Pacific Gas and Electric Company®

Automated Demand Response (ADR) AFE Update

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ENERGY SOLUTIONS

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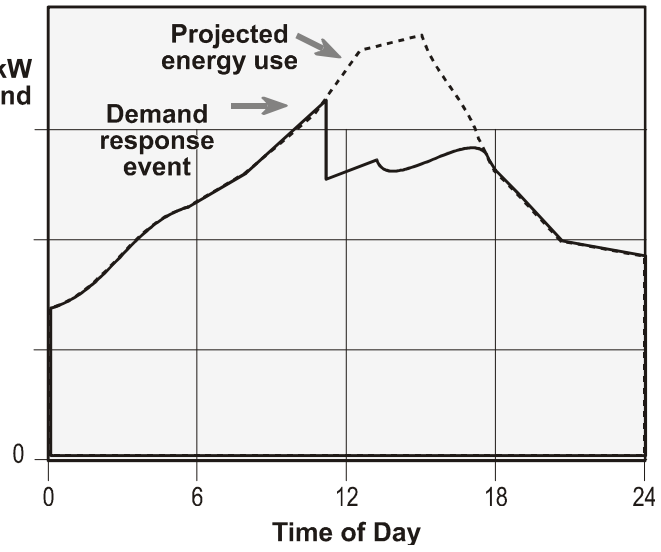
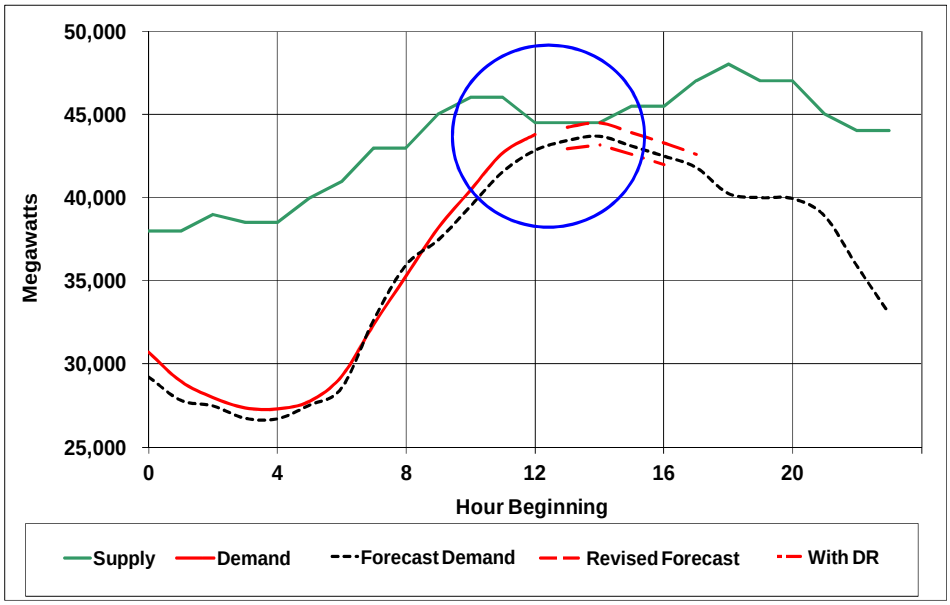
What is Demand Response?

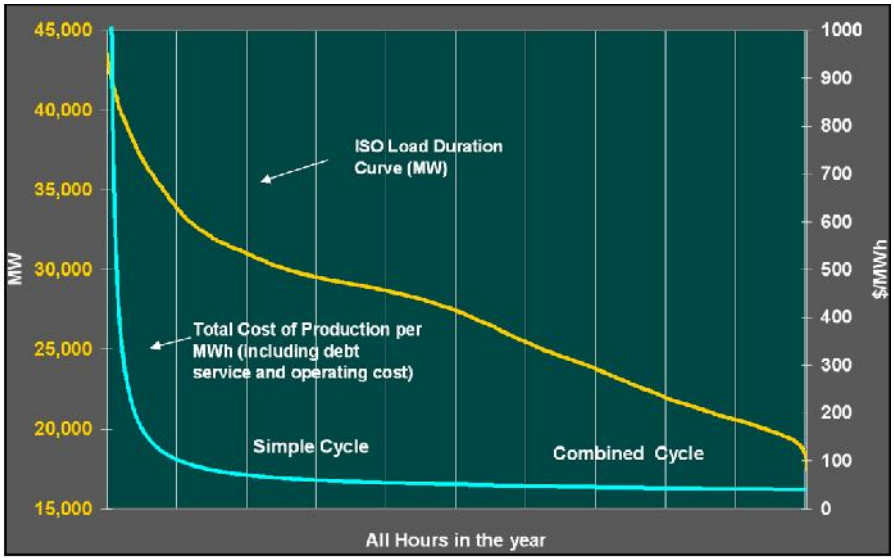
- Only when requested
- Temporary, uncommon activities
- Voluntary
- Pays incentives



