**Public**
**Version Enclosed**

5000 West Russell Street
P.O. Box 988
Sioux Falls, SD 57101-0988

May 1, 2020

**—Via Electronic Filing—**

Ms. Patricia Van Gerpen, Executive Director
South Dakota Public Utilities Commission
State Capitol Building
500 East Capitol Avenue
Pierre, South Dakota 57501-5070

RE: PETITION
2019 DSM STATUS REPORT AND PROPOSED 2021 DSM PLAN

Dear Ms. Van Gerpen:

Enclosed for filing is a Petition by Northern States Power Company requesting approval of our 2019 DSM Status Report which includes our request for: 1) approval of cost recovery for 2019 actual expenditures and incentive, 2) approval of our Proposed 2021 DSM Plan, and 3) proposed DSM Cost Adjustment Factor.

In accordance with South Dakota Admin. R. 20:10:01:39 through 42, Xcel Energy respectfully requests confidential treatment of certain information contained in this filing. In compliance with South Dakota Admin. R. 20:10:01:41, we have clearly marked each page of the confidential version with the term "CONFIDENTIAL". A public non-confidential version is also being filed simultaneously.

Pursuant to S.D. Codified Laws Chapter 20:10:01:41, the Company submits the following justification for confidential treatment of this petition.

**(1) An identification of the document and the general subject matter of the materials or the portions of the document for which confidentiality is being requested;**

We request confidential treatment on the grounds that the material is proprietary and contains trade secret information, the disclosure of which would result in material damage to the Company's financial or competitive position. The petition contains financial information that is not available to the general public.

**(2) The length of time for which confidentiality is being requested and a request for handling at the end of that time. This does not preclude a later request to extend the period of confidential treatment;**

The Company requests that the petition be recognized as confidential in perpetuity.

**(3) The name, address, and phone number of a person to be contacted regarding the confidentiality request;**

Steve Kolbeck
Principal Manager –South Dakota
Xcel Energy
500 W. Russell Street
P.O. Box 988
Sioux Falls, South Dakota 57101
(605) 339-8303

**(4) The statutory or common law grounds and any administrative rules under which confidentiality is requested. Failure to include all possible grounds for confidential treatment does not preclude the party from raising additional grounds in the future;**

The Company requests confidential treatment because the information is both trade secret and proprietary. The claim for confidential treatment is based on South Dakota Admin. R. 20:10:01:39 (4) and S.D. Codified Laws Chapter 1-27-30. The information contained within the referenced documents meets the definition of "trade secret" under S.D. Codified Laws Chapter 37-29-1(4)(1), the South Dakota Uniform Trade Secrets Act, which is defined as information that "[d]erives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and… is the subject of efforts that are reasonable under the circumstances to maintain its secrecy." The information also meets the definition of "proprietary information" under S.D. Codified Laws Chapter 1-27-28, which is defined as "information on pricing, costs, revenue, taxes, market share, customers, and personnel held by private entities and used for that private entity's business purposes."

**(5) The factual basis that qualifies the information for confidentiality under the authority cited.**

Consistent with the terms of the Settlement Stipulation approved by the Commission in the Company's 2012 electric rate case (Docket EL12-046), the rate of return on equity is confidential.

For any questions regarding this filing, please feel free to call me at (605) 339-8350 or email Steven.T.Kolbeck@xcelenergy.com or contact Jessica Peterson at (612) 330-6850 or email Jessica.K.Peterson@xcelenergy.com.

Sincerely,

Steve Kolbeck
Principal Manager –South Dakota

**PUBLIC**

**STATE OF SOUTH DAKOTA**
**BEFORE THE**
**SOUTH DAKOTA PUBLIC UTILITIES COMMISSION**

| | |
|---|---|
| IN THE MATTER OF THE PETITION OF NORTHERN STATES POWER COMPANY FOR APPROVAL OF THE 2019 ANNUAL DSM STATUS REPORT, INCLUDING 2019 COST RECOVERY AND INCENTIVE AND APPROVAL OF THE PROPOSED 2021 DSM COST ADJUSTMENT FACTOR AND PROGRAM PLAN | **PETITION FOR 2019 DSM PROGRAM APPROVAL AND PROPOSED 2021 DSM COST ADJUSTMENT FACTOR**<br><br>DOCKET NO. EL20- ___ |

Northern States Power Company, doing business as Xcel Energy, submits to the South Dakota Public Utilities Commission, this Petition seeking approval of our 2019 Annual Demand Side Management (DSM) Report and Proposed 2021 DSM Plan (Plan).

Our 2019 DSM portfolio achievement marks the most successful year in our programs history; saving customers over 8.6 GWh. These savings will reduce overall energy consumption and, as a result, lower a customer's electric bill. In 2020, we began offering two new programs: air source heat pump water heaters and residential demand response. These efforts will help us increase our ability to reach customers with new energy efficient technologies and provide additional customer options when managing their electric bills. Our enclosed 2021 Plan builds on 2020 as we continue our energy efficiency and conservation focus to help customers manage their energy usage.

Additionally, we want to acknowledge the COVID-19 public health concern. We anticipate hitting our goals and forecast spending our filed budget for 2020, but realize that this may be altered as our performance adjusts. We will update our DSM Tracker and any evolving concerns due to COVID-19 with a supplemental filing on September 28, 2020.

The remainder of this Petition will provide the following: (1) 2019 DSM results and earned incentive; (2) DSM program portfolio; (3) Report on DSM recovery; (4) DSM cost adjustment factor report; and (5) the Company's 2021 DSM plan.

We respectfully request that the Commission approve the following as part of this Petition:

- The Company's 2019 DSM Tracker account;

- Approve the incentive of $225,607earned for 2019 program performance;
- Approve the proposed 2021 electric DSM Adjustment Factor of $0.000527 per kWh; and
- Approve the proposed 2021 DSM Plan.

## PETITION

## I. 2019 DSM RESULTS AND EARNED INCENTIVE

### A. Executive Summary

Demand Side Management resources are part of a wide variety of offerings by the Company to empower our customers to control their energy usage and their monthly electric bills. Our DSM portfolio offers a mix of solutions designed to meet individual needs and preferences. In 2019, we reached our highest energy savings achievement of 8.6 GWh. This achievement is a result of high penetration of LED lighting for both residential and commercial customers. Our total actual expenditures of $815,393 falls above the filed budget, but within the Commission approved budget flexibility.[1] Further, no programs were suspended in 2019.

### B. Cross Subsidization Review

In compliance with Commission request, we verify that neither the residential nor the business segment is receiving more benefit than another. [2] Although there have been changes in the percent of spend, as well as percent of kWh over time, the percent of recovery between classes, as shown in Table1, has been consistent over the past five years.

**Table 1 – Cross Subsidization Review**

| | Percent of Spend (excl. Planning) | | Percent of kWh | | Percent of Recovery | |
|---|---|---|---|---|---|---|
| Year | Residential | Business | Residential | Business | Residential | Business |
| 2015 | 67% | 33% | 62% | 38% | 35% | 66% |
| 2016 | 34% | 66% | 26% | 74% | 35% | 65% |
| 2017 | 44% | 56% | 45% | 55% | 35% | 65% |
| 2018 | 42% | 58% | 42% | 58% | 35% | 65% |
| 2019 | 44% | 56% | 29% | 71% | 36% | 64% |

[1] Docket EL13-015, Commission Order December 3, 2013.
[2] The Commission requested the Company provide a cross-subsidization table in Docket No.EL17-019 during the December 5, 2017 Hearing.

## C. Program Achievement

To evaluate the cost-effectiveness of our portfolio for 2019, we looked at the Total Resource Cost (TRC) ratio, which compares total benefits to total costs of the portfolio.[3] If a program or portfolio has a TRC ratio above one, it is considered cost-effective. As shown in the table below, the 2019 portfolio demonstrated a TRC Ratio value of 1.99.

Table 2 provides a breakdown of 2019 achievements by program. A full executive summary, which includes both a comparison of 2019 goals versus actuals and cost-effectiveness test results, is provided as Attachment A.

**Table 2 – Executive Summary Table of 2019 Actual Achievements**

| 2019 | Electric Participants | Electric Budget | Generator kW | Generator kWh | TRC Ratio |
|---|---|---|---|---|---|
| **Business Segment** | | | | | |
| Lighting Efficiency | 144 | $ 409,434 | 886 | 6,071,035 | 1.56 |
| Business Saver's Switch | 18 | $ 36,823 | 35 | 87 | 1.06 |
| Electric Rate Savings | 1 | $ 6,529 | 1,065 | 39,315 | 76.61 |
| **Business Segment Total** | **163** | **$ 452,787** | **1,986** | **6,110,436** | **1.76** |
| | | | | | |
| **Residential Segment** | | | | | |
| Home Lighting | 4,293 | $ 78,282 | 257 | 2,492,147 | 3.82 |
| Residential Saver's Switch | 705 | $ 241,098 | 518 | 1,515 | 2.40 |
| Consumer Education | 70,706 | $ 37,613 | N/A | N/A | N/A |
| **Residential Segment Total** | **75,704** | **$ 356,993** | **774** | **2,493,662** | **2.70** |
| | | | | | |
| **Planning Segment** | | | | | |
| Regulatory Affairs | N/A | $ 5,614 | N/A | N/A | N/A |
| **Planning Segment Total** | N/A | **$ 5,614** | N/A | N/A | N/A |
| | | | | | |
| **PORTFOLIO TOTAL** | **75,867** | **$ 815,393** | **2,760** | **8,604,099** | **1.91** |

The Status Report shows a successful year for the DSM portfolio. We maintain a well-balanced portfolio of programs and continue to educate customers on the benefits of choosing energy efficiency.

[3] A TRC ratio above 1.0 indicates the benefit outweighs the costs.

## D. DSM Incentive Report – Calculation Inputs

The Company submits the following 2019 incentive calculation in accordance with the Commission's October 21, 2011 Order, which approved an incentive of 30 percent of expenditures capped at the approved budget.

| | |
|---|---|
| Approved Budget | $ 752,023 |
| Actual Spend | $ 815,393 |

Since the actual expenditure was greater than the approved budget, the incentive was capped at the approved budget amount. The incentive is calculated as follows: Approved Budget x 30% = Awarded Incentive or **$752,023 x 30% = $225,607.**

This incentive is accounted for in our 2019 DSM Tracker included in Attachment D.

## II. DSM PROGRAM PORTFOLIO

We offer our commercial and residential customers several different opportunities to participate in our energy efficiency programs. In this section, we provide program details, 2019 results and any changes we anticipate for 2021. There are no new programs being launched in 2021.

## A. Business Portfolio

1. Business Lighting Efficiency

The Business Lighting program offers retrofit and new construction rebate incentives to commercial and industrial customers who purchase and install qualifying energy efficient lighting fixtures and lamps. Rebates are offered to encourage customers to purchase energy efficient lighting by reducing the up-front costs associated with light emitting diode (LED) lamps and fixtures.

*a. 2019 Program Activity and Results*

The Business Lighting program had a successful year increasing energy savings achievement to nearly 6 GWh's; a record high for the program. In addition, the program reduced its cost per kWh from 11.8 to 7 cents increasing the benefit to our customers.

We attribute these results to the success of linear LED options for customers. For example, in 2018 LED linear tube rebates were added to the program. We rebated nearly

10,000 units that year. In 2019, this measure grew to 25,000 units and accounted for 44 percent of the total energy saving for the program. LED tubes offer customers a less costly alternative than upgrading to a LED troffer or high bay fixture.

We note rebated and forecasted units in Table 3 below and have included rebate types in Attachment B.

**Table 3: Business Lighting Efficiency Units**

| Year | Actual/ Forecasted Units | Additional Information |
|---|---|---|
| 2017 | 11,700 | Achieved |
| 2018 | 21,291 | Achieved |
| 2019 | 33,832 | Achieved |
| 2020 | 21,924 | Filed/Forecasted |
| 2021 | 27,526 | Filed/Forecasted |

To enhance our success, we also invested funding in a research study to determine the saturation of LED lighting and controls within the market. We visited 30 companies in South Dakota and completed an inventory of the installed lighting technologies (fixtures, lamps and controls). Key findings indicated that:

- The greatest opportunity of facilities surveyed was for LED linear fixtures and lamps in the area of ambulatory health care facilities.
- Conference rooms, classrooms, and restrooms appear to be commonly over-lit. Illuminance measurements taken in these space types found light output at higher-than-recommended levels for a majority of the square footage observed.
- Opportunity for efficient controls spans across facility types. The majority of lighting across facility types was controlled by manual on/off switches. This validates the need for networked lighting control measures, which were added as a measure to the program in 2020.

This study will position the program better for forecasting future benefits, limiting additional cost and providing prospects for future marketing activities. We have included the saturation study as Attachment C.[4]

[4] To ensure that the cost to customers in South Dakota was reasonable, the Company paired lighting research in South Dakota with another territory (New Mexico) to minimize administrative expenses and maximize the number of sites that could be surveyed on a limited budget.

*b. 2021 Proposed Changes*

The demand for LED lighting technologies grew in 2019, as a result we are adjusting 2021 savings goals and budgets to better align with actual 2019 results and our approved 2020 program plan.

2. Business Saver's Switch

Business Saver's Switch is a load management program available to commercial customers. The program uses direct load control to cycle customers' rooftop air conditioning units during periods of peak demand, helping to maintain system reliability. Loads are controlled through the use of load control receivers operated remotely via wireless signals. The program is marketed via direct mail, email and via our customer representatives at our Business Solutions Center.

*a. 2019 Program Activity and Results*

The Business Saver's Switch program had a successful year with the number of new participants slightly higher than anticipated. The load reduction achievements, however, were lower due to participants enrolling into the program with smaller AC units than projected. We execute one control event per cooling season as required by the Midcontinent Independent System Operator (MISO); this was the only event conducted in 2019.

*b. 2021 Proposed Changes*

The budget and projected achievements for 2021 will be unchanged.

3. Electric Rate Savings: Peak and Energy Controlled Rates

The Electric Rate Savings (ERS) program is offered to any business customer that can reduce their electric loads by at least 50 kW during control periods initiated by the Company or MISO. Participating customers fall under the Peak and Energy Control Rate as part of our electric service. In return for their load availability, customers receive a monthly discount on their demand charges and can potentially save up to 50 percent on their demand charges over the entire year. ERS is promoted directly to customers through our Account Management and Business Solutions Center teams.

*a. 2019 Program Activity and Results*

In 2019, the program spent less than budgeted but participants were as expected. The program experienced minor growth to the program's controllable load due to one large customer joining the program.[5]

We execute one control event in 2019 which required program participants to curtail their load down to their predetermined demand level for one hour. This event was required by MISO. Additionally, we performed an annual notification test which does not require program participants to control their load, but is necessary to verify customer contact information to ensure that in the event of an actual curtailment event the correct contacts are notified to ensure program compliance and customer satisfaction.

Program costs were for administrative and application development costs as the Company implemented a new notification system.

*b. 2021 Proposed Changes*

We will continue to increase participation in the program during 2021 by promoting directly to qualifying customers through our Account Management and Business Solutions Center teams. We expect additional growth in participants and achievements and based on recent forecasts the budget should be expected to remain relatively the same for 2021.

## B. Residential Portfolio

### 1. Home Lighting

The Home Lighting program offers discounted prices on LED bulbs. Energy efficient lights are an easy and low cost way for residential and small business customers to save energy and lower their monthly electric bills. Due to the low up-front cost to customers and ease of participation the Home Lighting program serves as a gateway product into our energy-efficiency programs. We promote the Home Lighting program through a variety of channels including bill onserts, emails, digital advertising and point of purchase displays.

We motivate customers to purchase LEDs by offering in-store retail discounts. The discounts are provided through collaboration with bulb manufacturers and retailers. The discount varies depending on the type of bulb and the manufacturer/retail partner.

[5] This was a large customer and therefore the controllable load was greater than anticipated from an average customer.

