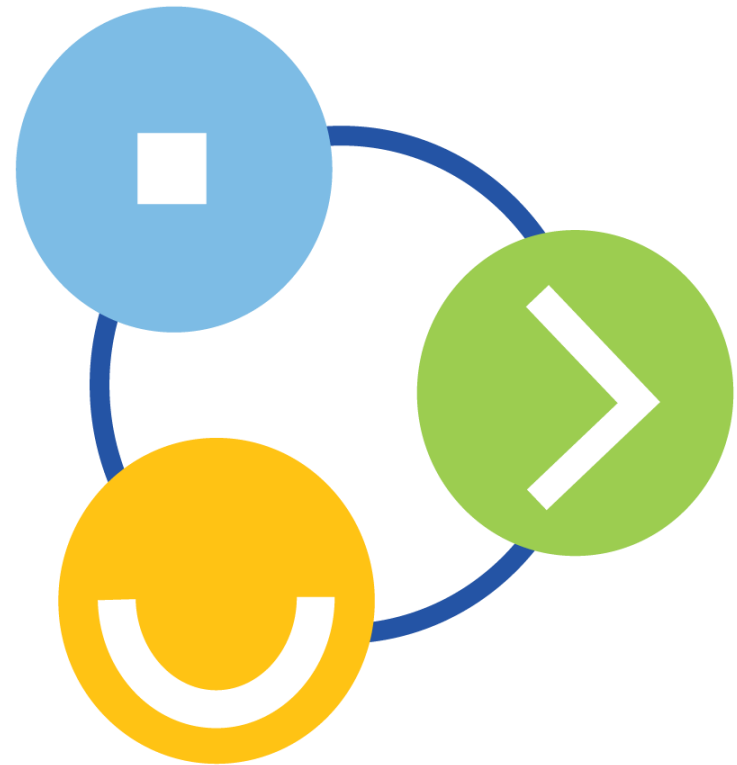


MADRI-Demand Response Programs in a Changing Market environment

Impacts of Changes to DR Product Categories

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DR Product Comparability

- **Generator Parameter Limited Schedules**
 - Many generators being paid as capacity resources are allowed numerous inflexibilities:
 - Notification lead-times: ex) 3 hours, 8, hours, 24 hours, 48 hours, 5 days
 - Minimum Run Times: ex) 2 hours, 4 hours, 8, hours, 12 hours, 24 hours
 - **Last years parameter limits for DR Products**
 - Notification lead-times: 2 hours, 8, hours, 24 hours, 48 hours, 5 days
 - Minimum Run Times: 2 hours
 - **New parameter limits for DR**
 - Notification lead-times: 30 MINUTES
 - Minimum Run Times: 1 hour
 - **Run-hour limited**
 - Water flow restrictions for hydro generation
 - Environmental regulations limiting generating units to 100 hours or less
 - Limited DR (60 hours limit)
 - Extended Summer DR (1,200 hours)
 - Annual DR (3,650 hours)
- **Conclusions:**
 - DR is more operationally flexible and valuable than much of the generation (which is paid higher capacity price)
 - DR is in many ways more available to PJM for emergencies than much of the generation
 - DR is not treated comparably to generation
 - Can DR be even more valuable (ex) 20 minute minimum run time for residential DLC

New Capacity Performance Product (Proposed by PJM)

- PJM Is Introducing New Product, “CAPACITY PERFORMANCE”, Meant for ~88% of All Generation Resources. CP is required to provide:
 - More flexible operations (less parameter limits)
 - More availability
- Should DR Already Qualify as CP?
 - Based on its superior flexibility
 - All DR (including Limited DR and Extended Summer DR) STRONGLY responded to last winter’s Polar Vortex emergency calls, even though they had no winter obligation
 - ~2,300 MW of voluntary DR
 - *“The responding, voluntary demand response resources, while only about 20 percent of the demand response capacity, performed very well”* –PJM Cold Weather report
- DR Has Value All Year Long
 - PJM could begin counting on resources, such as DR to the extent that they consistently perform, when needed, even if on a voluntary basis
 - Could use a probabilistic approach such as with load forecasting in setting installed Reserve margin
 - All resources should be treated comparably, and their capacity payments should be reduced due to unavailability, but that does not require elimination of them completely as a capacity resources

Product Change – Customer Choices

- We Are Unsure of Product Selection Decisions C&I Customers Will Make:
 - Price is a key to performance, If overall energy revenues are not increasing then 30 min notification as well as 1 hour min-run-time can be a factor
 - Limited DR (reduction in MWs that can clear)
 - Extended Summer DR (reduction in MWs that can clear)
 - Annual DR (not necessarily Capacity Performance Product)
- Possibly Withdraw from Wholesale Resource Market
 - Price Responsive Demand (PRD) (retail product)
 - Peak Shaving
- Possible Reasons for Discouraged Participation (Based on ISO New England Experience)
 - Poor performance with short-notification lead time
 - Requirement for automated controls
 - Severe Penalties
 - Fungability Issues
- New Market Product Possibilities
 - PJM's old ALM program
 - CP Annual DR

