



Energy Efficiency Solutions Program

Annual Report - 2012



Report Contents

The overall results of Black Hills Power's Energy Efficiency Solutions (EES) Program in year one of the Program (September 1, 2011 through August 31, 2012) are summarized in this report.

- Program Highlights - Page 2
- Adaptive Management Strategies - Page 3
- Program Results Attachment A
- Educational and Promotional Events Attachment B

Program Highlights

Residential Program. Highlights of the Residential program include the following:

1. Residential: Refrigerator Recycling. This measure was popular with our customers. There were 154 participants compared to the goal of 150.
2. Residential: School Based Education. The goal was to provide energy efficiency education materials to 125 students and 289 students actually participated in the program. BHP will likely fund the remaining program years at the first year's participation levels. Our plan is to provide the energy education materials to a small sampling of different schools throughout our service territory each year. Feedback received from the teachers who participated in year 1 indicated they would repeat the program if given the opportunity.
3. Residential: Weatherization. BHP set a goal of completing weatherization at 18 homes in South Dakota each program year. This goal was met in 2011. BHP is exploring other ways to accomplish weatherization such as providing kits to local organizations. BHP would then sponsor training on how to install various energy saving items around the home. By expanding the program of weatherization kits to organizations BHP could provide the service to more homes.

Commercial & Industrial Program. Highlights of the C&I program include the following:

1. Lighting. The Prescriptive Lighting program was well received by customers. BHP also had some contractors and vendors aggressively promote the program. There are quite a few customers in need of lighting upgrades and the owners appear to be very receptive to complete these improvements.
2. Variable Frequency Drives (VFDs). The two customer projects were large in scale and the energy savings were significant.
3. Custom Lighting Rebates. BHP has a couple of vendors promoting light emitting diode (LED) equipment. Customers are showing an interest in LED lighting primarily due to the significant energy savings associated with the retrofit.

Necessary changes were made in evaluating the rebate amounts and are discussed further in the Adaptive Management Strategies section of this report.

4. Custom Heat Pump Rebates. Two large projects received rebates - One installation was a large project with a geothermal heat pump system. Four other large geothermal heat pump projects are either completed, but the project owners have either yet to apply for rebates, or the installation is in progress.

Adaptive Management Strategies

BHP is using in-house staff to support the EES Program. This includes processing applications, evaluating measures, follow up discussions with applicants, rebate processing, and other associated administrative duties. The use of in-house staff has been valuable in adopting the necessary changes to the Program.

VisionDSM software was implemented to manage rebate applications. VisionDSM captures detailed customer and contact data, program application data, approvals and statuses of applications and payments. Detailed information such as measure savings is tracked. The required customer documents (purchase receipts, invoices from contractors, measurement and verification reports) are stored for each application. The development of the VisionDSM software was included in the General Administration budget rather than spread across all program measures.

Residential Program. BHP made some adjustments to the energy efficiency criteria levels established with the Geothermal (Ground Source) Heat Pump and Electric Hot Water Heater Programs. In addition, BHP is streamlining our energy audit and heat pump retro-commissioning programs.

1. The initial qualifying criteria established in the program for Geothermal (Ground Source) Heat Pumps for Residential and Commercial Customers were based on a minimum 15 SEER and 4.2 COP. Meeting this level of efficiency proved to be unattainable. Heating and cooling consultants, contractors and equipment salesmen provided feedback that encouraged BHP to change the criteria to a 16.5 EER and 3.6 COP. These efficiency levels continue to exceed the benefit/cost (B/C) requirement of 1.0 on the Total Resource Cost (TRC) test. The new levels were also based on Energy Star's energy efficiency levels for heat pumps. This change was made early in the implementation of the EES Program.
2. The hot water heater efficiency criteria were initially based on meeting or exceeding an Energy Factor (EF) rating of 0.94. This level is too high for the larger tanks so a minor adjustment was made. The new level is 0.94 for tanks up to 50 gallons and 0.92 for tanks over 50 gallons. This was a more recent change

in the EES Program. The TRC test is still being satisfied with the change in EF rating for larger hot water heaters.

