PJM Order 2222 Use Case Update
Clarifications and Capacity, Energy, AS Walkthrough

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- This Use Case review may reflect proposal items that have been revised or updated since the most recent PJM Draft Proposal presented at the **November 2021 DIRS**

  – Proposal items with updated requirements will be noted verbally or visually

  – There will be examples outlined in PJM Proposal slides not captured in this presentation

  – PJM still welcomes comments and questions on updated proposal items during this presentation for consideration

- Provide an update on capacity valuation methodology
- Walk through market participation for Use Cases
    – Capacity
    – Energy
    – Ancillary Services
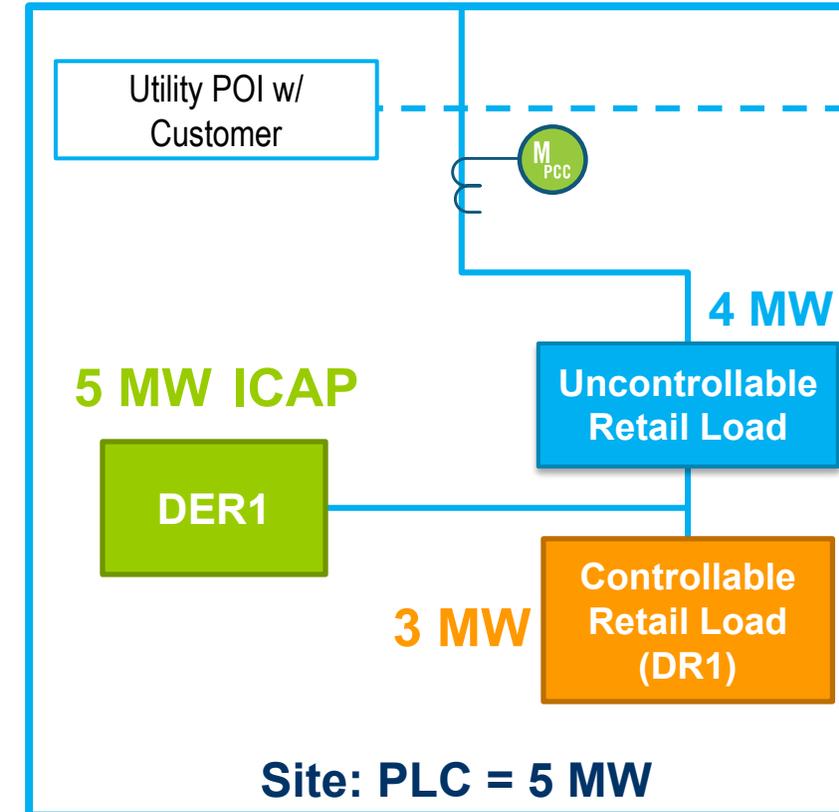- Recap current NEM and double counting proposal

	Composition	Configuration	Sites	Use Case Goal
1	Homogeneous	Front of the meter	One	• Demonstrate size requirements and their implications.
2	Heterogeneous	Front of the meter	Multiple	• Demonstrate information exchange on an aggregate basis. • Walkthrough utility review with multiple distribution feeders.
3	Homogeneous	Behind the meter	One	• Demonstrate participation for sites co-located with retail load. • Illustrate rules where aggregates contain both potential for injection and load reduction.
4	Heterogeneous	Behind the meter	One	• Demonstrate participation for sites co-located with retail load. • Illustrate rules where aggregates contain both potential for injection and load reduction. • Highlight rules for multiple technology types where necessary.
5	Homogeneous	Behind the meter	Multiple	• Illustrate an aggregation of **many customer sites with BTM generation** wanting to participate in one or multiple markets.
6	Heterogeneous	Behind the meter	Multiple	• Illustrate an aggregation of **many customer sites, each with mixed technology types**, wanting to participate in one or multiple markets.
7	Homogeneous	Behind the meter	Multiple	• Illustrate an aggregation of **many distinct customer sites with load reduction** wanting to participate in one or multiple markets.

