

**BLACK HILLS POWER, INC.**  
SD PUC DOCKET: EL-09-018

REQUEST DATE : November 5, 2009  
RESPONSE DATE : December 8, 2009  
REQUESTING PARTY: Black Hills Industrial Intervenors

**BHII Request No. 1-107:** Please provide a summary of the DSM savings and the cost of achieving those savings for programs implemented in 2006, 2007, 2008 and 2009 to date.

**Response to BHII Request No. 1-107:**

Technology	Year	Savings	Total Cost
Heat Pumps-Air & Ground Source Residential and Commercial	2006	80,591 kWh	\$49,411
	2007	96,684 kWh	\$54,387
	2008	85,432 kWh	\$49,708
	2009	88,441 kWh	\$51,133
Water Heating	2009	24,840 kWh	\$7,747
Residential Demand Controllers	2006	76.5 kW	\$65,053
	2007	76.5 kW	\$87,343
	2008	71.5 kW	\$85,732
	2009	50.0 kW	\$52,386

Notes:

1. The costs associated with heat pumps and water heaters are only those costs that exceed a 13.0 SEER for heat pumps and only those costs that exceed a .90 EF for water heaters.
2. Total savings for heat pumps include heating season savings and assumed the average installed performance = 10.0 HSPF; actual HSPF values not reported.
3. Savings calculated using the Energy Star calculator for heat pumps.

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4. Savings for water heaters based on average installed unit capacity for 60 gallons and performance of 0.922 EF based on limited reported efficiency data; savings based on a baseline of 0.851 EF as per ASHRAE Std.
  5. Electric water heater efficiency program implemented in 2009 with a 0.911 EF standard set by BHP.
  6. BHP promotes other programs including power factor correction, energy storage applications, energy audits, heat loss analysis, rate comparisons and trade ally programs in addition to the programs set forth above. Savings and/or costs are difficult to quantify for these additional programs. In addition, large commercial and industrial tariffs encourage customers to shift loads from on-peak periods to off-peak periods.
  7. Residential Demand Controller kW savings were calculated by using an estimate of 0.5 kW saved per controller during the summer peak. Winter peak savings are estimated at 2 kW per controller.
  8. Total costs include program research, marketing, administration, rebates, results documentation and promotion.

## Summary of Electric Savings, Black Hills Power South Dakota

Technology	Year	Qty	Units	Efficiency	Savings	
					kwh per year	kwh over life of measure
Ground Source Heat Pumps	2006	79	264 tons	14.9 SEER	75,176	1,503,520
	2007	78	279 tons	15.5 SEER	89,004	1,780,080
	2008	80	284 tons	15.1 SEER	82,522	1,650,440
	2009	72	231 tons	15.4 SEER	69,391	1,387,820

Technology	Year	Qty	Units	Efficiency	Savings	
Water Heating	2009	60	3694 gallons	0.922 EF	24,840	372,600

## Notes:

- savings for ground source heat pumps calculated from a 13.4 SEER and 8.0 HSPF baseline as per ASHRAE Std. 90.1-1999
- total savings for ground source heat pumps include heating season savings and assumed the average installed performance = 10.0 HSI HSPF values not reported
- savings for ground source heat pumps calculated using the Energy Star calculator for heat pumps
- savings for water heaters based on average installed unit capacity of 60 gallons and performance of 0.922 EF based on limited reported data; savings based on a baseline of 0.851 EF as per ASHRAE Std.
- measure life for GSHP based on New York study: 20 years
- measure life for water heater based on Utah study: 15 years

Rebates  
\$37,800  
\$35,275  
\$35,575  
\$33,065

Rebates  
\$7,468

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PF; actual

Efficiency