

Getting Ahead of the Demand Curve

A Customer-Focused Approach to Energy Savings through
Automated Demand Response

Clay Collier, Akuacom

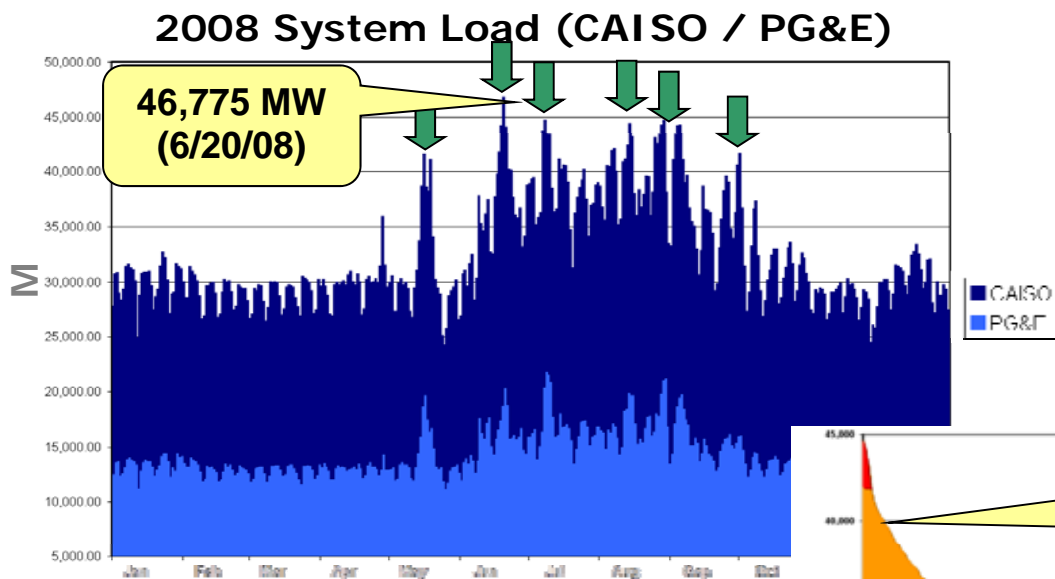
February 9, 2012



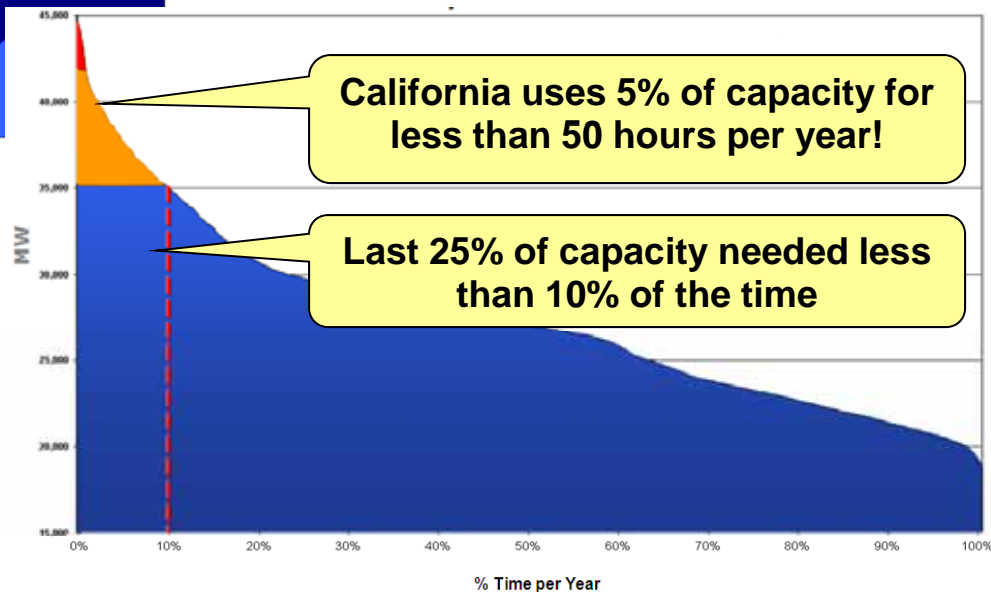
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Peak System Load Management

