



CASE STUDY SUMMARY

The Doubletree Hotel Sacramento uses enhanced automation to access real-time data and shed HVAC load as needed.

- Participant: Doubletree Hotel Sacramento
- Building Type: Hotel
- Site Size: 680,000 ft²
- 2000 Electricity Usage: 7,451 MWh
- 2001 Electricity Usage: 6,642 MWh
- Primary Benefit: Access to real-time data

The Doubletree® Hotel Sacramento uses enhanced automation to manage energy costs in a volatile market.

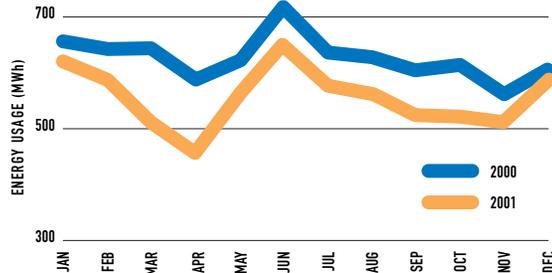
Using a proactive energy management strategy that includes enhanced automation technologies, the Doubletree Hotel Sacramento is able to mitigate the effects of California's energy crisis. Despite an average annual rate increase of 15 percent in 2001, the hotel was able to hold their electricity cost increase to 2.5 percent and cut energy use by more than 800 megawatt-hours.

- High energy costs
- Unpredictable energy supply
- Multiple HVAC systems

PROBLEM

Controlling the energy costs of a 680,000 square-foot hotel and conference center with multiple HVAC systems is not an easy task, particularly in California. Over the past ten years, the State's electricity prices have remained well above the national average. With the added threat of rolling blackouts, price volatility, and the potential for real-time energy pricing, controlling energy costs has become essential for the Doubletree Hotel and other California businesses.

**Doubletree Hotel Sacramento
2001 Energy Savings**



The above graph illustrates the Doubletree Hotel's reduction in energy use from 2000 to 2001. Their use of enhanced automation and lighting efficiency measures led to this reduction in energy use.

- EMS and direct digital controls
- Software interface to interval meter data
- Partnership in voluntary curtailment program

SOLUTION

The Doubletree Hotel Sacramento is meeting this challenge with an aggressive energy management strategy that utilizes enhanced automation technologies. Their effort began six years ago, when the hotel installed its energy management system (EMS) and partnered with the local utility, the Sacramento Municipal Utility District (SMUD), to participate in a demand curtailment program. Since then, the hotel has been an annual partner in this program, installed a real-time energy information system (EIS), and made concerted efforts to reduce loads and improve the efficiency of energy-using equipment. For example, the Doubletree can now monitor real-time energy use through EnerLink, a software interface that is linked to the hotel's interval meter. From a PC, facility operators watch the hotel's overall demand level throughout the day. As demand reaches peak levels, they can start shedding load and avoid excessive demand charges. The Doubletree uses their EMS to target numerous HVAC systems from a central location, and their EIS to immediately see the effects on overall demand.

"Access to real-time data enables us to identify and address potentially costly problems."

"By managing every hour of every day, I was able to reduce my consumption by about 11%, helping to offset a 15% rate increase."

Bob Hughes
Regional Director of
Engineering, Doubletree
Hotel Sacramento



"We are now in a position to help ourselves by helping to keep blackouts from happening."

- Energy and cost savings
- 24-hour access to real-time and archived energy and demand data
- Centralized and remote control of multiple HVAC systems
- Prior notification of regional energy shortages and blackouts

BENEFITS

Thanks to their enhanced automation system and reductions in lighting loads, the Doubletree reduced annual energy use by 11 percent in 2001. As a result, they were able to hold electricity cost increases to 2.5 percent, despite a 15 percent average increase in the electricity rates.

The hotel's EIS has become a valuable tool for analyzing operation of HVAC and lighting systems. Immediate access to usage data, on the order of minutes or years, has led to the discovery of potentially costly problems. For instance, the system recently revealed that a contract janitorial service was inadvertently turning kitchen ovens on each night at around 8 p.m. and leaving them on for about three hours. The hotel's engineering director first became aware of this problem when he looked at the energy data and saw a recurring, dramatic spike in energy consumption during an unlikely time.

As a participant in SMUD's voluntary curtailment program, the hotel receives daily page notifications about the chances of rolling blackouts in the area. Bob Hughes, the hotel's regional engineering director, has turned this knowledge into a service that has been viewed positively by hotel guests—by sharing what he knows about potential blackouts with guests in the affected areas, these guests can schedule their activities accordingly. Guests are therefore more accepting of warmer temperatures during peak hours and supply shortages.