3. The delivery costs associated with the energy auditing and retro-commissioning programs were higher than planned. BHP has developed in-house auditing tools to streamline the process. An initial process was adopted for the retro-commissioning program that may be further modified as we gain experience delivering the service. Although the costs to deliver the two programs are higher than planned, BHP has received favorable comments from participants. The retro-commissioning program has resulted in the identification and replacement of old heat pumps with new, high efficient models.

Commercial & Industrial (C&I) Program. The new criteria levels established in the Residential Programs for Geothermal Heat Pumps and Electric Hot Water Heater are now also used for C&I Prescriptive applications. In addition, BHP made a change to the Custom Rebate Program to provide smaller rebates to light emitting diode (LED) applications.

1. BHP found that Custom Applications for light emitting diode (LED) lighting projects were not qualifying for rebates. This was primarily due to the higher cost of LED equipment. As a result the B/C calculation, associated with the TRC test, would not pass. In order to still support LED lighting with a rebate – BHP reduces the installed cost in the application evaluation to a level that would meet the B/C of 1. Therefore, we are able to award a rebate which is typically from 5 to 10% of the incremental cost of the project rather than no rebate at all. A fully funded measure can qualify for a full rebate and can receive up to 50% of incremental costs. By providing a reduced rebate amount for LEDs, BHP has demonstrated a willingness to support an evolving technology.

BHP believes that the cost of LEDs will go down over time similar to what has been the case with the cost of compact fluorescent light (CFL). The Applicants proposing the LED measure have been pleased that BHP provides any amount of rebate since they recognize that the cost is presently high. However, these customers believe that the future of lighting is with LEDs and their preference would be to install them today and enjoy higher savings with reduction in maintenance and replacement costs.

Future Strategies. BHP is making a number of changes associated with the website.

1. Black Hills Corporation is currently upgrading the websites for all of its affiliated utilities. BHP's link to the EES Program will be through BHPSaveMoney.com. One of the goals of the changes is to provide an easier way for customers to access the information. BHP's updated website is scheduled to be completed in early 2013.

2. BHP has a project underway with Apogee Interactive, which is the supplier of the HomeEnergySuite products (Residential On-line Energy Audit Tool, Energy References and Special Purpose Calculators). A Commercial On-line Energy Audit tool is now available to model energy usage. Like the Residential model, the energy use is summarized on an annual and monthly basis. The user provides some basic input data to model energy usage. To increase the accuracy of the energy models, Apogee has added the capability to incorporate actual billing information. Adding the Commercial On-line product and the inclusion of billing information for the Residential and Commercial models will be completed in the 2nd quarter of 2013.

Education Outreach, Community Events and Trade Ally Promotion

The marketing efforts associated with the promotion of BHP's EES Program were completed and summarized in Attachment B. The events were well attended by vendors, contractors and customers.

Summary

Black Hills Power expects participation in our Energy Efficiency Solutions program to grow in 2013, in particular, with commercial lighting retrofits. We will roll out a redesigned Black Hills Power website as well as enhanced on-line commercial and residential energy auditing tools to help customers make informed decisions.