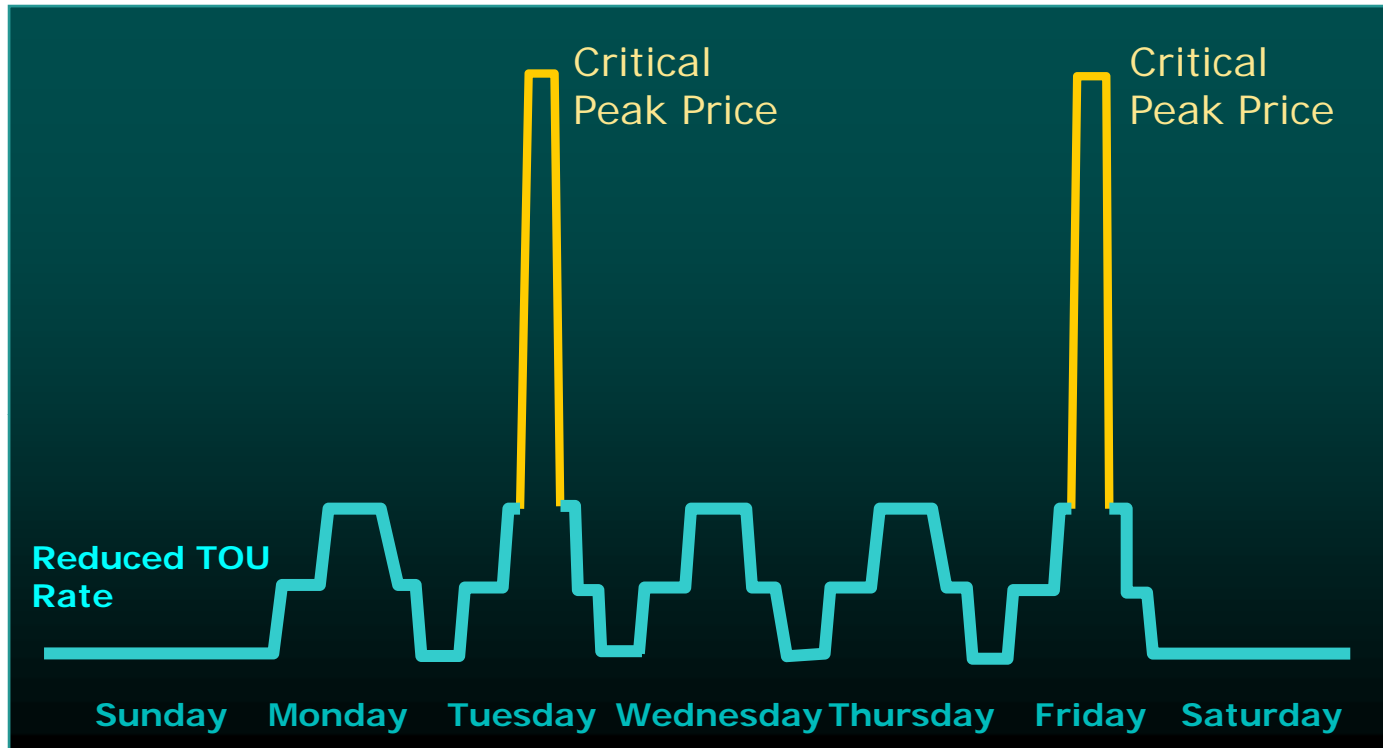


California System Load
Duration Curve



California Independent System Operator Corporation

New Tariff Adoption



- Time-Of-Use Pricing
- Peak Pricing
- Capacity Bidding
- Real-Time Pricing
- Localized Marginal Pricing
- Wholesale Markets

