Manage ISO Coincidence Peak Events Utilizing Existing Building Management Systems

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Agenda

• Challenges of Traditional Demand Response
• Advantages of Economic Demand Response
• Economic DR/Coincident Peak (CP) Methodology
• Lowe’s CP Management Approach
• BMS Load Reduction Methods
• Load Reduction Support Activities
Challenges of Traditional Demand Response

- DR programs vary from 1-24 hour notification and shifting to under 30 minute response times to better align with real-time ISO/utility loads
- Single person/small energy team with no 3rd party DR management support
- Operate multiple building management systems with no enterprise bulk tool capabilities and/or no ADR integration capability
- Typically must enter into a contract from a list of approved or exclusive DR service providers with 65%-90% revenue share
- Enrollment deadlines, firm kW commitments, varying baseline methodology, over performance marginally rewarded
- May require a main sub-meter installed on location by DR vendor
- Year-round programs may not align with hours of operation
- Some programs may apply add back demand calculation if DR dispatched on a ISO Coincident Peak day/hour
Advantages of Economic Demand Response

- Can identify potential events from 1-7 days in advance.
- Easier to plan and deploy manual demand reduction strategies across multiple building management systems.
- ISO Coincident Peak (CP) participation hours vary from 15 hours (1CP) to 36 hours (5CP) similar to traditional DR programs with 40-hour limitations.
- 100% avoided cost based on actual demand reduction achieved.
- Provides greater flexibility to change strategies throughout the year.
- Does not require contract with DR vendors, enrollment deadlines, and kW commitments.
- Can leverage same building automation tools to dispatch during high cost Time-of-Use opportunities especially for block & index energy procurement strategies.
Economic DR/Coincident Peak Methodology

• Identify demand reduction opportunities that yield most avoided costs with minimal impact to operations <40 hrs./yr./store

  1. Demand Response – 800+ stores
  2. Coincidence Peak (CP) Avoidance: ISO-NE, NYISO, and PJM
  3. Time-of-Use (TOU) Opportunities: High day-ahead/real-time price hours

• Tolerance to event frequency, duration, minimum notification, and ease of performing control strategy changes at enterprise level
  • Invoke pre-configured control strategies for defined periods

• Determine the upper/lower limits of alternate control strategies to minimize the impact to human comfort and store operations

• Define minimum demand and energy cost thresholds ($/MW & $/MWh)

• 50% of Lowe’s total DR revenue & avoided costs are attributed to manually initiated CP and TOU demand reduction activities
Lowe’s CP Management Approach

• Monitor 7-day load forecasts for PJM, NE, & NY markets for 1CP & 5CP

• Morning of potential CP event monitor ISO load forecast, temperature, and rain forecasts

• Initiate pre-configured bulk push BMS strategies and DR event notification to Facilities and Store level personnel

• 5-8 days to hit 1CP; 8-12 days to hit all 5CPs with a 3-hour event duration

• Realize 3-8% total cost avoidance applied to subsequent year’s invoices, vary by zone and load curtailment ability
BMS Load Reduction Methods

• Group stores by BMS system, ISO, utility, zone, and DR strategy

• Building asset mix plays a factor on strategy (Dimmable vs. non-dimmable lighting, BACnet vs. proprietary HVAC controllers, VFDs, etc.)

• Understand the existing batch tools functionality and limitations of your controls system(s) that may require different strategies based on the platform capabilities

  • Sales Floor General Ambient Lighting
    • Strategy A: 50% lighting circuits OFF (alternating fixtures or drivers), in-rack display ON
    • Strategy B: Dimmable LED 30-70% output by zone, in-rack display ON
    • Strategy C: Occupancy data used to limit lighting output

  • HVAC
    • Strategy A: 1-2°F ΔT select RTUs, Fan Auto Mode
    • Strategy B: Load Roll 4-6 HVAC off 20-minute intervals
Load Reduction Support Activities

• Ensure store assets are performing within the defined alternate parameters during load reduction events

• Verify all schedules, set points, and loads have restored back to their original programmed status

• Identify underperforming stores for remediation
  • Local overrides, programming or circuiting issue, store assets replaced

• Utilize BMS data to validate load reductions events and calculate projected energy savings for financial forecasts