

What is Demand Response

- Demand response (DR) is a load management tool which provides a cost-effective alternative to traditional supply-side solutions to address the growing demand during times of peak electrical load.
- The California Energy Commission (CEC) defines DR as “a reduction in customers’ electricity consumption over a given time interval relative to what would otherwise occur in response to a price signal, other financial incentives, or a reliability signal.”
- This definition is most reflective of how DR is understood and implemented today in countries such as the US, Canada, and Australia.
 - DR is primarily a “dispatch-able” resource responding to signals from utilities, grid operators, and/or load aggregators (or DR providers).

Understanding the Benefits

- Summarize some of the benefits of demand response programs:
 - Demand response is less expensive than using natural gas-fired peaking power plant. The capital cost required to build out 1MW of demand response capacity is of the order of \$240,000 versus \$400,000 for a gas-fired plant, a 40% cost savings.
 - Demand response capacity managed by a large, technology-enabled demand response provider, can be dispatched in a very short time (less than 5 minutes), whereas a peaking power plant can take up to 30 minutes to ramp up to full capacity.
 - By reducing the stress on the grid and keeping wholesale electricity prices down during peak demand, demand response also facilitates the sale of power in the wholesale markets from a region with surplus capacity to another in need of the extra capacity, thus ensuring nationwide grid reliability.
 - Demand response is a clean source of capacity since it does not generate greenhouse and other toxic emissions unlike a power plant.
 - Demand response capacity is more reliable than peaking power plant capacity, as it can be sourced from a large and diversified geographic region.

Types of DR Programs

- Demand response programs are established to motivate changes in electricity use by end-use customers in response to changes in the price of electricity over time, or to give incentive payments designed to induce lower electricity use at times of high-market prices or when grid reliability is jeopardized:
 - **Price-based demand response programs such as real-time pricing (RTP), critical peak pricing (CPP) and time-of-use (TOU) tariffs**, charge customers time-varying rates that reflect the value and cost of electricity in different time periods. Customers who have access to the electricity rates they are paying, tend to use less electricity when electricity prices are high
 - **Incentive-based demand response programs pay participating customers to reduce their loads** at times requested by the program sponsor, triggered either by a grid reliability problem or high electricity rates

Utility DR Programs for Business

- Business Programs
 - Peak Day Pricing: Price discount to conserve energy during times of peak demand
 - Base Interruptible Program: Incentives to reduce your businesses' consumption to a level that you preselect.
 - Demand Bidding Program: Incentives to reduce consumption when we notify you of a Demand Response event day.
 - Scheduled Load Reduction Program: Get paid to reduce consumption to a previously agreed level; customer specifies the time period and the days in advance.
 - Opt-In Binding Mandatory Curtailment Plan: Reduce the overall load of your facility and avoid rotating outages during high demand periods

DR Programs for Aggregators

- **Aggregator Managed Portfolio:**
 - A non-tariff program of bilateral contracts with aggregators to provide utility with price-responsive Demand Response
- **Capacity Bidding Program**
 - A monthly incentive to reduce energy by a previously agreed amount once an electric-resource generation facility reaches a pre-determined level

DR Enablement Incentives

- Technology Incentives
 - Financial incentive to help businesses invest in energy management technologies that will enable them to take part in Demand Response.
- Automated Demand Response Incentive
 - Provides funds to help businesses pre-program energy management and control systems. These allow us to automatically initiate previously agreed load reduction strategies during times of high demand.
 - ADR Program incentives, as defined by category of technology selected:
 - Semi-Automated Demand Response \$125
 - Automated Demand Response \$200
 - Emerging & Advanced Technology HVAC/R \$350
 - Emerging & Advanced Technology Lighting \$400

BEST Center Curricula, Resources & Recordings

Academic Programs

Georgia Piedmont Technical College - Building Automation Systems

Milwaukee Area Technical College - Sustainable Facilities Operations

Laney College - Commercial HVAC Systems

City College San Francisco - Commercial Building Energy Analysis & Audits

Professional Development Materials, Presentations & Videos

National Institutes

Building Automation Systems Instructor Workshops

Webinars (e.g., BEST Talks)

Faculty Profile Videos

Reports & Case Studies

Marketing Resources

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