Site Max Load = 7 MW = Controllable Load (DR) + Uncontrollable Load
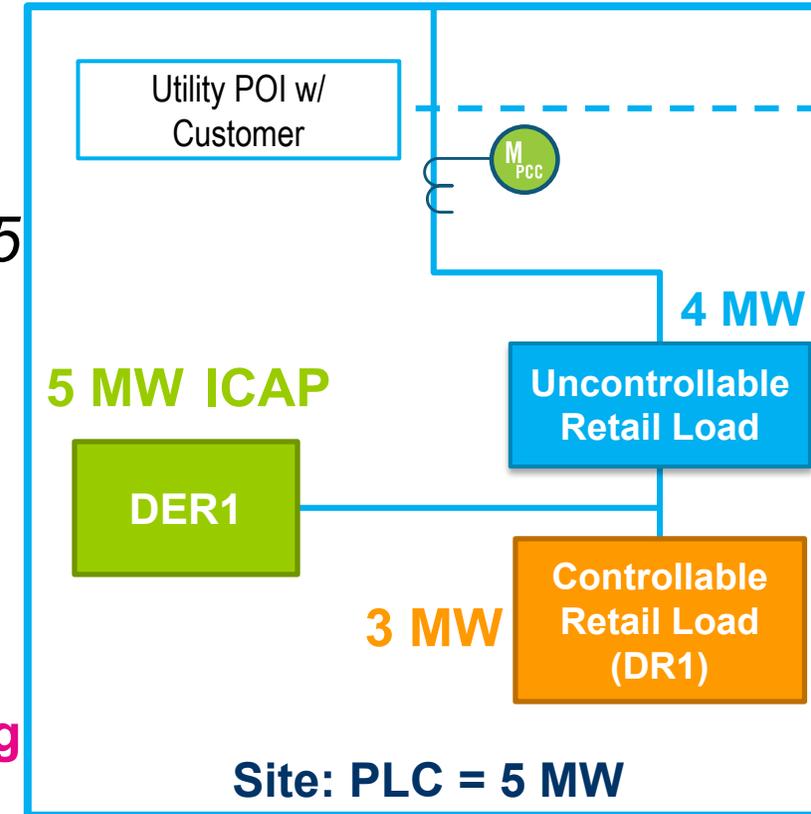
PLC = 5 MW, DER1 = 5 MW ICAP

Continuous DER Capacity Valuation

- Two part calculation accounting for load reduction and injection MWs

  1. **Load Reduction:** PLC MW, under current rules
  2. **Injection:** Site Generation ICAP – Max Load

Utility POI w/ Customer

M PCC

4 MW

5 MW ICAP

Uncontrollable Retail Load

DER1
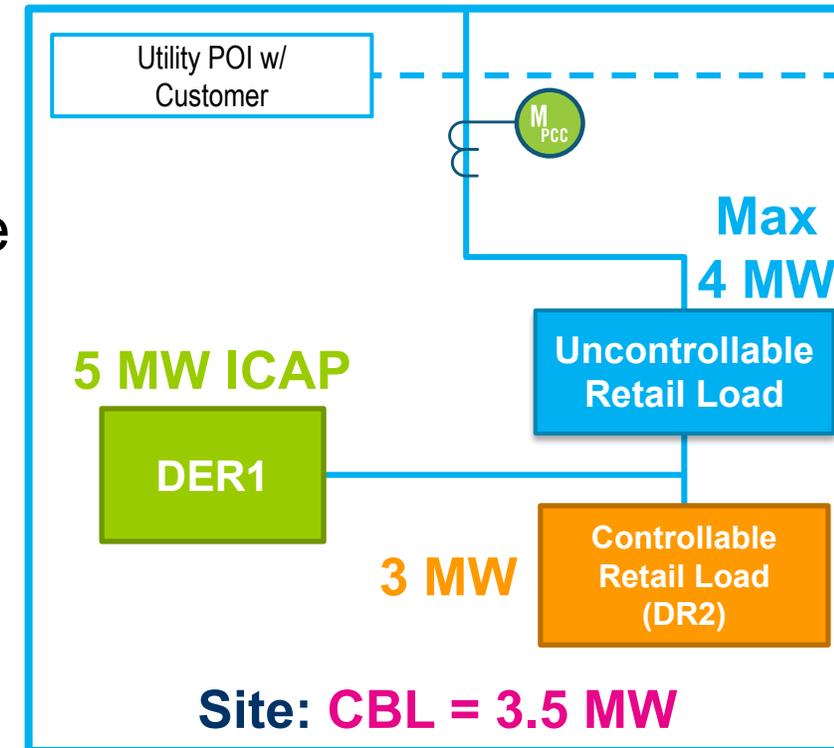
Controllable Retail Load (DR1)