California Energy Commission, 2005

Slide 3

BG1

Brenda Gehl, 1/4/2012

New Technology Implementation



BG3

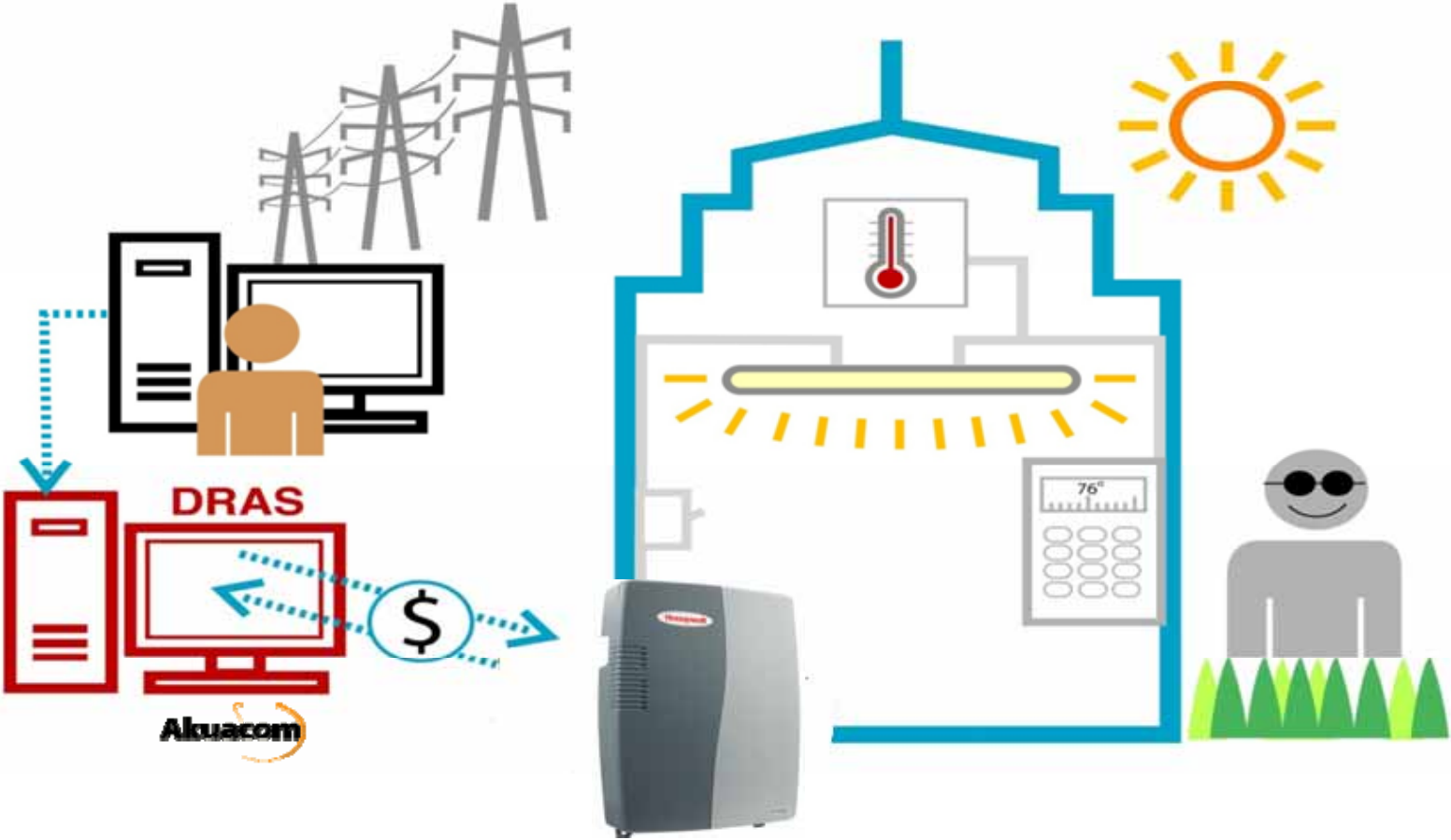
Slide 4

BG3

Why is this reference here?

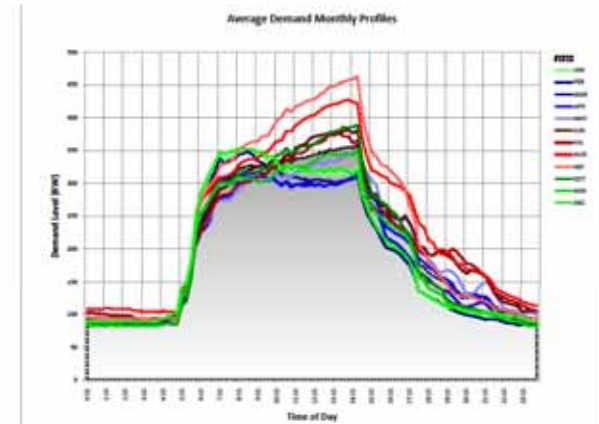
Brenda Gehl, 1/4/2012

Automated Demand Response (ADR)