Discounted prices are received at the cash register, making it easy to participate without the hassle of submitting rebates. Incentives are paid upstream and the discounts are passed directly to customers.

*a. 2019 Program Activity and Results*

The program surpassed the participation and energy savings goals for 2019. The increased achievements were a result of customers looking for ways to reduce their energy bills, responding favorably to promotions and acting on discounted lighting prices. The number of residential versus business bulbs sold is defined in the table below. The program anticipates a small amount of bulbs will be purchased by small business owners.

**Table 4: Home Lighting Achievement**

| Type of Customer | Number of LED Bulbs Sold | Percent of Bulbs | Rebate Total |
|---|---|---|---|
| Residential | 54,086 | 94% | $ 55,053 |
| Business (*Generally Small Business*) | 3,452 | 6% | $ 3,514 |

*b. 2021 Proposed Changes*

We have updated our assumptions and savings calculations for the Home Lighting program. First, we have updated the forecast for linear tubes (TLEDs) to reflect the market weighting between residential and commercial customers found in a U.S. Department of Energy Lighting Market Characterization study.[6]

Second, we have modified the lifetime for screw-in LED lamps. In anticipation of the Energy Independence and Security Act (EISA) efficiency standards scheduled to go into effect on January 1, 2020, the Company filed our 2020 DSM Plan with reduced lifetimes for screw-in LED lamps.[7] The Department of Energy's ("DOE") final EISA ruling issued at the end 2019 determined that the EISA backstop had not be triggered and that the DOE would not create a new efficiency standard leaving the 2012-2014 standards in place.

In response to the DOE's ruling and the manufactures' response, the Company will revert to its standard methodology to calculate the lifetime for LEDs based on the rated lifetime

[6] *See* study at https://www.energy.gov/sites/prod/files/2017/12/f46/lmc2015_nov17.pdf
[7] EISA would have eliminated halogens from the market.

hours divided by the hours of use. The lifetimes for Home Lighting are calculated using the average rated lifetime for the bulbs rebated in 2019.

The slightly higher energy savings and budget target for the product was derived by analyzing the market potential and historical sales data, while considering new technologies, available retail channels and participating customer segments.

2. Heat Pump Water Heaters

Beginning in 2020, the Heat Pump Water Heaters program began offering retrofit and new construction rebates to residential customers who purchase and install qualifying energy efficient heat pump water heaters. Rebates are offered to encourage customers to purchase energy efficient equipment by reducing up-front costs associated with new heat pump water heaters. The following water heating measures are rebated at this time:

- Medium Draw Heat Pump Water Heater – Refrigerant Based Cooling & Electric Resistance Heat (30-50 Gallon);
- Medium Draw Heat Pump Water Heater – Refrigerant Based Cooling & ASHP Heat (30-50 Gallon);
- Medium Heat Pump Water Heater – Refrigerant Based Cooling & Natural Gas Heat (30-50 Gallon);
- Medium Draw Heat Pump Water Heater-Non-Refrigerant Based Cooling & Electric Resistance Heat (30-50 Gallon);
- Medium Draw heat Pump Water Heater-Non-Refrigerant Based Cooling & ASHP Heat (30-50 Gallon); and
- Medium Draw Heat Pump Water Heater – Non-Refrigerant Based Cooling & Natural Gas Heat (30-50 Gallon).

Heat pump water heaters have a much larger incremental cost but save a significant amount of energy over an electric resistance water heater. Rebates are provided at $300 per unit. The up-front cost of the technology is a barrier for most customers. We want to encourage the use of energy-efficient opportunities with our customers and providing rebates on electric heat pump water heaters will continue to reduce customer barriers towards energy efficient options.

This program was launched in 2020, therefore, there are no results for 2019 nor does the Company propose to make any adjustments in 2021.

3. Residential Demand Response: Saver's Switch, AC Rewards and Smart Thermostat Optimization

We offer two demand response products to our residential customers under the Residential Demand Response program: Saver's Switch® and AC Rewards. Both products target central air conditioners for reducing system load during demand peaks. Both offerings will be promoted primarily via email, direct mail and our customer care organization.

Saver's Switch offers a seasonal bill discount to customers who agree to allow the Company to remotely control their central air conditioners during the summer months. Customers with qualifying electric water heaters can also enroll their equipment. Electric water heaters can be controlled year-round, and customers receive incentives for their participation year-round.

The AC Rewards program (smart thermostat offering) was launched in 2020 and offers residential electric customers the opportunity to implement a new load management option. The purpose of this product is to allow the Company to control residential cooling load when deemed it is needed.

AC Rewards requires customers to "Bring Your Own Thermostat (BYOT)", which means that any customer who has a central AC and a qualifying thermostat in our service territory is eligible to participate. Customers will be incentivized with a onetime incentive for enrolling their qualifying device in AC Rewards. For customers who do not have a qualifying thermostat, but have a central AC, they can receive a discount for purchasing and installing an ENERGY STAR® rated thermostat that is AC Rewards qualified.

We provide available incentives for the program in Table 5 below.

**Table 5: Residential Demand Response Incentives**

| **Measure Offerings** | **Incentive** |
|---|---|
| Saver Switch for AC | 15% discount off electric charges between June and September. |
| Saver Switch for Water Heaters | 2% discount off electric charges year-round |
| AC Rewards | $75 bill credit for enrolling in the demand management program and $25 annual bill credit in October. |
| Thermostat Optimization | $50 Rebate for installing a qualifying smart thermostat. |

*a. 2019 Program Activity and Results*

In 2019, the historic Saver's Switch program spent its budget while participants and achievements were slightly below target. This is primarily due to higher than anticipated costs for materials and service delivery. Approximately one third of the participants came from the replacement of switches scheduled for maintenance. These switches have outlived their useful life and were due for equipment replacement. We execute one control event per cooling season as required by MISO; this was the only event conducted in 2019.

The AC Rewards and Thermostat Optimization products were launched in 2020.

*b. 2021 Proposed Changes*

There are no program changes for 2021 and the budget is similar to 2020.

## C. Additional Demand Side Efforts

1. Trade Partners

Trade Partners are a key marketing channel for our DSM efforts. Trade Partners educate and promote our programs to customers, verify that the equipment they are installing meets our program specifications and help customers complete the rebate paperwork. We consider our Trade Partners to be contractors, distributors and manufacturers of energy-efficient equipment.

Trade Partner support is conducted through training workshops and Account Manager outreach. Account Management in Sioux Falls has an important role in supporting the efforts of our South Dakota Trade Partners as they are available to meet with Trade Partners for program training, site visits and help with rebate paperwork.

Other support is provided through phone and email communications from Trade Relations Managers. Our Trade Relations Managers are based in Minneapolis and assist our South Dakota Trade Partners providing answers to trade questions on our rebate specifications and paperwork. They produce email updates for Trade Partners when there is important information to share. Trade Relations Managers are also available to conduct additional, in depth, trainings on an as-needed basis.

2. Consumer Education

The Consumer Education program creates awareness of energy conservation by providing residential customers with information and resources to reduce their homes' energy use. We provide customers with opportunities to actively engage in energy efficiency via community outreach events and advertising. Utilizing these different tactics allows us to reach a wide variety of customers.

*a. 2019 Program Activity and Results*

The program's primary focus at community events is to drive customers to learn more about what they can do to save energy and money. Our 2019 events allowed us to help customers, in-person, with energy-related questions and recommended energy efficiency programs that worked for them.

In 2019, the Company participated in four large community events:

**Table 6: 2019 Community Events and Generated Leads**

| Community Event | Location/Date | Targeted Program Leads | Direct Program Signups |
|---|---|---|---|
| *Empire Home Show* | Sioux Falls Convention Center, Sioux Falls (February 22-24) | 94 | 67 |
| *Sioux Falls Jazz Festival* | Yankton Trails Park, Sioux Falls (July 19-20) | 23 | 12 |
| Sidewalk Arts Festival | Washington Pavilion, Sioux Falls (September 7) | 69 | 16 |
| Sioux Falls Empire Arts & Crafts Show | W.H. Lyons Fairgrounds – Expo Building, Sioux Falls (November 8-9) | 302 | 33 |
| ***Total*** | | 488 | 128 |

In 2019, the Company met the goals of participation targets for this program.

Participation achievement continues to be measured through the following channels:

- Event attendance at sponsored events;
- Program signups generated at sponsored events;

- Program leads generated at sponsored events; and
- Reach through paid media channels.

*b. 2021 Proposed Changes*

To continuously improve our education efforts, the team began exploring ways to increase awareness and participation. To evolve the event experience we will by incorporating digital/interactive components. The aim is to educate customers in an inviting space. The combination of these initiatives continues to drive participation in DSM programs.

3. Regulatory Affairs

The Planning & Administration group manages all DSM regulatory filings, directs and prepares cost-benefit analysis, provides results of energy conservation achievements and prepares cost recovery reports. This group also provides procedures and policies for effectively addressing requirements and complying with the DSM regulatory process. The entirety of the budget is to cover non-direct program labor including labor for such things as onserts and regulatory requests. We are lowering the budget for Regulatory Affairs based on historical spend in 2021.

## III. DSM COST RECOVERY REPORT

Cost-effective conservation benefits customers by reducing the need to build a new power plant or other generation facilities to meet our customers' electricity needs. Conservation also has environmental benefits, including a reduction in air pollution and greenhouse gas emissions associated with using fossil fuels. This section reports the actual 2019 spending and cost recovery as well as the Company's carrying charge rates.

In 2019, the total portfolio spend came in at $815,393. This amount is above our approved budget of $752,023, but falls within the ten percent spend flexibility granted by the Commission.[8] In addition to DSM expenses, the Company is requesting recovery of $225,607 in financial incentive earned for our 2019 DSM performance for total recovery of $1,041,000.[9]

[8] The Commission approved a 10 percent spend flexibility beginning in 2013 as part of the approval of the Company's 2012 DSM Status Report and 2014 DSM Proposed Plan. (Docket No. EL13-017)
[9] Our final 2019 Tracker notes this amount at **[CONFIDENTIAL DATA BEGINS HERE CONFIDENTIAL DATA ENDS HERE]** due to under recovery of the 2018 incentive. The additional amount appears as a top line adjustment in the 2018 Tracker for $3,244.

Supportive documentation for this cost recovery request, some of which falls under the category of confidential data, is provided as Attachment D of this filing and includes:

- Calculations of the Carrying Charge Rates in 2019 and found in the 2019 Tracker; and
- Xcel Energy's 2019 DSM Tracker, which documents monthly DSM expenditures and recovered costs.

## IV. DSM COST ADJUSTMENT FACTOR

The current DSM Cost Adjustment Factor of $0.000477 per kWh was implemented on January 1, 2020.[10] The Company requests a new DSM Cost Adjustment Factor of $0.000527 per kWh to be effective with the first billing cycle of January 2021.

Supportive documentation for this rate change request, some of which falls under the category of confidential data, is provided as Attachments E1-E4 of this filing and includes:

- Information specified in South Dakota Administrative Rule 20:10:13:26 regarding the updated DSM Cost Adjustment Factor;
- Forecasted 2020 and 2021 DSM Trackers reflecting the forecasted cost recovery with the current and proposed rates;
- Proposed bill onsert notice; and
- Proposed updated tariff sheet in both redlined and clean versions.

The Company requests a new DSM Cost Adjustment Factor of $0.000527 per customer kWh to be effective with the first billing cycle of January 2021 and to remain in effect through December 2021 or until the Commission approves a new DSM Cost Adjustment Factor. This is an increase of $0.000050 per kWh or approximately ten percent compared to the previous DSM Cost Adjustment Factor. The increase is due to over achievement of 8.6 GWh versus planned 5.5 GWh and an increase in energy benefits. However, the bill impact to customers is a 0.04% increase amounting to $0.02 to $0.10 per month.

In the event that Commission approval of the proposed adjustment is delayed beyond the timeframe needed to implement the rate change by January 1, 2021 the Company will continue to apply the current DSM Cost Adjustment of $0.000477 per kWh up to the first cycle of the first full billing period following Commission approval of a revised factor.

[10] Docket EL19-019, Commission Order December 12, 2019.

This proposed factor is calculated to reduce the DSM Tracker balance to $0 by the end of December 2021. It is based on the forecasted December 2021 unrecovered balance in the Company's DSM Tracker account. This 2021 forecasted balance is based on the forecasted January beginning balance, projected expenditures and the forecasted incentive. The inputs and calculation are shown below.

**[CONFIDENTIAL DATA BEGINS HERE**

**CONFIDENTIAL DATA ENDS HERE]**

This calculation results in a rate that would recover the sum of the beginning balance, approved expenditures and estimated incentives over the January 1, 2020 – December 31, 2021 period. This rate of **[CONFIDENTIAL DATA BEGINS HERE CONFIDENTIAL DATA ENDS HERE]** would result in a negative balance because it does not consider carrying charges, which are negative for several months during 2021. To get as close to a possible $0 balance by December 31, 2021, the rate was incrementally decreased to reflect future inclusion of carrying charges, until the balance approached $0 without going negative. The resulting rate is **$0.000527 per customer kWh**.

We note that the bill onsert for the DSM Cost Adjustment Factor has, in the past, been combined with the South Dakota Infrastructure Rider Rate. Attempts are made to limit the amount of onserts per bill when necessary; this further reduces cost. We will combine in 2021 if timing of each filing allows the ability to do so.

## V. 2021 DSM Plan

This section includes a summary of our proposed 2021 Plan. Our plan for 2021 is to continue to provide customers energy efficient options and rebates to help them manage future energy bills. Table 7 summarizes our proposed goals and provides updated cost-effectiveness results by program. The total portfolio has a passing TRC Ratio of 1.53. The budget is higher than our 2020 filed budget due to additional lighting incentives; as explained above. A full executive summary, which includes all cost-effectiveness test results, is provided as Attachment F.

**Table 7 – Executive Summary Table of 2021 Forecast**

| 2021 | Electric Participants | Electric Budget | Generator kW | Generator kWh | TRC Ratio |
|---|---|---|---|---|---|
| **Business Segment** | | | | | |
| Lighting Efficiency | 591 | $414,226 | 591 | 5,181,197 | 1.02 |
| Business Saver's Switch | 10 | $25,250 | 28 | 39 | 1.30 |
| Peak and Energy Control | 1 | $10,000 | 174 | 345 | 8.37 |
| **Business Segment Total** | **602** | **$449,476** | **793** | **5,181,582** | **1.04** |
| | | | | | |
| **Residential Segment** | | | | | |
| Home Lighting | 4,999 | $99,655 | 413 | 3,011,712 | 4.13 |
| Heat Pump Water Heaters | 21 | $12,900 | 9 | 71,574 | 1.00 |
| Residential Demand Response | 1,400 | $235,500 | 817 | 99,889 | 3.12 |
| Consumer Education | 68,000 | $21,165 | N/A | N/A | N/A |
| **Residential Segment Total** | **74,420** | **$369,220** | **1,239** | **3,183,176** | **3.34** |
| | | | | | |
| **Planning Segment** | | | | | |
| Regulatory Affairs | 0 | $10,000 | N/A | N/A | N/A |
| **Planning Segment Total** | **0** | **$10,000** | N/A | N/A | N/A |
| | | | | | |
| **PORTFOLIO TOTAL** | **75,022** | **$828,696** | **2,032** | **8,364,757** | **1.53** |

**PUBLIC**

## Service of Filings

We request that communications regarding this Application be directed to:

Paget Pengelly
Records Analyst
Xcel Energy Services Inc.
414 Nicollet Mall, 401-7
Minneapolis, MN 55401
(612) 330-5500
Regulatory.Records@xcelenergy.com

## CONCLUSION

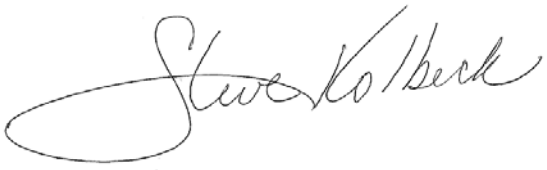
In summary, the Company respectfully requests that the Commission:

- The Company's 2019 DSM Tracker account;
- Approve the incentive of $225,607earned for 2019 program performance;
- Approve the proposed 2021 electric DSM Adjustment Factor of $0.000527 per kWh; and
- Approve the proposed 2021 DSM Plan.