Attachment A



ENERGY EFFICIENCY SOLUTIONS PROGRAM			
PROGRAM EXPENDITURES – September 1, 2011 through August 31, 2012			
Program	Total Budget	Actual Expenditures	Percent of Budget Expended
Residential :- Water Heating	\$8,050.00	\$4,142.50	51.46%
Residential :-Refrigerator Recycling	\$25,500.00	\$28,583.70	112.09%
Residential :- Residential Heat Pumps - Air Source Heat Pumps	\$85,070.00	\$13,800.00	16.22%
Residential :- Residential Heat Pumps - Geothermal Heat Pumps	\$10,000.00	\$5,200.00	52.00%
Residential :- Residential Heat Pumps - ASHP Retro-Commissioning Rebate	\$30,000.00	\$13,024.02	43.41%
Residential :- Energy Audits	\$46,800.00	\$56,649.47	121.05%
Residential :- School Based Education	\$5,500.00	\$14,166.90	257.58%
Residential :- Weatherization	\$10,000.00	\$10,246.00	102.46%
Residential Total:	\$220,920.00	\$145,812.59	66.00%
C&I Prescriptive Rebate :- C&I Lighting	\$50,000.00	\$28,969.71	57.94%
C&I Prescriptive Rebate :- C&I Motors	\$10,000.00		0.00%
C&I Prescriptive Rebate :- C&I VFDs	\$34,000.00	\$3,105.00	9.13%
C&I Prescriptive Rebate :- C&I Air Source Heat Pumps	\$20,000.00	\$4,611.71	23.06%
C&I Prescriptive Rebate :- C&I GS Heat Pumps	\$50,000.00	\$222.41	0.44%
C&I Prescriptive Rebate :- C&I Water Heaters	\$1,000.00	\$231.56	23.16%
C&I Prescriptive Rebate :- C&I Refrigerator Recycling	\$1,304.00	\$150.00	11.50%
C&I Custom Rebate	\$85,000.00	\$31,867.24	37.49%
C&I Total:	\$251,304.00	\$69,157.63	27.52%
Cross Marketing and Training	\$100,000.00	\$113,365.56	113.37%
General Administration	\$16,000.00	\$67,692.80	423.08%
Total:	\$588,224.00	\$396,028.58	67.33%



ENERGY EFFICIENCY SOLUTIONS PROGRAM			
ELECTRIC SAVINGS – kWh - September 1, 2011 through August 31, 2012			
Program	Annual Goal (kWh)	Annual Savings (kWh)	Percent Goal Achieved
Residential :- Water Heating	20,211.00	3,354.9	16.60%
Residential :-Refrigerator Recycling	185,850.00	156,122.4	84.00%
Residential :- Residential Heat Pumps - Air Source Heat Pumps	236,229.00	15,264.7	6.46%
Residential :- Residential Heat Pumps - Geothermal Heat Pumps	22,220.00	9,527.2	42.88%
Residential :- Residential Heat Pumps - ASHP Retro-Commissioning Rebate	859,100.00	103,313.0	12.03%
Residential :- Energy Audits	169,784.00	58,581.0	34.50%
Residential :- School Based Education	23,750.00	57,617.4	242.60%
Residential :- Weatherization	0		0.00 %
Residential Total:	1,517,144.00	403,780.52	26.61%
C&I Prescriptive Rebate :- C&I Lighting	468,910.00	465,914.5	99.36%
C&I Prescriptive Rebate :- C&I Motors	15,998.00		0.00%
C&I Prescriptive Rebate :- C&I VFDs	164,537.00	153,115.2	93.06%
C&I Prescriptive Rebate :- C&I Air Source Heat Pumps	87,511.00	16,402.2	18.74%
C&I Prescriptive Rebate :- C&I GS Heat Pumps	39,996.00		0.00%
C&I Prescriptive Rebate :- C&I Water Heaters	2,526.00		0.00%
C&I Prescriptive Rebate :- C&I Refrigerator Recycling	8,673.00	6,195.0	71.43%
C&I Custom Rebate	592,042.00	149,816.0	25.30%
C&I Total:	1,380,193.00	791,442.86	57.34%
Total:	2,897,337.00	1,195,223.37	41.25%