Simple Steps to Implement ADR

- Collaborative customer selection
- Audit and review with customer
- Collaborative shed strategy development
- Identify equipment, controller and software upgrade requirements
- Implement automation technology upgrades
- Validate shed



The screenshot displays the Honeywell Building Solutions DRAS interface. Key elements include:

- Demand Response Signal:** A panel with a "High" signal circled in red. Below it is the "Akuacom" logo and a "Launch DRAS Website" button.
- Smart Grid:** A central diagram showing "Smart Grid" with "DRAS" and "Messaging Infrastructure" connecting to "Utility I/O", "Facilities", and "Apparatus".
- Temperature Control - VAV Box:** Shows "Room Temperature 81.1°F" and "Effective Setpoint 75°F" circled in red. "Wall Mouse Setpoint" is 70°F. HVAC outputs for cooling and heating are inactive.
- Electric Meter:** Shows "Consumption 0.1 kWh" and "Demand 0.0 kw".
- Lighting Control:** Shows "Zone 7 Schedule Command Off" and "Zone 8 Schedule Command On", both circled in red. A "Schedule Icon" is also present.
- Temperature Control - Thermostat:** Shows "Room Temperature 85.0°F" and "Effective Setpoint 77°F" circled in red. "Wall Mouse Setpoint" is 72°F and "DLC Bump Setpoint" is 5°F. HVAC outputs show "Fan Active", "Cooling 3", and "Heating 0".
- Temperature Control - Fan Coil Unit:** Shows "Room Temperature 81.6°F" and "Effective Setpoint 75°F" circled in red. "Wall Mouse Setpoint" is 70°F and "DLC Bump Setpoint" is 5°F. HVAC outputs for fan, cooling, and heating are inactive.
- Electric Detail:** Shows "Voltage 122.1", "Current 0.1", and "Power Factor 87.6".
- Lighting Overrides:** Shows "Zone 7 Do Nothing" and "Zone 8 Do Nothing".
- HVAC Outputs - Thermostat:** Shows "Fan Active", "Cooling 3", and "Heating 0".
- HVAC Outputs - Fan Coil Unit:** Shows "Fan Inactive", "Cooling Inactive", and "Heating Inactive".

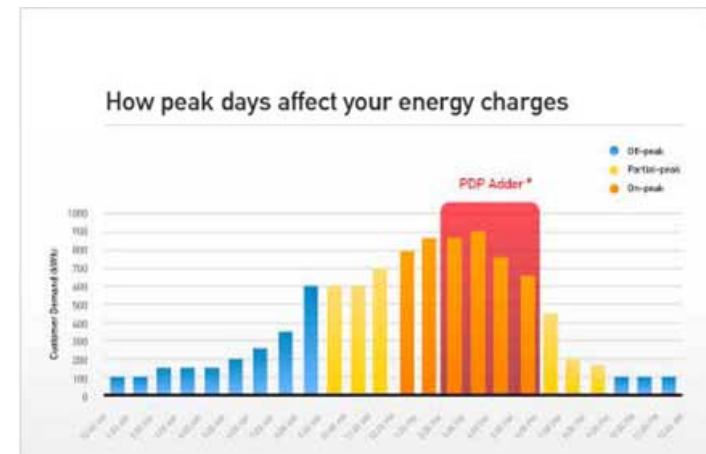
Customizable Shed Strategies

Application Type	Load Reduction Description	Shed Strategy
HVAC	HVAC system optimization	Adjust outside air intake dampers
HVAC	Lock-out charging during events	Pre-cool the facility
HVAC	Controls for package units	Global temperature adjustment for air cooled units
Lighting	Lighting controls / switching	Dim lights or shut off portion
Manufacturing	Process optimization	Curtail or reset industrial operations by specific equipment
Other	Forklift battery chargers	Schedule to off-peak hours
Other	Pump controls	Turn off fountains
Other	Elevator controls	Reduce speed or number of elevators

Real World Meets New Tariff



- 235,000 sq ft fulfillment warehouse
- Office, Warehouse, Packaging, Shipping
- South Orange County, CA
- 4:00 am to 8:00 pm M-F
- 100-350 employees



