

DR and DER co-sited with W-DER

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Distributed Energy Resources Subcommittee

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Working Definitions for this Subcommittee:

- **“W-DER”**: a DER unit participating in PJM markets under the (newly renamed) “W-DER” (Wholesale DER) ruleset.
- **“DR-DER”**: a DER unit that reduces load at a site participating in PJM markets under the Demand Response ruleset.
- **“R-DER”**: a DER unit that either simply reduces instantaneous load or injects and is accounted for under a retail tariff (like Net Energy Metering or a PURPA avoided cost rate).

Proposal: A DER unit must remain either W-DER or DR-DER for the duration of a delivery year.

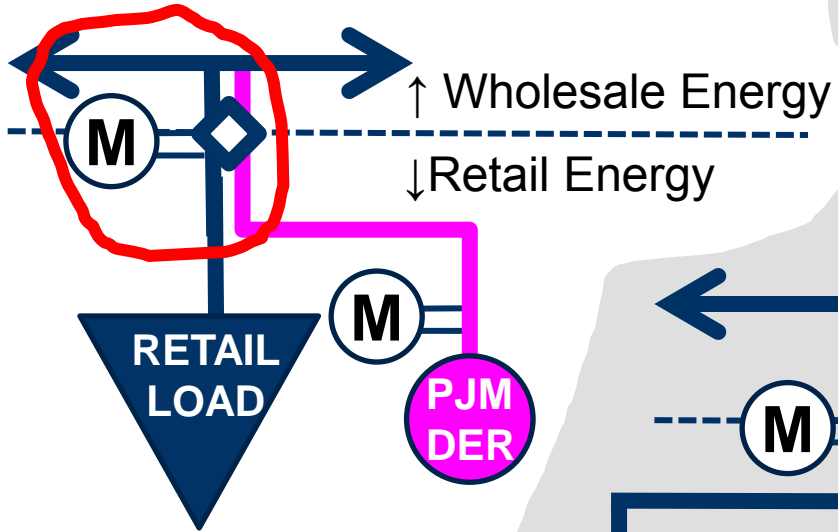
- Sites that combine W-DER and other DER must be approved by EDC with an interconnection agreement for all parallel-operating (i.e., not exclusively off-grid) DER at the site.
- In general, the Maximum Facility Output MW will be based on the sum of all DER, regardless of W-DER designation.
 - Exceptions may be possible if there is a power-limiting relay

Existing rule: sites may not inject beyond their MFO.

