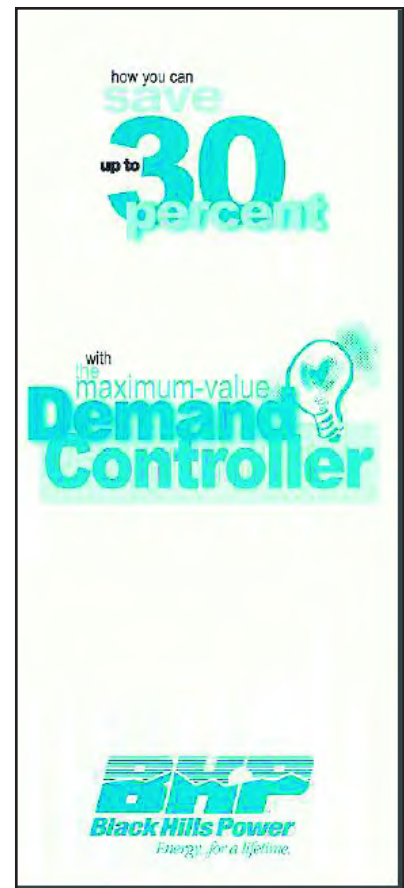


Demand Response Case Study

developed and implemented by
Black Hills Power with
Brayden Automation



presented at Introduction to Demand Response webinar hosted by Western Area Power Administration on May 1, 2007

Program Description

Black Hills Power (BHP) offers an innovative “residential demand service” rate for customers that use an average of 1,200 kilowatt-hours (kWh) or more per month. In addition, customers may purchase a whole house Demand Controller that cycles heating and cooling systems, water heating, clothes dryer and hot tub to assure that the home’s energy use doesn’t exceed set levels during peak energy conditions.

Design Strategy

Demand Management objective

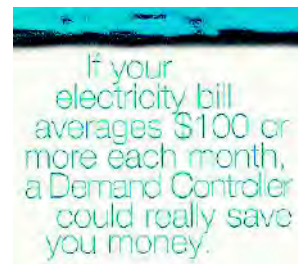
When the program began in 1983, the goal was to reduce peak load energy use to perhaps sell “excess” power to other utilities. However, the strategic goal now is primarily to offer customers pricing options.

Customer Segment Targeted: Residential

End Use Targeted: Customers with over 1,000 kWh use per month. As a result, most customers are those in larger homes or have electric heat and/or a hot tub.

Decision-making Drivers:

Customers appreciate having a choice of electric rates so the utility offers three: standard, electric heat or the demand rate.



Implementation Tactics

Customer incentive strategy/levels

A Maximum Value feature has been added to the Residential Demand Service Rate. The Maximum Value feature is designed to allow customers three times on peak demand during weekends, designated holidays, and nightly Off-Peak periods. The Demand Controller will automatically limit the customer's use of major appliances during the On-Peak periods. The customer will only be billed for the kW Demand recorded during the On-Peak periods and energy (kWh) consumed. There is no limit or charge for the Off-Peak kW Demand.

The off-peak and on-peak time periods are as follows:

Summer Season (Weekdays): April 1 - October 31

- On-Peak Time: 10:00 a.m. - 10:00 p.m.
- Off-Peak Time: 10:00 p.m. - 10:00 a.m.

Winter Season (Weekdays): November 1 - March 31

- On-Peak Time: 7:00 a.m. - 11:00 p.m.
- Off-Peak Time: 11:00 p.m. - 7:00 a.m.

Weekends: All weekends are considered Off-Peak Time Periods. The Off-Peak weekend time frame is:

- Summer: Friday, 10:00 p.m. - Monday, 10:00 a.m.
- Winter: Friday, 11:00 p.m. - Monday, 7:00 a.m.

The following holidays are considered off-peak: New Year's Day, Labor Day, President's Day, Veteran's Day, Memorial Day, Thanksgiving Day, Independence Day and Christmas Day

Promotion/Marketing/Recruitment activities

Customer education was difficult at first but a breakthrough came about 10 year ago. Today Black Hills offers a 10-minute DVD that explains the program and a program manual that is less technical than the equipment manual. The primary customer recruiting is to new construction, high bill complaint customers and referrals.

