



Black Hills/Colorado Electric
Utility Company, LP d/b/a Black
Hills Energy
Energy-Efficiency (Demand Side
Management) Plan
2016-2018

Prepared for:
Public Utilities Commission of Colorado

Prepared by:
**Black Hills/Colorado Electric Utility
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Executive Summary

Applied Energy Group, Inc. (“AEG”) was retained by Black Hills/Colorado Electric Utility Company, LP d/b/a Black Hills Energy (“Black Hills” or “Company”) to conduct an energy efficiency potential assessment and design the 2016 through 2018 Energy Efficiency (Demand Side Management) Program Portfolio (“2016-2018 DSM Plan” or “Plan”).

As part of the Potential Assessment, technical, economic and achievable potential were utilized to determine the total potential savings that could be achieved through the installation of energy efficiency measures.

- The technical potential assessment evaluates the potential of all efficiency technologies and design practices, unconstrained by budgets or measure cost effectiveness.
- The economic potential assessment screens the list of potential efficiency measures, from the technical potential assessment, for cost-effectiveness according to societal cost effectiveness tests.
- Achievable potential is the maximum amount of energy savings from efficiency measures that can realistically be achieved in response to one or more of the following conditions:
 - The existence of real-world barriers with a need to encourage consumers to adopt energy efficiency measures;
 - The most aggressive program scenario possible, including rebates and incentives; and
 - Inclusion of comprehensive program costs including administration, marketing, data collection and tracking, and monitoring and evaluation.

Black Hills developed its energy efficiency program portfolio for 2016 through 2018 through a comprehensive planning process, including a comprehensive benefit-cost analysis of a wide range of measures that affect electricity consumption across all customer classes.

The Black Hills Plan is divided into three broad program categories based on customer sector – residential, commercial and industrial, and special programs. The residential, commercial and industrial programs provide a variety of energy efficiency opportunities for residential customers, small and large commercial customers, and industrial customers. Special programs target low-income residents, and education in schools.

The program portfolio is detailed in the table below by program by category.

TABLE ES1: ENERGY EFFICIENCY PORTFOLIO SUMMARY

Residential Energy Efficiency Programs	
High Efficiency Lighting	Point-of-purchase incentives for CFLs and LEDs.
Appliance Recycling	Incentives for recycling older, inefficient refrigerators, freezers, or room air conditioners.
On-Site Energy Evaluation	The program consists of two levels. <ul style="list-style-type: none"> • Level 1. Evaluation and Direct Install • Level 2. In-Depth Evaluation, Direct Install and Incentives (air sealing, insulation and duct sealing)
High Efficiency Cooling	Rebates to purchase and install heat pump water heaters, central air conditioners, heat pumps and evaporative coolers.
Home Energy Comparison Reports	Behavior program utilizing customized energy reports.
Online Home Energy Evaluation	Online energy evaluation tool.
Commercial and Industrial Energy Efficiency Programs	
C&I New Construction	Incentives for the design and construction of LEED-certified new <u>energy efficient</u> buildings.
C&I Custom	Rebates for cost-effective non-prescriptive measures/equipment.
<u>C&I Self Direct</u>	<u>Rebates for cost-effective non-prescriptive measures/equipment for customers with an aggregated peak demand higher than 1 MW in any single month and annual energy usage of 5,000 MWh.</u>
C&I Prescriptive	Rebates for the purchase and installation of pre-qualified measures, including HVAC, motors and refrigeration.
C&I Lighting	The program is comprised of two components: <ul style="list-style-type: none"> • Prescriptive Lighting. Standardized prescriptive rebates customers that purchase and install qualifying lighting measures. • Small Business Direct Install Lighting. Small commercial customers receive free evaluation and incentives that cover up to 70% of the equipment and installation.
Special Programs	
Low Income Assistance Program	Qualifying customers receive: <ul style="list-style-type: none"> • Lighting, refrigerators, and evaporative coolers at no cost. • Evaluation and direct install of measures at no cost.
School Education Program	School children receive energy kits, plus education and information on how they can help parents save energy.



2016-2018 DSM Plan

1. Introduction

Black Hills is pleased to present this Energy Efficiency Program Portfolio to the Public Utilities Commission of the State of Colorado (“Commission”) for years 2016 through 2018. This Plan follows the previous two program cycles rolled out by Black Hills in 2009 and 2012.

House Bill 07-1037, *Concerning Measures to Promote Energy Efficiency, and Making an Appropriation Therefore*, was passed by the Colorado General Assembly and signed into law by Governor Ritter in 2007, and codified in relevant part at §§ 40-1-102(5), (6) and (7), C.R.S., as well as §§ 40-3.2-101 and 104, C.R.S. The bill establishes that:

...cost-effective natural gas and electricity demand-side management programs will save money for consumers and utilities and protect Colorado’s environment. The general assembly further finds, determines, and declares that providing funding mechanisms to encourage Colorado’s public utilities to reduce emissions or air pollutants and to increase energy efficiency are matters of statewide concern and that the public interest is served by providing such funding mechanisms. Such efforts will result in an improvement in the quality of life and health of Colorado citizens and an increase in the attractiveness of Colorado as a place to live and conduct business.¹

Section 40-3.2-104(2), C.R.S., further charges the Commission to:

...establish energy savings and peak demand reduction goals to be achieved by an investor-owned electric utility, taking into account the utility’s cost-effective DSM potential, the need for electricity resources, the benefits of DSM investments, and other factors as determined by the commission. The energy savings and peak demand reduction goals shall be at least five percent of the utility’s retail system peak demand measured in megawatts in the base year and at least five percent of the utility’s retail energy sales measured in megawatt-hours in the base year. The base year shall be 2006. The goals shall be met in 2018, counting savings in 2018 from DSM measures installed starting in 2006. The commission may establish interim goals and may revise the goals as it deems appropriate.

Therefore, the Commission is tasked with ensuring that utilities develop and implement DSM programs that give customers an opportunity to participate, and consider the impact on non-participants and low income customers.

The Company’s energy-efficiency portfolio is composed of three broad categories: residential programs, commercial and industrial programs and special programs. Each program has been designed to address the needs of various customer types. The residential programs include lighting,

¹ § 40-3.2-101, C.R.S.



appliance recycling, high efficiency cooling, energy evaluation, home energy reports, and online evaluations. The commercial and industrial programs include new construction, prescriptive rebates, lighting, and custom rebates. The special programs include those targeted at low-income homes and education in schools.

In conjunction with the 2016-2018 DSM Plan, Black Hills completed a comprehensive potential study, contained in a separately filed document titled *Demand Side Management Potential Study*.

2. General Program Design Approach

The Black Hills 2016-2018 DSM Plan is based upon the combination of Black Hill’s existing energy efficiency portfolio, the potential study, and a multi-criteria program development selection approach. Criteria included the potential study, analysis of other utility programs, cost-effectiveness, and stakeholder input.

The two tenets that guide the design of Black Hill’s programs are:

- **The service territory benefits from energy efficiency programs.** As part of the overall strategy for meeting the needs of its customers, cost-effective energy-efficiency programs offer an alternative to the construction of infrastructure and purchase of fuel for generation.
- **Black Hills customers benefit from energy efficiency programs.** Energy efficiency can result in lower energy bills, immediately reducing program participant’s consumption of electricity. Furthermore, the programs are designed to be inclusive, giving all customers the opportunity to benefit from participating in Black Hill’s energy efficiency programs.

The Plan’s design adhered to a comprehensive planning process. Whenever possible, the portfolio leverages existing resources to ensure comprehensive, cost-effective programs. The 2016-2018 DSM Plan includes twelve energy efficiency programs administered by Black Hills.

a. Ability to Meet Commission Goals

The Black Hills program portfolio uses a combination of education, contractor training and customer incentives to advance energy efficiency in Colorado. To achieve the Commission’s savings goals, it is important that the programs save energy and peak demand over the short- and long-term.

The programs have been designed to maximize participation given best practice marketing and incentive designs. In addition to ensuring participation while efficiently utilizing budget resources, incentives have been targeted to promote the adoption of qualifying Energy Efficiency Measures that maximize savings.²

Educating customers and trade allies on the benefits of energy efficiency can speed the adoption of energy efficient measures and promote the market transformation. This is a longer-term strategy of

² Energy Efficiency Measures are more efficient models of end-use appliances, such as central air conditioners or compact fluorescent lighting, or technological improvements that can make an end-use appliance more efficient in its use of energy (e.g. energy management systems). Energy Efficiency Measures that qualify for each program represent a substantial improvement over the standard efficiency model available on the market.



achieving savings with the end goal of market transformation. However, education complements the short-term strategy of offering rebates to achieve more immediate energy and demand savings.

b. Program Participation and Eligibility

Program eligibility has been defined broadly to make programs as inclusive as possible. For most residential programs, eligible participants include customers living in every type of residential structure, including single-family, multi-family and manufactured homes. For specific programs, customers who have recently participated in a Black Hills program may be limited because repeated participation would not render sufficient savings to justify the expense.³ In general, participation guidelines are designed to include all customer sectors and end uses.

c. Customer and Trade Ally Engagement

Customer incentives are the primary mechanism for program delivery. Customers receive rebates to purchase energy efficient equipment and services through existing market actors, including contractors, equipment dealers and retailers. To achieve the portfolio's long-term savings goals, it will be necessary for Black Hills to engage customers, trade allies, and state and local agencies. Targeting trade allies and leveraging the Company's relationships with stakeholders will increase program awareness and promote the market adoption of high efficiency equipment/systems.

Marketing components of several programs include strategies to engage trade allies as well as state and local agencies. In some programs, portions of the budget have been reserved for training and informational outreach activities with trade allies. These activities are intended to keep key trade allies apprised of program changes, allowing them to better assist customers and ensure they maintain high-efficiency equipment in their stock.

Marketing and informational outreach activities are also aimed at customers, including the children of residential electric customers through targeted school programs. Creative and sustained marketing is important to a successful and robust energy efficiency program portfolio.

3. Benefit-Cost Analysis and Screening Inputs

To determine the Black Hills portfolio of energy efficiency measures, a comprehensive benefit-cost analysis was conducted on a wide range of measures that affect electricity consumption across all customer classes.

Black Hills uses the Colorado Modified Total Resource Cost Test (mTRC) as the primary method of assessing the cost-effectiveness of energy efficiency measures and programs. The mTRC test is a widely-accepted methodology that has been used specifically in Colorado to assess cost-effectiveness. The mTRC measures the net costs of an energy efficiency program as a resource option based on the total costs of the program, including both the participant and the utility costs. This test represents the combination of the effects of a program on both participating and non-participating customers.

³ For example, if a customer recycled their primary refrigerator in 2015, they would not benefit from recycling a new refrigerator in 2016.



There are four other tests that analyze cost-effectiveness from different perspectives:

- **Participant Cost Test:** quantifies the benefits and costs to the customer due to participation in a program. The benefits include reduction in the participant’s bill and incentives received. The costs are out-of-pocket expenses incurred as a result of participation.
- **Ratepayer Impact Measure Cost Test:** measures what happens to a customer’s bill or rates due to changes in utility revenues and operating costs. Benefits are the savings from avoided supply costs of energy and demand. Costs are the program costs incurred by the utility, participant incentives, and decreased utility revenues.
- **Utility Cost Test:** measures the net costs of a program as a resource option based on the costs incurred by the program administrator, excluding any net costs incurred by the participant. The benefits are the avoided supply costs of energy and demand. The costs are the program costs incurred by the utility and participant incentives.
- **Societal Cost Test:** is a variant of the mTRC, intended to determine the effects of a program on society as a whole. The benefits are the avoided supply costs of energy and demand as well as externalities (including environmental benefits, etc.). The costs are the program costs incurred by the utility and the participants.

The benefit-cost screening model has been adapted from Minnesota Office of Energy Security “BenCost” software and is consistent with the California Standard Practice Manual. The benefit-cost tests were performed using utility-specific data. The input data required for the model includes:

TABLE 11: BENEFIT-COST MODEL INPUTS

General Inputs	Project-Specific Inputs
Retail Rate (\$/kWh)	Utility Project Costs (Administrative & Incentives)
Commodity Cost (\$/kWh)	Direct Participant Project Costs (\$/Participant)
Demand Cost (\$/kW-Year)	Project Life (Years)
Environmental Externality Cost (\$/kWh)	kWh/Participant Saved (Net and Gross)
Discount Rate (%)	kW/Participant Saved (Net and Gross)
Growth Rate (%)	Number of Participants
Line Losses (%)	

Savings estimates for individual measures or programs were developed using a variety of sources. Colorado-specific data was utilized where available, with regional and national data filling the information gaps. Impacts were calculated using generally accepted engineering algorithms based on a set of reasonable assumptions. Because of the diversity in equipment and energy consumption patterns across multiple building types and end-uses, there exists a variability in these savings estimates as they relate to program design and target markets, particularly at the planning stage of these programs.



4. 2016-2018 DSM Plan Programs

The composition of the 2016-2018 DSM Plan is based upon the combination of Black Hill’s existing energy efficiency portfolio, the potential study, and a multi-criteria program development selection approach. AEG updated measure inputs utilizing Black Hill’s program evaluations, historical program achievements, United States Department of Energy (DOE) federal standards and ENERGY STAR® standards, as well as others.

Recent changes to the DOE federal appliance standards have significantly impacted the savings potential of a number of appliances, including, but not limited to, the following residential measures:

- Room Air Conditioners
- Refrigerators
- Freezers
- Dishwashers
- Air Source Heat Pumps
- Lighting
- Clothes Washers

Program modifications and new programs were considered to achieve the Commission’s goals and provide all Black Hills customers with access to cost-effective energy efficiency programs.

a. Black Hills’ 2016-2018 DSM Plan Portfolio – Budgets and Goals

The Black Hills Plan is divided into three broad program categories based on customer sector – residential, commercial and industrial, and special programs. The residential programs provide a variety of energy efficiency opportunities for residential customers. The C&I programs provide a range of energy efficiency opportunities for both small and large commercial and industrial customers. Special programs target low-income residents and provide education on energy efficiency to middle school aged children and their parents. The table below summarizes the Plan being proposed, segmented by sector.