When Demand Meets Supply



The Cost of Meeting the Peak



Efficiency and Demand

Energy Efficiency	Daily Load Shift	Demand Response
A reduction in kWh throughout the year 8,760 hours	Actions taken to reduce or shift load during summer on-peak hours (kWh and kW) up to 900 hours during the summer	Reduce load (kW) when requested during unusual events Occasional, called by the utility; 12 to 60 hours

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Financial Benefits of DR

- Annual DR load shedding participation revenue stream
- One time Technology Incentives— help pay for hardware and software that enable ADR

ADR Program Uses Tiered Incentive Structure to Promote Advanced Technologies

Technology Category	Incentive Rate ($/dispatchable kW)
Automated Demand Response	$200
Advanced Technology HVAC	$350
Advanced Technology Lighting	$400

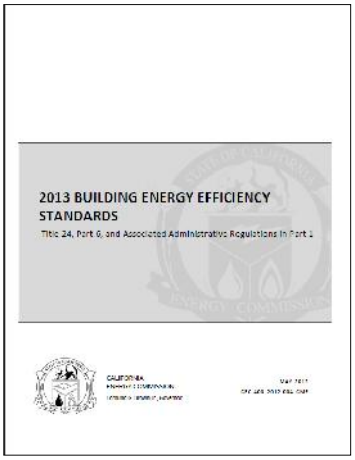
Incentive calculation based on dispatchable kW according to the committed load reduction strategy

Incentives capped at 100 percent of total project cost.

Benefits of DR—to Businesses

- Maximize use of building system enhancements
- Reduce peak demand energy costs
- Lower operating costs—increased property value
- Prepare property managers and tenants for dynamic pricing
- Promote a strong California economy

2013 Title 24 Code DR Implications



- **Lighting DR controls**—for buildings larger than 10,000 square feet, must be capable of lowering lighting by at least 15%
- **HVAC DR controls**—requires Occupant Controlled Smart Thermostats (OCST); capable of remotely using EMS to increase cooling temperature by 4 degrees or more
- Equipment used to meet non-DR code requirements can facilitate demand response activity

Control Methods for Achieving DR

Automated (ADR)

The EMS initiates the control strategy

- No human intervention
- EMS receives a signal from PG&E's Demand Response server

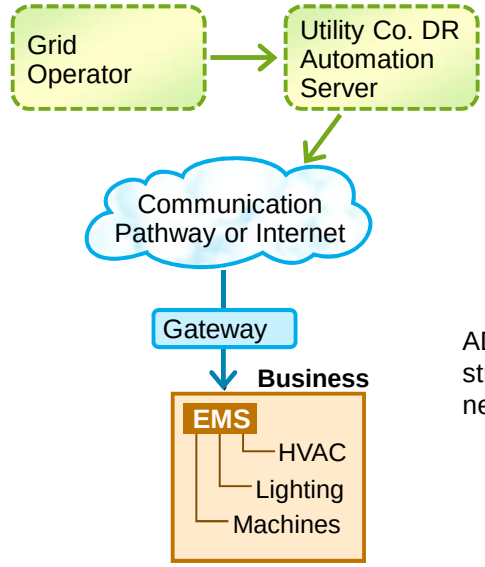
Semi-automated

A person initiates a control strategy preprogrammed into the Energy Management System (EMS)

Manual

A person turns off selected equipment

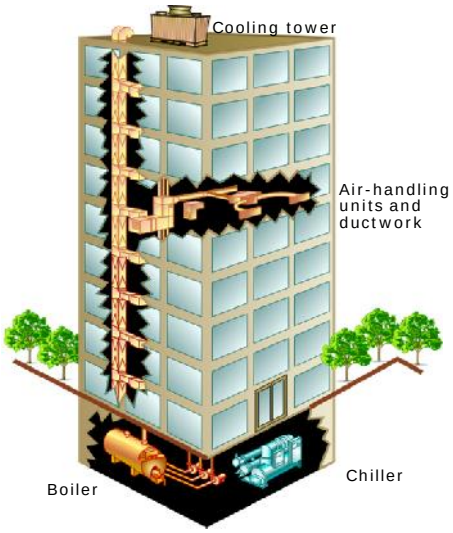
How Does ADR Work?