- Peak rate of \$0.13 / kW
- DR event adds \$1.36 / kW
- 3x Demand Charge price tiers
- Rebated \$12.47 / kW off Demand Charge per event
- Utility funded ADR technical implementation at \$300 / kW
- Up to 12 events

Non Business-Critical Load Reduction

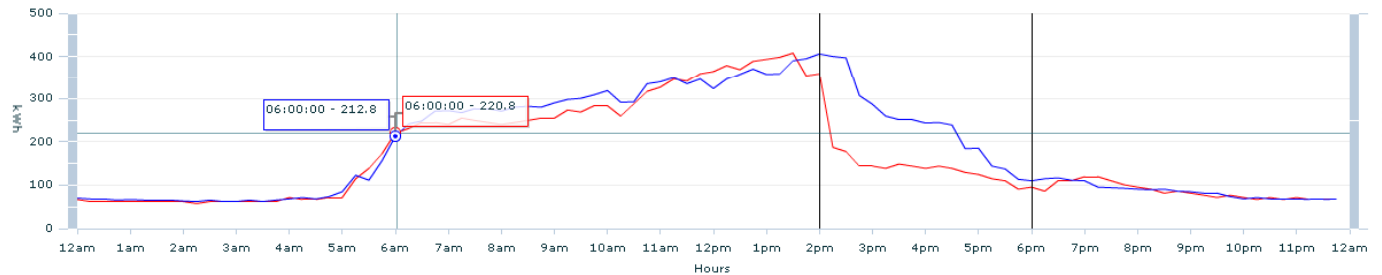
Application Type	Shed Strategy	Energy Savings
HVAC	Raise global temperatures	32 kW
Forklift charging	Lock-out charging during events	38 kW
Lighting	Reduce lighting in production areas during non-production hours	48kW
Exhaust fans	Shut off fans during non-production hours	6 kW



Load Control & Visibility



	Baseline		Actual		Shed	
	Avg(KW)	Total(KWH)	Avg(KW)	Total(KWH)	Avg(KW)	Total(KWH)
Entire Day	185.60	4,454.40	165.20	3,964.80	20.40	489.60
During Event	244.71	978.82	149.08	596.33	95.62	382.49



- ☑ Demand
- ☑ Baseline
- ☑ Event Start
- ☑ Event End

Customer Education & Adoption



[Pay My Bill](#) [Customer Service](#) [Outage Center](#) [Jobs](#) [News Room](#)

Event History

Search for event history by program and date range. Past events do not indicate nor guarantee future event activity.

[Event Status Home](#)

[Event History](#)

Updated: 12/16/2011 08:46AM

[Search and export event history by program.](#)

Program

Critical Peak Pricing

Product Type

CPP

Date Range

06/06/2011 - To - 09/30/2011

Critical Peak Pricing

[Export CSV](#)

Program Name	Date	Start Time	End Time
CPP	09/23/2011	02:00PM	06:00PM
CPP	09/06/2011	02:00PM	06:00PM
CPP	08/26/2011	02:00PM	06:00PM

Questions?

Contact Us: 1-866-334-7827

Related Links

[Demand Response Program Page](#)

[TOU-BIP Event Status](#)

[Summer Discount Plan \(SDP\) Event Status](#)

Measurable Savings

Demand Response Demand Charge Savings

Peak demand	538 kW
Demand Charge credit	\$12.47 per kW / month
Demand Charge savings	\$6,709 per month

Demand Response Energy Cost Savings

DR load reduction	147 kW
Event length	4 hours
Avoided energy cost	\$0.13 per kW
Avoided peak surcharge	\$1.36 per kW
Savings per event	\$876
Total over 12 events	\$10,513

Additional Savings

- **\$3,000** shifting forklift charging to lower tariff price window
- Utility funding enabled ADR deployment and new EMS at **minimal cost** to customer

Thank you!

Clay Collier
clay.collier@honeywell.com





Save the Date

May 15-17, 2012

**AESP's Spring Conference
Baltimore, MD**

Oct. 15-17, 2012

**AESP's Fall Conference
Long Beach, CA**

Jan. 28-31, 2013

**AESP's 23rd National Conference
Orlando, FL**

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