

DR Aggregation Rules

June 1, 2017



- Allow participation into the markets
 - => 100 kw minimum
 - Seasonal capability for CP requirements
 - LSE/EDC review process
- Allow retail customer portfolio management for compliance
 - Varies by market

Must balance grid management/dispatch and aggregation participation needs (vs convenience)

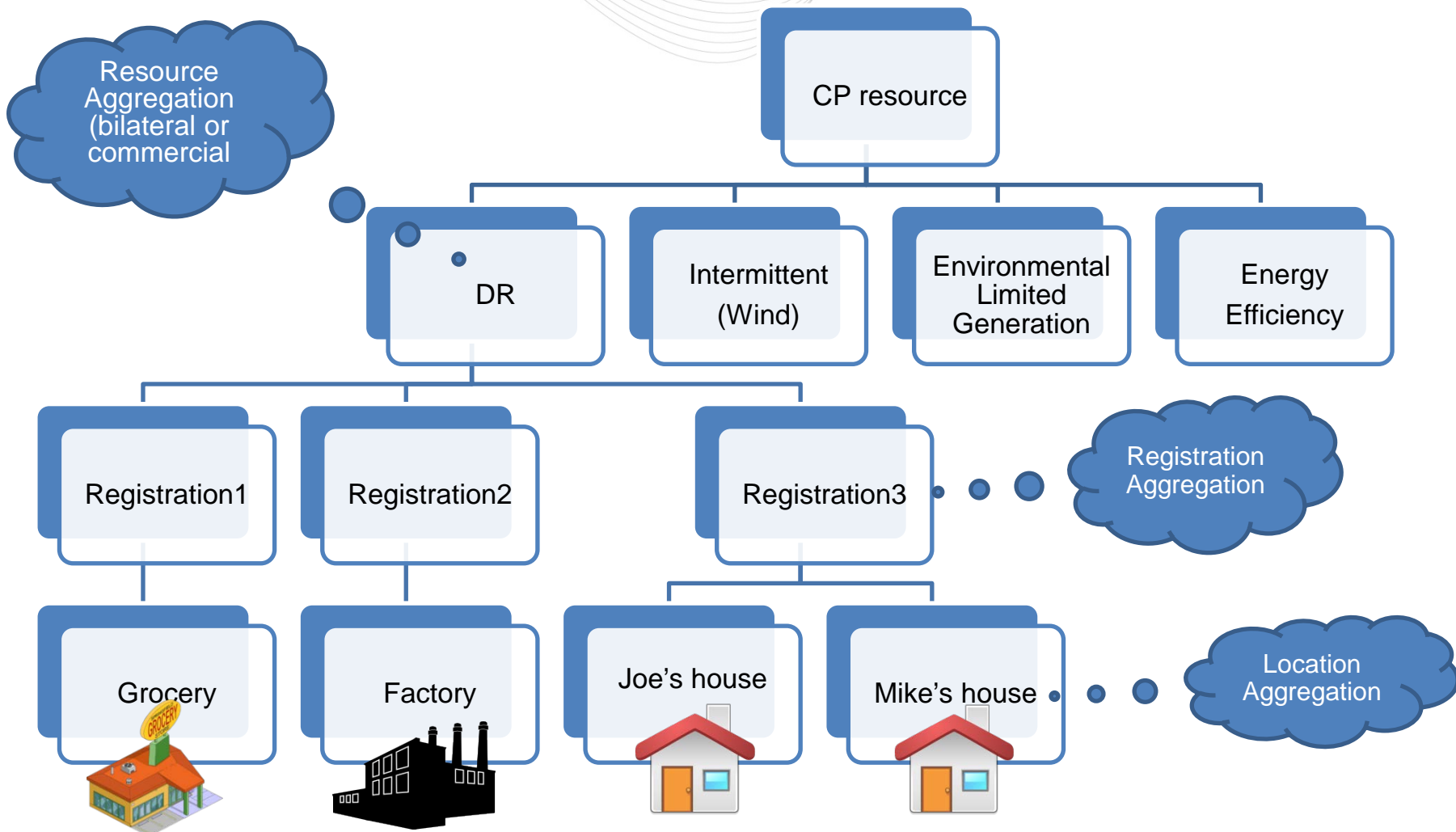
Demand Response and Energy Efficiency Opportunities in PJM Wholesale Market

Wholesale Service	Demand Response
Capacity	Yes
Energy	Yes
Day Ahead Scheduling Reserves (30 min)	Yes
Synchronized Reserves (10 min)	Yes
Regulation	Yes

Load Management (bracketed next to Capacity, Energy, Day Ahead Scheduling Reserves)

Economic DR (bracketed next to Synchronized Reserves, Regulation)

- Location = EDC account number, typically a premise or single building with an address
- Registration = CSP contract with locations to participate in specific market for a period of time for a certain amount. Includes one or more locations
- RPM/FRR resource – represent RPM/FRR capacity commitment for certain for period of time. Includes one of more registrations.
- EAA = Emergency Action Area. Represents location of CP issue (may be multiple zones)
- Subzone = collection of zipcodes. All registrations with locations in zipcode are include in subzone