We look forward to continuing these programs in South Dakota. The Company appreciates the interest and efforts of South Dakota policy makers in supporting this DSM portfolio.

Dated: May 1, 2020

Xcel Energy



By: _____

Steve Kolbeck
Principal Manager –South Dakota

| Full Executive Summary Table - 2019 Actual Achievements | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GOAL | | | | ACTUAL | | | | | | | | | | TEST RESULTS | | | |
| 2019 | Participants | Electric Budget | Generator kW | Generator kWh | Participants | % of Goal | Electric Spend | % of Goal | Generator kW | % of Goal | Generator kWh | Lifetime years | Lifetime kWh | % of Goal | Part Ratio | Utility Ratio | RIM Ratio | TRC Ratio |
| **Business Segment** | | | | | | | | | | | | | | | | | | |
| Lighting Efficiency | 334 | $ 389,320 | 484 | 3,985,513 | 144 | 7% | $409,434 | 105% | 886 | 183% | 6,071,035 | 15.17 | 92,079,717 | 152% | 3.34 | 7.88 | 0.54 | 1.56 |
| Business Saver's Switch | 12 | $ 37,213 | 42 | 107 | 18 | 150% | $36,823 | 99% | 35 | 83% | 87 | 15.00 | 1,303 | 82% | INF | 1.06 | 0.98 | 1.06 |
| Peak and Energy Control | 1 | $ 10,000 | 99 | 3,695 | 1 | 100% | $6,529 | 65% | 1065 | 1074% | 39,315 | 5.00 | 196,574 | 1064% | INF | 76.61 | 4.92 | 76.61 |
| **Business Segment Total** | **347** | **$ 436,533** | **626** | **3,989,315** | **163** | **47%** | **$452,787** | **104%** | **1986** | **317%** | **6,110,436** | **15.10** | **92,277,594** | **153%** | **3.39** | **8.32** | **0.62** | **1.76** |
| | | | | | | | | | | | | | | | | | | |
| **Residential Segment** | | | | | | | | | | | | | | | | | | |
| Residential Home Lighting | 2,635 | $ 93,412 | 154 | 1,508,018 | 4,293 | 163% | $78,282 | 84% | 257 | 167% | 2,492,147 | 4.87 | 12,137,535 | 165% | 17.75 | 6.53 | 0.37 | 3.82 |
| Residential Saver's Switch | 770 | $ 187,913 | 546 | 1,651 | 705 | 92% | $241,098 | 128% | 518 | 47% | 1,515 | 15.00 | 22,730 | 92% | INF | 2.40 | 1.95 | 2.40 |
| Consumer Education | 68,000 | $ 21,165 | N/A | N/A | 70,706 | 104% | $37,613 | 178% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Residential Segment Total** | **71,405** | **$ 302,490** | **700** | **1,509,669** | **75,704** | **106%** | **$356,993** | **118%** | **774** | **111%** | **2,493,662** | **4.88** | **12,160,265** | **165%** | **18.45** | **3.05** | **0.63** | **2.70** |
| | | | | | | | | | | | | | | | | | | |
| **Planning Segment** | | | | | | | | | | | | | | | | | | |
| Regulatory Affairs | | **$ 13,000** | **N/A** | **N/A** | N/A | N/A | $5,614 | 43% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Planning Segment Total** | | $ 13,000 | N/A | N/A | N/A | N/A | **$5,614** | **43%** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | | | | | | | |
| **PORTFOLIO TOTAL** | **71,752** | **$ 752,023** | **1,326** | **5,498,983** | **75,867** | **106%** | **$815,393** | **108%** | **2760** | **208%** | **8,604,099** | **12.14** | **104,437,859** | **156%** | **4.03** | **5.95** | **0.62** | **1.91** |

## LIGHTING EFFICIENCY — 2019 ELECTRIC — ACTUAL

**2019 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $588,755 | $588,755 | $588,755 | $588,755 |
| T & D | N/A | $358,683 | $358,683 | $358,683 | $358,683 |
| Marginal Energy | N/A | $2,279,604 | $2,279,604 | $2,279,604 | $2,279,604 |
| Environmental Externality | N/A | N/A | N/A | N/A | $769,261 |
| Subtotal | N/A | $3,227,042 | $3,227,042 | $3,227,042 | $3,996,303 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $5,532,047 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $377,703 | N/A | N/A | $377,703 | $377,703 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $5,909,750 | N/A | N/A | $377,703 | $377,703 |
| Total Benefits | $5,909,750 | $3,227,042 | $3,227,042 | $3,604,745 | $4,374,006 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $0 | $0 | $0 | $0 |
| Utility Administration | N/A | $31,731 | $31,731 | $31,731 | $31,731 |
| Advertising & Promotion | N/A | $0 | $0 | $0 | $0 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $377,703 | $377,703 | $377,703 | $377,703 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $409,434 | $409,434 | $409,434 | $409,434 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $5,532,047 | N/A | N/A |
| Subtotal | N/A | N/A | $5,532,047 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $1,751,968 | N/A | N/A | $1,751,968 | $1,751,968 |
| Incremental O&M Costs | $154,680 | N/A | N/A | $154,680 | $154,680 |
| Subtotal | $1,906,648 | N/A | N/A | $1,906,648 | $1,906,648 |
| Total Costs | $1,906,648 | $409,434 | $5,941,482 | $2,316,082 | $2,316,082 |
| Net Benefit (Cost) | $4,003,102 | $2,817,607 | ($2,714,440) | $1,288,662 | $2,057,924 |
| Benefit/Cost Ratio | 3.10 | 7.88 | 0.54 | 1.56 | 1.89 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 15.2 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 75.04% |
| Gross Load Factor at Customer | E | 58.64% |
| Transmission Loss Factor (Energy) | F | 4.420% |
| Transmission Loss Factor (Demand) | G | 4.310% |
| Societal Net Benefit (Cost) | H | $1,822 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 7.85 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 6.15 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 40,296 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 42,160 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 144 |
| **Total Budget** | K | **$409,434** |
| Gross kW Saved at Customer | ( J x I ) | 1,129.71 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **886 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 5,802,695 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **6,071,035 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$2,057,924** |

| | |
|---|---|
| **Utility Program Cost per kWh Lifetime** | **$0.0044** |
| **Utility Program Cost per kW at Gen** | **$462** |

**BUSINESS SAVER'S SWITCH** **2019 ELECTRIC** **ACTUAL**

**2019 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $24,230 | $24,230 | $24,230 | $24,230 |
| T & D | N/A | $14,758 | $14,758 | $14,758 | $14,758 |
| Marginal Energy | N/A | $49 | $49 | $49 | $49 |
| Environmental Externality | N/A | N/A | N/A | N/A | $11 |
| Subtotal | N/A | $39,037 | $39,037 | $39,037 | $39,048 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $2,914 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $0 | N/A | N/A | $0 | $0 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $2,914 | N/A | N/A | $0 | $0 |
| Total Benefits | $2,914 | $39,037 | $39,037 | $39,037 | $39,048 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $0 | $0 | $0 | $0 |
| Utility Administration | N/A | $35,362 | $35,362 | $35,362 | $35,362 |
| Advertising & Promotion | N/A | $1,461 | $1,461 | $1,461 | $1,461 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $0 | $0 | $0 | $0 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $36,823 | $36,823 | $36,823 | $36,823 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $2,914 | N/A | N/A |
| Subtotal | N/A | N/A | $2,914 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Costs | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $0 | N/A | N/A | $0 | $0 |
| Total Costs | $0 | $36,823 | $39,738 | $36,823 | $36,823 |
| Net Benefit (Cost) | $2,914 | $2,214 | ($701) | $2,214 | $2,225 |
| Benefit/Cost Ratio | INF | 1.06 | 0.98 | 1.06 | 1.06 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 15.0 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 21.92% |
| Gross Load Factor at Customer | E | 0.01% |
| Transmission Loss Factor (Energy) | F | 4.420% |
| Transmission Loss Factor (Demand) | G | 4.310% |
| Societal Net Benefit (Cost) | H | $15 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 8.49 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 1.94 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 5 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 5 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 18 |
| **Total Budget** | K | **$36,823** |
| Gross kW Saved at Customer | ( J x I ) | 152.74 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **35 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 83 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **87 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$2,225** |

| | |
|---|---|
| **Utility Program Cost per kWh Lifetime** | **$28.2697** |
| **Utility Program Cost per kW at Gen** | **$1,052** |

**ELECTRIC RATE SAVINGS PROGRAM** **2019 ELECTRIC** **ACTUAL**

**2019 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $305,086 | $305,086 | $305,086 | $305,086 |
| T & D | N/A | $184,871 | $184,871 | $184,871 | $184,871 |
| Marginal Energy | N/A | $10,228 | $10,228 | $10,228 | $10,228 |
| Environmental Externality | N/A | N/A | N/A | N/A | $2,278 |
| Subtotal | N/A | $500,186 | $500,186 | $500,186 | $502,464 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $95,203 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $0 | N/A | N/A | $0 | $0 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $95,203 | N/A | N/A | $0 | $0 |
| Total Benefits | $95,203 | $500,186 | $500,186 | $500,186 | $502,464 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $0 | $0 | $0 | $0 |
| Utility Administration | N/A | $6,529 | $6,529 | $6,529 | $6,529 |
| Advertising & Promotion | N/A | $0 | $0 | $0 | $0 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $0 | $0 | $0 | $0 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $6,529 | $6,529 | $6,529 | $6,529 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $95,203 | N/A | N/A |
| Subtotal | N/A | N/A | $95,203 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Costs | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $0 | N/A | N/A | $0 | $0 |
| Total Costs | $0 | $6,529 | $101,732 | $6,529 | $6,529 |
| Net Benefit (Cost) | $95,203 | $493,657 | $398,453 | $493,657 | $495,935 |
| Benefit/Cost Ratio | INF | 76.61 | 4.92 | 76.61 | 76.96 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 5.0 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 48.00% |
| Gross Load Factor at Customer | E | 0.20% |
| Transmission Loss Factor (Energy) | F | 4.420% |
| Transmission Loss Factor (Demand) | G | 4.310% |
| Societal Net Benefit (Cost) | H | $234 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 2123.00 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 1064.90 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 37,577 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 39,315 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 1 |
| **Total Budget** | K | **$6,529** |
| Gross kW Saved at Customer | ( J x I ) | 2,123.00 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **1,065 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 37,577 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **39,315 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$495,935** |

| | |
|---|---|
| **Utility Program Cost per kWh Lifetime** | **$0.0332** |
| **Utility Program Cost per kW at Gen** | **$6** |

**BUSINESS SEGMENT TOTAL** **2019 ELECTRIC** **ACTUAL**

**2019 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $918,071 | $918,071 | $918,071 | $918,071 |
| T & D | N/A | $558,312 | $558,312 | $558,312 | $558,312 |
| Marginal Energy | N/A | $2,289,881 | $2,289,881 | $2,289,881 | $2,289,881 |
| Environmental Externality | N/A | N/A | N/A | N/A | $771,551 |
| Subtotal | N/A | $3,766,264 | $3,766,264 | $3,766,264 | $4,537,815 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $5,630,165 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $377,703 | N/A | N/A | $377,703 | $377,703 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $6,007,868 | N/A | N/A | $377,703 | $377,703 |
| Total Benefits | $6,007,868 | $3,766,264 | $3,766,264 | $4,143,967 | $4,915,518 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $0 | $0 | $0 | $0 |
| Utility Administration | N/A | $73,622 | $73,622 | $73,622 | $73,622 |
| Advertising & Promotion | N/A | $1,461 | $1,461 | $1,461 | $1,461 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $377,703 | $377,703 | $377,703 | $377,703 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $452,787 | $452,787 | $452,787 | $452,787 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $5,630,165 | N/A | N/A |
| Subtotal | N/A | N/A | $5,630,165 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $1,751,968 | N/A | N/A | $1,751,968 | $1,751,968 |
| Incremental O&M Costs | $154,680 | N/A | N/A | $154,680 | $154,680 |
| Subtotal | $1,906,648 | N/A | N/A | $1,906,648 | $1,906,648 |
| Total Costs | $1,906,648 | $452,787 | $6,082,952 | $2,359,435 | $2,359,435 |
| Net Benefit (Cost) | $4,101,220 | $3,313,477 | ($2,316,687) | $1,784,533 | $2,556,083 |
| Benefit/Cost Ratio | 3.15 | 8.32 | 0.62 | 1.76 | 2.08 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 15.1 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 55.80% |
| Gross Load Factor at Customer | E | 19.58% |
| Transmission Loss Factor (Energy) | F | 4.420% |
| Transmission Loss Factor (Demand) | G | 4.310% |
| Societal Net Benefit (Cost) | H | $751 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 20.89 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 12.18 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 35,830 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 37,487 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 163 |
| **Total Budget** | K | **$452,787** |
| Gross kW Saved at Customer | ( J x I ) | 3,405.45 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **1,986 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 5,840,355 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **6,110,436 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$2,556,083** |

| | |
|---|---|
| **Utility Program Cost per kWh Lifetime** | **$0.0049** |
| **Utility Program Cost per kW at Gen** | **$228** |

**RESIDENTIAL HOME LIGHTING** **2019 ELECTRIC** **ACTUAL**

**2019 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $70,374 | $70,374 | $70,374 | $70,374 |
| T & D | N/A | $42,641 | $42,641 | $42,641 | $42,641 |
| Marginal Energy | N/A | $398,100 | $398,100 | $398,100 | $398,100 |
| Environmental Externality | N/A | N/A | N/A | N/A | $140,894 |
| Subtotal | N/A | $511,115 | $511,115 | $511,115 | $652,009 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $1,305,291 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $58,555 | N/A | N/A | $58,555 | $58,555 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $23,732 | N/A | N/A | $23,732 | $23,732 |
| Subtotal | $1,387,577 | N/A | N/A | $82,287 | $82,287 |
| Total Benefits | $1,387,577 | $511,115 | $511,115 | $593,401 | $734,296 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $0 | $0 | $0 | $0 |
| Utility Administration | N/A | $17,546 | $17,546 | $17,546 | $17,546 |
| Advertising & Promotion | N/A | $2,181 | $2,181 | $2,181 | $2,181 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $58,555 | $58,555 | $58,555 | $58,555 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $78,282 | $78,282 | $78,282 | $78,282 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $1,305,291 | N/A | N/A |
| Subtotal | N/A | N/A | $1,305,291 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $77,174 | N/A | N/A | $77,174 | $77,174 |
| Incremental O&M Costs | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $77,174 | N/A | N/A | $77,174 | $77,174 |
| Total Costs | $77,174 | $78,282 | $1,383,573 | $155,456 | $155,456 |
| Net Benefit (Cost) | $1,310,403 | $432,833 | ($872,458) | $437,945 | $578,839 |
| Benefit/Cost Ratio | 17.98 | 6.53 | 0.37 | 3.82 | 4.72 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 4.9 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 11.81% |
| Gross Load Factor at Customer | E | 13.08% |
| Transmission Loss Factor (Energy) | F | 5.376% |
| Transmission Loss Factor (Demand) | G | 5.327% |
| Societal Net Benefit (Cost) | H | $281 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 0.48 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 0.06 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 549 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 581 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 4,293 |
| **Total Budget** | K | **$78,282** |
| Gross kW Saved at Customer | ( J x I ) | 2,058.00 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **257 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 2,358,170 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **2,492,147 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$578,839** |

| | |
|---|---|
| **Utility Program Cost per kWh Lifetime** | **$0.0064** |
| **Utility Program Cost per kW at Gen** | **$305** |