TABLE 2: 2016-2018 DSM PLAN SUMMARY

Residential Energy Efficiency Programs	
High Efficiency Lighting	Point-of-purchase incentives for CFLs and LEDs.
Appliance Recycling	Incentives for recycling older, inefficient refrigerators, freezers or room air conditioners.
On-Site Energy Evaluation	The program consists of two levels. <ul style="list-style-type: none"> • Level 1. Evaluation and Direct Install • Level 2. In-Depth Evaluation, Direct Install and Incentives (air sealing, insulation and duct sealing)
High Efficiency Cooling	Rebates to purchase and install heat pump water heaters, central air conditioners, heat pumps and evaporative coolers.
Home Energy Comparison Reports	Behavior program utilizing customized energy reports.
Online Home Energy Evaluation	Online energy evaluation tool.
Commercial and Industrial Energy Efficiency Programs	
C&I New Construction	Incentives for the design and construction of LEED certified <u>new energy efficient</u> buildings.
C&I Custom	Rebates for cost-effective non-prescriptive measures/equipment.
<u>C&I Self Direct</u>	<u>Rebates for cost-effective non-prescriptive measures/equipment for customers with an aggregated peak demand higher than 1 MW in any single month and annual energy usage of 5,000 MWh.</u>
C&I Prescriptive	Rebates for the purchase and installation of pre-qualified measures, including HVAC, motors and refrigeration.
C&I Lighting	The program is comprised of two components: <ul style="list-style-type: none"> • Prescriptive Lighting. Standardized prescriptive rebates customers that purchase and install qualifying lighting measures. • Small Business Direct Install Lighting. Small commercial customers receive free evaluations and incentives that cover up to 70% of the equipment and installation.
Special Programs	
Low Income Assistance Program	Qualifying customers receive: <ul style="list-style-type: none"> • Lighting, refrigerators, and evaporative coolers at no cost. • Evaluation and direct install of measures at no cost.
School Education Program	School children receive energy kits, plus education and information on how they can help parents save energy.

The tables below summarize the 2016-2018 DSM Plan budgets, participants, energy and demand savings, and mTRC ratios. Detailed benefit-cost analysis modeling results are available in Appendix A.



TABLE 3: THREE YEAR PROGRAM SUMMARY, BY SECTOR⁴

Sector	3 Year mTRC	2016				
		Budget	kW Goal @ Meter	kWh Goal @ Meter	kW Goal @ Generator	kWh Goal @ Generator
Residential	2.32	\$1,327,978	1,444	6,020,341	1,536	6,407,449
C&I	3.41	\$2,945,307	2,513	8,891,014	2,675	9,462,706
Special	3.54	\$1,028,026	959	2,013,891	1,020	2,143,384
General Administration	-	\$187,500	-	-	-	-
General Marketing/Education	-	\$187,500	-	-	-	-
Evaluation	-	\$283,816	-	-	-	-
Total	2.88	\$5,960,126	4,916	16,925,245	5,232	18,013,538
		2017				
Residential	-	\$1,353,506	1,646	7,117,048	1,751	7,574,675
C&I	-	\$3,126,354	2,657	9,443,588	2,828	10,050,811
Special	-	\$1,028,026	959	2,013,891	1,020	2,143,384
General Administration	-	\$187,500	-	-	-	-
General Marketing/Education	-	\$187,500	-	-	-	-
Evaluation	-	\$294,144	-	-	-	-
Total	-	\$6,177,030	5,261	18,574,528	5,599	19,768,870
		2018				
Residential	-	\$1,432,992	1,705	7,390,062	1,814	7,865,243
C&I	-	\$3,303,271	2,803	9,982,329	2,983	10,624,193
Special	-	\$1,028,026	959	2,013,891	1,020	2,143,384
General Administration	-	\$187,500	-	-	-	-
General Marketing/Education	-	\$187,500	-	-	-	-
Evaluation	-	\$346,964	-	-	-	-
Total	-	\$6,486,252	5,466	19,386,282	5,818	20,632,820

⁴ Note: For all budget and savings 'Totals' listed in each table, the sum of each line item may not equal the 'Total' due to rounding.

TABLE 4: DETAILED PROGRAM BUDGET FOR 2016

Program Name	Incentives	Admin	Market	Delivery	Total
High Efficiency Lighting	\$317,175	\$6,344	\$6,344	\$186,156	\$516,018
Appliance Recycling	\$8,500	\$425	\$680	\$38,150	\$47,755
On-Site Energy Evaluation	\$52,473	\$11,563	\$18,500	\$231,250	\$313,786
High Efficiency Cooling	\$93,150	\$4,658	\$7,452	\$60,200	\$165,460
Home Energy Comparison Report	\$0	\$5,480	\$5,480	\$274,000	\$284,960
C&I New Construction	\$15,300	\$765	\$1,224	\$30,000	\$47,289
C&I Custom	\$551,000	\$27,550	\$44,080	\$9,500	\$632,130
C&I Self Direct	\$31,900	\$479	\$391	\$500	\$33,270
C&I Prescriptive	\$124,770	\$4,991	\$11,229	\$6,900	\$147,890
C&I Lighting	\$1,386,225	\$77,913	\$124,760	\$495,830	\$2,084,728
Low-Income Assistance	\$0	\$22,818	\$36,508	\$781,450	\$840,776
School Based Energy Education	\$0	\$8,750	\$3,500	\$175,000	\$187,250
General Administration	\$0	\$0	\$0	\$0	\$187,500
General Marketing/Education	\$0	\$0	\$0	\$0	\$187,500
Evaluation	\$0	\$0	\$0	\$0	\$283,816
Total Program	\$2,580,493	\$171,733	\$260,149	\$2,288,936	\$5,960,126

TABLE 5: DETAILED PROGRAM BUDGET FOR 2017

Program Name	Incentives	Admin	Market	Delivery	Total
High Efficiency Lighting	\$336,175	\$6,724	\$6,724	\$191,906	\$541,528
Appliance Recycling	\$10,000	\$500	\$800	\$44,900	\$56,200
On-Site Energy Evaluation	\$57,462	\$12,719	\$20,350	\$254,375	\$344,906
High Efficiency Cooling	\$104,400	\$5,220	\$8,352	\$64,100	\$182,072
Home Energy Comparison Report	\$0	\$4,400	\$4,400	\$220,000	\$228,800
C&I New Construction	\$15,300	\$765	\$1,224	\$30,000	\$47,289
C&I Custom	\$623,500	\$31,175	\$49,880	\$10,750	\$715,305
C&I Self Direct	\$31,900	\$479	\$391	\$500	\$33,270
C&I Prescriptive	\$130,520	\$5,221	\$11,747	\$7,360	\$154,848
C&I Lighting	\$1,447,515	\$81,171	\$130,276	\$516,681	\$2,175,643
Low-Income Assistance	\$0	\$22,818	\$36,508	\$781,450	\$840,776
School Based Energy Education	\$0	\$8,750	\$3,500	\$175,000	\$187,250
General Administration	\$0	\$0	\$0	\$0	\$187,500
General Marketing/Education	\$0	\$0	\$0	\$0	\$187,500
Evaluation	\$0	\$0	\$0	\$0	\$294,144
Total Program	\$2,756,772	\$179,940	\$274,152	\$2,297,022	\$6,177,030



TABLE 6: DETAILED PROGRAM BUDGET FOR 2018

Program Name	Incentives	Admin	Market	Delivery	Total
High Efficiency Lighting	\$355,175	\$7,104	\$7,104	\$197,656	\$567,038
Appliance Recycling	\$11,500	\$575	\$920	\$51,650	\$64,645
On-Site Energy Evaluation	\$62,709	\$13,875	\$22,200	\$277,500	\$376,284
High Efficiency Cooling	\$113,650	\$5,683	\$9,092	\$67,800	\$196,225
Home Energy Comparison Report	\$0	\$4,400	\$4,400	\$220,000	\$228,800
C&I New Construction	\$15,300	\$765	\$1,224	\$30,000	\$47,289
C&I Custom	\$696,000	\$34,800	\$55,680	\$12,000	\$798,480
C&I Self Direct	\$31,900	\$479	\$391	\$500	\$33,270
C&I Prescriptive	\$147,635	\$5,905	\$13,287	\$8,050	\$174,878
C&I Lighting	\$1,498,790	\$83,913	\$134,891	\$531,760	\$2,249,354
Low-Income Assistance	\$0	\$22,818	\$36,508	\$781,450	\$840,776
School Based Energy Education	\$0	\$8,750	\$3,500	\$175,000	\$187,250
General Administration	\$0	\$0	\$0	\$0	\$187,500
General Marketing/Education	\$0	\$0	\$0	\$0	\$187,500
Evaluation	\$0	\$0	\$0	\$0	\$346,964
Total Program	\$2,932,659	\$189,066	\$289,197	\$2,353,366	\$6,486,252

TABLE 7: DETAILED PROGRAM SAVINGS AND PARTICIPANTS FOR 2016

Program Name	Participants	kW Goal @ Meter	kWh Goal @ Meter	kW Goal @ Generator	kWh Goal @ Generator
High Efficiency Lighting	161,875	324	2,811,718	345	2,992,511
Appliance Recycling	310	22	170,879	24	181,867
On-Site Energy Evaluation	1,000	89	260,739	95	277,504
High Efficiency Cooling	602	538	517,005	572	550,248
Home Energy Comparison Report	30,000	470	2,260,000	500	2,405,318
C&I New Construction	1	41	143,413	43	152,635
C&I Custom	38	319	1,889,619	339	2,011,121
C&I Self Direct	2	17	99,454	18	105,848
C&I Prescriptive	60	234	273,113	250	290,674
C&I Lighting	559	1,903	6,485,416	2,025	6,902,428
Low-Income Assistance	1,889	835	929,404	889	989,165
School Based Energy Education	2,500	124	1,084,487	132	1,154,219
Total Program	198,836	4,916	16,925,245	5,232	18,013,538

TABLE 8: DETAILED PROGRAM SAVINGS AND PARTICIPANTS FOR 2017

Program Name	Participants	kW Goal @ Meter	kWh Goal @ Meter	kW Goal @ Generator	kWh Goal @ Generator
High Efficiency Lighting	166,875	338	2,927,185	359	3,115,404
Appliance Recycling	365	26	201,473	27	214,427
On-Site Energy Evaluation	1,100	99	288,318	105	306,857
High Efficiency Cooling	641	563	544,263	600	579,259
Home Energy Comparison Report	27,300	620	3,155,809	660	3,358,728
Online Home Energy Evaluation	0	0	0	0	0
C&I New Construction	1	41	143,413	43	152,635
C&I Custom	43	361	2,138,253	384	2,275,742
C&I Self Direct	2	17	99,454	18	105,848
C&I Prescriptive	64	250	280,655	266	298,701
C&I Lighting	595	1,989	6,781,814	2,117	7,217,885
Low-Income Assistance	1,889	835	929,404	889	989,165
School Based Energy Education	2,500	124	1,084,487	132	1,154,219
Total Program	201,375	5,261	18,574,528	5,599	19,768,870

TABLE 9: DETAILED PROGRAM SAVINGS AND PARTICIPANTS FOR 2018

Program Name	Participants	kW Goal @ Meter	kWh Goal @ Meter	kW Goal @ Generator	kWh Goal @ Generator
High Efficiency Lighting	171,875	351	3,042,653	374	3,238,296
Appliance Recycling	420	29	232,066	31	246,988
On-Site Energy Evaluation	1,200	107	311,915	114	331,971
High Efficiency Cooling	678	587	569,908	625	606,553
Home Energy Comparison Report	24,843	630	3,233,521	671	3,441,436
Online Home Energy Evaluation	0	0	0	0	0
C&I New Construction	1	41	143,413	43	152,635
C&I Custom	48	403	2,386,887	428	2,540,363
C&I Self Direct	2	17	99,454	18	105,848
C&I Prescriptive	70	278	318,840	296	339,342
C&I Lighting	623	2,065	7,033,735	2,198	7,486,004
Low-Income Assistance	1,889	835	929,404	889	989,165
School Based Energy Education	2,500	124	1,084,487	132	1,154,219
Total Program	204,149	5,466	19,386,282	5,818	20,632,820

The following sections contain detailed program descriptions of the proposed energy efficiency programs. Each description contains the following components:

- Program objective, target market and description.
- Implementation strategy, including delivery channels, education and outreach.
- Eligible measures and incentive levels.
- Estimated participation.
- Estimated energy savings and demand reductions.
- Estimated program budgets.



- Cost-effectiveness.

b. Evaluation, Measurement, and Verification of Programs

Evaluation, measurement, and verification (EM&V) of programs will be performed on a three-year rotating schedule. That is, each program and sub-program will be analyzed to determine the extent to which implementation is achieving the desired goal(s) at some point during the life of the Plan. The schedule for EM&V for each program is:

TABLE 10: EM&V SCHEDULE

Program Name	Sector	Proposed EM&V Year
Low-Income Assistance	Residential	2016
On-Site Energy Evaluation	Residential	2016
Home Energy Comparison Report	Residential	2016
Appliance Recycling	Residential	2016
C&I Lighting	Non-residential	2017
C&I Custom	Non-residential	2017
C&I Prescriptive	Non-residential	2017
High Efficiency Cooling	Residential	2017
C&I New Construction	Non-residential	2018
<u>C&I Self Direct</u>	<u>Non-residential</u>	<u>2018</u>
School Based Energy Education	Residential	2018
High Efficiency Lighting	Residential	2018

Black Hills will file the EM&V reports with the Commission in this proceeding no later than 30 days after completion. These EM&V reports will be filed in the year following the “Proposed EM&V Year.”

~~Black Hills will file the EM&V reports with the Commission in this proceeding no later than April 1 of the year following the “Proposed EM&V Year”~~

The principal purpose of comprehensive program evaluations is to assess customer satisfaction with the program being evaluated, assess changes that should be made to technical assumptions, including but not limited to, net-to-gross (NTG) ratios, assess overall program cost effectiveness, and assess program processes based on the evaluator’s own research as well as a thorough review of industry-wide and the Company’s own technical assumptions.