3 MW

Site: PLC = 5 MW

Site Max Load = 7 MW = Controllable Load (DR) + Uncontrollable Load PLC = 5 MW, DER1 = 5 MW ICAP

- Example:

1. **Load Reduction:** 5 MW PLC – *Resource eligible for 5 MW capacity given 5 MW of load reduction (3 MW of DR1 + 2 MW from DER1)*

2. **Injection:** (DER1 ICAP – Max Load)

   = 5 MW – 7 MW = 0 MW

   - This site would **not** have any capacity value for injections
   - **Discussions regarding load reduction role here are ongoing**
   - *Alternate: (DER1 ICAP – Max Uncontrollable Load) = 1MW*
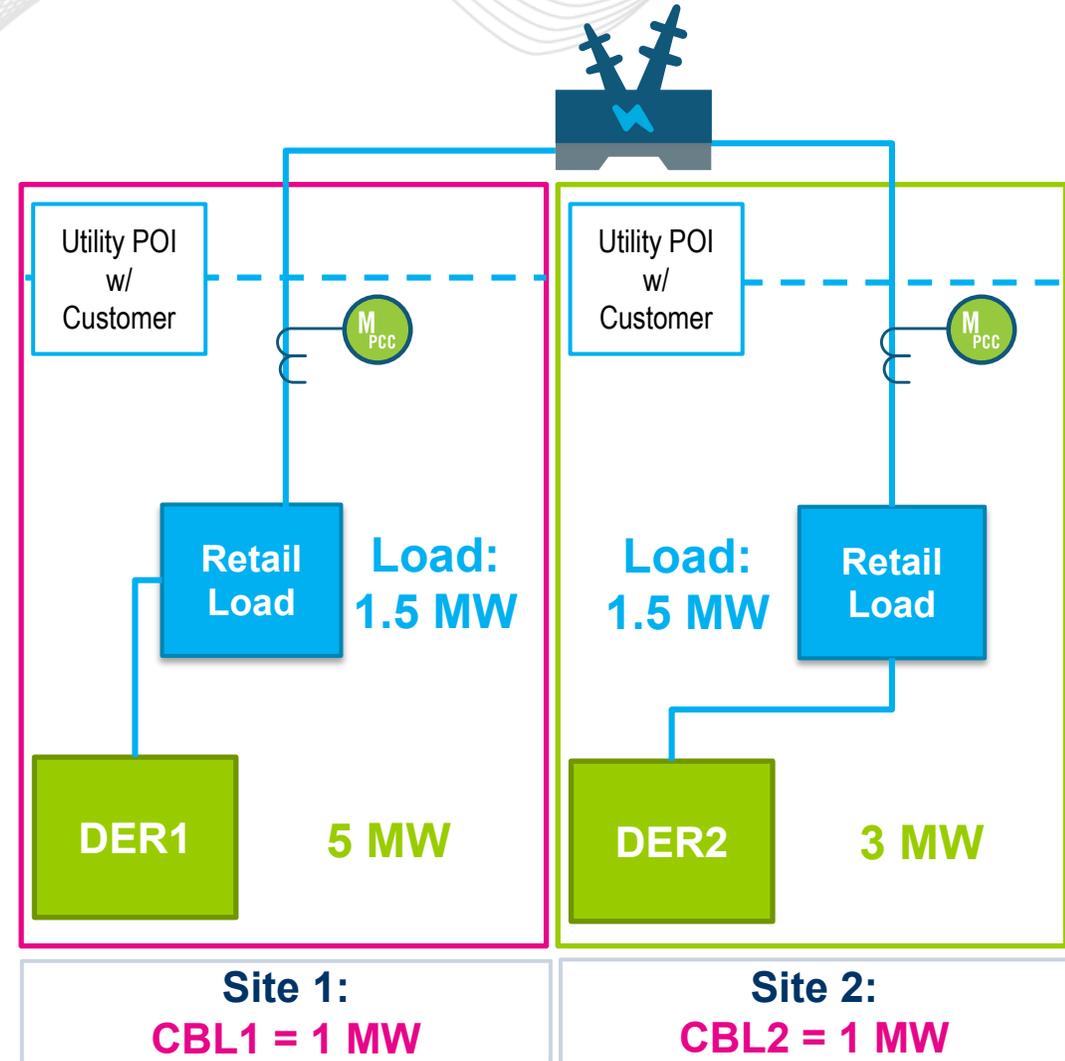   - Looking across other initiatives within PJM (BTMG, co-sited load)