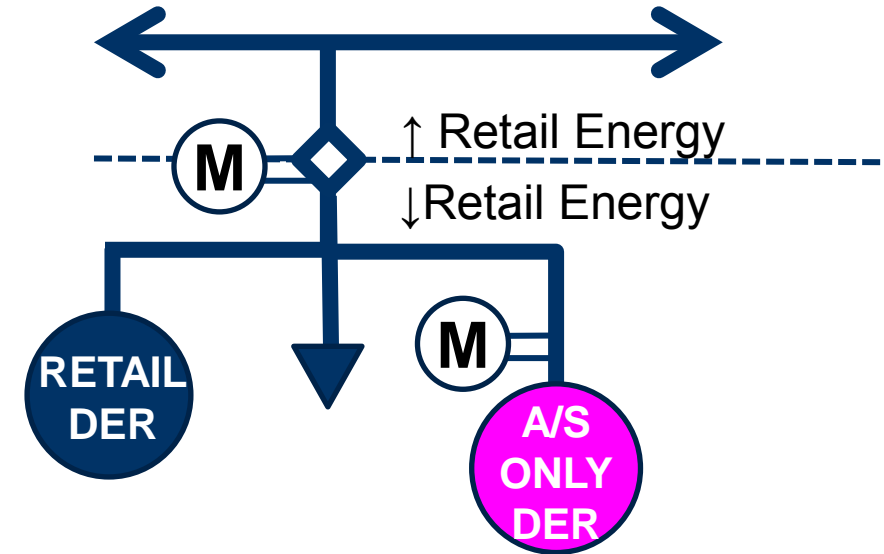
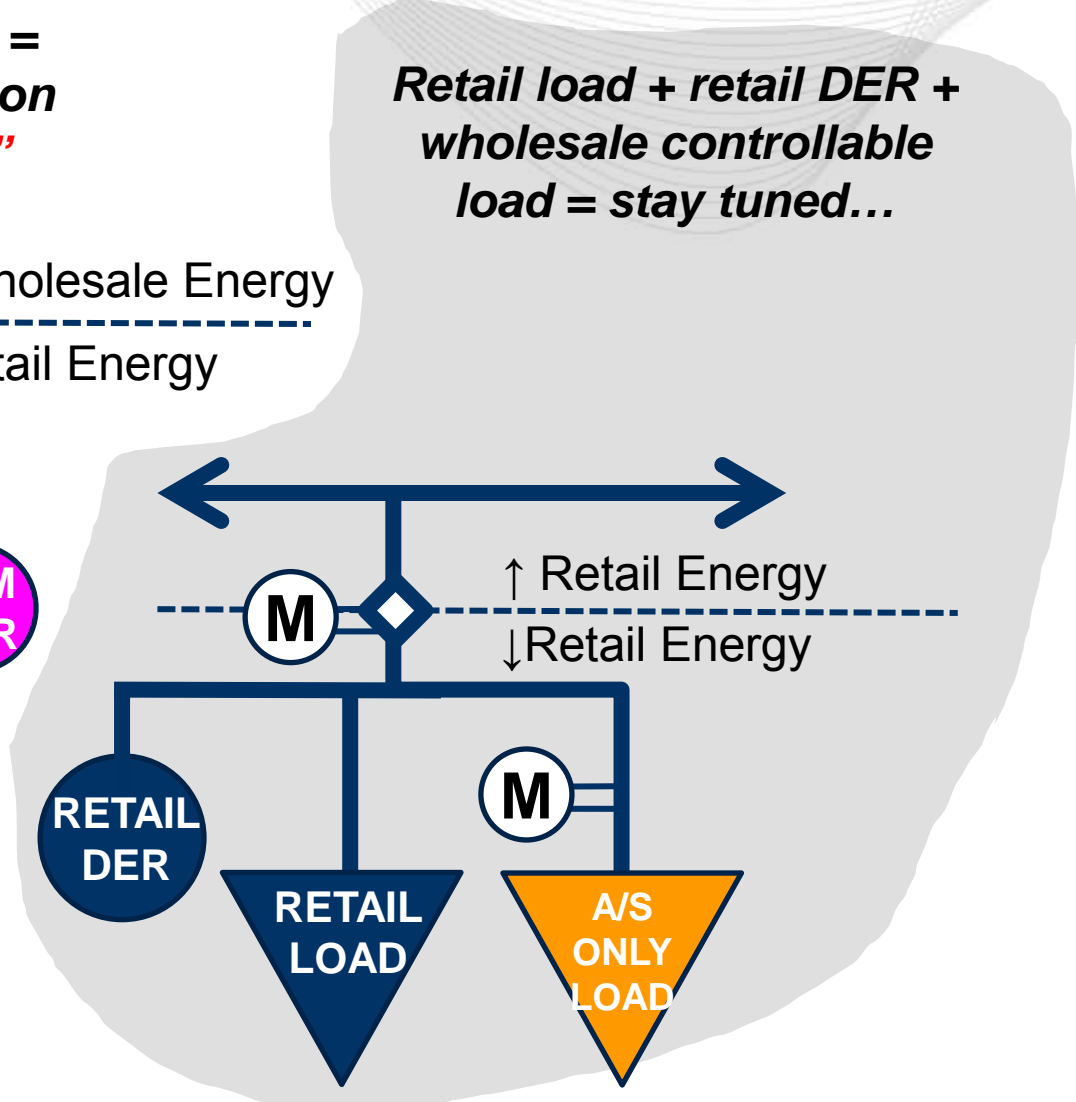
- Sites with mixed wholesale and retail jurisdictional things pose legal and regulatory challenges.
- Examples of notable jurisdictional topics:
 - Wholesale demand response
 - Station Power
 - Wholesale sales on retail distribution lines
- In the case of W-DER + other DER combining at a single site, the jurisdiction over the “attachment facilities” and operating conditions, among other items, is important to clarify.
 - Interconnection Agreement terms and conditions
 - Rules for operating limits on voltage, harmonics, ramp, etc.
 - Emergency provisions
 - Transfer trip
 - Obligation to serve

- W-DER + load = established jurisdiction, “dual use facility”.
 - FERC is careful to take jurisdiction over only the wholesale aspects of facilities that are also used to serve retail load.
- R-DER + DR: stay tuned...
- W-DER + R-DER + load = stay tuned...

Retail load + W-DER = established jurisdiction
“Dual Use Facilities”



Retail load + retail DER + wholesale controllable load = stay tuned...



Retail load + retail DER + A/S-only W-DER = stay tuned...