The Company will consider implementing recommended changes in the program year following the period of evaluation. These changes will not be “backward looking” and so shall not affect calculations, including calculations for achieved savings or net economic benefits, for the Plan year covered by the EM&V. Black Hills will, within thirty days after the annual filing of the EM&V, provide ~~6~~30-Day and/or ~~9~~60-Day Notice, as applicable, detailing which EM&V recommendations will be implemented.

c. Budget Flexibility

Budget flexibility is important in order to effectively implement programs over multiple program years to meet energy savings targets. Black Hills will, during each Plan year, have the flexibility to move budget dollars between programs and customer segments within the Plan without further Commission authorization and approval, so long as the Company does not incur costs in excess of 115 percent of the applicable overall annual budget amount. This flexibility allows Black Hills to focus on achieving energy savings targets across the entire portfolio.

d. Residential Programs

Residential High Efficiency Lighting Program

Objective	Increase the penetration of efficient lighting in customer homes by providing incentives for the purchase of ENERGY STAR® qualified lighting.
Target Market	Residential customers, lighting manufacturers and local retailers.
Description	<p>ENERGY STAR® qualified CFLs and LEDs use up to 75% less energy than typical incandescent light bulbs. They also offer superior performance by lasting up to 10 times longer than incandescent bulbs, reducing the need to change hard-to-reach light bulbs.</p> <p>Customers may purchase up to 12 CFLs and 105 LEDs from local participating retailers at a reduced cost. Instant incentives are available at participating stores at the time of purchase. Incentives vary depending upon the product, retail location and associated retail cost.</p>
Program Goals	<ul style="list-style-type: none"> • Help residential customers reduce their electricity bills. • Educate customers about the program and the benefits of installing CFLs and LEDs. • Develop partnerships with retailers to market the program and benefits of energy efficient lighting. • Demonstrate persistent energy savings and provide other benefits to end-users such as improved health, safety, and comfort. • Effectively install efficient lighting through the Black Hills Program. • Encourage energy saving behavior and awareness.
Implementation Strategy	<p>Black Hills will engage an implementation contractor to:</p> <ul style="list-style-type: none"> • Establish relationships with lighting manufacturers and retailers throughout Black Hills' service territory. • Provide in-store promotional materials and retail sales staff training. • Track program performance, including tracking sales data, reviewing sales data for accuracy and payment to retailers. • Periodically report progress towards program goals and opportunities for improvement. <p>Black Hills' marketing staff will work with the implementation contractor to market the program. Marketing tactics will include bill inserts, advertisements, and partnerships with participating retailers.</p>

Measures & Incentives	Eligible Measure		Incentive per Unit		
	Standard CFL		\$0.90		
	Specialty LED		\$5.00		
	Standard LED		\$3.00		
Estimated Participation	CFLs and LEDs are the number of bulbs that will be purchased through the program. Each customer is eligible to purchase up to 12 CFLs and 105 LEDs.				
	****	2016	2017	2018	
	Standard CFL	94,500	94,500	94,500	
	Specialty LED	15,000	17,000	19,000	
	<u>Standard LED</u>	52,375,200	55,375,200	58,375,200	
Total	161,875,950	166,875,33,500	171,875,7,500		
Estimated Savings	Net Energy Savings Goals				
	Eligible Measure	Net kWh per Bulb @ Meter	Annual Net Energy Savings Goals (kWh) @ Meter		
			2016	2017	2018
	Standard CFL	148	1,330,376	1,330,376	1,330,376
	Specialty LED	27	402,577	456,254	509,931
	<u>Standard LED</u>	21	1,078,765	1,140,556	1,202,347
	TOTAL		2,811,718	2,927,185	3,042,653
			524,999	619,870	2,714,740
	Eligible Measure	Net kWh per Bulb @ Generator	Annual Net Energy Savings Goals (kWh) @ Generator		
	<u>Standard CFL</u>	15	1,415,919	1,415,919	1,415,919
	<u>Specialty LED</u>	29	428,462	485,591	542,719
	<u>Standard LED</u>	22	1,148,130	1,213,894	1,279,658
	TOTAL		2,992,511	3,115,404	3,238,296
Net Demand Savings Goals					
Eligible Measure	Net kW per Bulb @ Meter	Annual Net Demand Savings Goals (kW) @ Meter			
		2016	2017	2018	
Standard CFL	0.002	153.54	153.549	153.549	
Specialty LED	0.003	46.4	52.6	58.8	

	<u>Standard LED</u>	0.002	<u>124.44</u> <u>7.5</u>	<u>131.652</u> <u>3</u>	<u>138.757</u> <u>0</u>	
	TOTAL		<u>32429</u> <u>1</u>	<u>338302</u>	<u>351313</u>	
	<u>Eligible Measure</u>	<u>Net kW per Bulb @ Generator</u>	<u>Annual Net Demand Savings Goals (kW) @ Generator</u>			
	<u>Standard CFL</u>	<u>0.002</u>	<u>163.3</u>	<u>163.3</u>	<u>163.3</u>	
	<u>Specialty LED</u>	<u>0.003</u>	<u>49.4</u>	<u>56.0</u>	<u>62.6</u>	
<u>Standard LED</u>	<u>0.003</u>	<u>132.4</u>	<u>140.0</u>	<u>147.6</u>		
TOTAL		<u>345</u>	<u>359</u>	<u>374</u>		
Estimated Budget	Budget Categories	2016	2017	2018		
	Incentives	<u>\$317,175</u> <u>\$220,050</u>	<u>\$336,175</u> <u>\$236,050</u>	<u>\$355,175</u> <u>\$252,050</u>		
	Administration	<u>\$6,344</u> <u>\$4,401</u>	<u>\$6,724</u> <u>\$4,721</u>	<u>\$7,104</u> <u>\$5,041</u>		
	Marketing	<u>\$6,344</u> <u>\$4,401</u>	<u>\$6,724</u> <u>\$4,721</u>	<u>\$7,104</u> <u>\$5,041</u>		
	Delivery	<u>\$186,156</u> <u>\$148,925</u>	<u>\$191,906</u> <u>\$153,525</u>	<u>\$197,656</u> <u>\$158,125</u>		
	Total	<u>\$516,018</u> <u>\$377,777</u>	<u>\$541,528</u> <u>\$399,017</u>	<u>\$567,038</u> <u>\$420,257</u>		
	Cost-Effectiveness	mTRC Test	RIM Test	Utility Cost Test	Societal Cost Test	Participant Cost Test
		<u>1.421.75</u>	<u>0.660</u> <u>67</u>	<u>3.033.25</u>	<u>1.511.86</u>	<u>2.683.19</u>

Residential Appliance Recycling Program

Objective	Promote the retirement of old, inefficient appliances.
Target Market	Residential customers disposing of primary or secondary inefficient refrigerators, freezers, or room air conditioners.
Description	<p>The program encourages residential customers to turn in their old inefficient refrigerators, freezers and room air conditioners, removing them from the electric system and disposing of them in an environmentally safe and responsible manner.</p> <p>Program requirements to recycle a refrigerator or freezer include:</p> <ul style="list-style-type: none"> • Unit must be between 10 and 30 cubic feet in size. • Unit must be in working condition. • At time of pickup the unit must be empty and plugged into an electrical outlet. • The appliance must have a clear path for removal. • Units using ammonia or SO₂ refrigerant are excluded from participation. • Unit can be primary or secondary. <p>Customers may recycle their old room air conditioners free of charge during a scheduled pick-up for a qualifying refrigerator/freezer. The recycled unit must be working at the time of pick-up. Customers are limited to two (2) refrigerator and freezer rebates and three (3) room air conditioners per household per year.</p> <p><u>Participating customers will receive a free energy savings kit, similar to the kit received in the School Based Energy Education program. A customer who is recycling multiple appliances will only receive one energy savings kit.</u></p>
Program Goals	<ul style="list-style-type: none"> • Educate customers about the energy and environmental benefit of recycling their inefficient appliances. • Increase customer awareness of Black Hills energy efficiency programs. • Reduce household energy consumption. • Influence consumer behavior by encouraging residential customers to avoid replacing their second refrigerator or freezer after it is recycled.
Implementation Strategy	<p>Black Hills will work with an implementation contractor to:</p> <ul style="list-style-type: none"> • Schedule pickups from customer homes, verify appliance qualification, and remove appliance(s) from customer homes. • Process rebates. • Track program data. <p>The implementation contractor will work with Black Hills to develop marketing strategies and materials. Marketing activities may include bill inserts, print and electronic advertisements, television and radio advertisements, media and community events, and direct mail.</p>

Measures & Incentives	Eligible Measure			Unit	Incentive per Unit		
	Refrigerator Recycle			per unit	\$50		
	Freezer Recycle			per unit	\$50		
	Room A/C Recycle			per unit	\$50		
	<u>Energy Savings Kit</u>			<u>per kit</u>	<u>\$0</u>		
Estimated Participation	Eligible Measure			2016	2017	2018	
	Refrigerator Recycle			100	115	130	
	Freezer Recycle			40	50	60	
	Room A/C Recycle			30	35	40	
	<u>Energy Savings Kit</u>			<u>140</u>	<u>165</u>	<u>190</u>	
	Total			170	200	230	
Estimated Savings	Net Energy Savings Goals						
	Eligible Measure	Unit	Net kWh per Unit @ Meter	Annual Net Energy Savings Goals (kWh) @ Meter			
				2016	2017	2018	
	Refrigerator Recycle	per unit	782	78,183	89,910	101,638	
	Freezer Recycle	per unit	855	34,190	42,738	51,286	
	Room A/C Recycle	per unit	361	10,835	12,641	14,446	
	<u>Energy Savings Kit</u>	<u>per kit</u>	<u>341</u>	<u>47,671</u>	<u>56,183</u>	<u>64,696</u>	
	TOTAL			170,879	123,208	201,473	145,289
						232,066	167,370
	Net Demand Savings Goals						
	Eligible Measure	Unit	Net kWh per Unit @ Generator	Annual Net Energy Savings Goals (kWh) @ Generator			
				2016	2017	2018	
	<u>Refrigerator Recycle</u>	<u>per unit</u>	<u>832</u>	<u>83,210</u>	<u>95,692</u>	<u>108,173</u>	
<u>Freezer Recycle</u>	<u>per unit</u>	<u>910</u>	<u>36,389</u>	<u>45,486</u>	<u>54,583</u>		
<u>Room A/C Recycle</u>	<u>per unit</u>	<u>384</u>	<u>11,532</u>	<u>13,453</u>	<u>15,375</u>		
<u>Energy Savings Kit</u>	<u>per kit</u>	<u>362</u>	<u>50,736</u>	<u>59,796</u>	<u>68,856</u>		
TOTAL			181,867	214,427	246,988		
Net Demand Savings Goals							
Eligible Measure	Unit	Net kW per Unit @ Meter	Annual Net Demand Savings Goals (kW) @ Meter				
			2016	2017	2018		

	Refrigerator Recycle	per unit	0.117	11.7	13.4	15.2
	Freezer Recycle	per unit	0.027	1.1	1.4	1.6
	Room A/C Recycle	per unit	0.130	3.9	4.5	5.2
	<u>Energy Savings Kit</u>	<u>per kit</u>	<u>0.039</u>	<u>5.4</u>	<u>6.4</u>	<u>7.4</u>
	TOTAL			2217	2619	2922
	Eligible Measure	Unit	Net kW per Unit @ Generator		Annual Net Demand Savings Goals (kW) @ Generator	
	<u>Refrigerator Recycle</u>	<u>per unit</u>	<u>0.124</u>	<u>12.4</u>	<u>14.3</u>	<u>16.2</u>
	<u>Freezer Recycle</u>	<u>per unit</u>	<u>0.029</u>	<u>1.2</u>	<u>1.4</u>	<u>1.7</u>
	<u>Room A/C Recycle</u>	<u>per unit</u>	<u>0.138</u>	<u>4.1</u>	<u>4.8</u>	<u>5.5</u>
	<u>Energy Savings Kit</u>	<u>per kit</u>	<u>0.041</u>	<u>5.8</u>	<u>6.8</u>	<u>7.9</u>
	TOTAL			24	27	31
Estimated Budget	Budget Categories	2016	2017	2018		
	Incentives	\$8,500	\$10,000	\$11,500		
	Administration	\$425	\$500	\$575		
	Marketing	\$680 <u>\$170</u>	\$800 <u>\$200</u>	\$920 <u>\$230</u>		
		\$38,150	\$44,900	\$51,650		
	Delivery	\$29,750	\$35,000	\$40,250		
	Total	\$47,755 \$38,845	\$56,200 \$45,700	\$64,645 \$52,555		
Cost-Effectiveness	mTRC Test	RIM Test	Utility Cost Test	Societal Cost Test	Participant Cost Test	
	1.66116	0.52050	1.36117	1.76123	n/a <u>8.70</u>	

Residential On-Site Energy Evaluation Program

Objective	Encourage whole house improvement to existing homes.
Target Market	Residential customers that own or rent a residence.
Description	<p>The program consists of:</p> <p>Level 1. Customers receive a home energy evaluation and direct installation of low-cost measures at no cost. The evaluation identifies potential efficiency improvements, educates the customer on managing energy costs and provides information about Company programs. The low-cost measures that may be installed include: faucet aerator, low-flow showerhead, water temperature setback, hot water pipe insulation and CFLs.</p> <p>Level 2. Customers pay \$100 to receive a home energy evaluation with a blower door test. The evaluation identifies potential efficiency improvements, educates the customer on managing energy costs and provides information about Company programs. Low-cost measures will be installed at no cost to the customer. The measures that may be installed include: faucet aerator, low-flow showerhead, water temperature setback, hot water pipe insulation and CFLs.</p> <p>Customers are eligible to receive incentives for the purchase and installation of air sealing, insulation and duct sealing. Customers must have a second blower door test, verifying the savings, to receive an incentive for air sealing or duct sealing.</p> <p>Homeowner advisory services (concierge services) will be offered to homeowners on an as-needed basis. If the homeowner identifies that they need additional assistance, the auditor will spend up to 1.5 hours discussing energy efficiency options, equipment, and potential costs and savings. The number of hours per customer will vary, but will not exceed 1.5 hours. The discussion may take place via telephone, internet or telephone, based upon customer location, budget, and other constraints.</p> <p>Energy evaluations are limited to homes 10 years or older.</p>
Program Goals	<ul style="list-style-type: none"> • Demonstrate persistent energy savings and provide other benefits to end-users such as improved health, safety, and comfort. • Encourage energy saving behavior and whole house improvements. • Help residential customers reduce their electricity bills.
Implementation Strategy	<p>Black Hills will work with a third-party implementation contractor to:</p> <ul style="list-style-type: none"> • Hire/sub-contract local staff to perform home evaluations, blower door test, direct measure installation and advisory services. • Engage customers and schedule home evaluation appointments. • Provide customer service support and advisory services. • Process rebate applications, including review and verification of applications and payment of customer rebates. • Track program performance. <p>Marketing activities may include bill inserts, newspaper advertisements, direct mail, bill messaging, radio advertisements, and community events.</p>

Measures & Incentives	<p>Level 1 is provided at no cost to the customer. The Level 2 evaluation is provided at a cost of \$100 per home. Measure incentives are presented in the table below.</p> <table border="1" data-bbox="415 401 1117 575"> <thead> <tr> <th>Eligible Measure</th> <th>Incentive per Unit</th> </tr> </thead> <tbody> <tr> <td>Air Sealing</td> <td>50% of incremental cost, up to \$200</td> </tr> <tr> <td>Attic Insulation</td> <td>\$0.35 per square foot, up to \$500</td> </tr> <tr> <td>Wall Insulation</td> <td>\$0.65 per square foot, up to \$750</td> </tr> <tr> <td>Duct Sealing</td> <td>50% of incremental cost, up to \$200</td> </tr> </tbody> </table>	Eligible Measure	Incentive per Unit	Air Sealing	50% of incremental cost, up to \$200	Attic Insulation	\$0.35 per square foot, up to \$500	Wall Insulation	\$0.65 per square foot, up to \$750	Duct Sealing	50% of incremental cost, up to \$200																																																																													
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Net Demand Savings Goals

Eligible Measure	Unit	Net kW per Unit @ Meter	Annual Net Demand Savings Goals (kW) @ Meter		
			2016	2017	2018
Customer Evaluation (Direct Install Measures)	per Home	0.019	19	21	22
Air Sealing	per Home	0.288	25	27	30
Attic Insulation	per Sq. Ft.	0.0004	22	26	27
Wall Insulation	per Sq. Ft.	0.0005	12	13	13
Duct Sealing	per Home	0.230	12	13	14
TOTAL			89	99	107