Bob Hughes uses a light meter to measure the hotel's lighting levels.

PROJECT SITE DESCRIPTION

- Location: Sacramento, California
- Size: 680,000 ft²
- Space Function: Lodging, conference center, retail, dining
- Building Occupancy: 448 guest rooms, 35,000 ft² of conference space
- Site Contact: Bob Hughes
Regional Director of Engineering
Doubletree Hotel Sacramento

Energy Usage

- Summer Peak Demand: 1.4 MW
- Curtailable Demand: 200 kW
- 2000 Electricity Usage: 7,451 MWh
- 2001 Electricity Usage: 6,642 MWh

Equipment Installed

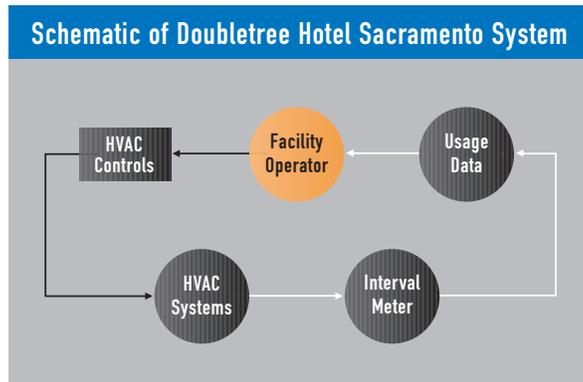
- Carrier ComfortVIEW™ EMS
- Direct digital controls
- Modem-enabled interval meter
- EnerLink energy information software

Technical Information

The Doubletree Hotel Sacramento uses Carrier ComfortVIEW™ as its energy management interface. Although this tool allows for automated lighting control, the hotel currently uses it to control only the HVAC system. The system includes: a 150-ton water-cooled centrifugal chiller and a 100-ton steam absorption chiller serving three guest wings and the main building; three 100-ton air-cooled centrifugal chillers serving three back wings; a 150-ton water-cooled centrifugal chiller serving the ballroom; 15 five- and ten-ton package units serving office space, retail space, and lounge and hallway areas; and four swamp coolers serving kitchens and a large pantry.

The EMS uses strategically located direct digital control modules to monitor and control chilled water loop temperatures, outside air intake and fan speeds. Facility operators set the operation of the associated equipment manually, through the EMS interface. If SMUD sends a notification to curtail load, an operator first views energy use data to see which systems are drawing the most load, and then uses the EMS to shed chiller or fan loads accordingly. Lighting loads, which are controlled manually, are also considered for curtailment, depending on occupancy levels.

The hotel's EIS combines a modem-enabled interval meter and EnerLink, a software interface through which facility operators can dial into the meter and retrieve recordings of energy use and demand levels in 15-minute increments. This function allows them not only to see what their utility bill is going to be each month, but also to generate reports and graphs in a number of formats for analysis and comparisons. The EnerLink software and meter were provided by SMUD, and the hotel pays a monthly usage fee to the utility to cover the cost of periodic software updates.



TAKING THE NEXT STEP

Free resources are available from the California Energy Commission.

- Business Case Guidebook
- Technical Options Guidebook
- Contractor and Vendor Lists
- Technical Assistance
- Case Studies

- 1 Alameda County
HVAC Controls/
Government Facility
- 2 Hewlett-Packard
Company
HVAC and Lighting Controls/
Office Campus
- 3 Comerica Building
HVAC and Lighting Controls/
Large Office Building
- 4 Foothill-De Anza
Community Colleges
HVAC and Lighting Controls/
College Campuses
- 5 Staples, Inc.
HVAC and Lighting Controls/
Retail Chain

Contact us for free materials or for further information:

- 1-866-732-5591
- enhancedautomation@xenergy.com
- www.ConsumerEnergyCenter.org/enhancedautomation

Additional Resources

- California Energy Commission
www.energy.ca.gov/peakload/index.html
- Cash for Kilowatts Web site
www.energy.ca.gov/peakload/cash_kilowatts.html
(also for 50-200 kW demand)
- Your local utility
 - www.sdge.com/business/drpf.html
 - www.pge.com/003_save_energy/003b_bus/index.shtml
 - www.sce.com/sc3/002_save_energy/002i_load_redn/default.htm