5 Co-siting Cases Behind The Customer Meter (BTCM)

1. W-DER + DR (excluding DR-DER) + Load
 - E.g., BTCM wholesale gas generator + controllable chiller load in DR
2. W-DER + W-DER + Load
 - E.g., BTCM wholesale gas generator + wholesale solar
3. W-DER + R-DER + Load
 - E.g., BTCM wholesale battery + net-metered solar
4. W-DER + DR-DER + Load
 - E.g., BTCM wholesale battery + diesel generator in DR
5. R-DER + DR + Load
 - E.g., net metered solar + controllable water heater in DR

5 Co-siting Cases Behind The Customer Meter (BTCM)

1. W-DER + DR (excluding DR-DER) + Load
 - E.g., BTCM wholesale gas generator + controllable chiller load in DR
2. W-DER + W-DER + Load
 - E.g., BTCM wholesale gas generator + wholesale solar

***ESTABLISHED JURISDICTION
OF INTERCONNECTION
FACILITIES:
GENERATION = FERC
LOAD = LOCAL
→“DUAL USE FACILITY”***

3. W-DER + R-DER + Load
 - E.g., BTCM wholesale battery + net-metered solar
4. W-DER + DR-DER + Load
 - E.g., BTCM wholesale battery + diesel generator in DR
5. R-DER + DR + Load
 - E.g., net metered solar + controllable water heater in DR

STAY TUNED...



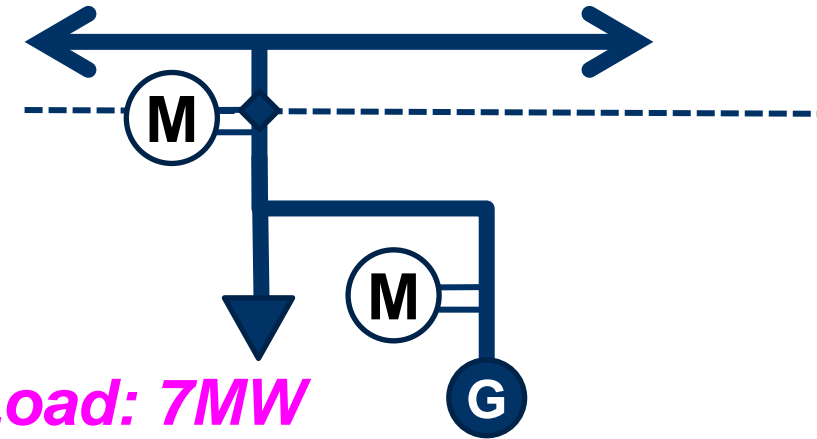
1st 2 Cases Co-siting Behind The Customer Meter (BTCM)

1. W-DER + DR (excluding DR-DER) + Load
 - E.g., BTCM wholesale gas generator + controllable chiller load in DR
2. W-DER + W-DER + Load
 - E.g., BTCM wholesale gas generator + wholesale solar

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- In General for co-sited W-DER and DR: site load will be “grossed up” by adding back submetered W-DER output to POI measurement.

POI: -3MW (INJECTION)



W-DER: 10MW

**POI Meter (-3) + W-DER Meter (10)
= Grossed-up Load (7)**

Case 1: W-DER + DR

1. For Regulation: a single site could host multiple Regulation-submetered W-DER units and Regulation-submetered DR resources as separate market resources, as per status quo for DR with multiple Regulation-submetered resources.
2. A single site could have a POI meter that incorporates activity from both W-DER and DR as a single market resource.
 - No Regulation-submetered DR or W-DER resources allowed at such a site.

Case 1: W-DER + DR

Ancillary Services: Synch Reserves

1. A single site could host Synch-submetered W-DER units and POI-metered DR
 - The output of the Synch-submetered W-DER units will be added back to the POI meter readings for DR Synch measurement
2. A single site could have a POI meter that incorporates activity from both W-DER(s) and DR
 1. For any submetered W-DER(s) at such a site: the output of the submetered W-DER(s) will be added back to the POI meter readings for DR Synch measurement.

Case 1: W-DER + DR

- For W-DER unit(s) co-sited with DR: the W-DER unit(s) must have a submeter.
 - Recall proposed rule that all W-DER >25 kW require a submeter.
 - Possible option for discussion: *DR at such sites may also opt to forgo DR energy payments in lieu of installing a W-DER submeter.*
- DR Energy measurement will be based on gross site load (without W-DER output).
- W-DER Energy measurement will continue to be based on actual injections at the POI (for wholesale energy settled W-DER) or will be zero (for retail energy settled W-DER).

Case 1: W-DER + DR

- **PATH ONE:** Under certain conditions, PJM can accommodate virtual separation sharing a single point of common coupling.
- **PATH TWO:** Multiple different types of DER at a single site can combine into a single “W-DER unit”.
 - Can set price.
 - Rules for cost-based offers will need to be developed.

Case 2: W-DER + W-DER