Utility POI w/ Customer

M PCC

4 MW

Uncontrollable Retail Load

5 MW ICAP

DER1

3 MW

Controllable Retail Load (DR1)

Site: PLC = 5 MW

Continuous DER Energy Participation

- DER Aggregations will be compensated in energy settlements for injections, plus any reductions that are calculated based on existing Economic Load Response Customer Baseline methodology (CBL)

- Example: CBL = 3.5 MW, DR2 reduces 3 MW, DER1 operates to 5 MW
  - Site meter sees net injection of 1 MW
  - Energy credit = 1 MW injection + 3.5 MW CBL reduction = **4.5 MW**

Utility POI w/ Customer

M PCC

Max 4 MW

5 MW ICAP

Uncontrollable Retail Load

DER1

3 MW

Controllable Retail Load (DR2)

Site: CBL = 3.5 MW

Continuous DER Energy Participation

- DER Aggregations will be compensated in energy settlements for injections and reductions, based on site CBL

- Example: CBL1 and CBL2 are 1 MW each, each load is 1.5 MW, DER1 operates to 5 MW and DER2 operates to 3 MW
  - Site 1 meter sees net injection of 3.5 MW, Site 2 meter sees net injection of 1.5 MW
  - Energy credit = Site 1 + Site 2 = (3.5 MW + 1.5 MW) injection + (1 MW + 1 MW) CBL reduction = **7 MW**


Utility POI w/ Customer

M PCC

Retail Load

Load: 1.5 MW

DER1 **5 MW**

Utility POI w/ Customer

M PCC

Load: 1.5 MW

Retail Load

DER2 **3 MW**

Site 1: CBL1 = 1 MW

Site 2: CBL2 = 1 MW

Use Case 6: Capacity Participation Options

Site 1: Max Load = 4 MW, DER1 = 5 MW ICAP (Storage), PLC = 2MW
Site 2: Max Load = 4 MW, DER2 = 3 MW ICAP (Generator), PLC = 2MW

