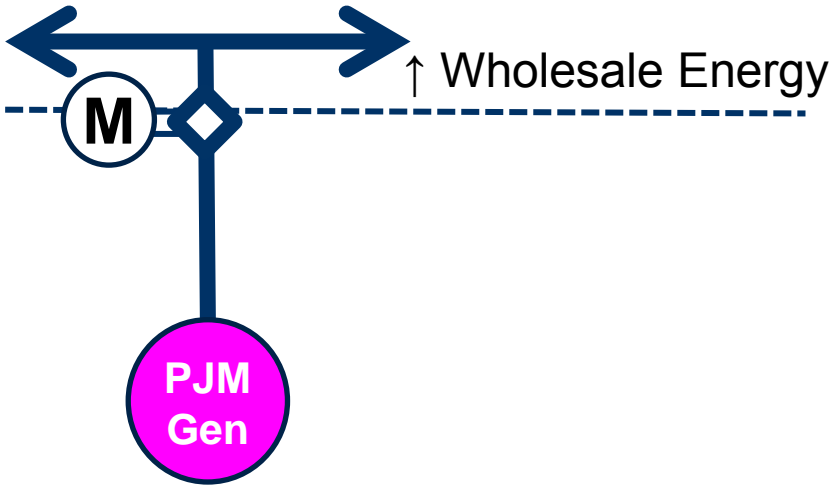




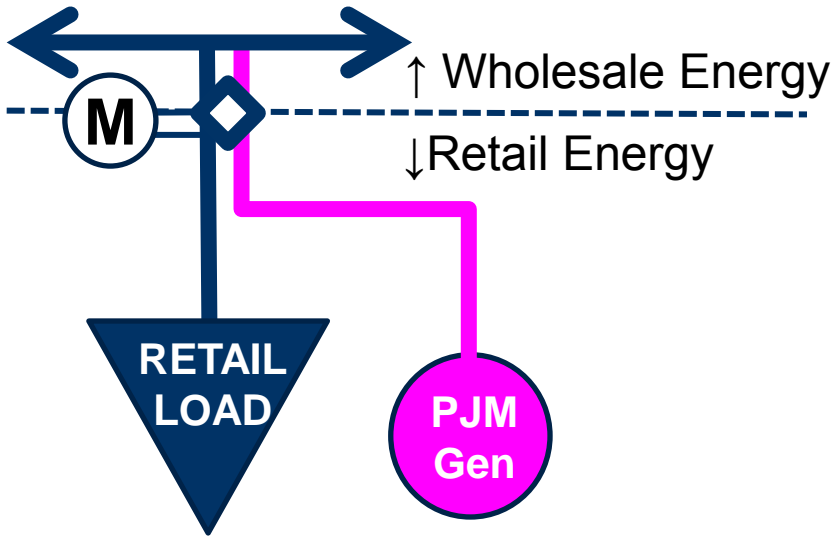
Wholesale DER, Metering Roles, and Energy Market Accounting