**RESIDENTIAL SAVER'S SWITCH** **2019** **ELECTRIC** **ACTUAL**

**2019 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $358,461 | $358,461 | $358,461 | $358,461 |
| T & D | N/A | $218,322 | $218,322 | $218,322 | $218,322 |
| Marginal Energy | N/A | $716 | $716 | $716 | $716 |
| Environmental Externality | N/A | N/A | N/A | N/A | $196 |
| Subtotal | N/A | $577,500 | $577,500 | $577,500 | $577,696 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $54,375 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $0 | N/A | N/A | $0 | $0 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $54,375 | N/A | N/A | $0 | $0 |
| Total Benefits | $54,375 | $577,500 | $577,500 | $577,500 | $577,696 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $0 | $0 | $0 | $0 |
| Utility Administration | N/A | $235,854 | $235,854 | $235,854 | $235,854 |
| Advertising & Promotion | N/A | $5,244 | $5,244 | $5,244 | $5,244 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $0 | $0 | $0 | $0 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $241,098 | $241,098 | $241,098 | $241,098 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $54,375 | N/A | N/A |
| Subtotal | N/A | N/A | $54,375 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Costs | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $0 | N/A | N/A | $0 | $0 |
| Total Costs | $0 | $241,098 | $295,472 | $241,098 | $241,098 |
| Net Benefit (Cost) | $54,375 | $336,402 | $282,027 | $336,402 | $336,599 |
| Benefit/Cost Ratio | INF | 2.40 | 1.95 | 2.40 | 2.40 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 15.0 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 28.43% |
| Gross Load Factor at Customer | E | 0.01% |
| Transmission Loss Factor (Energy) | F | 5.500% |
| Transmission Loss Factor (Demand) | G | 5.525% |
| Societal Net Benefit (Cost) | H | $196 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 2.44 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 0.73 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 2 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 2 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 705 |
| **Total Budget** | K | **$241,098** |
| Gross kW Saved at Customer | ( J x I ) | 1,719.83 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **518 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 1,432 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **1,515 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$336,599** |

| | |
|---|---|
| **Utility Program Cost per kWh Lifetime** | **$10.6069** |
| **Utility Program Cost per kW at Gen** | **$466** |

**RESIDENTIAL SEGMENT TOTAL** **2019 ELECTRIC** **ACTUAL**

**2019 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $428,835 | $428,835 | $428,835 | $428,835 |
| T & D | N/A | $260,964 | $260,964 | $260,964 | $260,964 |
| Marginal Energy | N/A | $398,816 | $398,816 | $398,816 | $398,816 |
| Environmental Externality | N/A | N/A | N/A | N/A | $141,091 |
| Subtotal | N/A | $1,088,614 | $1,088,614 | $1,088,614 | $1,229,705 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $1,359,666 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $58,555 | N/A | N/A | $58,555 | $58,555 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $23,732 | N/A | N/A | $23,732 | $23,732 |
| Subtotal | $1,441,952 | N/A | N/A | $82,287 | $82,287 |
| Total Benefits | $1,441,952 | $1,088,614 | $1,088,614 | $1,170,901 | $1,311,992 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $0 | $0 | $0 | $0 |
| Utility Administration | N/A | $254,407 | $254,407 | $254,407 | $254,407 |
| Advertising & Promotion | N/A | $44,031 | $44,031 | $44,031 | $44,031 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $58,555 | $58,555 | $58,555 | $58,555 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $356,993 | $356,993 | $356,993 | $356,993 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $1,359,666 | N/A | N/A |
| Subtotal | N/A | N/A | $1,359,666 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $77,174 | N/A | N/A | $77,174 | $77,174 |
| Incremental O&M Costs | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $77,174 | N/A | N/A | $77,174 | $77,174 |
| Total Costs | $77,174 | $356,993 | $1,716,659 | $434,167 | $434,167 |
| Net Benefit (Cost) | $1,364,778 | $731,621 | ($628,044) | $736,734 | $877,825 |
| Benefit/Cost Ratio | 18.68 | 3.05 | 0.63 | 2.70 | 3.02 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 4.9 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 19.38% |
| Gross Load Factor at Customer | E | 7.13% |
| Transmission Loss Factor (Energy) | F | 5.376% |
| Transmission Loss Factor (Demand) | G | 5.459% |
| Societal Net Benefit (Cost) | H | $232 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 0.05 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 0.01 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 31 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 33 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 75,704 |
| **Total Budget** | K | **$356,993** |
| Gross kW Saved at Customer | ( J x I ) | 3,777.83 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **774 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 2,359,602 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **2,493,662 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$877,825** |

| | |
|---|---|
| **Utility Program Cost per kWh Lifetime** | **$0.0294** |
| **Utility Program Cost per kW at Gen** | **$461** |

**PORTFOLIO TOTAL** **2019 ELECTRIC** **ACTUAL**

**2019 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $1,346,906 | $1,346,906 | $1,346,906 | $1,346,906 |
| T & D | N/A | $819,275 | $819,275 | $819,275 | $819,275 |
| Marginal Energy | N/A | $2,688,697 | $2,688,697 | $2,688,697 | $2,688,697 |
| Environmental Externality | N/A | N/A | N/A | N/A | $912,641 |
| Subtotal | N/A | $4,854,879 | $4,854,879 | $4,854,879 | $5,767,520 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $6,989,830 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $436,258 | N/A | N/A | $436,258 | $436,258 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $7,426,089 | N/A | N/A | $436,258 | $436,258 |
| Total Benefits | $7,426,089 | $4,854,879 | $4,854,879 | $5,291,137 | $6,203,778 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $0 | $0 | $0 | $0 |
| Utility Administration | N/A | $328,030 | $328,030 | $328,030 | $328,030 |
| Advertising & Promotion | N/A | $51,106 | $51,106 | $51,106 | $51,106 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $436,258 | $436,258 | $436,258 | $436,258 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $815,393 | $815,393 | $815,393 | $815,393 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $6,989,830 | N/A | N/A |
| Subtotal | N/A | N/A | $6,989,830 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $1,829,142 | N/A | N/A | $1,829,142 | $1,829,142 |
| Incremental O&M Costs | $130,949 | N/A | N/A | $130,949 | $130,949 |
| Subtotal | $1,960,090 | N/A | N/A | $1,960,090 | $1,960,090 |
| Total Costs | $1,960,090 | $815,393 | $7,805,224 | $2,775,484 | $2,775,484 |
| Net Benefit (Cost) | $5,465,998 | $4,039,485 | ($2,950,345) | $2,515,653 | $3,428,294 |
| Benefit/Cost Ratio | 3.79 | 5.95 | 0.62 | 1.91 | 2.24 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 12.1 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 36.64% |
| Gross Load Factor at Customer | E | 13.03% |
| Transmission Loss Factor (Energy) | F | 4.697% |
| Transmission Loss Factor (Demand) | G | 4.633% |
| Societal Net Benefit (Cost) | H | $477 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 0.09 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 0.04 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 108 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 113 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 75,867 |
| **Total Budget** | K | **$815,393** |
| Gross kW Saved at Customer | ( J x I ) | 7,183.28 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **2,760 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 8,199,957 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **8,604,099 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$3,428,294** |

| | |
|---|---|
| **Utility Program Cost per kWh Lifetime** | **$0.0078** |
| **Utility Program Cost per kW at Gen** | **$295** |

**2021 Lighting Measures**

| Type | Lighting Efficiency | 2019 Rebate Amount ($) | 2020 Rebate Amount ($) | 2021 Rebate Amount ($) | Rebate Adjustment | Justification |
|---|---|---|---|---|---|---|
| Retrofit | Wall mount occupancy sensor - 50 Watts to 300 Watts Controlled Load | $ 15.00 | $ - | | Eliminated in 2020 | Removed to align with Networked Lighting Controls |
| Retrofit | Wall mount occupancy sensor - Greater than 300 Watts Controlled Load | $ 25.00 | $ - | | Eliminated in 2020 | Removed to align with Networked Lighting Controls |
| Retrofit | Ceiling mount occupancy sensor - 50 Watts to 300 Watts Controlled Load | $ 30.00 | $ - | | Eliminated in 2020 | Removed to align with Networked Lighting Controls |
| Retrofit | Ceiling mount occupancy sensor - Greater than 300 Watts Controlled Load | $ 40.00 | $ - | | Eliminated in 2020 | Removed to align with Networked Lighting Controls |
| Retrofit | Occupancy Sensor - Photocell | $ 25.00 | $ - | | Eliminated in 2020 | Removed to align with Networked Lighting Controls |
| Retrofit | Stairwell Fixture with Integral Occupancy Sensor | $ 25.00 | $ - | | Eliminated in 2020 | Removed to align with Networked Lighting Controls |
| Retrofit | Stairwell Fixture | $ - | $40 | $40 | New in 2020 | Decoupled integral control and fixture rebate. Customers can obtain standalone or networked lighting controls in additional to fixture rebate. |
| Retrofit | Networked Lighting Controls | $ - | $.40/watt | $.40/watt | New in 2020 | New Technology |
| Retrofit | Standalone Occupancy sensor | $ - | $.05/watt | $.05/watt | New in 2020 | New Technology |
| Retrofit | Standalone Daylighting sensor | $ - | $.10/watt | $.10/watt | New in 2020 | New Technology |
| Retrofit | Standalone Daylighting & Occupancy sensors | $ - | $.015/watt | $.015/watt | New in 2020 | New Technology |
| Retrofit | LED Mogul Screw-base lamp 30-39W | $ - | $ 30.00 | $ 30.00 | New in 2020 | New Technology |
| Retrofit | LED Mogul Screw-base lamp 40-49W | $ - | $ 40.00 | $ 40.00 | New in 2020 | New Technology |
| Retrofit | LED Mogul Screw-base lamp 50-79W | $ - | $ 50.00 | $ 50.00 | New in 2020 | New Technology |
| Retrofit | LED Mogul Screw-base lamp 80-119W | $ - | $ 60.00 | $ 60.00 | New in 2020 | New Technology |
| Retrofit | LED Mogul Screw-base lamp 120-250W | $ - | $ 75.00 | $ 75.00 | New in 2020 | New Technology |
| Retrofit | LED/LEC Exit Sign | $ 25.00 | $ 25.00 | $ 25.00 | NA | |
| Retrofit | LED Interior Screw In Fixture Retrofit | $ 15.00 | $ 10.00 | $ 10.00 | Rebate reduced in 2020 | Change in incremental cost |
| Retrofit | LED Interior Fixture <= 25W | $ 20.00 | $ 20.00 | $ 20.00 | Change in 2020 | Add CFL baseline |
| Retrofit | LED Interior Fixture 26W - 50W | $ 40.00 | $ 40.00 | $ 40.00 | Change in 2020 | Add CFL baseline |
| Retrofit | LED Ref and Frz Cases 5' or 6' doors | $ 100.00 | $ 45.00 | $ 45.00 | Rebate reduced in 2020 | Increase in rebate to promote technology |
| Retrofit | LED Parking Garage Lighting 25W-60W | $ 75.00 | $ 75.00 | $ 75.00 | NA | |
| Retrofit | LED Area Lighting - 45-65W | $ 25.00 | $ 25.00 | $ 25.00 | NA | |
| Retrofit | LED Area Lighting - 66-89W | $ 25.00 | $ 25.00 | $ 25.00 | NA | |
| Retrofit | LED Area Lighting - 90-119W | $ 50.00 | $ 50.00 | $ 50.00 | NA | |
| Retrofit | LED Area Lighting - 120-140W | $ 50.00 | $ 50.00 | $ 50.00 | NA | |
| Retrofit | LED Troffer Fixture 1X4 | $ 20.00 | $ 20.00 | $ 20.00 | NA | |
| Retrofit | LED Troffer Fixture 2X2 | $ 20.00 | $ 20.00 | $ 20.00 | NA | |
| Retrofit | LED Troffer Fixture 2X4 | $ 30.00 | $ 30.00 | $ 30.00 | NA | |
| Retrofit | LED Troffer Retrofit Kit 1X4 | $ 15.00 | $ 15.00 | $ 15.00 | NA | |
| Retrofit | LED Troffer Retrofit Kit 2X2 | $ 15.00 | $ 15.00 | $ 15.00 | NA | |
| Retrofit | LED Troffer Retrofit Kit 2X4 | $ 25.00 | $ 25.00 | $ 25.00 | NA | |
| Retrofit | LED Exterior Wall Pack <= 25W | $ 25.00 | $ 25.00 | $ 25.00 | NA | |
| Retrofit | LED Exterior Wall Pack 26W - 60W | $ 50.00 | $ 50.00 | $ 50.00 | NA | |
| Retrofit | LED Exterior Wall Pack 61W - 150W | $ 80.00 | $ 80.00 | $ 80.00 | NA | |
| Retrofit | LED Parking Garage Wall Pack <= 25W | $ 35.00 | $ 35.00 | $ 35.00 | NA | |
| Retrofit | LED Parking Garage Wall Pack 26W - 60W | $ 75.00 | $ 75.00 | $ 75.00 | NA | |
| Retrofit | LED Parking Garage Wall Pack 61W - 150W | $ 100.00 | $ 100.00 | $ 100.00 | NA | |
| Retrofit | LED Outdoor Canopy or Soffit lighting 25W - 60W | $ 75.00 | $ 75.00 | $ 75.00 | NA | |
| Retrofit | LED Outdoor Canopy or Soffit lighting 61W - 150W | $ 100.00 | $ 100.00 | $ 100.00 | NA | |
| Retrofit | LED Interior Lamp <= 5W | $ 4.00 | $ 4.00 | $ 4.00 | NA | |
| Retrofit | LED Interior Lamp 6W - 10W | $ 6.00 | $ 6.00 | $ 6.00 | NA | |
| Retrofit | LED Interior Lamp 11W - 20W | $ 8.00 | $ 8.00 | $ 8.00 | NA | |
| Retrofit | LED Tube Type A 2 foot | $ 2.00 | $ 2.00 | $ 2.00 | NA | |
| Retrofit | LED Tube Type C 2 foot | $ 5.00 | $ 5.00 | $ 5.00 | NA | |
| Retrofit | LED Tube Type A 4 foot | $ 2.00 | $ 2.00 | $ 2.00 | NA | |
| Retrofit | LED Tube Type C 4 foot | $ 5.00 | $ 5.00 | $ 5.00 | NA | |
| Retrofit | LED Tube Type B 4 foot | $ 3.00 | $ 3.00 | $ 3.00 | NA | |
| Retrofit | LED High Bay Fixture - 95-189W replaces HID | $ 100.00 | $ 100.00 | $ 100.00 | New in 2019 | New Technology |
| Retrofit | LED High Bay Fixture - 190-290W replaces HID | $ 120.00 | $ 120.00 | $ 120.00 | New in 2019 | New Technology |
| Retrofit | LED High Bay Fixture - 291-464W replaces HID | $ 150.00 | $ 150.00 | $ 150.00 | New in 2019 | New Technology |
| Retrofit | LED High Bay Fixture - 465-625W replaces HID | $ 200.00 | $ 200.00 | $ 200.00 | New in 2019 | New Technology |
| Retrofit | LED High Bay Retrofit Kit - 95-189W replaces HID | $ - | $ 40.00 | $ 40.00 | New in 2020 | New Technology |
| Retrofit | LED High Bay Retrofit Kit - 190-290W replaces HID | $ - | $ 50.00 | $ 50.00 | New in 2020 | New Technology |
| Retrofit | LED High Bay Retrofit Kit - 291-464W replaces HID | $ - | $ 80.00 | $ 80.00 | New in 2020 | New Technology |
| Retrofit | LED High Bay Retrofit Kit - 465-625W replaces HID | $ - | $ 160.00 | $ 160.00 | New in 2020 | New Technology |
| Retrofit | LED High Bay Fixture - 95-189W replaces fluorescent | $ - | $ 100.00 | $ 100.00 | New in 2020 | New Baseline |
| Retrofit | LED High Bay Fixture - 190-290W replaces fluorescent | $ - | $ 120.00 | $ 120.00 | New in 2020 | New Baseline |
| Retrofit | LED High Bay Fixture - 291-464W replaces fluorescent | $ - | $ 150.00 | $ 150.00 | New in 2020 | New Baseline |
| Retrofit | LED High Bay Fixture - 465-625W replaces fluorescent | $ - | $ 200.00 | $ 200.00 | New in 2020 | New Baseline |
| Retrofit | LED High Bay Retrofit Kit - 95-189W replaces fluorescent | $ - | $ 40.00 | $ 40.00 | New in 2020 | New Technology |
| Retrofit | LED High Bay Retrofit Kit - 190-290W replaces fluorescent | $ - | $ 50.00 | $ 50.00 | New in 2020 | New Technology |
| Retrofit | LED High Bay Retrofit Kit - 291-464W replaces fluorescent | $ - | $ 80.00 | $ 80.00 | New in 2020 | New Technology |
| Retrofit | LED High Bay Retrofit Kit - 465-625W replaces fluorescent | $ - | $ 160.00 | $ 160.00 | New in 2020 | New Technology |
| New Construction | LED Interior Lamp <= 5W | $ 4.00 | $ 4.00 | $ 4.00 | NA | |
| New Construction | LED Interior Lamp 6W - 10W | $ 6.00 | $ 6.00 | $ 6.00 | NA | |
| New Construction | LED Interior Lamp 11W - 20W | $ 8.00 | $ 8.00 | $ 8.00 | NA | |
| New Construction | LED Interior Fixture <= 25W | $ 15.00 | $ 15.00 | $ 15.00 | NA | |
| New Construction | LED Interior Fixture 26W - 50W | $ 20.00 | $ 20.00 | $ 20.00 | NA | |
| New Construction | LED Ref and Frz Cases 5' or 6' doors | $ 70.00 | $ 35.00 | $ 35.00 | Reduced in 2020 | |
| New Construction | LED Parking Garage Lighting 25W-60W | $ 35.00 | $ 35.00 | $ 35.00 | NA | |
| New Construction | LED Area Lighting - 45-65W | $ 15.00 | $ 15.00 | $ 15.00 | NA | |
| New Construction | LED Area Lighting - 66-89W | $ 15.00 | $ 15.00 | $ 15.00 | NA | |
| New Construction | LED Area Lighting - 90-119W | $ 30.00 | $ 30.00 | $ 30.00 | NA | |
| New Construction | LED Area Lighting - 120-140W | $ 30.00 | $ 30.00 | $ 30.00 | NA | |
| New Construction | LED Troffer Fixture 1X4 | $ 15.00 | $ 15.00 | $ 15.00 | NA | |
| New Construction | LED Troffer Fixture 2X2 | $ 15.00 | $ 15.00 | $ 15.00 | NA | |
| New Construction | LED Troffer Fixture 2X4 | $ 25.00 | $ 25.00 | $ 25.00 | NA | |
| New Construction | LED Exterior Wall Pack <= 25W | $ 15.00 | $ 15.00 | $ 15.00 | NA | |
| New Construction | LED Exterior Wall Pack 26W - 60W | $ 30.00 | $ 30.00 | $ 30.00 | NA | |
| New Construction | LED Exterior Wall Pack 61W - 150W | $ 50.00 | $ 50.00 | $ 50.00 | NA | |
| New Construction | LED Parking Garage Wall Pack <= 25W | $ 15.00 | $ 15.00 | $ 15.00 | NA | |
| New Construction | LED Parking Garage Wall Pack 26W - 60W | $ 30.00 | $ 30.00 | $ 30.00 | NA | |
| New Construction | LED Parking Garage Wall Pack 61W - 150W | $ 50.00 | $ 50.00 | $ 50.00 | NA | |
| New Construction | LED Outdoor Canopy or Soffit lighting 25W - 60W | $ 50.00 | $ 50.00 | $ 50.00 | NA | |
| New Construction | LED Outdoor Canopy or Soffit lighting 61W - 150W | $ 90.00 | $ 50.00 | $ 50.00 | Reduced in 2020 | Change in incremental cost |