Eligible Measure	Unit	Net kW per Unit @ Generator	Annual Net Demand Savings Goals (kW) @ Generator		
<u>Home Evaluation & Measures</u>	<u>per Home</u>	<u>0.020</u>	<u>20</u>	<u>22</u>	<u>24</u>
<u>Air Sealing</u>	<u>per Home</u>	<u>0.306</u>	<u>26</u>	<u>29</u>	<u>32</u>
<u>Attic Insulation</u>	<u>per Square Foot</u>	<u>0.000</u>	<u>24</u>	<u>27</u>	<u>29</u>
<u>Wall Insulation</u>	<u>per Square Foot</u>	<u>0.001</u>	<u>13</u>	<u>14</u>	<u>14</u>
<u>Duct Sealing</u>	<u>per Home</u>	<u>0.245</u>	<u>12</u>	<u>13</u>	<u>15</u>
TOTAL			95	105	114

Estimated Budget

Budget Categories	2016	2017	2018
Incentives	\$52,473	\$57,462	\$62,709
Administration	\$11,563	\$12,719	\$13,875
Marketing	\$18,500	\$20,350	\$22,200
Delivery	\$231,250	\$254,375	\$277,500
Total	\$313,786	\$344,906	\$376,284

Cost-Effectiveness

mTRC Test	RIM Test	Utility Cost Test	Societal Cost Test	Participant Cost Test
1.74	0.72	2.22	1.78	4.92

Residential High Efficiency Cooling Program

Objective	Encourage contractors and distributors to use energy efficiency as a marketing tool, stocking and selling more efficient units and moving the entire residential cooling market toward greater energy efficiency.																												
Target Market	Residential customers, trade allies and distributors.																												
Description	<p>The program encourages residential customers to purchase and install energy-efficient heat pump water heaters, evaporative coolers, central air conditioners, and heat pumps by providing financial incentives to offset a portion of the equipment’s higher initial cost.</p> <p>HVAC contractors receive training on Quality Installations, which focus on air and duct sealing. The Manual J course trains HVAC contractors to properly size equipment and accurately perform and document cooling load calculations. The System Charging and Airflow course covers airflow and charging procedures, standards and includes hands-on training in the use of testing equipment. HVAC contractors will receive a \$100 incentive for Quality Installation of the HVAC unit.</p>																												
Program Goals	<ul style="list-style-type: none"> • Educate customers about the benefits of installing efficient HVAC equipment. • Develop partnerships with contractors to bring efficient cooling systems to the market. • Demonstrate persistent energy savings and provide other benefits to end-users such as improved health, safety, and comfort. • Effectively install efficient cooling equipment through the Black Hills program. • Help residential customers reduce their electricity bills. • Build consumer confidence in the reliability of savings estimates through an educated and highly trained contract services team. 																												
Implementation Strategy	Strong relationships have been formed with retailers and trade to promote participation. These relationships will be cultivated to drive new participants into the program. Marketing activities may include bill inserts, direct mail, and newspaper, radio and billboard advertising.																												
Measures & Incentives	<table border="1"> <thead> <tr> <th data-bbox="415 1388 950 1423">Eligible Measure</th> <th data-bbox="956 1388 1138 1423">Incentive</th> </tr> </thead> <tbody> <tr> <td data-bbox="415 1432 950 1461">Heat Pump Water Heater</td> <td data-bbox="956 1432 1138 1461">\$500</td> </tr> <tr> <td data-bbox="415 1465 950 1495">Evaporative Cooler >2,500 CFM</td> <td data-bbox="956 1465 1138 1495">\$100</td> </tr> <tr> <td data-bbox="415 1499 950 1528">Evaporative Cooler Media Saturation >85%</td> <td data-bbox="956 1499 1138 1528">\$400</td> </tr> <tr> <td data-bbox="415 1533 950 1562">Evaporative Cooler – Whole House Cooler</td> <td data-bbox="956 1533 1138 1562">\$1,000</td> </tr> <tr> <td data-bbox="415 1566 950 1596">Heat Pump Ductless Mini Split</td> <td data-bbox="956 1566 1138 1596">\$300</td> </tr> <tr> <td data-bbox="415 1600 950 1629">Air Conditioner SEER 15</td> <td data-bbox="956 1600 1138 1629">\$250</td> </tr> <tr> <td data-bbox="415 1633 950 1663">Air Conditioner SEER 16</td> <td data-bbox="956 1633 1138 1663">\$400</td> </tr> <tr> <td data-bbox="415 1667 950 1696">Air Conditioner SEER 17</td> <td data-bbox="956 1667 1138 1696">\$550</td> </tr> <tr> <td data-bbox="415 1701 950 1730">Heat Pump SEER 15</td> <td data-bbox="956 1701 1138 1730">\$250</td> </tr> <tr> <td data-bbox="415 1734 950 1764">Heat Pump SEER 16</td> <td data-bbox="956 1734 1138 1764">\$450</td> </tr> <tr> <td data-bbox="415 1768 950 1797">Heat Pump SEER 17</td> <td data-bbox="956 1768 1138 1797">\$650</td> </tr> <tr> <td data-bbox="415 1801 950 1831">Quality Installation</td> <td data-bbox="956 1801 1138 1831">\$100</td> </tr> <tr> <td data-bbox="415 1835 950 1864">Geothermal Heat Pump</td> <td data-bbox="956 1835 1138 1864">\$1,500</td> </tr> </tbody> </table>	Eligible Measure	Incentive	Heat Pump Water Heater	\$500	Evaporative Cooler >2,500 CFM	\$100	Evaporative Cooler Media Saturation >85%	\$400	Evaporative Cooler – Whole House Cooler	\$1,000	Heat Pump Ductless Mini Split	\$300	Air Conditioner SEER 15	\$250	Air Conditioner SEER 16	\$400	Air Conditioner SEER 17	\$550	Heat Pump SEER 15	\$250	Heat Pump SEER 16	\$450	Heat Pump SEER 17	\$650	Quality Installation	\$100	Geothermal Heat Pump	\$1,500
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Estimated Participation	Eligible Measure	2016	2017	2018
	Heat Pump Water Heater	8	8	8
	Evaporative Cooler >2,500 CFM	480	500	520
	Evaporative Cooler Media Saturation >85%	8	8	8
	Evaporative Cooler – Whole House Cooler	8	10	10
	Heat Pump Ductless Mini Split	30	30	30
	Air Conditioner SEER 15	20	25	30
	Air Conditioner SEER 16	30	35	40
	Air Conditioner SEER 17	5	7	9
	Heat Pump SEER 15	6	8	10
	Heat Pump SEER 16	2	4	6
	Quality Installation	3	3	3
	Geothermal Heat Pump	2	3	4
	Total	602	641	678

Estimated Savings

Net Energy Savings Goals

Eligible Measure	Unit	Net kWh per Unit @ Meter	Annual Net Energy Savings Goals (kWh) @ Meter		
			2016	2017	2018
Heat Pump Water Heater	Unit	939	7,512	7,512	7,512
Evaporative Cooler >2,500 CFM	Unit	944	453,024	471,900	490,776
Evaporative Cooler Media Saturation >85%	Unit	944	7,550	7,550	7,550
Evaporative Cooler - Whole House Cooler	Unit	807	6,456	8,070	8,070
Heat Pump Ductless Mini Split	Ton	462	20,786	20,786	20,786
Air Conditioner SEER 15	Ton	62	3,695	4,619	5,543
Air Conditioner SEER 16	Ton	87	7,795	9,094	10,393
Air Conditioner SEER 17	Ton	109	1,630	2,282	2,934
Heat Pump SEER 15	Ton	91	1,640	2,187	2,734
Heat Pump SEER 16	Ton	116	697	1,394	2,091
Quality Installation SEER 16	Unit	313	626	626	626
Quality Installation SEER 17	Unit	295	295	295	295
Geothermal Heat Pump	Ton	883	5,299	7,949	10,598
TOTAL			517,005	544,263	569,908

Eligible Measure	Unit	Net kWh per Unit @ Generator	Annual Net Energy Savings Goals (kWh) @ Generator		
<u>Heat Pump Water Heater</u>	<u>Unit</u>	<u>999</u>	<u>7,995</u>	<u>7,995</u>	<u>7,995</u>
<u>Evaporative Cooler >2,500 CFM</u>	<u>Unit</u>	<u>1,004</u>	<u>482,153</u>	<u>502,243</u>	<u>522,333</u>
<u>Evaporative Cooler Media Saturation >85%</u>	<u>Unit</u>	<u>1,004</u>	<u>8,036</u>	<u>8,036</u>	<u>8,036</u>
<u>Evaporative Cooler - Whole House Cooler</u>	<u>Unit</u>	<u>859</u>	<u>6,871</u>	<u>8,589</u>	<u>8,589</u>
<u>Heat Pump Ductless Mini Split</u>	<u>Ton</u>	<u>492</u>	<u>22,123</u>	<u>22,123</u>	<u>22,123</u>
<u>Air Conditioner SEER 15</u>	<u>Ton</u>	<u>66</u>	<u>3,933</u>	<u>4,916</u>	<u>5,899</u>
<u>Air Conditioner SEER</u>	<u>Ton</u>	<u>92</u>	<u>8,296</u>	<u>9,679</u>	<u>11,061</u>

<u>16</u>					
<u>Air Conditioner SEER 17</u>	<u>Ton</u>	<u>116</u>	<u>1,735</u>	<u>2,429</u>	<u>3,123</u>
<u>Heat Pump SEER 15</u>	<u>Ton</u>	<u>97</u>	<u>1,746</u>	<u>2,328</u>	<u>2,910</u>
<u>Heat Pump SEER 16</u>	<u>Ton</u>	<u>124</u>	<u>742</u>	<u>1,483</u>	<u>2,225</u>
<u>Quality Installation SEER 16</u>	<u>Unit</u>	<u>333</u>	<u>666</u>	<u>666</u>	<u>666</u>
<u>Quality Installation SEER 17</u>	<u>Unit</u>	<u>313</u>	<u>313</u>	<u>313</u>	<u>313</u>
<u>Geothermal Heat Pump</u>	<u>Ton</u>	<u>940</u>	<u>5,640</u>	<u>8,460</u>	<u>11,280</u>
		<u>TOTAL</u>	<u>550,248</u>	<u>579,259</u>	<u>606,553</u>

Net Demand Savings Goals

Eligible Measure	Unit	Net kW per Unit	Annual Net Demand Savings Goals (kW)		
			2016	2017	2018
Heat Pump Water Heater	Unit	0.044	0.4	0.4	0.4
Evaporative Cooler >2,500 CFM	Unit	1.047	503	523	544
Evaporative Cooler Media Saturation >85%	Unit	1.047	8.4	8.4	8.4
Evaporative Cooler - Whole House Cooler	Unit	0.895	7.2	9.0	9.0
Heat Pump Ductless Mini Split	Ton	0.153	6.9	6.9	6.9
Air Conditioner SEER 15	Ton	0.053	3.2	4.0	4.8
Air Conditioner SEER 16	Ton	0.053	4.8	5.6	6.4
Air Conditioner SEER 17	Ton	0.068	1.0	1.4	1.8
Heat Pump SEER 15	Ton	0.033	0.6	0.8	1.0
Heat Pump SEER 16	Ton	0.033	0.2	0.4	0.6
Quality Installation SEER 16	Unit	0.480	1.0	1.0	1.0
Quality Installation SEER 17	Unit	0.462	0.5	0.5	0.5
TOTAL			538	563	587

Eligible Measure	Unit	Net kW per Unit @ Generator	Annual Net Demand Savings Goals (kW) @ Generator		
<u>Heat Pump Water Heater</u>	<u>Unit</u>	<u>0.047</u>	<u>0.4</u>	<u>0.4</u>	<u>0.4</u>
<u>Evaporative Cooler >2,500 CFM</u>	<u>Unit</u>	<u>1.114</u>	<u>534.8</u>	<u>557.1</u>	<u>579.4</u>
<u>Evaporative Cooler Media Saturation >85%</u>	<u>Unit</u>	<u>1.114</u>	<u>8.9</u>	<u>8.9</u>	<u>8.9</u>
<u>Evaporative Cooler - Whole House Cooler</u>	<u>Unit</u>	<u>0.953</u>	<u>7.6</u>	<u>9.5</u>	<u>9.5</u>
<u>Heat Pump Ductless Mini Split</u>	<u>Ton</u>	<u>0.163</u>	<u>7.3</u>	<u>7.3</u>	<u>7.3</u>
<u>Air Conditioner SEER 15</u>	<u>Ton</u>	<u>0.057</u>	<u>3.4</u>	<u>4.3</u>	<u>5.1</u>
<u>Air Conditioner SEER 16</u>	<u>Ton</u>	<u>0.057</u>	<u>5.1</u>	<u>6.0</u>	<u>6.8</u>
<u>Air Conditioner SEER 17</u>	<u>Ton</u>	<u>0.073</u>	<u>1.1</u>	<u>1.5</u>	<u>2.0</u>
<u>Heat Pump SEER 15</u>	<u>Ton</u>	<u>0.035</u>	<u>0.6</u>	<u>0.8</u>	<u>1.0</u>
<u>Heat Pump SEER 16</u>	<u>Ton</u>	<u>0.035</u>	<u>0.2</u>	<u>0.4</u>	<u>0.6</u>
<u>Quality Installation SEER 16</u>	<u>Unit</u>	<u>0.511</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>
<u>Quality Installation SEER 17</u>	<u>Unit</u>	<u>0.491</u>	<u>0.5</u>	<u>0.5</u>	<u>0.5</u>

	<u>Geothermal Heat Pump</u>	<u>Ton</u>	<u>0.191</u>	<u>1.1</u>	<u>1.7</u>	<u>2.3</u>
	TOTAL			572	600	625
Estimated Budget	Budget Categories	2016	2017	2018		
	Incentives	\$93,150	\$104,400	\$113,650		
	Administration	\$4,658	\$5,220	\$5,683		
	Marketing	\$7,452	\$8,352	\$9,092		
	Delivery	\$60,200	\$64,100	\$67,800		
	Total	\$165,460	\$182,072	\$196,225		
Cost-Effectiveness	mTRC Test	RIM Test	Utility Cost Test	Societal Cost Test	Participant Cost Test	
	8.37	2.71	11.77	8.50	5.99	