Distributed Energy Resources
Subcommittee

March 2, 2018



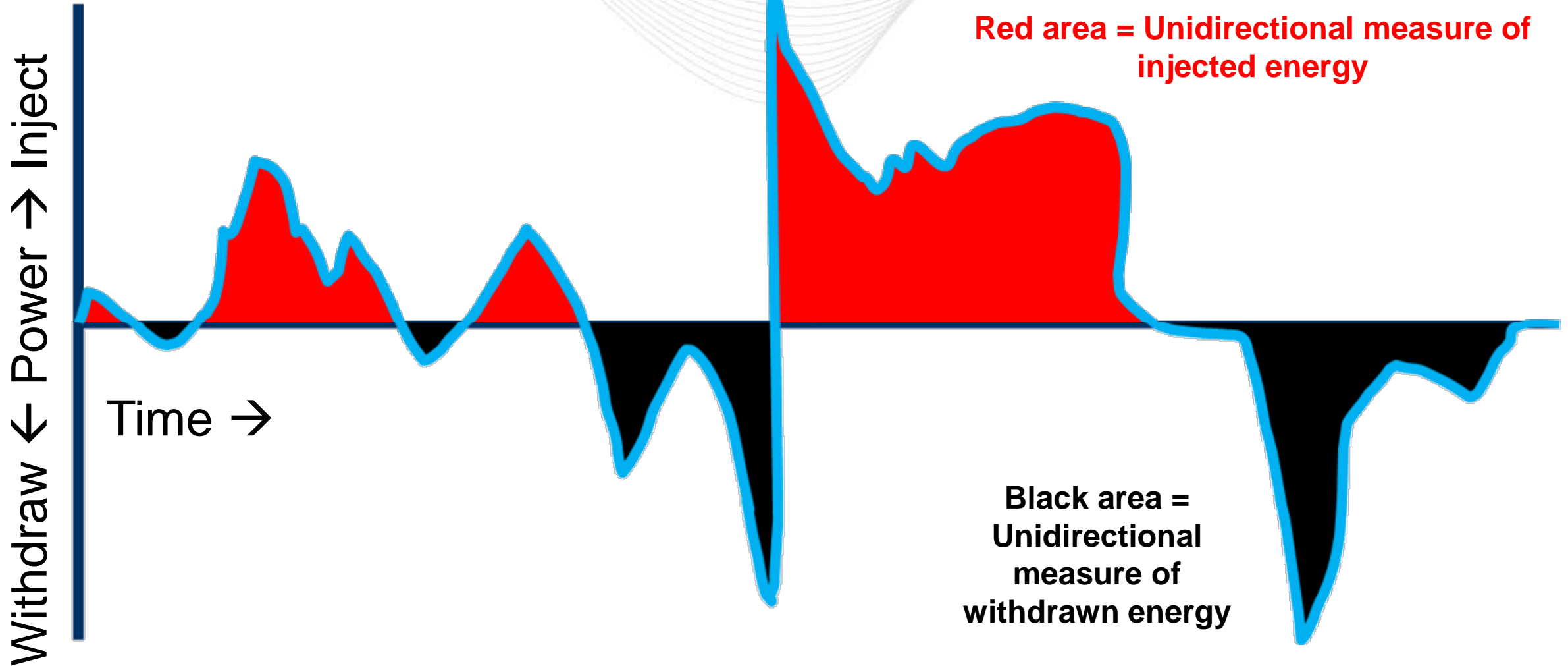
What?	Who?	How?
POI Meter Owner	EDC or Gen Owner	Interconnection process
Wholesale MWh injections: data submitter	EDC or Gen Owner	POI meter values → PowerMeter
Wholesale MWh injections: data validator	EDC	PowerMeter



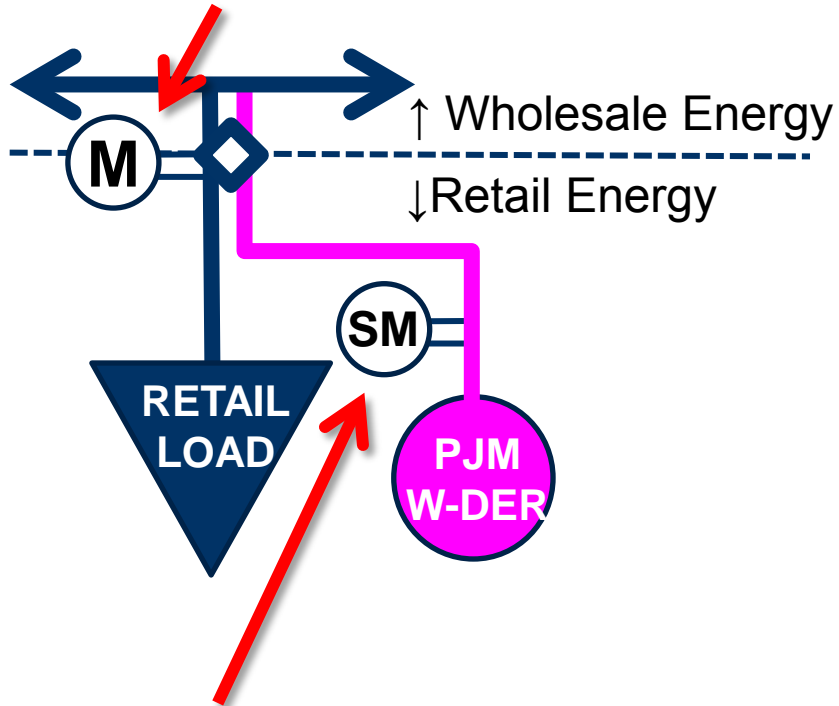
What?	Who?	How?
POI Meter Owner	EDC or Gen Owner	Interconnection process
Wholesale MWh injections: data submitter	EDC or Gen Owner	Unidirectional (Out) POI meter values → PowerMeter
Wholesale MWh injections: data validator	EDC	PowerMeter
Retail MWh withdrawals	EDC	Unidirectional (In) POI meter values → EDC