Continuous DER Capacity Evaluation

- **Site 1:** DR: 2 MW PLC = 2 MW capability
  - Injection: (5 MW ICAP – 4 MW) = 1 MW capability
  - **Site 1 = 3 MW capability**
- **Site 2:** DR: 2 MW PLC = 2 MW capability
  - Injection: (3 MW ICAP – 4 MW) = 0MW capability
  - **Site 1 = 2 MW capability**
- DER Aggregation = Site 1 + Site 2
- **Up to 5 MW capability** can be offered into PJM capacity market
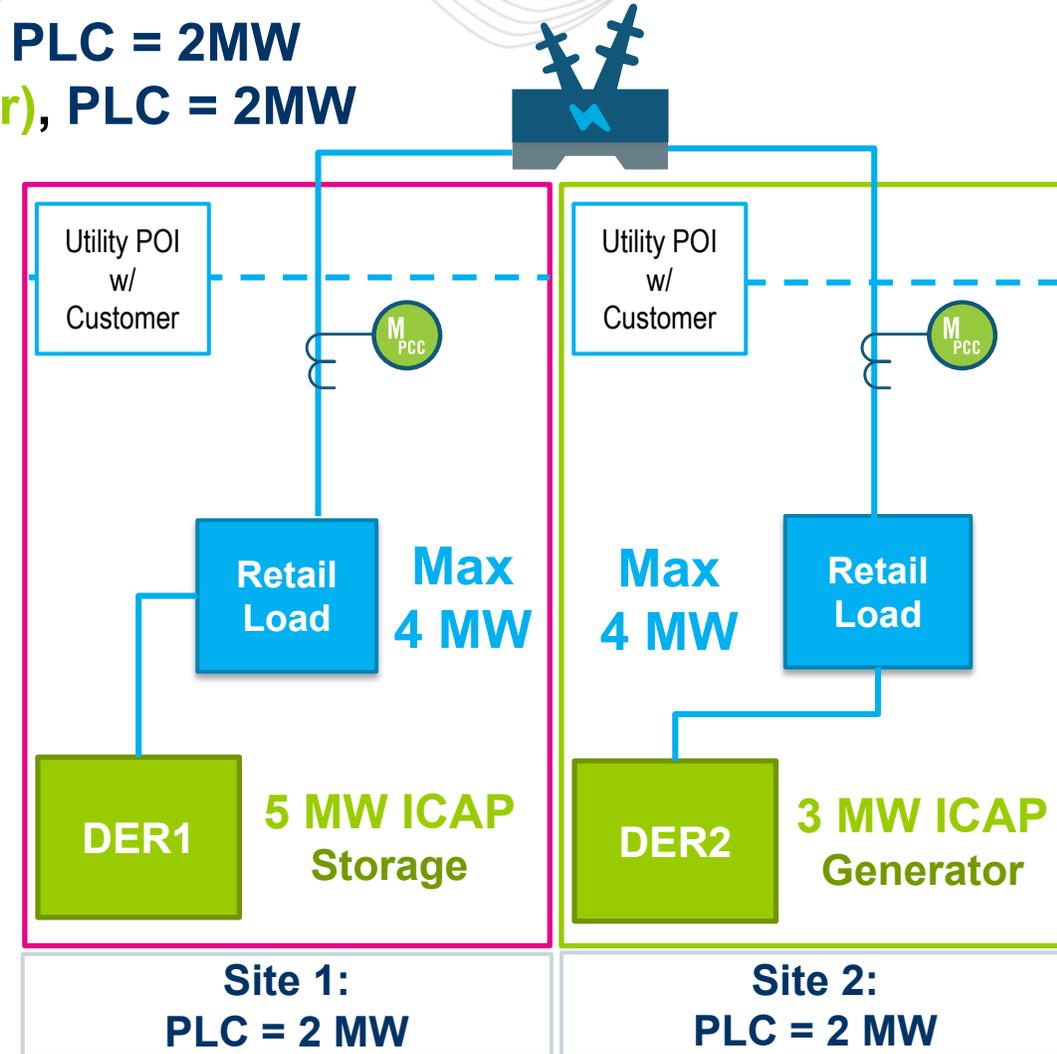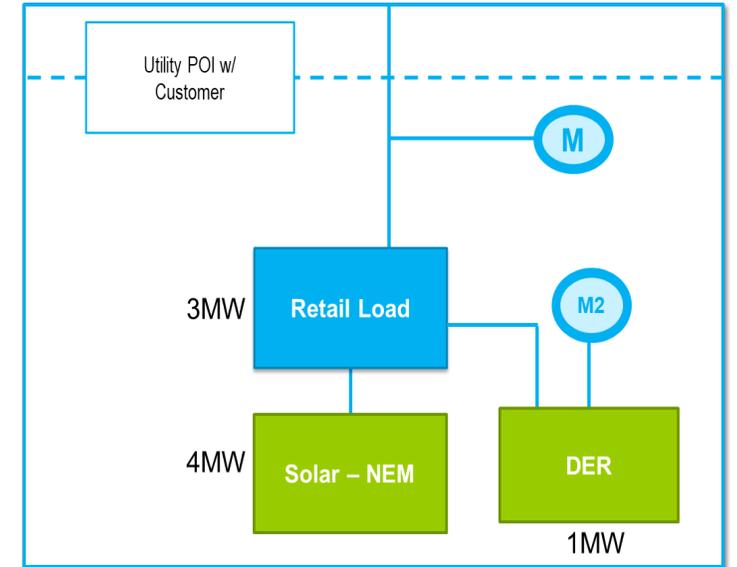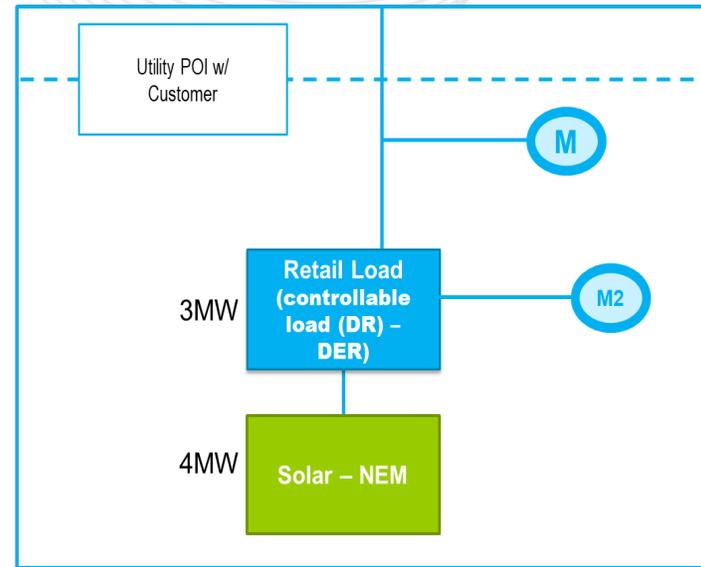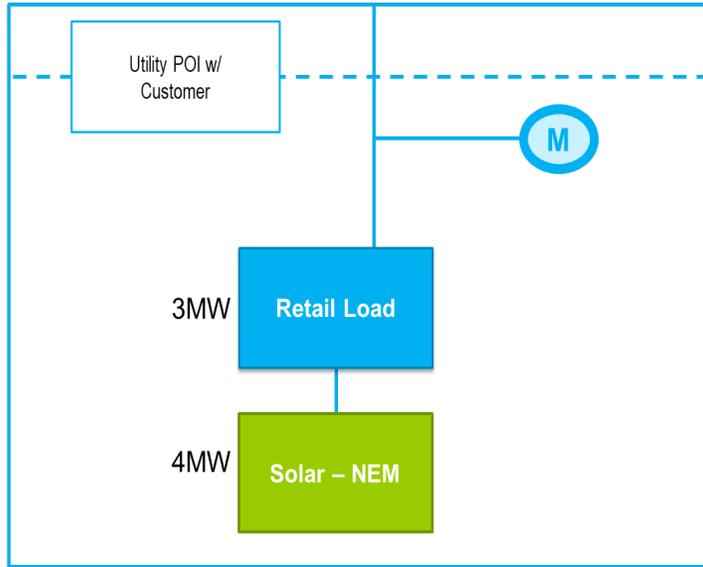
- Net Energy Metering customers are eligible to participate in A/S Only using the DERA model, assuming metering and performance requirements can be met.
- NEM customers that have a PLC are only eligible to offer capacity as a Demand Resource (DR).