Residential Home Energy Comparison Report Program

Objective	Encourage reduced energy consumption through behavioral change.																										
Target Market	Residential single family homes.																										
Description	The Home Energy Comparison Report Program provides individualized energy use information to customers while simultaneously offering recommendations on how to save money and energy by making changes to energy consuming behaviors. Energy reports are sent periodically to customer households to give them awareness and a peer comparison of their energy usage. Social competitiveness increases behavior to reduce energy consumption.																										
Program Goals	<ul style="list-style-type: none"> • Build utility-customer relationship. • Increase awareness of the Black Hills energy efficiency portfolio. • Increase customer awareness of energy consumption patterns. • Educate residential customers about the opportunities to reduce energy consumption. 																										
Implementation Strategy	The Company will work with an implementation contractor that specializes in developing and issuing residential energy reports. The implementation contractor will select report recipients and a control group, design the reports and develop customized energy reduction tips with input from Black Hills. The program will cross-promote the Black Hills energy efficiency portfolio.																										
Measures & Incentives	Customers receive energy reports. There is no monetary incentive.																										
Estimated Participation	<table border="1"> <thead> <tr> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>30,000</td> <td>27,300</td> <td>24,843</td> </tr> </tbody> </table>			2016	2017	2018	30,000	27,300	24,843																		
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Estimated Savings	<table border="1"> <thead> <tr> <th colspan="4">Net Energy Savings Goals</th> </tr> <tr> <th></th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Net Energy Savings per Customer (kWh) <u>@ Meter</u></td> <td>75</td> <td>116</td> <td>130</td> </tr> <tr> <td>Net Annual Energy Savings Goals (kWh) <u>@ Meter</u></td> <td>2,260,000</td> <td>3,155,809</td> <td>3,233,521</td> </tr> <tr> <td><u>Net Energy Savings per Customer (kWh) @ Generator</u></td> <td><u>80</u></td> <td><u>123</u></td> <td><u>139</u></td> </tr> <tr> <td><u>Net Annual Energy Savings Goals (kWh) @ Generator</u></td> <td><u>2,405,318</u></td> <td><u>3,358,728</u></td> <td><u>3,441,436</u></td> </tr> </tbody> </table>			Net Energy Savings Goals					2016	2017	2018	Net Energy Savings per Customer (kWh) <u>@ Meter</u>	75	116	130	Net Annual Energy Savings Goals (kWh) <u>@ Meter</u>	2,260,000	3,155,809	3,233,521	<u>Net Energy Savings per Customer (kWh) @ Generator</u>	<u>80</u>	<u>123</u>	<u>139</u>	<u>Net Annual Energy Savings Goals (kWh) @ Generator</u>	<u>2,405,318</u>	<u>3,358,728</u>	<u>3,441,436</u>
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	Net Demand Savings Goals					
		2016	2017	2018		
	Net Demand Savings per Customer (kW) <u>@ Meter</u>	0.02	0.02	0.03		
	Net Annual Demand Savings Goals (kW) <u>@ Meter</u>	470	620	630		
	<u>Net Demand Savings per Customer (kW) @ Generator</u>	<u>80</u>	<u>123</u>	<u>139</u>		
	<u>Net Annual Demand Savings Goals (kW) @ Generator</u>	<u>2,405,318</u>	<u>3,358,728</u>	<u>3,441,436</u>		
Estimated Budget	Budget Categories			2016	2017	2018
	Incentives			\$0	\$0	\$0
	Administration			\$5,480	\$4,400	\$4,400
	Marketing			\$5,480	\$4,400	\$4,400
	Delivery			\$274,000	\$220,000	\$220,000
	Total			\$284,960	\$228,800	\$228,800
Cost-Effectiveness	mTRC Test	RIM Test	Utility Cost Test	Societal Cost Test	Participant Cost Test	
	1.19	0.55	1.19	1.25	n/a	

Residential Online Home Energy Evaluation

Objective	Encourage energy education.																											
Target Market	All residential customers.																											
Description	<p>The program provides online evaluations to customers to help them understand how they use electricity and what opportunities they have to reduce their electricity use. Information about measures such as ENERGY STAR® products, heating and cooling equipment, weatherization materials, lighting and other end use products will be offered online. The program will also provide links to other Company residential energy efficiency programs.</p> <p>Customers that complete an online evaluation will receive a free energy saving kit. The kit may include: faucet aerator, low-flow showerhead and CFLs.</p>																											
Program Goals	<ul style="list-style-type: none"> • Increase awareness of energy efficiency and energy use in the home. • Educate residential customers about the benefits of energy efficiency and the opportunities to reduce energy consumption. • Increase awareness of and participation in Black Hills energy efficiency programs. • Support the use of the internet as a source of education and resources on energy efficiency. 																											
Implementation Strategy	The program may be marketed through bill inserts and other media, as well as online through BHE's website.																											
Measures & Incentives	The online tool and energy saving kit are offered to customers for no charge.																											
Estimated Participation	<table border="1"> <thead> <tr> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>2,000</td> <td>2,000</td> <td>2,000</td> </tr> </tbody> </table>				2016	2017	2018	2,000	2,000	2,000																		
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Estimated Savings	<p>Net Energy and Demand Savings Goals</p> <table border="1"> <thead> <tr> <th rowspan="2">Eligible Measure</th> <th rowspan="2">Net Savings per Customer</th> <th colspan="3">Annual Net Savings Goals</th> </tr> <tr> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Net Energy Savings Goals (kWh)</td> <td>106</td> <td>212,297</td> <td>212,297</td> <td>212,297</td> </tr> <tr> <td>Net Demand Savings Goals (kW)</td> <td>0.013</td> <td>26</td> <td>26</td> <td>26</td> </tr> </tbody> </table>				Eligible Measure	Net Savings per Customer	Annual Net Savings Goals			2016	2017	2018	Net Energy Savings Goals (kWh)	106	212,297	212,297	212,297	Net Demand Savings Goals (kW)	0.013	26	26	26						
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Cost-Effectiveness	mTRC Test	RIM Test	Utility Cost Test	Societal Cost Test	Participant Cost Test
	4.05	0.59	4.05	4.15	n/a



e. Commercial and Industrial Programs

C&I New Construction Program

Objective	Promote energy-efficiency in new construction and major renovation projects.
Target Market	Commercial and industrial customers and builders for new construction and major renovations.

<p>Description</p>	<p>The program encourages customers and builders to incorporate energy efficiency into new construction and major building renovations. Customers can follow one of four tracks:</p> <ul style="list-style-type: none"> • Track I. Targets small commercial buildings, between 5,000 and 15,000 square feet in size, that are primarily design or construction. Buildings must achieve 15% savings over IECC code. • Track II. Targets buildings larger than 15,000 square feet that are straightforward in design and may be on a faster design schedule. Track II provides evaluation of efficiency options of one type of mechanical system solution. Buildings must achieve 15% savings over IECC code. • Track III. Targets buildings larger than 15,000 square feet that have energy savings goals in mind and time to integrate new ideas and strategies into the design. Buildings are typically modeled to achieve energy savings of 30 to 40% greater than IECC code. • Track IV. Track IV offers incentives and assistance to help building owners or developers achieve energy savings of 40 to 60% better than current IECC code. The track also provides technical and certification support for participants to meet the requirements of LEED, ENERGY STAR, EPA Act, 2030 Challenge and other initiatives. <p>Customers are eligible for design and construction incentives:</p> <ul style="list-style-type: none"> • Design Incentives. BHE’s independent energy design consultant facilitates design team planning of various energy-saving strategies. Incentives are provided to the owner’s team of professionals to help offset expenses associated with program participation. The design team payment is a one-time lump sum amount paid to the design team lead and based on the program track. • Construction Incentives. Must achieve a minimum energy savings of 15% higher than IECC code. Incentives are paid upon receipt of the final energy verification report. <p>Incentives cannot reduce overall payback to less than one year. Customers cannot receive incentives for these measures through other energy efficiency programs offered by BHE.</p> <table border="1" data-bbox="418 1230 1089 1402"> <thead> <tr> <th>Track</th> <th>Design Incentive</th> <th>Construction Incentive</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>\$1,000</td> <td>\$0.06–0.19/kWh</td> </tr> <tr> <td>II</td> <td>\$3,500</td> <td>\$0.06–0.19/kWh</td> </tr> <tr> <td>III</td> <td>\$5,500</td> <td>\$0.06–0.19/kWh</td> </tr> <tr> <td>IV</td> <td>\$6,500 - \$8,500</td> <td>\$0.17–0.19/kWh</td> </tr> </tbody> </table>	Track	Design Incentive	Construction Incentive	I	\$1,000	\$0.06–0.19/kWh	II	\$3,500	\$0.06–0.19/kWh	III	\$5,500	\$0.06–0.19/kWh	IV	\$6,500 - \$8,500	\$0.17–0.19/kWh
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IV	\$6,500 - \$8,500	\$0.17–0.19/kWh														
<p>Program Goals</p>	<ul style="list-style-type: none"> • Education of C&I customers about the benefits of green buildings. • Develop partnerships with design and construction firms that specialize in green building. • Demonstrate persistent energy savings and provide other benefits to end-users such as improved health, safety, and comfort. • Help commercial and industrial customers reduce their electricity bills. 															

<p>Implementation Strategy</p>	<p>The Company will engage an implementation contractor to:</p> <ul style="list-style-type: none"> • Review, screen and pre-qualify energy design projects. • As needed, facilitate meetings with the client design team to develop energy conservation strategies. • Develop the energy design report, detailing implementation, energy savings and payback for potential strategies. • Review construction documents and verify equipment/system installation. • Process customer applications and customer incentives. • Track program performance. <p>The program will be marketed primarily through partnerships with Black Hills trade allies, design firms, and building developers. Other marketing may include newspaper advertisements, email blasts or targeted mailings to customers and contractors, bill inserts, and advertising in building development trade publications.</p>																				
<p>Measures & Incentives</p>	<p>Incentives vary depending upon the building square footage and energy savings.</p> <table border="1" data-bbox="418 758 1089 934"> <thead> <tr> <th>Track</th> <th>Design Incentive</th> <th>Construction Incentive</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>\$1,000</td> <td>\$0.06–0.19/kWh</td> </tr> <tr> <td>II</td> <td>\$3,500</td> <td>\$0.06–0.19/kWh</td> </tr> <tr> <td>III</td> <td>\$5,500</td> <td>\$0.06–0.19/kWh</td> </tr> <tr> <td>IV</td> <td>\$6,500 - \$8,500</td> <td>\$0.17–0.19/kWh</td> </tr> </tbody> </table>	Track	Design Incentive	Construction Incentive	I	\$1,000	\$0.06–0.19/kWh	II	\$3,500	\$0.06–0.19/kWh	III	\$5,500	\$0.06–0.19/kWh	IV	\$6,500 - \$8,500	\$0.17–0.19/kWh					
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<p>Estimated Participation</p>	<table border="1" data-bbox="418 968 794 1035"> <thead> <tr> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	2016	2017	2018	1	1	1														
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<p>Estimated Savings</p>	<p>The savings in the table below are estimated based upon average historical customer savings. Actual savings will vary by project.</p> <p>Annual Net Energy and Demand Savings Goals</p> <table border="1" data-bbox="418 1178 1114 1591"> <thead> <tr> <th></th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Annual Net Energy Savings Goals (kWh) @ Meter</td> <td>143,413</td> <td>143,413</td> <td>143,413</td> </tr> <tr> <td>Annual Net Energy Savings Goals (kWh) @ Generator</td> <td>152,635</td> <td>152,635</td> <td>152,635</td> </tr> <tr> <td>Annual Net Demand Savings Goals (kW) @ Meter</td> <td>41</td> <td>41</td> <td>41</td> </tr> <tr> <td>Annual Net Demand Savings Goals (kW) @ Generator</td> <td>43</td> <td>43</td> <td>43</td> </tr> </tbody> </table>		2016	2017	2018	Annual Net Energy Savings Goals (kWh) @ Meter	143,413	143,413	143,413	Annual Net Energy Savings Goals (kWh) @ Generator	152,635	152,635	152,635	Annual Net Demand Savings Goals (kW) @ Meter	41	41	41	Annual Net Demand Savings Goals (kW) @ Generator	43	43	43
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Estimated Budget	Budget Categories				2016	2017	2018
	Incentives				\$15,300	\$15,300	\$15,300
	Administration				\$765	\$765	\$765
	Marketing				\$1,224	\$1,224	\$1,224
	Delivery				\$30,000	\$30,000	\$30,000
	Total				\$47,289	\$47,289	\$47,289
Cost-Effectiveness	mTRC Test	RIM Test	Utility Cost Test	Societal Cost Test	Participant Cost Test		
	3.59	1.57	5.57	3.73	3.41		

C&I Custom Program

Objective	Encourage commercial and industrial facilities to purchase and install energy efficient equipment.										
Target Market	Commercial and industrial customers.										
Description	<p>Equipment that does not qualify for a prescriptive rebate will be eligible for a custom rebate. Applications must be pre-approved by Black Hills before equipment is purchased and installed. The projects must (1) have an incremental payback of 1 year or longer and (2) have a societal benefit-to-cost ratio of 1.0 or higher.</p> <p>Incentives are the lesser of:</p> <ul style="list-style-type: none"> • 50% of the incremental project cost • \$ per kWh saved based on project size <table border="1" data-bbox="500 751 1143 915"> <thead> <tr> <th>kWh Savings</th> <th>Incentive \$ per kWh Savings</th> </tr> </thead> <tbody> <tr> <td>0 – 30,000</td> <td>\$0.30</td> </tr> <tr> <td>30,000 – 100,000</td> <td>\$0.25</td> </tr> <tr> <td>100,000 – 250,000</td> <td>\$0.20</td> </tr> <tr> <td>>250,000 kWh</td> <td>\$0.15</td> </tr> </tbody> </table> <p>A \$500,000 incentive cap is imposed per facility per program year. Multiple rebate applications for different measures may be submitted.</p>	kWh Savings	Incentive \$ per kWh Savings	0 – 30,000	\$0.30	30,000 – 100,000	\$0.25	100,000 – 250,000	\$0.20	>250,000 kWh	\$0.15
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30,000 – 100,000	\$0.25										
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>250,000 kWh	\$0.15										
Goals	<ul style="list-style-type: none"> • Educate C&I customers about the benefits of installing energy efficient equipment. • Demonstrate persistent energy savings and provide other benefits to end-users such as improved health, safety, and comfort. • Effectively install efficient equipment/systems through the Black Hills program. • Help commercial and industrial customers reduce their electricity bills. 										
Implementation Strategy	<p>Black Hills will engage an implementation contractor to:</p> <ul style="list-style-type: none"> • Review pre-approved applications • Process customer applications, verify eligibility, and process customer rebates. • Conduct QA/QC to verify equipment installation. • Track program performance. <p>The marketing strategy includes partnerships with Black Hills trade allies and distributors as well as direct customer marketing. The implementation contractor may work with Black Hills program staff to develop partnerships with contractors and distributors through trade ally breakfasts and other informational events. Direct customer marketing may include newspaper advertisements, email blasts or targeted mailings, bill inserts, and advertising in trade publications.</p>										