Note: POI metering system may be single meter (wholesale & retail) or separate wholesale and retail meters depending on retail requirements.

Unidirectional metering depiction



*POI meter: Gen Owner or EDC owns.
EDC (mainly) administers.*



*Submeter: W-DER Marketer owns.
PJM administers.*

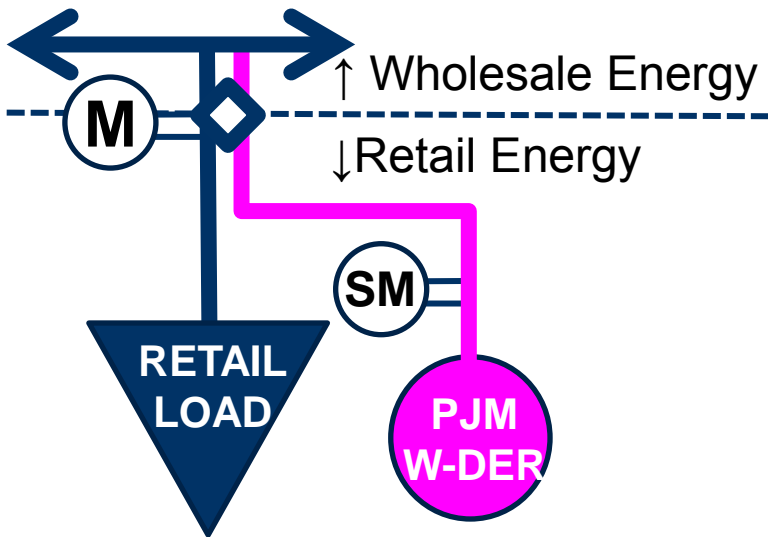
What's the submeter used for?

1. Calculating gross load for PJM Planning.
2. Optional telemetry point for PJM ancillary services.
3. Possible use in Capacity market accounting [pending upcoming discussion].
4. Calculating “actual load curtailments” vs. “DER load offsets” for PJM compensation of curtailments vs. CBL.
5. Counting wholesale stored MWh in case of a multi-use battery [pending stakeholder process for Storage Rule]

What's the submeter NOT used for?

- **Calculating quantities in the energy market per se** (Note: curtailment compensation is per MWh, but is not accounted through the energy market).

Roles for Proposed W-DER behind a customer meter



What?	Who?	How?
POI Meter [M] Owner	EDC or Gen Owner	Interconnection process
POI MWh data submitter	EDC or Gen Owner	Unidirectional (Out) POI meter values → PowerMeter
POI MWh data validator	EDC	PowerMeter
Retail MWh withdrawals	EDC	Unidirectional (In) POI meter values → EDC
Submeter [SM] Owner	Gen Owner	W-DER registration process
Submeter data submitter	W-DER Marketer	[Possibly PowerMeter or DER Hub or other]

Note: POI metering system may be single meter (wholesale & retail) or separate wholesale and retail meters depending on retail requirements. Retail metering must be unidirectional for PJM energy market compensation.