Ancillary Service Participation
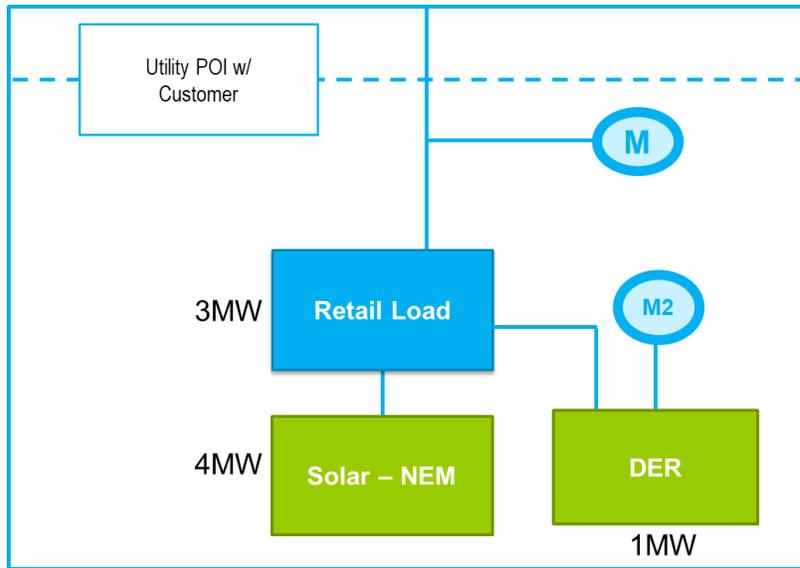
Regulation
- DER eligible to be submetered for regulation (M2)
- Offer up to qualified / tested capability

Reserves
- Eligible up to the MW capability of DER for reserve offers
- MWs provided would be validated at the POI (M) (ex. 1MW assignment would need to show a 1MW response at M during a spin event)

- Receive feedback

- Complete market participation review for Use Cases

- Address feedback

- Continue to iterate with stakeholders, adding additional detail throughout implementation process

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