| Home Lighting | 2019 Rebate Amount ($) | 2020 Rebate Amount ($) | 2021 Rebate Amount ($) | Rebate Adjustment | Justification |
|---|---|---|---|---|---|
| LED Bulb - A-Line | $ 2.10 | $1.06 | $1.07 | Rebate increased | Updated to average A-Line rebate in 2019 |
| LED Bulb - Specialty | $ 2.10 | $1.10 | $1.54 | Rebate increased | Updated to average Specialty rebate in 2019; incremental cost also increased from 2020 to 2021 |
| LED Bulb - Linear Tube - Residential portion | n/a | $2.00 | $2.00 | n/a | n/a |
| LED Bulb - Linear Tube - Business portion | n/a | $2.00 | $3.92 | Rebate increased | 2021 includes Type A, B and C in assumptions, which have a higher incremental cost |

EMI CONSULTING

NM & SD BUSINESS LIGHTING SATURATION STUDY

March 27, 2020

Mad Dash, Inc.

TO: Kim Sherman & Nick Minderman, Xcel Energy

FROM: Donna Whitsett & Bilsay Varcin, EMI Consulting

CC: Matthew Rose and Jeremy Kraft, EMI Consulting
Michele Jung, Mad Dash

DATE: March 27, 2020

RE: Xcel Energy 2019 NM & SD Business Lighting Saturation Study – FINAL Results Memo

# INTRODUCTION

This memo summarizes results of the 2019 Business Lighting Saturation Study conducted in New Mexico and South Dakota, by EMI Consulting and its partner, Mad Dash. The data collected for this study will help Xcel Energy understand the current saturation of lighting technologies among their business customers in these states, and it supplements data collected in 2018 in the states of Colorado and Minnesota. Altogether, the data collected in all four states will inform Xcel Energy's lighting forecast as it seeks to understand the remaining energy efficiency potential associated with non-residential lighting retrofits.

The remainder of this memo contains the following sections:

- Methods
- Results
- Conclusions

While the study methods largely remained the same as the 2018 study, the next section details methodology that is unique to the 2019 study.

# METHODS

This section includes a summary of methods used to complete the study, focusing on changes from the 2018 study.

For this study, 80 customer on-site visits were completed in New Mexico, and 30 on-site visits were completed in South Dakota. Recruiting took place from September through November 2019. Visits began in New Mexico in October and

were completed in November. In South Dakota, all visits took place in early December.

In general, the same types of data were collected in 2019 as in 2018, with a few minor changes:

- The 2019 study added:
  - data on lamp base size, fixture type, and whether the facility used an EMS (energy management system).
  - a requirement that all spaces observed have six illuminance measurements taken, rather than "up to 6" measurements as with the 2018 study.
- 2019 did not collect:
  - data measuring spillover for program participants.
  - data on reasons for partial retrofits among program participants.

Table 1 shows the number of completed on-sites for each facility type in New Mexico. The 80 completed on-sites included 3 lighting program participants. Actual completes were very similar to the targeted completes outlined in the sampling plan. There was one less site completed than planned for Ambulatory Health Care and Educational Services and one more site completed than planned for Food Services and Drinking Places and Real Estate. While the research team targeted four "large" customer sites in New Mexico (defined as having at least 400 kW peak demand), no large sites agreed to participate in the study. However, it is worth noting that among these facility types, less than 1% of the population is classified as large.

Table 1. Completes in New Mexico

| Facility Type | Number of Sites | Participant Sites Included |
|---|---|---|
| Administrative and Support Services | 10 | 0 |
| Ambulatory Health Care | 9 | 0 |
| Educational Services | 9 | 1 |
| Food Services and Drinking Places | 11 | 1 |
| Merchant Wholesalers, Durable Goods | 10 | 0 |
| Professional, Scientific, and Technical Services | 10 | 0 |
| Real Estate | 11 | 0 |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 10 | 1 |
| **Total** | **80** | **3** |

Table 2 shows the number of completed on-sites for each facility type in South Dakota. Again, actual completes achieved in each category were very similar to the

number targeted in the sampling plan. There were two less sites completed than planned for Real Estate and one more site completed than planned for Ambulatory Health Care and Food Services and Drinking Places. Although we targeted up to two program participants in South Dakota, none were surveyed. Because Xcel Energy does not market programs differently based on customer size in South Dakota, there were no targets based on customer size. Similar to New Mexico, large customers are less than 1% of the population among the targeted facility types.

Table 2. Completes in South Dakota

| Facility Type | Number of Sites | Participant Sites Included |
|---|---|---|
| Ambulatory Health Care | 11 | 0 |
| Food Services and Drinking Places | 11 | 0 |
| Real Estate | 8 | 0 |
| **Total** | **30** | **0** |

In the next section, we provide detailed results of the data collected through the on-site visits.

# RESULTS

This section summarizes key results of the 2019 Xcel Energy Business Lighting Saturation Study conducted by EMI Consulting and its partner, MadDash. Results are presented in the following order:

- Lamp Saturation
- Lamps in Storage
- Lighting Controls Saturation
- Illuminance
- Lighting Forecast Inputs

## LAMP SATURATION

This section describes the lighting saturation results. Based on the data collected by on-site technicians, EMI Consulting computed lamp saturation as the percentage of each lamp type in a given facility type.

### LINEAR VS. NON-LINEAR LIGHTING

As shown in Table 3 (New Mexico) and Table 4 (South Dakota), all facility types except Food Services and Drinking Places had mostly linear lamps installed. In New Mexico, the Food Services and Drinking Places and Real Estate categories had the highest proportion of non-linear lamps installed, at 46% and 41%, respectively. This was similar to the 2018 results in Colorado and Minnesota.

Table 3. Linear & Non-Linear Lighting, New Mexico

| Facility Type | % Linear Lamps | % Non-Linear Lamps |
|---|---|---|
| Ambulatory Health Care | 95% | 5% |
| Educational Services | 90% | 10% |
| Merchant Wholesalers, Durable Goods | 88% | 12% |
| Professional, Scientific, and Technical Services | 86% | 14% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 79% | 21% |
| Administrative and Support Services | 73% | 27% |
| Real Estate | 59% | 41% |
| Food Services and Drinking Places | 54% | 46% |

In South Dakota (Table 4), the Food Services and Drinking Places category had the highest proportion of non-linear lamps installed (65%), higher than the proportion observed in the facility type in the 2018 study (46%).

Table 4. Linear & Non-Linear Lighting, South Dakota

| Facility Type | % Linear Lamps | % Non-Linear Lamps |
|---|---|---|
| Ambulatory Health Care | 68% | 32% |
| Real Estate | 67% | 33% |
| Food Services and Drinking Places | 35% | 65% |

Table 5 shows linear and non-linear lighting saturation combining all four states included in the 2018 and 2019 studies. Merchant Wholesalers had the highest linear lamp share with 91%. Similar to 2018, Food Services and Drinking Places and Real Estate had the highest proportions of non-linear lamps installed.

Table 5. Linear & Non-Linear Lighting, NM, SD, CO & MN Combined

| Facility Type | % Linear Lamps | % Non-Linear Lamps |
|---|---|---|
| Merchant Wholesalers, Durable Goods | 91% | 8% |
| Educational Services | 83% | 17% |
| Ambulatory Health Care | 74% | 26% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 73% | 27% |
| Administrative and Support Services | 67% | 33% |
| Professional, Scientific, and Technical Services | 64% | 35% |
| Real Estate | 52% | 45% |
| Food Services and Drinking Places | 50% | 50% |

*Note: Values may not sum to 100% due to rounding.*

## LINEAR LIGHTING

This sub-section shows saturation of linear lamps disaggregated into T12, T8, and T5 fluorescent lamps, as well as linear LEDs and fluorescent lamps for which size could not be identified by the on-site technicians.

Table 6 shows linear lighting saturation by facility type in New Mexico, sorted in descending order by proportion of Linear LEDs. Across facility types, T12 lamps were more common in New Mexico compared to South Dakota, Colorado, and Minnesota (where they ranged from 5% to 13%). T12s were particularly common among Professional, Scientific, and Technical Services and the Religious, Grantmaking, Civic, Professional, and Similar Organizations category. Meanwhile, the highest proportion of linear LEDs were observed in Educational Services (36%) and Food Services and Drinking Places (22%).[1] Linear LEDs were least common within the Administrative and Support Services and Merchant Wholesalers categories.

[1] The high proportion of linear LEDs in the Education category was mostly driven by two sites that had a very high proportion of linear LEDs installed. For one site, 100% of their linear lamps were LED, while another site had 97% linear LEDs.

Table 6. Linear Lighting Saturation by Facility Type, New Mexico

| Facility Type | % T12 | % T8 | % T5 | % Linear LED | % Unknown Fluorescent |
|---|---|---|---|---|---|
| Educational Services | 29% | 26% | | 36% | 10% |
| Food Services and Drinking Places | 42% | 36% | | 22% | |
| Professional, Scientific, and Technical Services | 71% | 16% | | 13% | |
| Real Estate | 36% | 37% | | 13% | 14% |
| Ambulatory Health Care | 37% | 54% | | 9% | |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 53% | 38% | | 9% | |
| Merchant Wholesalers, Durable Goods | 36% | 47% | 10% | 7% | <1% |
| Administrative and Support Services | 37% | 58% | | 5% | <1% |

Given the high proportion of T12s observed in New Mexico, the research team examined particular sites with a high proportion of installed T12s to determine if these sites also had a high number of T12s in storage. Table 7 shows the proportion of stored T12s to installed T12s, among the 36 sites that had at least 50% of linear lamps that were T12s. Overall, seven sites had a surplus-to-active ratio for T12s that was 25% or greater (meaning of the T12s they had installed, there was an additional 25% or more in storage). About half of the facilities whose installed T12 saturation among linear lights was 100% had no T12 lamps in storage.

Table 7. T12 Lamps in Usage vs. In Storage, New Mexico (Individual Sites With At Least 50% T12s)

| Facility Type | T12 Saturation of Linear Lighting % | T12 Lamps Active n | T12 Lamps in Storage n | Surplus to Active Ratio |
|---|---|---|---|---|
| Professional, Scientific, and Technical Services | 100% | 20 | 17 | 85% |
| Food Services and Drinking Places | 100% | 24 | 14 | 58% |
| Merchant Wholesalers, Durable Goods | 100% | 38 | 15 | 39% |
| Ambulatory Health Care Services | 100% | 28 | 7 | 25% |
| Real Estate | 100% | 54 | 12 | 22% |
| Ambulatory Health Care Services | 100% | 98 | 10 | 10% |
| Ambulatory Health Care Services | 100% | 156 | 14 | 9% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 100% | 80 | 7 | 9% |
| Food Services and Drinking Places | 100% | 148 | 10 | 7% |
| Educational Services | 100% | 162 | 10 | 6% |
| Professional, Scientific, and Technical Services | 100% | 72 | 1 | 1% |
| Professional, Scientific, and Technical Services | 100% | 172 | 0 | 0% |
| Educational Services | 100% | 148 | 0 | 0% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 100% | 120 | 0 | 0% |
| Administrative and Support Services | 100% | 113 | 0 | 0% |
| Merchant Wholesalers, Durable Goods | 100% | 92 | 0 | 0% |
| Merchant Wholesalers, Durable Goods | 100% | 74 | 0 | 0% |
| Real Estate | 100% | 30 | 0 | 0% |
| Food Services and Drinking Places | 100% | 24 | 0 | 0% |
| Real Estate | 100% | 8 | 0 | 0% |
| Professional, Scientific, and Technical Services | 100% | 2 | 0 | 0% |
| Professional, Scientific, and Technical Services | 97% | 126 | 0 | 0% |
| Educational Services | 94% | 67 | 0 | 0% |
| Ambulatory Health Care Services | 94% | 118 | 0 | 0% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 94% | 86 | 25 | 29% |
| Merchant Wholesalers, Durable Goods | 88% | 96 | 10 | 10% |
| Merchant Wholesalers, Durable Goods | 88% | 58 | 8 | 14% |
| Professional, Scientific, and Technical Services | 86% | 68 | 0 | 0% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 78% | 232 | 0 | 0% |
| Administrative and Support Services | 73% | 32 | 0 | 0% |
| Real Estate | 68% | 17 | 15 | 88% |
| Food Services and Drinking Places | 67% | 24 | 0 | 0% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 64% | 132 | 30 | 23% |
| Food Services and Drinking Places | 61% | 41 | 11 | 27% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 56% | 20 | 0 | 0% |
| Administrative and Support Services | 51% | 173 | 0 | 0% |

Table 8 shows the breakdown of installed linear lighting observed in South Dakota, where T12s were less common than in New Mexico (where they ranged from 29%

to 71%). Linear LEDs in South Dakota were found in higher proportions at Real Estate facilities (31%) and Food Services and Drinking Places (29%), compared to 2018 study (12% and 1%, respectively). No linear LEDs were observed in the Ambulatory Health Care category.