“The Energy Market”: reporting data flow

Customer Submissions

Revenue Quality
Generation MWh

EDC Boundary
Tie MWh

LSE controlled
Metered Load
MWh

EDC determined
and or Metered
Load MWh

PJM eSuite

PowerMeter

EDC's Territory
Load MWh

Sum of InSchd for given EDC may
not exceed PowerMeter Load

InSchedule

Energy Market Settlements

Generator Owner's
Settlements based on RT MWh
reporting via PowerMeter

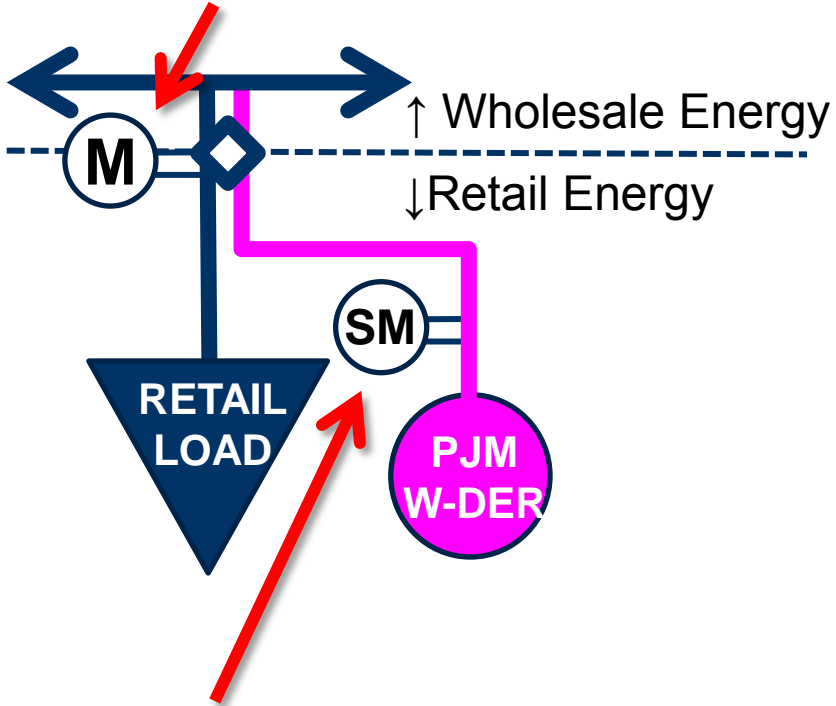
Load Serving Entity's
Settlement based on RT
MWh report via InSchedule

Unaccounted For Energy

- Unaccounted For Energy is a largely retail-jurisdictional term. There is no explicit UFE line on a PJM bill.
- Shows up in Attachment M of Tariff which deals with LSE billing and which TOs administer.
- PJM has limited UFE expertise.
- To the extent UFE is a function of PJM Energy Market billing (and not billing for items like transmission charges, ancillary services charges, demand response charges, etc), then UFE can only be impacted to the extent Energy Market accounting is changed.
- The W-DER proposal would use the status quo accounting and roles for POI meter values in the Energy Market.
- **Question: to what extent is the submeter used for Energy Market accounting?**

To what extent is the submeter used for Energy Market accounting?

POI meter: Gen Owner or EDC owns. EDC (mainly) administers.



Submeter: W-DER Marketer owns. PJM administers.

What's the submeter used for?

1. ~~Calculating gross load for PJM Planning.~~
2. ~~Optional telemetry point for PJM ancillary services.~~
3. ~~Possible use in Capacity market accounting [pending upcoming discussion].~~
4. Calculating “actual load curtailments” vs. “DER load offsets” for PJM compensation of curtailments vs. CBL.
 - This compensation would follow the **status quo** for MWh compensation from demand response, which is not processed through the Energy Market per se. Should not impact UFE.
5. Counting wholesale stored MWh in case of a multi-use battery [pending stakeholder process for Storage Rule]
 - Stored MWh would be accounted for using the **status quo** method for Pumped Hydro pumping.
 - Follow up education on this will be scheduled through stakeholder process for Storage Rule.