Customer enrollment/fulfilment process

The Demand Controller package varies in price depending on the type of electric heating and cooling equipment controlled through the unit. The package includes: Demand Controller set station, relay box, and wire. The price may increase based on added equipment for unique installations.

To enroll, customers contact their local utility office or the Energy and Marketing Services Department. Customers must provide information about their home's electric usage and equipment. A utility representative will then present a Demand Service Rate Comparison report along with a Demand Controller Service Application form. When the utility receives the Demand Controller Service Application form with the customer's signed approval, they activate the installation service for the new Demand Controller.

The utility offers "free" installation (up to \$300.) of the Demand Controller to customers purchasing a Demand Controller for an existing home. For newly constructed homes, BHP offers a \$150 cash rebate to customers instead of the free installation offered to existing home customers. The \$150 is used to cover the installation cost of the demand controller in the newly constructed home by a Demand Controller Certified Electrician.

Black Hill Power also offers 0% Interest Financing to qualified customers purchasing a Demand Controller. The maximum loan length is 12 months and the minimum monthly payment is \$25.

Also, electricians and utility employees are able to purchase the controller at a discount for their personal use.

Roles

When the customer purchases equipment with installation directly from BHP the utility schedules a local electrician to handle the installation and set-up. A utility staff person follows up with customer after installation for a brief 15-20 minute customer visit to ensure system is properly programmed based on the electric loads within the house.

Customers may no longer purchase the controllers for self-installation. Although local electrical supply houses used to offer demand controllers manufactured by others, they have discontinued this voluntarily because the units were not as reliable or cost competitive as the units manufactured by Brayden and sold by the utility.

Builder associations play a key role in helping us reach out to builders. Another key outreach method has been to target electricians.

HVAC contractors are beginning to promote the demand controllers to their customers installing heat pumps. This new segment is now accounting for about 50% of all new connections. To support this effort, BHP is providing heat pump installation training to local contractors through the Alabama Heat Pump Training Center.

Results

How Measure Success

Customers on the demand rate appear to be saving up to 30% annually as compared to those on the standard utility rate, and 15%-20% annually as compared to those on the electric heat rate.

Case Study

The utility simply measures success by number of customers on the demand rate. They no longer calculate the value in terms of peak demand savings achieved but are confident that demand rate customers contribute more net revenue.

Evaluation and Verification Activities

None. However, during off-peak times when customers are “allowed” unrestricted use of energy, no significant load increase is noticed at the system level.

Lessons Learned

Key Success Factors

Customer education is the key success factor. Customers must understand that managing their demand use so miserly that they are uncomfortable is not a long-term goal.

Builders, electricians and HVAC contractors play a key role in promoting the value of the demand rate to utility customers

Key Lessons Learned

There appears to be no saturation level of customers who can benefit from the demand rate. Requiring electricians to become certified to install the controllers is necessary to ensure quality installations

Planned Program Enhancements: None

To Learn More

Utility Key Contact and Overview:

Keith Gade, Black Hills Power

(605) 721-2683, kgade@blackhillspower.com, www.blackhillspower.com



Black Hills Power – Black Hills Power has been delivering energy for over 123 years. It was formed through the consolidation of several smaller electric suppliers in the Black Hills of South Dakota, Montana and Wyoming. Black Hills Power is an investor-owned utility and is part of the Black Hills Corporation family. The utility serves 63,500 customers in 20 communities located in Western South Dakota, Northern Wyoming, and Southeastern Montana. Its customers use 1,501,805,000 kilowatt hours (kWh) of electricity at an average price of \$0.0714 per kWh. The utility employs over 350 people in its 12 District Offices and five electric power plants.



Trade Allies' Key Contact and Overview:

Bill Brayden, President, Brayden Automation

(970) 221-9200, bill@brayden.com, www.brayden.com

Since 1977, Brayden Automation has been designing, manufacturing and installing Energy Sentry® devices in thousands of homes and businesses for better electricity management. They've helped more than 25,000 customers save 20 to 40% off their electric bills. They are in their fourth generation of products, using the latest microprocessing technology. All Energy Sentry demand controllers and monitors are approved by Underwriters Laboratories and the FCC.