ADR enables demand response strategies automatically, without the need for human intervention.

Potential Demand Response Loads for Conditioned Spaces

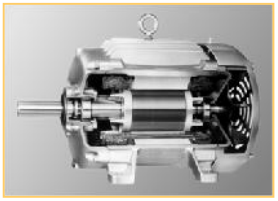
Office Spaces



Hotels

The "Top 10 List"

1. Dim lights
2. Global Temperature Adjustment (GTA)
3. Limit chiller
4. Reconfigure chillers
5. Cycle package units
6. Reset static pressure
7. Elevators off
8. Fan VFD speed reduction
9. Pre-cool facility
10. Curtail decorative fountain pumps/motors



ADR Incentives are Win-Win…

…for customers and the utilities

Technology Incentives funds can be used for a variety of enabling technologies

Thermostats

Lighting control panels

Monitoring energy use

PG&E ADR Program Implementers

Program implementers:

- Energy Solutions
- ASWB Engineering
- Demand Response Research Center (DRRC) at Lawrence Berkeley National Laboratory (LBNL)
- Akuacom

Resources

- Incentives, contact Energy Solutions
  - Dennis Rowan: drowan@aswb-engineering.com
    (714) 731-8193 x 256
  - Alex Alzugaray: aalzugaray@energy-solution.com
    (510) 482-4420 x 225
  - General Program: pge-adr@energy-solution.com
    (510) 550-8513
- PG&E ADR Website: http://pge-adr.com/
- OpenADR Alliance: http://www.openadr.org/
  - Certified devices: http://www.openadr.org/certified-products

Appendix

What is Advanced Technology?

Meets standard ADR eligibility and considered case-by-case

- Inclusion in a California Emerging Technologies Coordination Council (CA ETCC) DR evaluation
- Inclusion other recent advanced technology evaluation
- Wireless or real-time two-way communication within the facility
- Granularity of control to fixture, zone, or thermostat level
- Granularity of data reporting and sensing
- Technologies in early stages of adoption are preferred

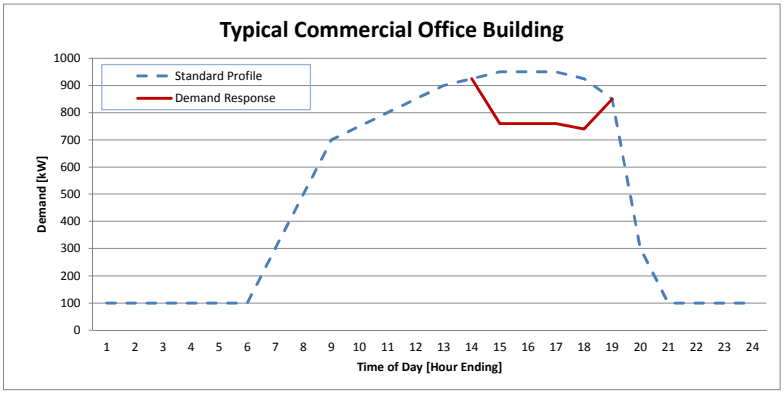
DR Load-Shedding Programs

- Capacity Bidding Program (CBP)
- Demand Bidding Program (DBP)
- Aggregator Managed Portfolio (AMP)
- Peak Day Pricing (PDP)

These are the qualifying programs for Technology Incentives

PDP Participation and Incentive

- 20% load shed ~ 200 kW for this customer
- ADR incentive would be $40,000 at $200 per kW
- Can Earn $10,000 annually with DR program participation*



*Assumes participation in multiple events and full kW reduction potential achieved in each event. Some programs provide less incentives and other programs can provide more. Please consult your account manager and/or ADR project lead for details.