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Some Remaining Issues for DR Integration in CAISO Markets

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Telemetry Issue

- Telemetry requirement
  - Required for DR resources in energy market over 10 MW
    - Need 5-minute meter data (can be 15-minute data divided by 3) in real-time market
    - Temporary waiver for SCE to use 60-minute residential meter data and divide by 12 for real-time market
  - Required for DR resources providing non-spinning reserve
    - Need 1-minute meter data (change from 4 seconds approved by CAISO in 2015/6); 5-minute data may be possible if can meet data accuracy requirements
  - Required for DR resources providing spinning reserve and regulation
    - Need 4-second meter data
  - Data quality must be +/- 2% accuracy
- 2013 IEPR stated:
  - Relaxed telemetry requirements and reduced technology costs could allow enrollment of large numbers of smaller loads that can provide DR benefits without significant negative effects on customers because those effects would be spread across a wider population. This could also increase portfolio diversification and improve DR performance.

Telemetry Issue

- Current cost is in the 5 figures and is prohibitive except for largest resources
- Promising research shows it is possible that advanced interval meters can use a protocol like Zigbee to wirelessly communicate with a gateway appliance like a HAN, which will then push data to a cloud-based system that can aggregate it and provide it to a remote intelligent gateway (RIG) that provides real-time telemetry to the CAISO
  - "CAISO Telemetry Solution Over Broadband Lab Test and Proof of Concept" Robert Anderson, Olivine, and Sam Piell, PG&E, May 2017
  - Research being expanded to 300 customers
  - Research shows can provide 1-minute and 5-minute meter data but not 4-second data
  - This solution requires meters with HAN devices, which excludes meters for large customers
- Telemetry with statistical sampling may be another option in the future for small customers with similar characteristics, since the CAISO has approved the use of statistical sampling for settlement

Other Remaining Issues

- Settlement baselines
  - CAISO has recently agreed to expand wholesale settlement baselines for PDR (proxy demand resource) aggregations to include control groups, day-matching, and weather-matching with day-of adjustments
  - However, FERC action is still required, and
  - CPUC-regulated retail DR programs still require individual baselines, not aggregated baselines, and the CPUC has not approved alternatives to day-matching, so the relationship between wholesale and retail baselines must be addressed for IOU DR
- CAISO minimum requirement for PDR is 1 demand response provider, 1 load-serving entity, 1 subLAP, and minimum size of 100 kW
  - Excludes some existing DR programs from the CAISO market, which will result in loss of their RA value
  - Complicated by increasing CCA activity, which moves customers to another LSE and can take the resource below 100 kW
- General concern on focus on integrating DR into CAISO market
  - The current focus on supply side DR over load modifying DR, except for pricing options like CPP and TOU, is quite limiting. The CAISO claims that load modifying DR has no value for RA unless the CEC can adjust the load forecast for it and perfectly predict it. There is not general agreement on that point. The CAISO insists that DR be integrated into its markets and if resources are too small the CPUC and CAISO give them no RA value. These are fairly rigid positions and exclude potential DR from smaller resources that can be triggered when the CAISO dispatches DR in its markets.

New Issues

- Resource Data Template Issues
  - No minimum run time provision for DR at zero P_{min}, so resource can be dispatched in and out of real-time market on a five-minute basis
  - No enforced maximum run time for DR, so resource can be dispatched for longer than authorized
  - No mechanism to make adjustments for output of weather-sensitive DR resources
- Resource Adequacy Issues
  - As of 2018, load modifying DR will not count for RA but no agreement on how it can be used to adjust CEC load forecast to be taken into account for determination of RA obligation
  - No ability to derate DR resources if output is temperature-sensitive
    - Creates problems with resource adequacy availability incentive mechanism
  - RA value for utility DR programs based on load impact protocols but for DR Auction Mechanism based on contract capacity
  - Outstanding issue of whether DR providing local RA must meet CAISO-proposed 20-minute requirement
  - Outstanding issue of finalizing definition of flexible RA requirement so DR knows what it must do to qualify as flexible