Measures & Incentives	<p>Incentives, up to a maximum cap of \$500,000 per facility, are the lesser of:</p> <ul style="list-style-type: none"> • 50% of the incremental project cost • \$ per kWh saved based on project size <table border="1" data-bbox="500 352 1143 512"> <thead> <tr> <th>kWh Savings</th> <th>Incentive \$ per kWh Savings</th> </tr> </thead> <tbody> <tr> <td>0 – 30,000</td> <td>\$0.30</td> </tr> <tr> <td>30,000 – 100,000</td> <td>\$0.25</td> </tr> <tr> <td>100,000 – 250,000</td> <td>\$0.20</td> </tr> <tr> <td>>250,000 kWh</td> <td>\$0.15</td> </tr> </tbody> </table>	kWh Savings	Incentive \$ per kWh Savings	0 – 30,000	\$0.30	30,000 – 100,000	\$0.25	100,000 – 250,000	\$0.20	>250,000 kWh	\$0.15																																		
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C&I Self Direct

Objective	<u>Encourage commercial and industrial facilities to purchase and install energy efficient equipment.</u>										
Target Market	<u>Commercial and industrial customers.</u>										
Description	<p><u>Equipment that does not qualify for a prescriptive rebate will be eligible for a custom rebate. Applications must be pre-approved by Black Hills before equipment is purchased and installed. The projects must (1) have an incremental payback of 1 year or longer, (2) have a societal benefit-to-cost ratio of 1.0 or higher, and (3) customers must have an aggregated peak load greater than 1 MW in any single month and aggregated annual energy usage of 5,000 MWh.</u></p> <p><u>Incentives are consistent with the Custom program and are the lesser of:</u></p> <ul style="list-style-type: none"> <u>• 50% of the incremental project cost</u> <u>• \$ per kWh saved based on project size</u> <table border="1" data-bbox="500 814 1143 978"> <thead> <tr> <th><u>kWh Savings</u></th> <th><u>Incentive \$ per kWh Savings</u></th> </tr> </thead> <tbody> <tr> <td><u>0 – 30,000</u></td> <td><u>\$0.30</u></td> </tr> <tr> <td><u>30,000 – 100,000</u></td> <td><u>\$0.25</u></td> </tr> <tr> <td><u>100,000 – 250,000</u></td> <td><u>\$0.20</u></td> </tr> <tr> <td><u>>250,000 kWh</u></td> <td><u>\$0.15</u></td> </tr> </tbody> </table> <p><u>Self-direct incentives will have a 10% adder to the value of the incentive from the Custom rebate. Incentives are reflected as a bill credit against the customer’s monthly DSM surcharge until the total amount of the rebate has been recouped through bill credits.</u></p> <p><u>Multiple rebate applications for different measures may be submitted.</u></p>	<u>kWh Savings</u>	<u>Incentive \$ per kWh Savings</u>	<u>0 – 30,000</u>	<u>\$0.30</u>	<u>30,000 – 100,000</u>	<u>\$0.25</u>	<u>100,000 – 250,000</u>	<u>\$0.20</u>	<u>>250,000 kWh</u>	<u>\$0.15</u>
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Goals	<ul style="list-style-type: none"> <u>• Educate C&I customers about the benefits of installing energy efficient equipment.</u> <u>• Demonstrate persistent energy savings and provide other benefits to end-users such as improved health, safety, and comfort.</u> <u>• Effectively install efficient equipment/systems through the Black Hills program.</u> <u>• Help commercial and industrial customers reduce their electricity bills.</u> 										
Implementation Strategy	<p><u>Black Hills will engage an implementation contractor to:</u></p> <ul style="list-style-type: none"> <u>• Review pre-approved applications</u> <u>• Process customer applications, verify eligibility, and process customer rebates.</u> <u>• Conduct QA/QC to verify equipment installation.</u> <u>• Track program performance.</u> <p><u>The marketing strategy includes partnerships with Black Hills trade allies and distributors as well as direct customer marketing. The implementation contractor may work with Black Hills program staff to develop partnerships with contractors and distributors through trade ally breakfasts and other informational events. Direct customer marketing may include newspaper advertisements, email blasts or targeted mailings, bill inserts, and advertising in trade publications.</u></p>										

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C&I Prescriptive Program

Objective	Encourage commercial and industrial facilities to purchase and install energy efficient equipment.
Target Market	Commercial and industrial customers.
Description	The program provides standardized prescriptive rebates to commercial and industrial customers that purchase and install qualifying energy efficient equipment/systems. Pre-qualified rebates are available for proven technologies that are readily available with known performance characteristics, including HVAC equipment, motors and refrigeration.
Program Goals	<ul style="list-style-type: none"> • Educate C&I customers about the benefits of energy efficient equipment/systems. • Develop partnerships with contractors and distributors to bring energy efficient products and systems to the market. • Demonstrate persistent energy savings and provide other benefits to end-users such as improved health, safety, and comfort. • Effectively install efficient equipment and systems through the Black Hills program. • Help commercial and industrial customers reduce their electricity bills.
Implementation Strategy	<p>Black Hills will engage an implementation contractor to:</p> <ul style="list-style-type: none"> • Process customer applications, verify eligibility, and process customer rebates. • Conduct QA/QC to verify equipment installation. • Track program performance. <p>The marketing strategy includes partnerships with Company trade allies and distributors as well as direct customer marketing. The implementation contractor may work with Black Hills program staff to develop partnerships with contractors and distributors through trade ally breakfasts and other informational events. Direct customer marketing may include newspaper advertisements, email blasts or targeted mailings, bill inserts, and advertising in trade publications.</p>

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Estimated Savings	Net Energy and Demand Savings per Unit			
	Eligible Measure	Unit	Net Energy Savings per Unit (kWh) @ Meter	Net Demand Savings per Unit (kW) @ Meter
	ECM for Refrigeration Evaporators	per unit	469	0.051
	Evaporative Fan Control	per unit	41	0.044
	Strip Curtains	per unit	2,379	0.280
	Pre-Rinse Spray Valves	per unit	2,094	-
	Automatic Door Closer for Walk-In Cooler	per unit	754	0.110
	Automatic Door Closer for Walk-In Freezer	per unit	1,846	0.247
	Door Heater Controls for Freezer	per Door	1,022	-
	VSD Air Compressor	per HP	422	0.176
	No Air Loss Drain	per Drain	2,894	0.286
	NEMA ODP/TEFC Motor	per HP	66	0.012
	Variable Frequency Drive (Fan)	per HP	1,049	0.190
	Variable Frequency Drive (Pump)	per HP	1,156	0.219
	Air Cooled Chiller	per Ton	29	0.118
	Water Cooled Chiller, Rotary Screw & Roll (<75 Tons)	per Ton	10	0.043
	Water Cooled Chiller, Rotary Screw & Roll (75 < 150 Tons)	per Ton	15	0.040
	Water Cooled Chiller, Rotary Screw & Roll (150 < 300 Tons)	per Ton	69	0.036
	Water Cooled Chiller, Rotary Screw & Roll (≥300 Tons)	per Ton	29	0.043
	PTAC	per Ton	159	0.910
	Air Source Heat Pump (<65 kBtuh)	per Ton	301	0.052
	Air Source Heat Pump (65<135 kBtuh)	per Ton	79	0.021
	Air Source Heat Pump (135<240 kBtuh)	per Ton	31	0.022
	Air Source Heat Pump (≥240 kBtuh)	per Ton	96	0.071
	Water Source Heat Pump	per Ton	257	0.103
	Air Conditioner (<65 kBtuh)	per Ton	65	0.052
	Air Conditioner (65<135 kBtuh)	per Ton	45	0.033
	Air Conditioner (135<240 kBtuh)	per Ton	64	0.047
	Air Conditioner (240<760 kBtuh)	per Ton	56	0.041
	Air Conditioner (≥760 kBtuh)	per Ton	24	0.018
	Air Conditioner Tune-Up	per Ton	702	0.312
	Direct Evaporative Pre-Cooling for Air Cooled Condensers	per Ton	223	0.236

<u>Eligible Measure</u>	<u>Unit</u>	<u>Net kWh per Unit @ Generator</u>	<u>Net kW per Unit @ Generator</u>
<u>ECM for Refrigeration Evaporators</u>	<u>per unit</u>	<u>499</u>	<u>0.054</u>
<u>Evaporative Fan Control</u>	<u>per unit</u>	<u>43</u>	<u>0.047</u>
<u>Strip Curtains</u>	<u>per unit</u>	<u>2,532</u>	<u>0.298</u>
<u>Pre-Rinse Spray Valves</u>	<u>per unit</u>	<u>2,228</u>	<u>0.000</u>
<u>Automatic Door Closer for Walk-In Cooler</u>	<u>per unit</u>	<u>803</u>	<u>0.117</u>
<u>Automatic Door Closer for Walk-In Freezer</u>	<u>per unit</u>	<u>1,964</u>	<u>0.263</u>
<u>Door Heater Controls for Freezer</u>	<u>per Door</u>	<u>1,088</u>	<u>0.000</u>
<u>VSD Air Compressor</u>	<u>per HP</u>	<u>449</u>	<u>0.187</u>
<u>No Air Loss Drain</u>	<u>per Drain</u>	<u>3,080</u>	<u>0.304</u>
<u>NEMA ODP Motor</u>	<u>per HP</u>	<u>70</u>	<u>0.013</u>
<u>NEMA TEFC Motor</u>	<u>per HP</u>	<u>70</u>	<u>0.013</u>
<u>Variable Frequency Drive (Fan)</u>	<u>per HP</u>	<u>1,116</u>	<u>0.202</u>
<u>Variable Frequency Drive (Pump)</u>	<u>per HP</u>	<u>1,230</u>	<u>0.233</u>
<u>Air Cooled Chiller</u>	<u>per Ton</u>	<u>31</u>	<u>0.126</u>
<u>Water Cooled Chiller, Rotary Screw & Roll (<75 Tons)</u>	<u>per Ton</u>	<u>10</u>	<u>0.046</u>
<u>Water Cooled Chiller, Rotary Screw & Roll (75 < 150 Tons)</u>	<u>per Ton</u>	<u>16</u>	<u>0.042</u>
<u>Water Cooled Chiller, Rotary Screw & Roll (150 < 300 Tons)</u>	<u>per Ton</u>	<u>73</u>	<u>0.038</u>
<u>Water Cooled Chiller, Rotary Screw & Roll (≥300 Tons)</u>	<u>per Ton</u>	<u>31</u>	<u>0.046</u>
<u>PTAC</u>	<u>per Ton</u>	<u>169</u>	<u>0.968</u>
<u>Air Source Heat Pump (<65 kBtuh)</u>	<u>per Ton</u>	<u>321</u>	<u>0.056</u>
<u>Air Source Heat Pump (65<135 kBtuh)</u>	<u>per Ton</u>	<u>84</u>	<u>0.022</u>
<u>Air Source Heat Pump (135<240 kBtuh)</u>	<u>per Ton</u>	<u>32</u>	<u>0.024</u>
<u>Air Source Heat Pump (≥240 kBtuh)</u>	<u>per Ton</u>	<u>102</u>	<u>0.075</u>
<u>Water Source Heat Pump</u>	<u>per Ton</u>	<u>274</u>	<u>0.109</u>
<u>Air Conditioner (<65 kBtuh)</u>	<u>per Ton</u>	<u>69</u>	<u>0.056</u>
<u>Air Conditioner (65<135 kBtuh)</u>	<u>per Ton</u>	<u>48</u>	<u>0.035</u>
<u>Air Conditioner (135<240 kBtuh)</u>	<u>per Ton</u>	<u>68</u>	<u>0.050</u>
<u>Air Conditioner (240<760 kBtuh)</u>	<u>per Ton</u>	<u>60</u>	<u>0.044</u>
<u>Air Conditioner (≥760 kBtuh)</u>	<u>per Ton</u>	<u>26</u>	<u>0.019</u>
<u>Air Conditioner Tune-Up</u>	<u>per Ton</u>	<u>748</u>	<u>0.332</u>
<u>Direct Evaporative Pre-Cooling for Air Cooled Condensers</u>	<u>per Ton</u>	<u>237</u>	<u>0.251</u>

	Annual Net Energy and Demand Savings Goals				
		2016	2017	2018	
	Annual Net Energy Savings Goals (kWh) @ Meter	<u>273,113</u> <u>90,792</u>	<u>280,655</u> <u>90,792</u>	<u>318,840</u> <u>90,792</u>	
	Annual Net Energy Savings Goals (kWh) @ Generator	<u>290,674</u>	<u>298,701</u>	<u>339,342</u>	
	Annual Net Demand Savings Goals (kW) @ Meter	<u>23486</u>	<u>25086</u>	<u>27886</u>	
	Annual Net Demand Savings Goals (kW) @ Generator	<u>250</u>	<u>266</u>	<u>296</u>	
Estimated Budget	Budget Categories				
		2016	2017	2018	
	Incentives	<u>\$124,770</u> <u>\$43,440</u>	<u>\$130,520</u> <u>\$43,440</u>	<u>\$147,635</u> <u>\$43,440</u>	
	Administration	<u>\$4,991</u> <u>\$2,172</u>	<u>\$5,221</u> <u>\$2,172</u>	<u>\$5,905</u> <u>\$2,172</u>	
	Marketing	<u>\$11,229</u> <u>\$4,344</u>	<u>\$11,747</u> <u>\$4,344</u>	<u>\$13,287</u> <u>\$4,344</u>	
	Delivery	<u>\$6,900</u> <u>\$3,000</u>	<u>\$7,360</u> <u>\$3,000</u>	<u>\$8,050</u> <u>\$3,000</u>	
	Total	<u>\$147,890</u> <u>\$52,956</u>	<u>\$154,848</u> <u>\$52,956</u>	<u>\$174,878</u> <u>\$52,956</u>	
Cost-Effectiveness	mTRC Test	RIM Test	Utility Cost Test	Societal Cost Test	Participant Cost Test
	<u>2.953.04</u>	<u>3.05</u> <u>3.22</u>	<u>6.606.67</u>	<u>2.993.08</u>	<u>1.061.03</u>

C&I Lighting Program

Objectives	Encourage commercial and industrial customers to purchase and install energy efficient lighting measures. Effectively engage small business customers.
Target Market	Commercial and industrial customers; commercial customers with an average electric demand of 350 kW or less per year.
Description	<p>The program is comprised of two components:</p> <p>Prescriptive Lighting. Provide standardized prescriptive rebates to all commercial and industrial customers that purchase and install qualifying energy efficient lighting measures. Pre-qualified rebates are available for proven technologies that are readily available with known performance characteristics.</p> <p>Small Business Direct Install Lighting. Commercial customers with an average electric demand of less than 350 kW per year will receive the following:</p> <ul style="list-style-type: none"> • Free lighting energy evaluation identifying potential energy savings. • Customized proposal, including information on potential energy savings, installation costs, and anticipated payback. • Incentives are up to 70% of the equipment and installation costs.
Program Goals	<ul style="list-style-type: none"> • Develop new partnerships with contractors to bring efficient lighting to the market. • Increase awareness of and participation in BHE’s program through improved branding, marketing, and coordination between market actors. • Educate customers and trade allies on the benefits of new efficient lighting technologies. • Help commercial customers reduce their electricity bills. • Build consumer confidence in the reliability of savings estimates through an educated sales force and a highly tailored program approach.
Implementation Strategy	<p>Black Hills will engage an implementation contractor(s) to assist in delivery of the program.</p> <p>Prescriptive Lighting. The implementation contractor will:</p> <ul style="list-style-type: none"> • Process customer applications, verify eligibility, and process customer rebates. • Conduct QA/QC to verify equipment installation. • Track program performance. <p>Small Business Direct Install Lighting. The implementation strategy will incorporate the following components:</p> <ul style="list-style-type: none"> • <i>Walk-Through Evaluations.</i> Trained evaluators complete a walk-through evaluation of the business using standard audit software, identifying specific energy saving opportunities. The evaluator will review the anticipated costs and savings of the measures, along with information on financial resources available to help defray costs. Customers will be provided with a customized proposal. • <i>Direct Installation of Measures.</i> Upon customer approval of the proposal, the implementation contractor will install the lighting measures.