Table 8. Linear Lighting Saturation by Facility Type, South Dakota

| Facility Type | % T12* | % T8 | % T5 | % Linear LED | % Unknown Fluorescent |
|---|---|---|---|---|---|
| Real Estate | 9% | 60% | | 31% | <1% |
| Food Services and Drinking Places | 10% | 55% | | 29% | 7% |
| Ambulatory Health Care | | 83% | 14% | | 4% |

Table 9 shows T12 saturation for all four states included in the 2018 and 2019 studies, illustrating the high proportion of T12s in New Mexico.

Table 9. T12 Saturation, NM, SD, CO and MN

| Facility Type | % of Linear Lamps (T12) | | | |
|---|---|---|---|---|
| | NM | SD | CO (2018) | MN (2018) |
| Educational Services | 29% | | 22% | 1% |
| Professional, Scientific, and Technical Services | 71% | | 21% | 2% |
| Ambulatory Health Care | 37% | 0% | 20% | 3% |
| Food Services and Drinking Places | 42% | 10% | 18% | 8% |
| Real Estate | 36% | 9% | 16% | 0% |
| Merchant Wholesalers, Durable Goods | 36% | | 12% | 4% |
| Administrative and Support Services | 37% | | 5% | 9% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 53% | | 2% | 11% |

## NON-LINEAR LIGHTING

Table 10 shows non-linear lighting by facility type in New Mexico, sorted in descending order by proportion of LEDs. The facility types that most commonly had LEDs installed in non-linear sockets included Administrative and Support Services and Merchant Wholesalers; both categories had higher saturation compared to the Colorado and Minnesota 2018 study where saturation was 38% and 32%, respectively. The greatest areas of opportunity appear to be in the Real Estate category, where CFLs were 58% on non-linear lamps, Professional, Scientific, and

Technical Services (69% Halogen/Incandescent), and Ambulatory Health Care (64% Halogen/Incandescent). All three of these facility types had lower proportions of installed non-linear LEDs compared to the Colorado and Minnesota 2018 study.

Table 10. Non-Linear Lighting by Facility Type, New Mexico

| Facility Type | % CFL | % Halogen / Incandescent | % HID | % Non-Linear LED |
|---|---|---|---|---|
| Administrative and Support Services | 1% | 10% | | 88% |
| Merchant Wholesalers, Durable Goods | 22% | 9% | 9% | 60% |
| Food Services and Drinking Places | 25% | 17% | | 57% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 16% | 27% | 5% | 52% |
| Educational Services | 18% | 30% | | 52% |
| Professional, Scientific, and Technical Services | 14% | 69% | | 17% |
| Real Estate | 58% | 39% | | 3% |
| Ambulatory Health Care | 34% | 64% | | 2% |

Table 11 shows that the Real Estate category in South Dakota had a relatively high proportion of HID lamps installed (29%), which was higher than any of the facility types in New Mexico.[2] Both the Ambulatory Health Care (44%) and Real Estate (36%) categories in South Dakota had a greater proportion of non-linear LEDs installed compared to installations in New Mexico (2% and 3%, respectively). Both Food Services and Drinking Places (33%), and Ambulatory Health Care (24%), had a higher proportion of halogen/incandescent lamps installed compared to the Minnesota and Colorado 2018 study, which found 11% among Food Services and Drinking Places and 9% among Ambulatory Health Care facilities. In contrast, in 2018, Food Services and Drinking Places in Minnesota (66%) and Colorado (76%) had a higher non-linear LED share compared to South Dakota. The Real Estate category in South Dakota had a higher share of HIDs than all the facilities in the 2018 Minnesota and Colorado study.[3]

[2] All of the HID lamps installed were in high bay fixtures.
[3] Except for the Fabricated Metal Product Manufacturing category in Colorado (87%); however, this category was not included in the 2019 study.

Table 11. Non-Linear Lighting by Facility Type, South Dakota

| Facility Type | % CFL | % Halogen / Incandescent | % HID | % Non-Linear LED |
|---|---|---|---|---|
| Food Services and Drinking Places | 15% | 33% | | 52% |
| Ambulatory Health Care | 32% | 24% | | 44% |
| Real Estate | 33% | 3% | 29% | 36% |

## ALL LAMPS

Saturation results across all lamp types are shown for New Mexico in Table 12. Results are sorted in descending order by proportion of fluorescent tubes installed. Across facility types, fluorescent tubes were the most commonly observed type of lamp in all facilities and represented at least half of all lamps observed for all but the Food Services and Drinking Places category. Including both linear and non-linear LEDs, the Real Estate and Ambulatory Health Care categories had the lowest saturation of LEDs. Linear LEDs were most commonly installed at Educational Services sites (32%), while non-linear LEDs were most common among Food Services and Drinking Places (27%).[4] CFLs were most common among Real Estate customers, where they represented nearly one-quarter of all installed lamps. Real Estate also had the highest proportion of installed halogen/incandescent lamps (16%).

[4] The high proportion of linear LEDs in the Education category was mostly driven by two sites that had a very high proportion of linear LEDs installed. For one site, 100% of their linear lamps were LED, while another site had 97% linear LEDs.

Table 12. Lamp Saturation by Facility Type, New Mexico

| Facility Type | % CFL | % Fluorescent Tube | % Halogen/ Incandescent | % HID | % Linear LED | % Non-Linear LED |
|---|---|---|---|---|---|---|
| Ambulatory Health Care | 2% | 86% | 3% | | 9% | <1% |
| Merchant Wholesalers, Durable Goods | 3% | 82% | 1% | 1% | 6% | 7% |
| Professional, Scientific, and Technical Services | 2% | 75% | 10% | | 11% | 2% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 3% | 72% | 6% | 1% | 7% | 11% |
| Administrative and Support Services | <1% | 70% | 3% | | 3% | 24% |
| Educational Services | 2% | 58% | 3% | | 32% | 5% |
| Real Estate | 24% | 52% | 16% | | 8% | 1% |
| Food Services and Drinking Places | 12% | 42% | 8% | | 12% | 27% |

As shown in Table 13, Food Services and Drinking Places had the highest proportion of LEDs installed in South Dakota, with fewer fluorescent tubes (25%) and more halogen/incandescent lamps (21%) compared to the 2018 study, when these values were 53% and 5%, respectively. Ambulatory Health Care had the highest percentage of fluorescent tubes, and no linear LEDs.

Table 13. Lamp Saturation by Facility Type, South Dakota

| Facility Type | % CFL | % Fluorescent Tube | % Halogen/ Incandescent | % HID | % Linear LED | % Non-Linear LED |
|---|---|---|---|---|---|---|
| Ambulatory Health Care | 10% | 68% | 8% | | | 14% |
| Real Estate | 11% | 48% | <1% | 10% | 19% | 12% |
| Food Services and Drinking Places | 10% | 25% | 21% | | 10% | 34% |

## FIXTURE TYPES

Table 14 shows fixture types observed in New Mexico, sorted in descending order by proportion of linear tubes. Linear tubes and troffers were the two most common fixture types in most of the facility type categories. Recessed downlights were relatively common at Real Estate sites, while task lighting was relatively common at Administrative and Support Services facilities and Food Services and Drinking Places.

Table 14. Proportion of Lamps Installed by Fixture Type, New Mexico

| Facility Type | Proportion of Lamps Installed by Fixture Type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Decorative Lighting | Exit Sign | Exterior Lighting | High Bay Lighting | Linear Tubes (Not Troffers) | Other | Recessed Downlights | Task Lighting | Troffers | Unknown |
| Professional, Scientific, and Technical Services | 1% | | | | 47% | | | 14% | 37% | <1% |
| Real Estate | | | | | 41% | 6% | 24% | 19% | 10% | <1% |
| Merchant Wholesalers, Durable Goods | 3% | | <1% | | 30% | | | 9% | 57% | |
| Ambulatory Health Care Services | <1% | | | 5% | 21% | | | 4% | 69% | 1% |
| Administrative and Support Services | | | <1% | | 20% | | | 27% | 53% | |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 1% | <1% | | <1% | 17% | <1% | 3% | 18% | 58% | <1% |
| Food Services and Drinking Places | 3% | | <1% | | 7% | 2% | 6% | 35% | 44% | 2% |
| Educational Services | <1% | | | | 6% | <1% | <1% | 7% | 84% | 1% |

Table 15 shows the fixture types observed in South Dakota. Linear tubes were the most common across all three facility types. Decorative lighting, recessed downlights, and troffers were also relatively common.

Table 15. Proportion of Lamps Installed by Fixture Type, South Dakota

| Facility Type | Proportion of Lamps Installed by Fixture Type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Decorative Lighting | High Bay Lighting | Linear Tubes (Not Troffers) | Other | Recessed Downlights | Refrigeration Case Lighting | Stairwell/ Passageway Lighting | Task Lighting | Troffers | Unknown |
| Real Estate | 18% | 9% | 61% | 4% | 4% | | 2% | | | <1% |
| Ambulatory Health Care Services | 5% | | 54% | 2% | 18% | <1% | | 7% | 14% | <1% |
| Food Services and Drinking Places | 26% | | 22% | 12% | 20% | <1% | | 5% | 14% | 1% |

## STORED LAMPS

This section describes lamps found in storage in New Mexico, followed by lamps found in storage in South Dakota.

### STORED LAMPS IN NEW MEXICO

Across the 80 sites visited in New Mexico, 56% of sites had at least one lamp in storage (i.e., not installed), with a total of 1,390 lamps in storage. Table 16 shows that most lamps in storage were fluorescent tubes, and 46% of sites had at least one fluorescent tube in storage, with an average of 25 tubes in storage. There were fewer CFLs in storage (5%) compared to the 2018 study in Colorado and Minnesota (13%).

Table 16. Lamps in Storage, New Mexico

| Lamp Type | Number of Lamps | % of Lamps | *n* Sites | % Sites | *M* Number of Lamps |
|---|---|---|---|---|---|
| Fluorescent Tube | 915 | 66% | 37 | 46% | 24.7 |
| Non-Linear LED | 196 | 14% | 15 | 19% | 13.1 |
| Halogen / Incandescent | 153 | 11% | 11 | 14% | 13.9 |
| CFL | 74 | 5% | 6 | 8% | 12.3 |
| Linear LED | 50 | 4% | 3 | 4% | 16.7 |
| HID | 2 | <1% | 1 | 1% | 2.0 |

In addition to assessing the overall number of lamps in storage, we examined stored lamps relative to installed lamps at each site. Table 17 shows the number of sites in New Mexico where each type of lamp was installed, the mean number of installed lamps, mean number of stored lamps, and the stored-to-installed lamp ratio. Halogen/incandescent lamps and non-linear LEDs (both screw-in bulbs) had the highest stored-to-installed ratios, whereas linear LEDs had the lowest stored-to-installed ratio.

Table 17. Ratio of Lamps in Storage to Installed Lamps, New Mexico

| Stored Lamp Type | *n* Sites Installed | *M* Number of Installed Lamps | *M* Number of Stored Lamps | Stored to Installed Ratio |
|---|---|---|---|---|
| Halogen / Incandescent | 49 | 10.9 | 2.9 | 27% |
| Non-Linear LED | 34 | 30.6 | 5.2 | 17% |
| Fluorescent Tube | 71 | 93.4 | 12.5 | 13% |
| CFL | 30 | 15.4 | 1.2 | 8% |
| HID | 2 | 16.0 | 1.0 | 6% |
| Linear LED | 21 | 54.0 | 2.4 | 4% |

## STORED LAMPS IN SOUTH DAKOTA

Across the 30 sites visited in South Dakota, 60% of sites had at least one lamp in storage (i.e., not installed), with a total of 573 lamps in storage. As in New Mexico, Table 18 shows that most lamps in storage in South Dakota were fluorescent tubes. Also similar to New Mexico, 47% of sites in South Dakota had fluorescent tubes in storage, with an average of 24 tubes in storage. There were more non-linear LEDs (26%) in storage compared to the 2018 study in Colorado and Minnesota (9%). And there were fewer CFLs in storage (6%) compared to the 2018 study (13%). Linear LEDs and HIDs were not observed in storage in South Dakota.

Table 18. Lamps in Storage, South Dakota

| Lamp Type | Number of Lamps | % of Lamps | *n* Sites | % Sites | *M* Number of Lamps |
|---|---|---|---|---|---|
| Fluorescent Tube | 341 | 60% | 14 | 47% | 24.4 |
| Non-Linear LED | 151 | 26% | 9 | 30% | 16.8 |
| Halogen / Incandescent | 47 | 8% | 6 | 20% | 7.8 |
| CFL | 34 | 6% | 3 | 10% | 11.3 |
| Linear LED | | | | | |
| HID | | | | | |

Table 19 shows the number of sites in South Dakota where each type of lamp was installed, the mean number of installed lamps, mean number of stored lamps, and the stored-to-installed lamp ratio. Fluorescent tubes and non-linear LEDs had the highest stored-to-installed ratio. There were no HIDs or linear LEDs in storage.

Table 19. Ratio of Lamps in Storage to Installed Lamps, South Dakota

| Stored Lamp Type | *n* Sites Installed | *M* Number of Installed Lamps | *M* Number of Stored Lamps | Stored to Installed Ratio |
|---|---|---|---|---|
| Fluorescent Tube | 27 | 49.8 | 12.6 | 25% |
| Non-Linear LED | 22 | 26.7 | 6.6 | 25% |
| CFL | 20 | 13.8 | 1.7 | 12% |
| Halogen / Incandescent | 13 | 23.7 | 2.2 | 9% |
| HID | 1 | 40.0 | 0.0 | 0% |
| Linear LED | 2 | 89.0 | 0.0 | 0% |

## LIGHTING CONTROLS SATURATION

This section displays results related to saturation of lighting controls. Results are first shown by facility type, then by space use.

### LIGHTING CONTROLS BY FACILITY TYPE

Table 20 and Table 21 show the distribution of lighting controls for each of the targeted facility types, in New Mexico and South Dakota, respectively. The proportions shown indicate the percentage of lamps controlled. The tables are sorted in descending order of Manual On/Off switches. Note that "Always On" does not necessarily indicate that lamps were on 24 hours a day; this designation was used when the on-site technician was unable to locate a control, and this could indicate the lamp is controlled via EMS or by turning off the breaker. We interpret the "Always On" designation to mean always on during business hours.

Across facility types and across states, the most common type of lighting control was a manual on/off switch, indicating a great deal of opportunity for increasing the uptake of efficient lighting controls. In New Mexico, Merchant Wholesalers (6%), and Educational Services (9%) had a small proportion of lamps controlled by occupancy sensors. All other efficient controls represented less than 5% of lamps controlled.