ENERGY EFFICIENCY SOLUTIONS PROGRAM			
ELECTRIC SAVINGS – kW - September 1, 2011 through August 31, 2012			
Program	Peak Goal (kW)	Annual Savings (kWh)	Percent Goal Achieved
Residential :- Water Heating	7.69	0.40	5.24%
Residential :-Refrigerator Recycling	28.29	21.00	74.23%
Residential :- Residential Heat Pumps - Air Source Heat Pumps	107.87	7.03	6.52%
Residential :- Residential Heat Pumps - Geothermal Heat Pumps	10.15	6.57	64.74%
Residential :- Residential Heat Pumps - ASHP Retro-Commissioning Rebate	392.25	32.94	8.40%
Residential :- Energy Audits	27.00	44.85	166.11%
Residential :- School Based Education	1.00	2.31	231.20%
Residential :- Weatherization	0.00		
Residential Total:	574.25	115.11	20.04%
C&I Prescriptive Rebate :- C&I Lighting	152.94	107.15	70.06%
C&I Prescriptive Rebate :- C&I Motors	4.00		0.00%
C&I Prescriptive Rebate :- C&I VFDs	0.00	0.00	
C&I Prescriptive Rebate :- C&I Air Source Heat Pumps	40.00	2.89	7.24%
C&I Prescriptive Rebate :- C&I GS Heat Pumps	18.27		0.00%
C&I Prescriptive Rebate :- C&I Water Heaters	0.96		0.00%
C&I Prescriptive Rebate :- C&I Refrigerator Recycling	1.32	0.95	71.97%
C&I Custom Rebate	0.00	16.67	
C&I Total:	217.49	127.66	58.70%
Total:	791.74	242.76	30.66%



ENERGY EFFICIENCY SOLUTIONS PROGRAM			
PARTICIPANTS - September 1, 2011 through August 31, 2012			
Program	Goal	Actual	Percent Goal Achieved
Residential :- Water Heating	80	19	23.75%
Residential :-Refrigerator Recycling	150	154	102.67%
Residential :- Residential Heat Pumps - Air Source Heat Pumps	72	20	27.78%
Residential :- Residential Heat Pumps - Geothermal Heat Pumps	5	2	40.00%
Residential :- Residential Heat Pumps - ASHP Retro-Commissioning Rebate	500	88	17.60%
Residential :- Energy Audits	200	68	34.00%
Residential :- School Based Education	125	289	231.20%
Residential :- Weatherization	18	19	106.00%
Residential Total:	1157	666	57.56%
C&I Prescriptive Rebate :- C&I Lighting	102	19	18.63%
C&I Prescriptive Rebate :- C&I Motors	20		0.00 %
C&I Prescriptive Rebate :- C&I VFDs	12	2	16.67%
C&I Prescriptive Rebate :- C&I Air Source Heat Pumps	40	2	5.00%
C&I Prescriptive Rebate :- C&I GS Heat Pumps	9		0.00 %
C&I Prescriptive Rebate :- C&I Water Heaters	10		0.00 %
C&I Prescriptive Rebate :- C&I Refrigerator Recycling	7	5	71.43%
C&I Custom Rebate	0	4	0.00 %
C&I Total:	200	32	16.00%
Total:	1,357	698	51.44%

Attachment B

Education Outreach & Community Events

Black Hills Power developed, managed and implemented an educational outreach strategy that became the “grassroots” approach of the overall Energy Efficiency Solutions plan. This program included easy-to-implement ways to improve the efficiency of a home and promoted these improvements as a family activity.

School-Based Education

Overview: The Living Wise school-based energy efficiency program was presented to fifth-grade students at Rapid City elementary schools. Teachers were provided a curriculum kit to guide the program, and each student was given a kit to take home that contained easy-to-use energy efficiency supplies that they could use in their home, with permission and assistance from parents. The kit contained a high-efficiency showerhead, kitchen faucet aerator, night light, compact fluorescent lamp (CFL), furnace filter alarm, digital thermostat, toilet leak detector tablets, water flow rate test bag, natural resources fact chart, tape measure and a student/parent program evaluation form. The program’s goal was to provide energy efficiency education to a sample group of fifth-grade students within a chosen school district within BHP’s service territory.

Reach: The Living Wise program reached 289 fifth-grade students at six elementary schools in Rapid City during the 2011-2012 academic year.

Public Energy Education

Overview: Black Hills Power conducted a two-hour class offered to home buyers enrolled in NeighborWorks Dakota Home Resources new home buyer program. The class, which is held in October of 2011, focused on the home owner and educated them on topics such as steps taken to create a more energy efficient home, basic hands-on weatherization and state & federal tax incentives to promote energy efficiency in new and existing homes. The course instructor was Keith Gade, BHP Energy Services Supervisor.

Reach: Seven people enrolled in NeighborWorks’ new home buyer program attended this class.