- *Customer Education.* Customers will be educated on energy efficient lighting and Company commercial and industrial programs.

The implementation contractor will:

- Hire qualified, local individuals to conduct energy evaluations and install efficient lighting. Provide training, ongoing as needed, to evaluators.
- Schedule customer evaluators and lighting upgrades.
- Assist with program marketing and outreach.
- Provide customer service support.
- Track program performance, including evaluation requests, evaluation activities and customer actions.

Black Hills will market the program through its website and bill inserts, as well as directly to business owners, operators, property owners and tenants. Program representatives will participate in trade association and business organization meetings, trade fairs, and other events. As projects are completed, case studies will be prepared and used to inform the utility's marketing efforts.

Measures & Incentives	<p>Small Business Direct Install incentives up to 70% of the equipment and installation costs.</p> <table border="1"> <thead> <tr> <th style="background-color: #f4a460;">Eligible Measure</th> <th style="background-color: #f4a460;">Incentive per Unit</th> </tr> </thead> <tbody> <tr><td>LED Exit Sign</td><td>\$10</td></tr> <tr><td>Ceiling Occupancy Sensor</td><td>\$40</td></tr> <tr><td>Wall Occupancy Sensor</td><td>\$15</td></tr> <tr><td>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 2-3 lamp)</td><td>\$55</td></tr> <tr><td>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 4-6 lamp)</td><td>\$75</td></tr> <tr><td>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 8-lamp)</td><td>\$85</td></tr> <tr><td>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 10-lamp)</td><td>\$95</td></tr> <tr><td>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 4-lamp)</td><td>\$55</td></tr> <tr><td>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 6-8 lamp)</td><td>\$75</td></tr> <tr><td>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 12-16 lamp)</td><td>\$85</td></tr> <tr><td>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 18-20 lamp)</td><td>\$95</td></tr> <tr><td>Low Wattage T8 Lamp</td><td>\$1.00</td></tr> <tr><td>Ceramic Metal Halide Fixture ($\leq 150W$)</td><td>\$35</td></tr> <tr><td>Ceramic Metal Halide Fixture (150-250W)</td><td>\$45</td></tr> <tr><td>Ceramic Metal Halide Fixture ($\geq 250W$)</td><td>\$55</td></tr> <tr><td>Ceramic Metal Halide Fixture w/ Integrated Ballast</td><td>\$25</td></tr> <tr><td>Pulse Start Metal Halide Fixture ($\leq 175W$)</td><td>\$25</td></tr> <tr><td>Pulse Start Metal Halide Fixture (175-320W)</td><td>\$40</td></tr> <tr><td>Pulse Start Metal Halide Fixture (320-750W)</td><td>\$55</td></tr> <tr><td>Pulse Start Metal Halide Fixture ($\geq 750W$)</td><td>\$70</td></tr> <tr><td>Energy Star LED Lamp ($\leq 5W$)</td><td>\$10</td></tr> <tr><td>Energy Star LED Lamp (5-10W)</td><td>\$15</td></tr> <tr><td>Energy Star LED Lamp (10-20W)</td><td>\$20</td></tr> <tr><td>Energy Star LED Lamp (20-22W)</td><td>\$25</td></tr> <tr><td>Energy Star LED Downlight Fixture</td><td>\$35</td></tr> <tr><td>High Performance T8</td><td>\$9</td></tr> <tr><td>LED Recessed Light Fixture (2x2)</td><td>\$30</td></tr> <tr><td>LED Recessed Light Fixture (2x4)</td><td>\$40</td></tr> <tr><td>LED Recessed Light Fixture (1x4)</td><td>\$50</td></tr> <tr><td>LED Parking Garage/Canopy ($< 30W$)</td><td>\$60</td></tr> <tr><td>LED Parking Garage/Canopy (30-75W)</td><td>\$100</td></tr> <tr><td>LED Parking Garage/Canopy ($\geq 75W$)</td><td>\$140</td></tr> <tr><td>LED Flood Light ($< 15W$)</td><td>\$12</td></tr> <tr><td>LED Flood Light ($\geq 15W$)</td><td>\$15</td></tr> <tr><td>LED Outdoor Pole/Arm Mounted Parking/Roadway ($< 30W$)</td><td>\$60</td></tr> <tr><td>LED Outdoor Pole/Arm Mounted Parking/Roadway (30-75W)</td><td>\$100</td></tr> <tr><td>LED Outdoor Pole/Arm Mounted Parking/Roadway ($\geq 75W$)</td><td>\$140</td></tr> <tr><td>Lighting Optimization - Remove Lamp from T8 System</td><td>\$8</td></tr> <tr><td>Exterior LED Wall Pack Fixtures ($\leq 25W$)</td><td>\$35</td></tr> <tr><td>Exterior LED Wall Pack Fixtures (25-60W)</td><td>\$75</td></tr> <tr><td>Exterior LED Wall Pack Fixtures ($\geq 60W$)</td><td>\$100</td></tr> <tr><td>LED Refrigerator Case Light</td><td>\$60</td></tr> </tbody> </table>	Eligible Measure	Incentive per Unit	LED Exit Sign	\$10	Ceiling Occupancy Sensor	\$40	Wall Occupancy Sensor	\$15	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 2-3 lamp)	\$55	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 4-6 lamp)	\$75	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 8-lamp)	\$85	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 10-lamp)	\$95	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 4-lamp)	\$55	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 6-8 lamp)	\$75	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 12-16 lamp)	\$85	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 18-20 lamp)	\$95	Low Wattage T8 Lamp	\$1.00	Ceramic Metal Halide Fixture ($\leq 150W$)	\$35	Ceramic Metal Halide Fixture (150-250W)	\$45	Ceramic Metal Halide Fixture ($\geq 250W$)	\$55	Ceramic Metal Halide Fixture w/ Integrated Ballast	\$25	Pulse Start Metal Halide Fixture ($\leq 175W$)	\$25	Pulse Start Metal Halide Fixture (175-320W)	\$40	Pulse Start Metal Halide Fixture (320-750W)	\$55	Pulse Start Metal Halide Fixture ($\geq 750W$)	\$70	Energy Star LED Lamp ($\leq 5W$)	\$10	Energy Star LED Lamp (5-10W)	\$15	Energy Star LED Lamp (10-20W)	\$20	Energy Star LED Lamp (20-22W)	\$25	Energy Star LED Downlight Fixture	\$35	High Performance T8	\$9	LED Recessed Light Fixture (2x2)	\$30	LED Recessed Light Fixture (2x4)	\$40	LED Recessed Light Fixture (1x4)	\$50	LED Parking Garage/Canopy ($< 30W$)	\$60	LED Parking Garage/Canopy (30-75W)	\$100	LED Parking Garage/Canopy ($\geq 75W$)	\$140	LED Flood Light ($< 15W$)	\$12	LED Flood Light ($\geq 15W$)	\$15	LED Outdoor Pole/Arm Mounted Parking/Roadway ($< 30W$)	\$60	LED Outdoor Pole/Arm Mounted Parking/Roadway (30-75W)	\$100	LED Outdoor Pole/Arm Mounted Parking/Roadway ($\geq 75W$)	\$140	Lighting Optimization - 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	Stairwell Fixtures w/ Integral Occupancy			\$30
Estimated Participation		2016	2017	2018
	Prescriptive Lighting	364163	393192	415228
	Small Business Direct Install Lighting	195	202	208
	Total	559358	595394	623436

Estimated Savings	Prescriptive Lighting Net Energy and Demand Savings per Lighting Unit		
	Eligible Measure	Net Energy Savings per Unit (kWh) @ Meter	Net Demand Savings per Unit (kW) @ Meter
	LED Exit Sign	348	0.047
	Ceiling Occupancy Sensor	558	0.381
	Wall Occupancy Sensor	333	0.227
	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 2-3 lamp)	216	0.060
	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 4-6 lamp)	374	0.104
	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 8-lamp)	886	0.248
	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 10-lamp)	1,149	0.321
	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 4-lamp)	226	0.063
	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 6-8 lamp)	666	0.186
	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 12-16 lamp)	1,058	0.296
	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 18-20 lamp)	1,330	0.372
	Low Wattage T8 Lamp	14	0.004
	Ceramic Metal Halide Fixture ($\leq 150W$)	130	0.036
	Ceramic Metal Halide Fixture (150-250W)	246	0.069
	Ceramic Metal Halide Fixture ($\geq 250W$)	248	0.069
	Ceramic Metal Halide Fixture w/ Integrated Ballast	186	0.052
	Pulse Start Metal Halide Fixture ($\leq 175W$)	49	0.014
	Pulse Start Metal Halide Fixture (175-320W)	146	0.041
	Pulse Start Metal Halide Fixture (320-750W)	200	0.056
	Pulse Start Metal Halide Fixture ($\geq 750W$)	622	0.174
	Energy Star LED Lamp ($\leq 5W$)	37	0.010
	Energy Star LED Lamp (5-10W)	56	0.016
	Energy Star LED Lamp (10-20W)	88	0.025
	Energy Star LED Lamp (20-22W)	111	0.031
	Energy Star LED Downlight Fixture	123	0.034
	High Performance T8	23	0.006
	LED Recessed Light Fixture (2x2)	37	0.010
	LED Recessed Light Fixture (2x4)	80	0.022
	LED Recessed Light Fixture (1x4)	62	0.017
	LED Parking Garage/Canopy ($< 30W$)	245	0.106
	LED Parking Garage/Canopy (30-75W)	303	0.130
	LED Parking Garage/Canopy ($\geq 75W$)	568	0.245
	LED Flood Light ($< 15W$)	100	-
	LED Flood Light ($\geq 15W$)	112	-
	LED Outdoor Pole/Arm Mounted Parking/Roadway ($< 30W$)	245	-
	LED Outdoor Pole/Arm Mounted Parking/Roadway (30-75W)	303	-
	LED Outdoor Pole/Arm Mounted Parking/Roadway ($\geq 75W$)	568	-
	Lighting Optimization - Remove Lamp from T8 System	71	-
	Lighting Optimization - Remove 2 Lamps from T8 System	141	-

Exterior LED Wall Pack Fixtures ($\leq 25W$)	216	-
Exterior LED Wall Pack Fixtures (25-60W)	513	-
Exterior LED Wall Pack Fixtures ($\geq 60W$)	789	-
LED Refrigerator Case Light	422	0.029
Stairwell Fixtures w/ Integral Occupancy (T8 1-2 lamp)	363	0.025
Stairwell Fixtures w/ Integral Occupancy (LED 20-30W)	380	0.026

Eligible Measure	Net kWh per Unit @ Generator	Net kW per Unit @ Generator
<u>LED Exit Sign</u>	<u>371</u>	<u>0.050</u>
<u>Ceiling Occupancy Sensor</u>	<u>594</u>	<u>0.405</u>
<u>Wall Occupancy Sensor</u>	<u>354</u>	<u>0.242</u>
<u>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 2-3 lamp)</u>	<u>230</u>	<u>0.064</u>
<u>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 4-6 lamp)</u>	<u>398</u>	<u>0.111</u>
<u>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 8-lamp)</u>	<u>943</u>	<u>0.264</u>
<u>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 10-lamp)</u>	<u>1,223</u>	<u>0.342</u>
<u>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 4-lamp)</u>	<u>240</u>	<u>0.067</u>
<u>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 6-8 lamp)</u>	<u>709</u>	<u>0.198</u>
<u>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 12-16 lamp)</u>	<u>1,126</u>	<u>0.315</u>
<u>High Bay Fluorescent Fixture w/ HE Electronic Ballast (T8 18-20 lamp)</u>	<u>1,415</u>	<u>0.396</u>
<u>Low Wattage T8 Lamp</u>	<u>15</u>	<u>0.004</u>
<u>Ceramic Metal Halide Fixture ($\leq 150W$)</u>	<u>138</u>	<u>0.039</u>
<u>Ceramic Metal Halide Fixture (150-250W)</u>	<u>262</u>	<u>0.073</u>
<u>Ceramic Metal Halide Fixture ($\geq 250W$)</u>	<u>264</u>	<u>0.074</u>
<u>Ceramic Metal Halide Fixture w/ Integrated Ballast</u>	<u>198</u>	<u>0.055</u>
<u>Pulse Start Metal Halide Fixture ($\leq 175W$)</u>	<u>52</u>	<u>0.015</u>
<u>Pulse Start Metal Halide Fixture (175-320W)</u>	<u>156</u>	<u>0.044</u>
<u>Pulse Start Metal Halide Fixture (320-750W)</u>	<u>212</u>	<u>0.059</u>
<u>Pulse Start Metal Halide Fixture ($\geq 750W$)</u>	<u>662</u>	<u>0.185</u>
<u>Energy Star LED Lamp ($\leq 5W$)</u>	<u>40</u>	<u>0.011</u>
<u>Energy Star LED Lamp (5-10W)</u>	<u>59</u>	<u>0.017</u>
<u>Energy Star LED Lamp (10-20W)</u>	<u>94</u>	<u>0.026</u>
<u>Energy Star LED Lamp (20-22W)</u>	<u>119</u>	<u>0.033</u>
<u>Energy Star LED Downlight Fixture</u>	<u>131</u>	<u>0.037</u>
<u>High Performance T8</u>	<u>25</u>	<u>0.007</u>
<u>LED Recessed Light Fixture (2x2)</u>	<u>40</u>	<u>0.011</u>
<u>LED Recessed Light Fixture (2x4)</u>	<u>85</u>	<u>0.024</u>
<u>LED Recessed Light Fixture (1x4)</u>	<u>66</u>	<u>0.019</u>
<u>LED Parking Garage/Canopy ($< 30W$)</u>	<u>261</u>	<u>0.113</u>
<u>LED Parking Garage/Canopy (30-75W)</u>	<u>322</u>	<u>0.139</u>

<u>LED Parking Garage/Canopy (≥75W)</u>	<u>604</u>	<u>0.260</u>
<u>LED Flood Light (<15W)</u>	<u>106</u>	<u>0.000</u>
<u>LED Flood Light (≥15W)</u>	<u>119</u>	<u>0.000</u>
<u>LED Outdoor Pole/Arm Mounted Parking/Roadway (<30W)</u>	<u>261</u>	<u>0.000</u>
<u>LED Outdoor Pole/Arm Mounted Parking/Roadway (30-75W)</u>	<u>322</u>	<u>0.000</u>
<u>LED Outdoor Pole/Arm Mounted Parking/Roadway (≥75W)</u>	<u>604</u>	<u>0.000</u>
<u>Lighting Optimization - Remove Lamp from T8 System</u>	<u>75</u>	<u>0.000</u>
<u>Lighting Optimization - Remove 2 Lamps from T8 System</u>	<u>150</u>	<u>0.000</u>
<u>Exterior LED Wall Pack Fixtures (≤25W)</u>	<u>229</u>	<u>0.000</u>
<u>Exterior LED Wall Pack Fixtures (25-60W)</u>	<u>546</u>	<u>0.000</u>
<u>Exterior LED Wall Pack Fixtures (≥60W)</u>	<u>839</u>	<u>0.000</u>
<u>LED Refrigerator Case Light</u>	<u>449</u>	<u>0.031</u>
<u>Stairwell Fixtures w/ Integral Occupancy (T8 1-2 lamp)</u>	<u>386</u>	<u>0.027</u>
<u>Stairwell Fixtures w/ Integral Occupancy (LED 20-30W)</u>	<u>404</u>	<u>0.028</u>

The Small Business Direct Install Lighting savings per customer are estimated based upon average historical customer savings. Actual savings will vary by project.