- Capacity market

- Size

- Look at RPM resource for 100kw min – reduce need to aggregate small locations
 - but can still aggregate locations <100 kw with ability to put 1 location >100kw to enable participation
 - Seasonal capability (summer vs winter)

- Geographic location

- Smaller of Zone or LDA

- EDC

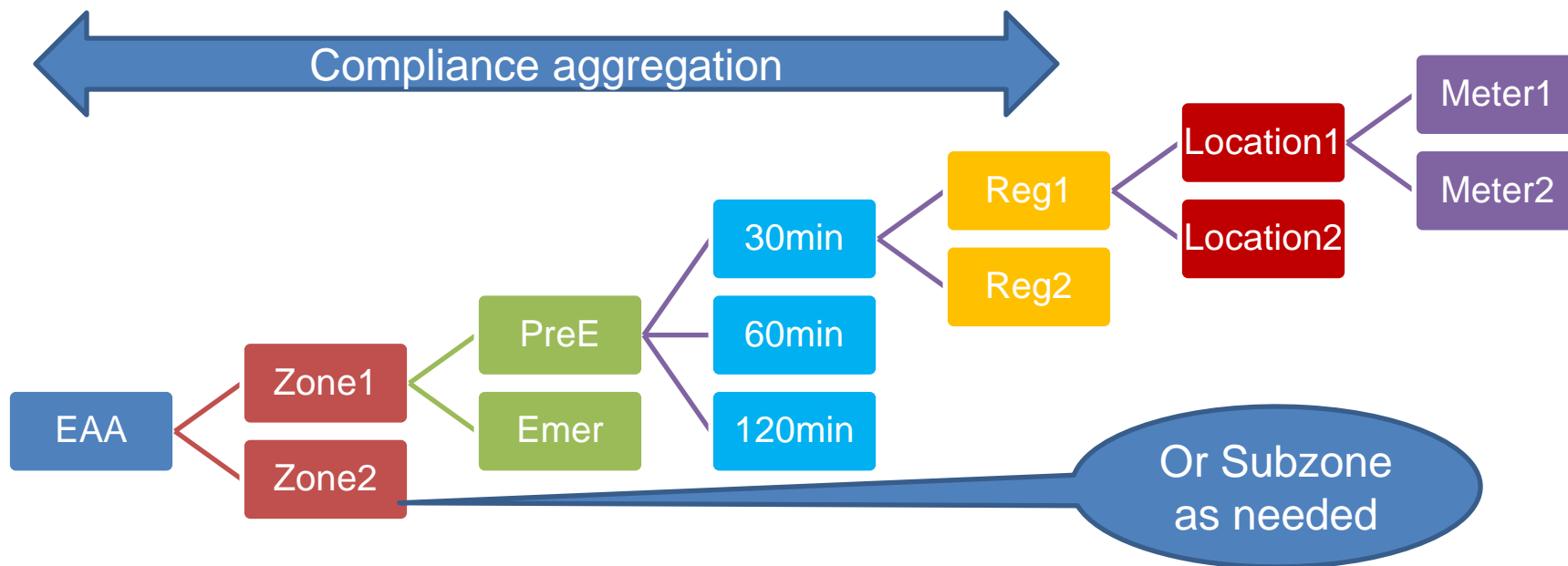
- Energy Pricing point

- Capacity Market attributes

- Type – Emergency/Pre-emergency
 - Lead time – 30/60/120 minute
 - Product – in transition with CP

Ensure aggregation allows dispatch flexibility

Aggregation for Performance is based on registration(s) dispatched and system condition



Allows CSP portfolio aggregation and dispatch flexibility

- Energy market (Economic DR)
 - Size
 - <100 kw with ability to put more than 1 >100kw to enable participation
 - Geographic location
 - Zone
 - EDC
 - LSE
 - Energy Pricing point

Multiple registration in same zone with same pricing point may be aggregated to “Dispatch Group” based on offer parameters

- Market Offer and Dispatch
 - Registration or Dispatch Group (optional)
- Compliance
 - Registration compliance based on sum of load data from associated locations
 - Dispatch Group based on aggregate registration load reductions
 - BOR measured based on Registration or Dispatch Group (optional) dispatched amount

- Participation aggregation
 - Same as energy except:
 - Location based on smaller of transmission zone and SR area
- Dispatch
 - SR area (MAD, non-MAD, RTO)
- Compliance
 - measured across the RTO based on what was dispatched
 - Lost revenue is done by Dispatch Group or Registration

- Participation aggregation
 - If regulation only (no energy market participation) then:
 - <100 kw with ability to put more than 1 >100kw to enable participation
 - Zone
 - EDC
- Market Offer
 - Registration or Dispatch Group (optional)
 - Required to be <10 MW
- Dispatch
 - Fleet which is made up of 1 or more Dispatch Groups (optional) or Registrations
 - Required to be <10 MW
- Compliance
 - Measured based Registration, Dispatch Group (optional) or Performance Group (optional)
 - Required to be <10 MW

- Geographic Location – dispatch flexibility based on grid need
- EDC – data review process (avoid duplicates)
- Pricing Point – all underlying locations receive same market prices
- Offer parameters – same offer parameters (price, MWs, lead time, min down time, etc.) or can be represented in offer curve
- LSE – if expected to significantly impact energy interchange (negative dec)
- Compliance & Settlement considerations