Table 20. Lighting Controls by Facility Type (Lamps Controlled), New Mexico

| Facility Type | % Always On | % Manual On/Off | % Manual Dimmer | % Timer | % Occupancy Sensor | % Photocell | % Other |
|---|---|---|---|---|---|---|---|
| Administrative and Support Services | | 100% | | | | | |
| Ambulatory Health Care Services | | 100% | | | | | |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | <1 | 99% | <1 | | | | <1 |
| Professional, Scientific, and Technical Services | 2% | 98% | | | | | |
| Real Estate | | 98% | | | | | 2% |
| Food Services and Drinking Places | | 95% | 4% | | | | <1 |
| Merchant Wholesalers, Durable Goods | | 90% | | | 9% | <1 | 1% |
| Educational Services | | 88% | 3% | | 6% | | 3% |

In South Dakota, manual dimmers were relatively frequent among Food Services and Drinking Places. As in New Mexico, there appears to be a great deal of opportunity for increasing the uptake of efficient lighting controls, with most lamps controlled by manual on/off switches.

Table 21. Lighting Controls by Facility Type (Lamps Controlled), South Dakota

| Facility Type | % Always On | % Manual On/Off | % Manual Dimmer | % Timer | % Occupancy Sensor | % Photocell | % Other |
|---|---|---|---|---|---|---|---|
| Ambulatory Health Care | | 98% | 1% | | | | <1% |
| Real Estate | 24% | 74% | | | 2% | | |
| Food Services and Drinking Places | | 73% | 26% | | <1% | | |

## LIGHTING CONTROLS BY SPACE USE

In addition to assessing the proportion of lighting controls in each target facility type, EMI Consulting also computed the proportion of lighting controls found in each space type across facility types. As shown in Table 22, several space types have a great deal of opportunity for efficient lighting controls in New Mexico; in particular, lobbies, inactive storage spaces, and restrooms may be good targets as they were found at a variety of facility types (see Attachment, "Spaces Sampled by Facility Type"). Efficient controls were less common across a variety of space types

in New Mexico, compared to the 2018 Minnesota and Colorado study. Most of the facilities in Minnesota and Colorado had some proportion of efficient lighting controls (most commonly occupancy sensors), and very few had 100% manual on/off switches.

Table 22. Lighting Controls by Space Use (Lamps Controlled), New Mexico

| Space Type | % Always On | % Manual On/Off | % Manual Dimmer | % Timer | % Occupancy Sensor | % Photocell | % Other |
|---|---|---|---|---|---|---|---|
| Bar (n = 3) | | 100% | | | | | |
| Dressing or Locker Room (n = 5) | | 100% | | | | | |
| General Dining (n = 45) | | 100% | | | | | |
| Laundry (n = 2) | | 100% | | | | | |
| Living Space (n = 17) | | 100% | | | | | |
| Lobby (n = 65) | <1% | 100% | | | | | |
| Medical (n = 12) | | 100% | | | | | |
| Refrigerated Storage (n = 5) | | 100% | | | | | |
| Retail Sales Floor (n = 32) | | 100% | | | | | |
| Server Room (n = 3) | | 100% | | | | | |
| Stairs (n = 1) | | 100% | | | | | |
| Storage - Inactive (n = 78) | 4% | 96% | | | | | |
| Workshop / Production Facility (n = 24) | | 100% | | | | | |
| Lounge or Recreation (n = 31) | | 99% | | | | | 1% |
| Office (n = 185) | | 99% | | | | | 1% |
| Restroom (n = 106) | | 99% | | | | | 1% |
| Corridor (n = 54) | | 99% | 2% | | | | |
| Classroom (n = 47) | | 97% | <1% | | | | 3% |
| Chapel (n = 17) | 3% | 93% | 5% | | | | |
| Other (n = 9) | | 95% | | | | | 5% |
| Food Preparation (n = 53) | | 91% | 9% | | | | |
| Conference (n = 30) | | 89% | 11% | | | | |
| Gymnasium (n = 9) | | 82% | | | 18% | | |
| Storage - Active (n = 24) | | 81% | | | 20% | | |
| Exterior (not Parking) (n = 4) | | 10% | | | | 30% | 60% |

*Note: the following space types were coded from open-ended "Other" space types: Bar, Chapel, Laundry, and Medical.*

Table 23 shows that manual on/off switches were by far the most common type of control across space types in South Dakota, although efficient lighting controls were generally more common in South Dakota compared to New Mexico. In South Dakota, two space types (bars and laundry spaces) had manual on/off switches controlling less than 50% of lamps. The greatest opportunity for efficient lighting

controls in South Dakota may be inactive storage spaces and corridors as they were found across all three facility types (see Attachment, "Spaces Sampled by Facility Type"). As with New Mexico, South Dakota had fewer efficient controls across a variety of space types compared to the 2018 Minnesota and Colorado study. In particular, occupancy sensors were much more common in the 2018 study.

Table 23. Lighting Controls by Space Use (Lamps Controlled), South Dakota

| Space Type | % Always On | % Manual On/Off | % Manual Dimmer | % Timer | % Occupancy Sensor | % Photocell | % Other |
|---|---|---|---|---|---|---|---|
| Food Preparation (n = 17) | | 100% | | | | | |
| Other (n = 16) | | 100% | | | | | |
| Storage - Inactive (n = 16) | | 100% | | | | | |
| Workshop / Production Facility (n = 5) | | 100% | | | | | |
| Conference (n = 1) | | 100% | | | | | |
| Gymnasium (n = 1) | | 100% | | | | | |
| Storage - Active (n = 1) | | 100% | | | | | |
| Mechanical Room (n = 19) | 2% | 98% | | | | | |
| Atrium (n = 5) | 11% | 89% | | | | | |
| Corridor (n = 31) | 8% | 91% | 1% | | | | |
| Stairs (n = 14) | 81% | 18% | | | 1% | | |
| Medical (n = 40) | | 98% | 2% | | | | |
| Lobby (n = 39) | | 96% | | | | | 4% |
| Office (n = 27) | | 94% | 6% | | | | |
| Restroom (n = 31) | | 93% | | | 7% | | |
| Retail Sales Floor (n = 11) | | 73% | 27% | | | | |
| General Dining (n = 30) | | 68% | 32% | | | | |
| Lounge or Recreation (n = 5) | | 61% | 39% | | | | |
| Bar (n = 8) | | 47% | 54% | | | | |
| Laundry (n = 3) | | 25% | | | 75% | | |

*Note: the following space types were coded from open-ended "Other" space types: Bar, Chapel, and Medical.*

## ILLUMINANCE

Six illuminance measurements were collected for each space inventoried. Results are displayed first by facility and then by space type.

## ILLUMINANCE BY FACILITY TYPE

Table 24 and Table 25 show the average and median site illuminances in foot candles for each of the 10 target facility types in New Mexico and South Dakota respectively. Results are shown in descending order by average illuminance.

In New Mexico, Professional, Scientific, and Technical Services showed the highest average illuminance (51.87 fc), followed by Religious, Grantmaking, Civic, Professional, and Similar Organizations (44.46 fc). In these cases, energy efficiency could be achieved by removing lamps, while still maintaining adequate light levels. Both of these facility types had higher illuminance compared to the 2018 study in Colorado and Minnesota. Categories where the average is significantly higher than the median suggest that some sites are outliers with very high illuminance measurements, which means some facilities in these categories may be over-lit.

Table 24. Illuminance by Facility Type, New Mexico

| Facility Type | Average Site Illuminance (fc) | Median Site Illuminance (fc) |
|---|---|---|
| Professional, Scientific, and Technical Services | 51.87 | 34.62 |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | 44.46 | 32.00 |
| Educational Services | 40.17 | 38.35 |
| Ambulatory Health Care Services | 34.72 | 37.40 |
| Merchant Wholesalers, Durable Goods | 34.40 | 32.36 |
| Food Services and Drinking Places | 32.32 | 26.08 |
| Administrative and Support Services | 29.68 | 28.62 |
| Real Estate | 27.16 | 29.17 |

In South Dakota, both Real Estate and Food Services and Drinking Places had lower illuminance compared to these facility types in the 2018 study in Colorado and New Mexico.

Table 25. Illuminance by Facility Type, South Dakota

| Facility Type | Average Site Illuminance (fc) | Median Site Illuminance (fc) |
|---|---|---|
| Ambulatory Health Care Services | 34.50 | 31.87 |
| Real Estate | 19.00 | 13.10 |
| Food Services and Drinking Places | 14.22 | 15.38 |

## ILLUMINANCE BY SPACE TYPE

In addition to analyzing illuminance by facility type, EMI Consulting also conducted analysis on the illuminance measurements at the space type level. We present results first for New Mexico, followed by South Dakota.

### ILLUMINANCE BY SPACE TYPE IN NEW MEXICO

Table 26 displays average and median illuminance levels (in foot candles, fc) and the number of spaces for space types observed across facility types in New Mexico. IES (Illuminating Engineering Society) publishes recommended light levels by space, and the table shows the recommended lighting levels for spaces included in the IES Guidelines. EMI Consulting compared the average illuminance observed to the IES guidelines in order to determine if any spaces appear to be over or under the range of average recommended values.

In New Mexico, several space types appear to be consistently above the recommended range of average illuminance values, including classrooms, conference rooms, and restrooms.

Table 26. Illuminance by Space Type, New Mexico

| Space Type | *n* Spaces | Average Space Illuminance (fc) | Median Space Illuminance (fc) | IES Guidelines (fc) |
|---|---|---|---|---|
| Laundry | 2 | 58.07 | 34.68 | |
| Retail Sales Floor | 17 | 51.75 | 35.23 | 40-50 |
| **Classroom** | **36** | **47.37** | **29.17** | **15-25** |
| Living Space | 8 | 46.69 | 29.10 | |
| Medical | 11 | 46.12 | 32.72 | |
| Food Preparation | 34 | 44.19 | 30.50 | |
| Workshop / Production Facility | 17 | 43.57 | 35.58 | |
| **Conference** | **22** | **42.65** | **45.87** | **30** |
| Server Room | 3 | 41.31 | 43.00 | |
| Office | 166 | 39.36 | 38.12 | 40 |
| Lounge or Recreation | 24 | 38.68 | 29.33 | |
| Lobby | 41 | 34.96 | 30.25 | |
| General Dining | 23 | 33.81 | 26.33 | |
| Dressing or Locker Room | 5 | 30.67 | 35.67 | |
| Storage - Inactive | 68 | 28.96 | 25.67 | |
| Refrigerated Storage | 4 | 28.79 | 30.68 | |
| **Restroom** | **91** | **25.70** | **19.65** | **5-15** |
| Corridor | 41 | 23.90 | 19.74 | |
| Gymnasium | 8 | 23.02 | 20.67 | 30-100 |
| Storage - Active | 14 | 22.93 | 18.55 | 10-30 |
| Other | 8 | 21.12 | 21.56 | |
| Stairs | 1 | 19.33 | 19.33 | 5 |
| Chapel | 7 | 16.50 | 13.33 | |
| Bar | 1 | 6.17 | 6.17 | 4-50 |

*Note. While six exterior spaces were included in the sample, illuminance was not measured in exterior spaces.*

The team also examined the proportion of square footage by space type with "above average" illuminance per IES guidelines. Table 27 shows, for New Mexico, the proportion of square footage with above average illuminance for spaces with IES guidelines. The spaces containing the greatest proportion of "above average" square footage were: stairs (100%, although there was only one of these spaces sampled), conference rooms (79%), classrooms (74%), and restrooms (61%).

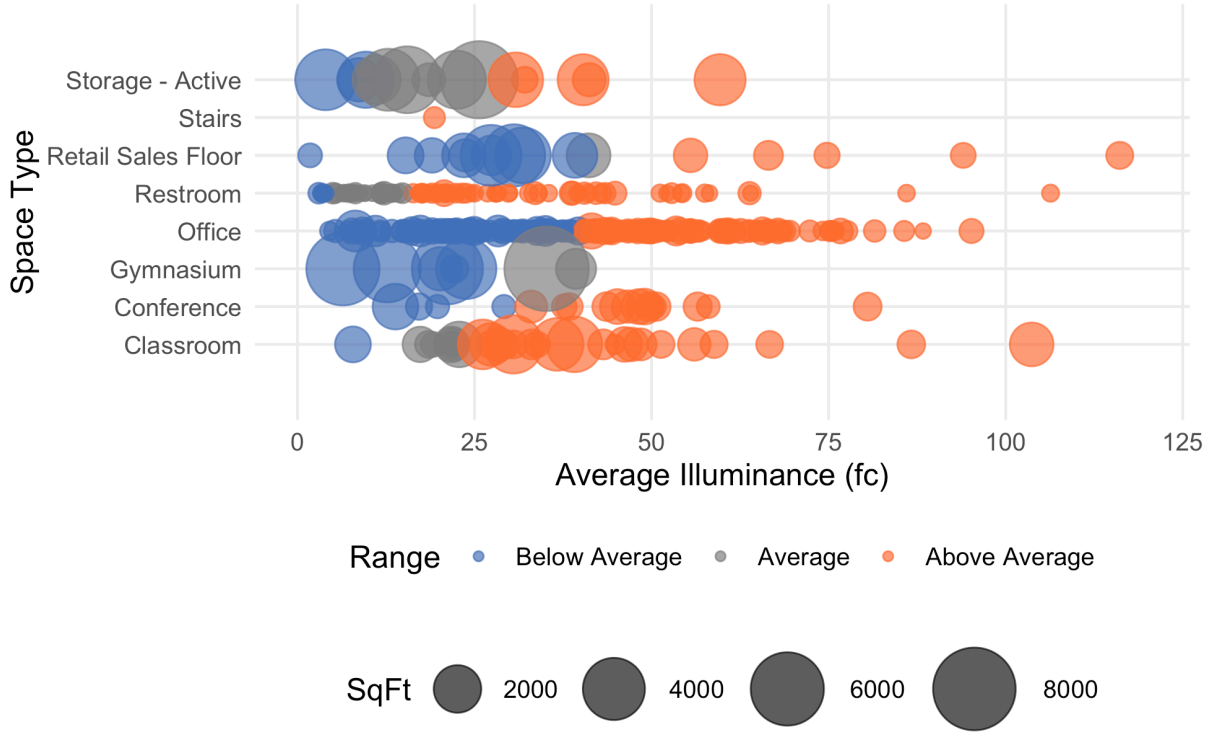
Table 27. Proportion of Square Footage with Above-Average Illuminance, by Space Type, New Mexico

| Space Type | *n* Spaces | Average Space Illuminance (fc) | Median Illuminance (fc) | IES Guidelines (fc) | % of Square Footage Above IES Guideline Value |
|---|---|---|---|---|---|
| Stairs | 1 | 19.33 | 19.33 | 5 | 100% |
| Conference | 19 | 39.72 | 46.67 | 30 | 79% |
| Classroom | 31 | 37.12 | 30.50 | 15-25 | 74% |
| Restroom | 85 | 27.12 | 19.50 | 5-15 | 61% |
| Office | 155 | 37.23 | 37.50 | 40 | 48% |
| Storage - Active | 14 | 21.59 | 20.53 | 10-30 | 36% |
| Retail Sales Floor | 17 | 63.34 | 31.83 | 40-50 | 35% |
| Gymnasium | 8 | 21.78 | 21.67 | 30-100 | 0% |

The ranges of illuminance values for individual spaces by space type are shown graphically in Figure 1 for New Mexico. In this figure, each dot represents an individual space, with larger dots representing spaces with greater square footage. Blue dots show spaces that are lit below IES guidelines; grey dots show spaces that are equal to the guidelines; and orange dots show spaces that are above the guidelines.

In New Mexico, restrooms, offices, conference rooms, and classrooms include spaces with a wide range of illuminance values that are much higher than the upper bound of average values included in the IES guidelines. One outlying illuminance observation (a retail sales floor with an average of 382 fc) was removed from the figure to make the figure more readable.