Community Events

Black Hills Power uses community events and training opportunities to promote energy efficient equipment and practices to residential, key customers and trade allies. The community events include workshops, training, home shows and two energy efficiency events organized and run by BHP. BHP included cross-marketing programs, information and/or short presentations about BHP’s Energy Efficiency Solutions program at each training program and event. The educational outreach targeted specific customers and stakeholders through scheduled programs and community-wide events.

C&I Energy Efficiency Workshop

Overview: Energy Services hosted an Energy Efficiency Workshop for key commercial and industrial customers, contractors, engineers and electricians on Thursday, Sept. 22, 2011. The one-day course focused on how commercial & industrial customers can improve energy efficiency through the use of energy efficient motors and variable frequency drives. Larry Sifers from Siemens was the course instructor for the 2011 BHP workshop. BHP also presented an overview of its Energy Efficiency Solutions program to attendees during the lunch hour.

Reach: A total of 57 Key C&I Customers and trade allies attended this workshop.

Energy Efficiency Awareness Day

Overview: Energy Efficiency Awareness Day is held on a Saturday each year in October. The 2011 EEAD was held on Saturday, Oct. 1. The purpose of the event is to raise the awareness among customers about energy efficiency and the need to weatherize and conserve energy during the upcoming winter season. Black Hills Power partnered with Montana-Dakota Utilities, the City of Rapid City, Rushmore Mall and Western South Dakota Community Action Agency to offer educational vendor booths at Rushmore Mall in a home-show style setting. BHP's booth was staffed by Energy Services personnel.

Reach: Estimates place EEAD visitors at approximately 600, with 137 people filling out registration cards. Fourteen vendors took part.

Weatherization Program

Overview: BHP targets the homes of elderly, disabled and low income customers during its Weatherization Program that takes place within communities in Black Hills Power's service territory. This program partners with NeighborWorks Dakota Home Resources, Rapid City Central High School, Box Elder Job Corp, the American Red Cross and Western South Dakota Community Action Agency during selection and weatherization on the selected homes. This program was held Oct. 12-18, 2011 in Rapid City, Sturgis, Newell, Belle Fourche, Edgemont and Hot Springs.

Reach: A total of 19 homes were weatherized in South Dakota – 7 in Rapid City, 1 in Newell, 2 in Belle Fourche, 2 in Hill City, 1 in Hot Springs and 2 in Edgemont.

Realtor Training

Overview: BHP hosted its annual Realtor Training course, *Using the Energy Factor to Sell Homes: An Energy Efficiency Course for Real Estate Professionals*, on Thursday, Nov. 17, 2011. Realtor Training is a one-day course designed to educate area realtors, appraisers, developers, builders and home

inspectors on ways to recognize and sell energy efficient homes, with a primary focus on energy efficient electric equipment and systems for homes. The course was led by BHP Energy Services professionals. The real estate commissions in South Dakota and Wyoming approved eight continuing education credits for those completing the course.

Reach: Thirteen realtors attended the 2011 Realtor Training course.

Electro-Technology Expo

Overview: Black Hills Power organized the Electro-Technology Expo, which was held on Thursday, Jan. 19, 2012 in Rapid City. The Expo is designed to inform professionals in the building industry, key commercial & industrial customers and trade allies about new electric technologies, energy efficient building programs, and energy efficiency measures and standards for residential and commercial business applications. Twenty-three class sessions were held during the day. The Expo offers code hours for electricians through the state electrical commissions in South Dakota and Wyoming, and CEUs for attendees from the City of Rapid City Mechanical Board. BHP's booth was staffed by Energy Services personnel.

Reach: A total of 311 attendees and 20 vendors took part in the 2012 Expo.

Community Retail Home Shows

Overview: Home show participation allows BHP to remain visible at a personal level during community home shows that attract thousands of consumers. BHP's booth and staff working the booth work in conjunction to assist customers in answering their energy questions and promoting energy efficiency programs, products and services. BHP featured the "How To" theme during the 2012 spring home show season, providing information about BHP's Energy Efficiency Solutions programs. BHP participated in seven community shows in South Dakota. BHP's booth was staffed by Energy Services, Construction Services and Customer Service personnel. In addition to providing customers with information on the Energy Efficiency Solutions program, BHP gave away nearly 2,000 CFL bulbs to booth visitors.