Unit	Net kWh per Unit	Net kW per Unit
per Customer @ Meter	25,709	7.664
per Customer @ Generator	27,363	8.157

Net kWh Savings Goals

	2016	2017	2018
<u>Prescriptive Lighting @ Meter</u>	<u>1,472,076</u> <u>654,416</u>	<u>1,588,508</u> <u>778,363</u>	<u>1,686,173</u> <u>914,113</u>
<u>Small Business Direct Install Lighting @ Meter</u>	5,013,340	5,193,306	5,347,563
<u>TOTAL @ Meter</u>	<u>5,667,756</u>	<u>5,971,669</u>	<u>6,261,676</u>
<u>Prescriptive Lighting @ Generator</u>	<u>1,566,730</u>	<u>1,690,649</u>	<u>1,794,594</u>
<u>Small Business Direct Install Lighting @ Generator</u>	<u>5,335,698</u>	<u>5,527,236</u>	<u>5,691,411</u>
<u>TOTAL @ Generator</u>	<u>6,902,428</u>	<u>7,217,885</u>	<u>7,486,004</u>

Net kW Savings Goals

	2016	2017	2018
<u>Prescriptive Lighting @ Meter</u>	<u>409179.0</u>	<u>441216</u> <u>.3</u>	<u>471256</u> <u>.6</u>
<u>Small Business Direct Install Lighting @ Meter</u>	1,494.4	1,548.1	1,594.1
<u>TOTAL @ Meter</u>	<u>1,9031,67</u> <u>3</u>	<u>1,9894</u> <u>,764</u>	<u>2,0651</u> <u>,851</u>
<u>Prescriptive Lighting @ Generator</u>	<u>435</u>	<u>470</u>	<u>502</u>
<u>Small Business Direct Install Lighting @ Generator</u>	<u>1,591</u>	<u>1,648</u>	<u>1,697</u>
<u>TOTAL @ Generator</u>	<u>2,025</u>	<u>2,117</u>	<u>2,198</u>

Estimated Budget	Budget Categories		2016	2017	2018
	Incentives		\$1,386,225 \$1,240,040	\$1,447,515 \$1,302,170	\$1,498,790 \$1,361,440
	Administration		\$77,913 \$95,698	\$81,171 \$100,014	\$83,913 \$104,014
	Marketing		\$124,760 \$124,004	\$130,276 \$130,217	\$134,891 \$136,144
	Delivery		\$495,830 \$478,055	\$516,681 \$499,406	\$531,760 \$518,135
	Total		\$2,084,728 \$1,937,797	\$2,175,643 \$2,031,807	\$2,249,354 \$2,119,733
Cost-Effectiveness	mTRC Test	RIM Test	Utility Cost Test	Societal Cost Test	Participant Cost Test
	3.693.70	1.58 1.59	5.375.29	3.833.84	2.702.72

f. Special Programs

Low-Income Assistance Program

Objective	Assist low-income customers in reducing their energy consumption.																							
Target Market	Income-eligible residential customers in the Black Hills service territory.																							
Description	<p>Qualifying low-income customers receive help managing their energy use and utility bills. The program works directly with local community action program (CAP) agencies that already provide services to low-income customers through the Colorado Energy Office (CEO) as well as NeighborWorks of Pueblo (NWP).</p> <p>Black Hills funds will be used in two ways:</p> <ol style="list-style-type: none"> (1) Pay the full cost of measures that reduce electric cooling, refrigeration and lighting. <ul style="list-style-type: none"> • Compact Fluorescent Lamps (CFLs) • Standard LEDs • ENERGY STAR® Refrigerators • Window/Wall Evaporative Coolers (2) Customers receive a home energy evaluation and direct installation of low-cost measures at no cost. The evaluation identifies potential efficiency improvements, educates the customer on managing energy costs. The low-cost measures that may be installed include: faucet aerator, low-flow showerhead, water temperature setback, hot water pipe insulation and CFLs. <p>Up to \$1,500 in free measures are available to customers.</p>																							
Program Goals	<ul style="list-style-type: none"> • Demonstrate persistent energy savings and provide other benefits to end-users such as improved health, safety, and comfort. • Encourage energy saving behavior. • Help residential customers reduce their electricity bills. • Assist income-eligible customers achieve energy savings. 																							
Implementation Strategy	Black Hills will work with the CAP agencies, CEO, and NWP to implement and directly market the program to income-eligible residential customers. Marketing may also include bill inserts and direct mailing. <u>Home energy evaluation/direct install participants will be provided with a list of local agencies providing bill payment assistance, in addition to Black Hills Energy Assistance Program (BHEAP) materials.</u>																							
Measures & Incentives	Participants receive CFLs , LEDs, refrigerators, and evaporative coolers at no cost.																							
Estimated Participation	<table border="1"> <thead> <tr> <th>Eligible Measure</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Customer Evaluation (Direct Install Measures)</td> <td>750175</td> <td>750175</td> <td>750175</td> </tr> <tr> <td>Standard CFL</td> <td>480</td> <td>420</td> <td>360</td> </tr> <tr> <td>Standard LED</td> <td>240120</td> <td>240180</td> <td>240</td> </tr> <tr> <td>ENERGY STAR Refrigerator</td> <td>435360</td> <td>435360</td> <td>435360</td> </tr> </tbody> </table>	Eligible Measure	2016	2017	2018	Customer Evaluation (Direct Install Measures)	750175	750175	750175	Standard CFL	480	420	360	Standard LED	240120	240180	240	ENERGY STAR Refrigerator	435360	435360	435360			
Eligible Measure	2016	2017	2018																					
Customer Evaluation (Direct Install Measures)	750175	750175	750175																					
Standard CFL	480	420	360																					
Standard LED	240120	240180	240																					
ENERGY STAR Refrigerator	435360	435360	435360																					

	Evaporative Cooling	464384	464384	464384		
		1,8891,519	1,8891,519	1,8891,519		
	Total	519	519	519		
Estimated Savings	Net Energy Savings Goals					
	Eligible Measure	Unit	Net kWh per Unit @ Meter	Annual Net Energy Savings Goals (kWh) @ Meter		
				2016	2017	2018
	Customer Evaluation (Direct Install Measures)	per Home	167	125,337 29,245	125,337 29,245	125,337 29,245
	Standard CFL	per bulb	20	96,535	84,468	72,401
	Standard LED	per bulb	23	54,925 27,463	54,925 41,194	54,925 54,925
	ENERGY STAR Refrigerator	per unit	44	19,270 15,947	19,270 15,947	19,270 15,947
	Evaporative Cooler	per unit	1,573	729,872 604,032	729,872 604,032	729,872 604,032
			TOTAL	929,404 773,222	929,404 74,887	929,404 776,551
	Net Energy Savings Goals (kWh) @ Generator					
	Eligible Measure	Unit	Net kWh per Unit @ Generator	2016	2017	2018
	Customer Evaluation (Direct Install Measures)	per Home	167	133,396	133,396	133,396
	Standard LED	per bulb	23	58,457	58,457	58,457
	ENERGY STAR Refrigerator	per unit	44	20,509	20,509	20,509
	Evaporative Cooler	per unit	1,573	776,803	776,803	776,803
			TOTAL	989,165	989,165	989,165
	Net Demand Savings Goals					
	Eligible Measure	Unit	Net kW per Unit @ Meter	Annual Net Demand Savings Goals (kW) @ Meter		
				2016	2017	2018
	Customer Evaluation (Direct Install Measures)	per Home	0.021	15.97 3.73	15.97 3.73	15.97 3.73
	Standard CFL	per bulb	0.002	11.14	9.74	8.35
Standard LED	per bulb	0.003	6.34 3.17	6.34 4.75	6.34 6.34	
ENERGY STAR Refrigerator	per unit	0.007	2.91 2.41	2.91 2.41	2.91 2.41	
Evaporative Cooler	per unit	1.745	810.670	810.670	810.670	
		TOTAL	835.690	835.690	835.691	
Net Demand Savings Goals (kW) @ Generator						
Eligible Measure	Unit	Net kW per Unit @ Generator	2016	2017	2018	

	<u>Customer Evaluation (Direct Install Measures)</u>	<u>per Home</u>	<u>0.023</u>	<u>16.99</u>	<u>16.99</u>	<u>16.99</u>
	<u>Standard LED</u>	<u>per bulb</u>	<u>0.003</u>	<u>6.74</u>	<u>6.74</u>	<u>6.74</u>
	<u>ENERGY STAR Refrigerator</u>	<u>per unit</u>	<u>0.007</u>	<u>3.09</u>	<u>3.09</u>	<u>3.09</u>
	<u>Evaporative Cooler</u>	<u>per unit</u>	<u>1.857</u>	<u>862</u>	<u>862</u>	<u>862</u>
	TOTAL			889	889	889
Estimated Budget	Budget Categories	2016	2017	2018		
	Incentives	\$0 \$0	\$0 \$0	\$0 \$0		
		\$22,818	\$22,818	\$22,818		
	Administration	\$29,131	\$29,131	\$29,131		
		\$36,508	\$36,508	\$36,508		
	Marketing	\$46,610	\$46,610	\$46,610		
		\$781,450	\$781,450	\$781,450		
	Delivery	\$582,625	\$582,625	\$582,625		
Total	\$840,776 \$658,366	\$840,776 \$658,366	\$840,776 \$658,366			
Cost-Effectiveness	mTRC Test	RIM Test	Utility Cost Test	Societal Cost Test	Participant Cost Test	
	<u>3.813-94</u>	<u>1.68</u> <u>1.8</u>	<u>3.813-94</u>	<u>3.873-97</u>	<u>n/an/a</u>	

School Based Energy Education Program

Objective	Enhance student education and awareness of energy efficiency and conservation.						
Target Market	Middle school and high school children, teachers, principals, parents						
Description	<p>The program provides hands-on education lessons and energy savings kits to middle and high school students within Black Hills' service territory. The energy savings kits consist of a set of low-cost measures to be installed in the home, providing hands-on methods for the students to evaluate the impact of measure implementation.</p> <p>Each teacher/classroom receives lesson plans, classroom posters, a program video, step-by-step checklist and supplemental activities. The energy savings kits may include:</p> <ul style="list-style-type: none"> • Standard LED bulbs • Standard CFL bulbs • Low-flow Showerhead • Kitchen Aerator • LED Light Bulb • Furnace/Air Conditioner Filter Alarm • Efficient Night Light • Digital Thermometer • Toilet Leak Detector Tablets • Flow Rate Test Bag • Natural Resources Fact Chart • Mini Tape Measure 						
Program Goals	<ul style="list-style-type: none"> • Increase awareness of efficiency and conservation among students, teachers, and parents. • Educate students about the benefits of efficiency and the opportunities to reduce energy consumption in the home and at school. • Increase awareness of and participation in other Company energy efficiency programs. • Expand school curricula to include lessons on efficiency and conservation. 						
Implementation Strategy	Black Hills promotes the program to school districts and teachers through education associations and targets middle and high school children and their households. The program is marketed to school officials including teachers, principals and school district personnel. Information on the benefits of this program is explained to teachers or principals prior to handing out the energy kits. The Company will target middle and high schools to minimize the number of students that would participate in the program twice.						
Measures & Incentives	Each student is provided with an energy savings kit at no cost.						
Estimated Participation	<p>High school students will account for 500 participants and middle school students will account for 2,000 participants.</p> <table border="1"> <thead> <tr> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>2,500</td> <td>2,500</td> <td>2,500</td> </tr> </tbody> </table>	2016	2017	2018	2,500	2,500	2,500
2016	2017	2018					
2,500	2,500	2,500					

Estimated Savings	Net Energy Savings Goals				
	Unit	Net kWh per Unit	Annual Net Energy Savings Goals (kWh)		
			2016	2017	2018
	per Customer @ Meter	434313	1,084,487 782,620	1,084,487 782,620	1,084,487 782,620
	per Customer @ Generator	462	1,154,219	1,154,219	1,154,219
Estimated Budget	Net Demand Savings Goals				
	Unit	Net kW per Unit	Annual Net Demand Savings Goals (kW)		
			2016	2017	2018
	per Customer @ Meter	0.0500 036	123,889.3	123,889.3	123,889.3
	per Customer @ Generator	0.053	131.8	131.8	131.8
Estimated Budget	Budget Categories	2016	2017	2018	
	Incentives	\$0	\$0	\$0	
	Administration	\$8,750 \$7,500	\$8,750 \$7,500	\$8,750 \$7,500	
	Marketing	\$3,500 \$3,000	\$3,500 \$3,000	\$3,500 \$3,000	
	Delivery	\$175,000 \$150,000	\$175,000 \$150,000	\$175,000 \$150,000	
	Total	\$187,250 \$160,500	\$187,250 \$160,500	\$187,250 \$160,500	
	Cost-Effectiveness	mTRC Test	RIM Test	Utility Cost Test	Societal Cost Test
2.372 05		0.600 57	2.372 05	2.522 17	n/a





Appendix A. Detailed Benefit-Cost Analysis Results

Detailed Benefit-Cost Analysis Results are contained in a separate file.