Reach: Feedback from staff working the home shows rated booth traffic as follows: Rapid City Area Chamber of Commerce Business To Business Expo, Rapid City, moderate; Sturgis Home & Ranch Show, Sturgis, moderate; Optimist Home Show, Spearfish, moderate; Custer Spring Home & Garden Show, Custer, good; Black Hills Home Builders Association Spring Home Show, Rapid City, very good; Spring Fling Home & Garden Show, Hot Springs, very good; Newell Home & Field Show, and Newell, poor (postponed from February due to fire in neighboring building, held on May 9).

Trade Ally Program

Consumers rely on trade professionals for their expertise in selecting energy efficient equipment. BHP continues to support reputable trade professionals with incentives, advertising support, home show booth rental support and program update meetings.

BHP fosters its relationships with the trade professionals that have common goals as follows:

- Promote and educate customers on the benefits of energy efficient electric equipment
- Promote BHP Energy Efficiency Solutions program, rebates and incentives
- Partner with BHP on energy efficiency events
- Increase value for programs and services offered at BHP

Dealer Incentive Program

Overview: BHP offers a dealer incentive program to promote energy efficiency heat pump and water heater systems to consumers at the retail level. This program offers personal contact at a retail consumer level in promoting high level of energy efficient products over the standard product. Qualified participation include: electrical contractors, plumbing contractors, heating/ventilation/air-conditioning contractors and appliance dealers. The cash incentive is designed for the individual sales person at a respected business. Incentives are \$10 per ton on heat pumps and \$5 per water heater.

Reach: BHP paid out a total of \$440 in incentives during Year 1 of the EES program -- \$375 in heat pump incentives and \$65 in water heater incentives.

Trade Ally Co-Op Advertising Program

Overview: BHP will reimburse 50 percent of advertising costs to trade ally businesses that promote energy efficiency products and services that include recognition of BHP Energy Efficiency Solutions rebates and incentives. Businesses taking part were required to display BHP's logo and have a tagline in the ad promoting BHP's Energy Efficiency Solutions program. The co-op advertiser program caps at \$500 per business per calendar year.

Reach: Two vendors used the co-op advertising program to support advertising campaigns during Year 1 of the BHP Energy Efficiency Solutions program.

Trade Ally Co-op Home Show Program

Overview: Black Hills Power will reimburse 50 percent of booth rental costs for trade ally businesses taking part in home shows within BHP's service territory. Businesses taking part in the co-op home show program were required to display

BHP Energy Efficiency Solutions program brochures to qualify for reimbursement. The co-op home show program caps booth rental support at \$500 per business per calendar year.

Reach: Two businesses used the co-op home show booth rental program during Year 1 of the BHP Energy Efficiency Solutions program.

HVAC Retro-Commissioning Program Meetings

Overview: Black Hills Power scheduled a series of meetings with HVAC contractors and technicians to update them on BHP's Energy Efficiency Solutions program. The program focused primarily on the retro-commissioning program, but attendees received a full overview of the EES program and other support and benefits available to them from BHP. Meetings were held in Rapid City on April 3, 2012; Spearfish, April 5, 2012; and Custer, April 10, 2012. Meetings were led Keith Gade and Jeff Easton from BHP Energy Services.

Reach: A total of 34 people attended the HVAC retro-commissioning program meetings – 16 in Rapid City, 8 in Spearfish and 10 in Custer.

Water Heater Retailer Meetings

Overview: Black Hills Power held a series of meetings with area electric water heater retailers to update them on the program offerings through the BHP Energy Efficiency Solutions programs. BHP Energy Services staff Jim Bunch, Keith Gade and Tom Berry met with retailers during the months of June and July to talk with them about rebates and dealer incentives that were available to them through the EES program.

Reach: BHP Energy Services personnel met with a total of 14 retailers – 9 in Rapid City and 5 in the northern Black Hills.