Figure 1. Range of Illuminance for Individual Spaces, New Mexico




*Note: "Storage-Active" denotes active storage rooms with installed lamps.*

### Illuminance by Space Type in South Dakota

Table 28 displays average and median illuminance levels (in foot candles, fc) and the number of spaces for space types observed across facility types in South Dakota. EMI Consulting compared the average illuminance observed to the IES guidelines in order to determine if any spaces appear to be over or under the range of average recommended values.

In South Dakota, for most of the spaces with IES guidelines present, average space illuminance was either within the range or slightly above the IES guidelines. Restrooms and stairs were the two space types where more than one space was sampled that had average space illuminance above IES guidelines.

Table 28. Illuminance by Space Type, South Dakota

| Space Type | *n* Spaces | Average Space Illuminance (fc) | Median Space Illuminance (fc) | IES Guidelines (fc) |
|---|---|---|---|---|
| Atrium | 4 | 137.50 | 72.50 | |
| Gymnasium | 1 | 105.67 | 105.67 | 30-100 |
| Workshop / Production Facility | 2 | 51.25 | 43.67 | |
| Medical | 31 | 44.91 | 33.64 | |
| Food Preparation | 10 | 43.40 | 43.25 | |
| Office | 23 | 38.25 | 32.00 | 40-50 |
| Conference | 1 | 35.17 | 35.17 | 30 |
| Lobby | 25 | 26.82 | 29.64 | |
| Lounge or Recreation | 5 | 25.43 | 12.67 | |
| General Dining | 16 | 23.03 | 14.00 | |
| Corridor | 27 | 21.71 | 24.08 | |
| **Restroom** | **27** | **21.60** | **20.00** | **5-15** |
| Laundry | 3 | 20.71 | 20.60 | |
| Other | 13 | 14.71 | 14.08 | |
| **Stairs** | **9** | **12.99** | **9.79** | **5** |
| Storage - Active | 1 | 12.83 | 12.83 | 10-30 |
| Storage - Inactive | 11 | 12.49 | 6.17 | |
| Mechanical Room | 18 | 10.52 | 7.17 | |
| Retail Sales Floor | 4 | 8.05 | 8.50 | 40-50 |
| Chapel | 5 | 6.40 | 6.00 | |

The team also examined the proportion of square footage by space type with "above average" illuminance per IES guidelines. Table 29 shows the proportion of square footage in South Dakota with above average illuminance for spaces with IES guidelines.

In South Dakota, the spaces containing the greatest proportion of "above average" square footage were stairs (88%) and restrooms (65%). Only one conference room and gymnasium were measured; therefore, no conclusions can be drawn for these two space types.

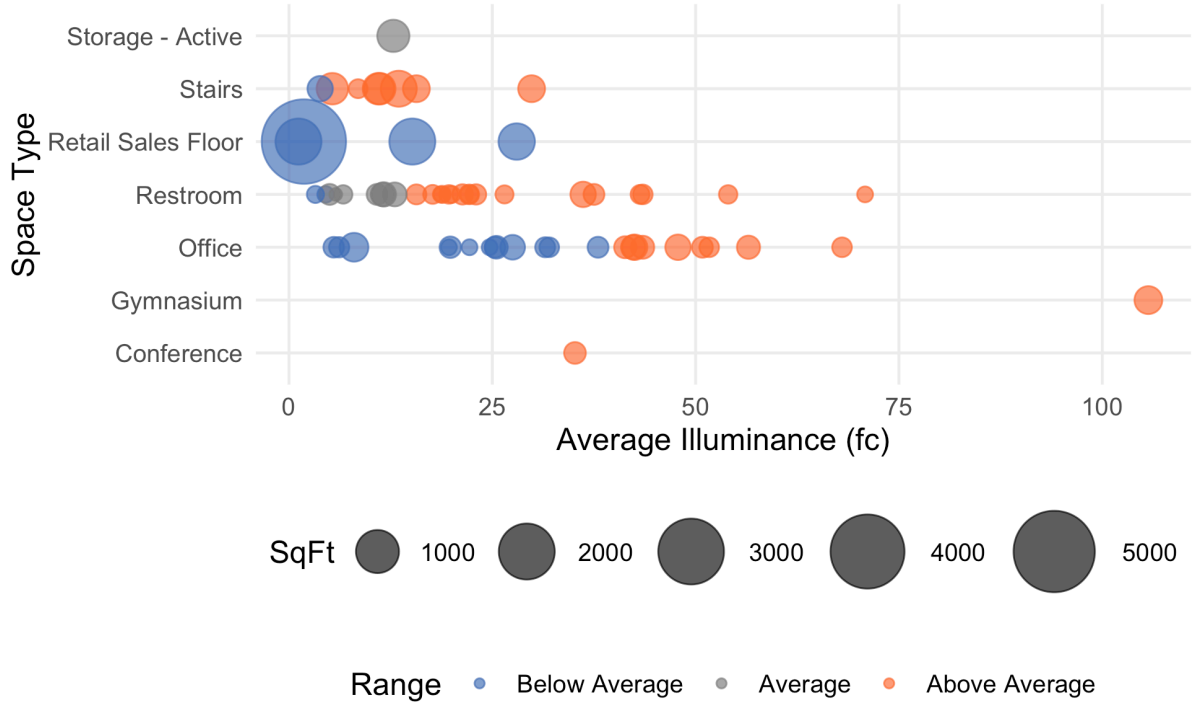
Table 29. Proportion of Square Footage with Above-Average Illuminance, by Space Type, South Dakota

| Space Type | *n* Spaces | Average Space Illuminance (fc) | Median Illuminance (fc) | IES Guidelines (fc) | % of Square Footage Above IES Guideline Value |
|---|---|---|---|---|---|
| Conference | 1 | 35.17 | 35.17 | 30 | 100% |
| Gymnasium | 1 | 105.67 | 105.67 | 30-100 | 100% |
| Stairs | 8 | 12.31 | 11.08 | 5 | 88% |
| Restroom | 26 | 21.88 | 19.25 | 5-15 | 65% |
| Office | 22 | 33.27 | 31.75 | 40 | 41% |
| Retail Sales Floor | 4 | 5.54 | 8.50 | 40-50 | 0% |
| Storage - Active | 1 | 12.83 | 12.83 | 10-30 | 0% |

The ranges of illuminance values for individual spaces by space type are shown graphically in Figure 2 for South Dakota. In this figure, each dot represents an individual space, with larger dots representing spaces with greater square footage. Blue dots show spaces that are lit below IES guidelines; grey dots show spaces that are equal to the guidelines; and orange dots show spaces that are above the guidelines.

In South Dakota, Stairs, Restrooms, and Offices had a wide range of illuminance values that are higher than the upper bound of average values included in the IES guidelines.

Figure 2. Range of Illuminance for Individual Spaces, South Dakota




*Note: "Storage - Active" denotes active storage rooms with installed lamps.*

## LIGHTING FORECAST INPUTS

This section details results specifically required for Xcel Energy's lighting forecast. This includes a breakdown, by proportion of square footage, of the four most common space use types for each facility type category.

### MOST COMMON SPACE USES, BY FACILITY TYPE

For each facility type, EMI Consulting computed the most frequently observed space types and the proportion of square footage that space type accounted for, across each of the targeted facility types, combining all data collected for the 2018 and 2019 studies (and only showing the eight facility types that were surveyed in all four states).

Table 30 shows that, adding the 2019 New Mexico and South Dakota data to the 2018 Colorado and Minnesota data resulted in few changes in the overall distribution of space types contained within each facility type. Notable changes include:

- The Administrative and Support Services category now has Classrooms as the third most common space type in terms of square footage. This is due to a large facility that has classrooms in support of a museum.

- Workshop/Production spaces are no longer among the top four spaces in the Ambulatory Healthcare category; instead, Medical spaces are the fourth most common space.
- The Professional, Scientific, and Technical Services category now has Retail Sales Floor as the fourth most common space type; Lobby spaces are no longer in the top four space types.
- Real Estate now has Lounge or Recreation spaces as the fourth most common space type; Mechanical Rooms are no longer in the top four space types.

Table 30. Most Common Space Uses by Facility Type, NM, SD, CO and MN Combined

| Facility Type | Space 1 | Space 2 | Space 3 | Space 4 | % Sq. Ft. 1 | % Sq. Ft. 2 | % Sq. Ft. 3 | % Sq. Ft. 4 |
|---|---|---|---|---|---|---|---|---|
| Administrative and Support Services | Parking Garage | Office | Classroom | Retail Sales Floor | 39% | 18% | 9% | 8% |
| Ambulatory Health Care Services | Lobby | Office | Lounge or Recreation | Medical | 21% | 19% | 8% | 8% |
| Educational Services | Gymnasium | Chapel | Corridor | Classroom | 22% | 14% | 14% | 12% |
| Food Services and Drinking Places | General Dining | Food Preparation | Refrigerated Storage | Storage - Active | 31% | 26% | 18% | 6% |
| Merchant Wholesalers, Durable Goods | Workshop / Production Facility | Storage - Active | Retail Sales Floor | Office | 56% | 32% | 6% | 3% |
| Professional, Scientific, and Technical Services | Office | Parking Garage | Workshop / Production Facility | Retail Sales Floor | 20% | 17% | 13% | 6% |
| Real Estate | Storage - Active | Parking Garage | Corridor | Lounge or Recreation | 28% | 14% | 9% | 8% |
| Religious, Grantmaking, Civic, Professional, and Similar Organizations | Parking Garage | Gymnasium | Chapel | Lobby | 43% | 11% | 10% | 5% |

# CONCLUSIONS

The 2019 Business Lighting Saturation Study conducted in New Mexico and South Dakota resulted in eight key conclusions, summarized below. Overall, the results of this study suggest substantial opportunity for efficient lighting upgrades exist for the facility types observed.

1. **The greatest opportunity for linear LEDs in New Mexico appears to be in the following business types: 1) Merchant Wholesalers and 2) Administrative & Support Services.** These facility types had a high percentage of installed fluorescent tubes (82% and 70% of all installed lamps, respectively), and low percentages of linear LEDs (6% and 3%, respectively).

2. **The greatest opportunity for linear LEDs in South Dakota appears to be in the Ambulatory Health Care Services category.** In this facility type, 68% of lamps were fluorescent tubes, and no linear LEDs were observed.

3. **Saturation of T12s was high across facility types in New Mexico.** T12 saturation ranged from 29% to 71% of linear lamps in New Mexico. On the other hand, T12 saturation in South Dakota was more similar to the 2018 Minnesota and Colorado study (in the 10% range). Among sites with a high proportion of installed T12s in New Mexico, about half had at least some T12s in storage.

4. **The greatest opportunity for non-linear LEDs appears to lie in the Real Estate category in New Mexico.** Real estate businesses had a high proportion of installed non-linear lamps (41%), and only 3% of non-linear lamps were LED, while 58% were CFLs.

5. **Most lamps in storage are fluorescent tubes, with non-linear LEDs second most common.** Across both states, nearly half of sites had fluorescent tubes in storage (similar to 2018). Compared to 2018, there were fewer CFLs in storage in New Mexico and South Dakota, and an increased storage of non-linear LEDs – especially in South Dakota, where they represented 26% of stored lamps (9% in the 2018 study).

6. **Opportunities for efficient controls span across facility types in New Mexico and South Dakota.** As a proportion of lamps controlled, between 73% and 100% of the lighting across facility types was controlled by manual on/off switches.

7. **Inactive storage spaces have opportunity for efficient controls in both New Mexico and South Dakota.** Lamps installed within this space type had manual on/off switches for nearly 100% of their controls, and this space use was surveyed many times throughout the study, across facility types, and across states. In New Mexico, lobbies and restrooms also have good opportunity for controls. In South Dakota, corridors also have good opportunity.

8. **In New Mexico, Conference rooms, classrooms, and restrooms appear to be commonly over-lit, while stairs and restrooms are commonly over-lit in South Dakota.** Illuminance measurements taken in

these space types found light output at higher-than-recommended levels for a majority of the square footage observed.

ATTACHED:
Spaces Sampled by Facility Type
Sample Design Memo
Data Collection Protocols

**Xcel Energy**
**South Dakota Capital Structure**
**Carrying Charge Calculation**

**State of South Dakota Jurisdiction**
**2014 Rate Case-Docket EL-14-058 (Order issued 7/22/15)**
**Base Assumptions**

| **Capital Structure:** | | **Percent** | **Cost** | **Weighted Cost** | |
|---|---|---|---|---|---|
| | [CONFIDENTIAL DATA BEGINS HERE | | | | |
| Long-term Debt | | | | | |
| Short-term Debt | | | | | |
| Perferred Stock | | | | | CONFIDENTIAL DATA ENDS HERE] |
| Common Equity | | | | | |
| | | | | 7.22% | |

| **Weighted Cost of Capital** | | | |
|---|---|---|---|
| | [CONFIDENTIAL DATA BEGINS HERE | | |
| Equity | | | |
| Debt | | | CONFIDENTIAL DATA ENDS HERE] |
| Total | | | |
| Weighted Cost of Capital | | | 7.22% |

| | | |
|---|---|---|
| Book Depreciation Rate | 30 years | 3.33% |
| Tax Depreciation Life - MACRS | 20 years | |
| Composite SD Tax Rate = | 21.0000% | |
| Composite Company Tax Rate = | 28.1100% | |
| Property Tax Exempt = | 0 | |

**Use these values beginning January 1, 2018:**
(b) Composite SD Tax Rate 21%

(c) Carrying Charge Rate =

[CONFIDENTIAL DATA BEGINS HERE

CONFIDENTIAL DATA ENDS HERE]

PUBLIC

**Northern States Power Company**
**State of South Dakota- Electric Utility**
**DSM Cost Recovery & Incentive Mechanism - Total**
**2019 Actual**

| **2019** | **January** | **February** | **March** | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXPENSES | Actual | Actual | Actual | Actual | Actual | Actual | Actual | Actual | Actual | Actual | Actual | Actual | |
| [CONFIDENTIAL DATA BEGINS | | | | | | | | | | | | | |
| 1. Beg. Balance | | | | | | | | | | | | | |
| 2. DSM Program Expenditures | | | | | | | | | | | | | |
| 3. Accrued Incentive | | | | | | | | | | | | | |
| 4. Total Expenditures + Incentive (Line 2 + 3) | | | | | | | | | | | | | |
| RECOVERY | | | | | | | | | | | | | |
| 5. Calendar Month Sales Volume (MWh) | | | | | | | | | | | | | |
| 6. DSM Adjustment Factor ($/MWh) | | | | | | | | | | | | | |
| 7. Cost and Incentive Recovery | | | | | | | | | | | | | |
| 8. Sub-Balance (Over)/Under Recovery (Sum Lines 1 - 3, minus Line 7) | | | | | | | | | | | | | |
| 9. Accumulated Deferred Income Tax (Line 8 x 21%) | | | | | | | | | | | | | |
| 10.Net Investment (Line 8 - 9) | | | | | | | | | | | | | |
| 11. Carrying Charge Rate | | | | | | | | | | | | | |
| 12. Carrying Charge (Line 10 x Line 11) | | | | | | | | | | | | | |
| 13. End of Month Balance (over)/under recovered (Line 8 + 12) | | | | | | | | | | | CONFIDENTIAL DATA ENDS] | | |

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CONFIDENTIAL DATA ENDS]

# Supporting Documentation for Updated DSM Cost Adjustment Factor

The following is information specified in South Dakota Administrative Rule 20:10:13:26 regarding the updated DSM Cost Adjustment Factor:

## (1) Name and address of the public utility;

Xcel Energy
500 West Russell Street
Sioux Falls, South Dakota 57104
(605) 339-8350

## (2) Section and sheet number of tariff schedule;

Xcel Energy proposes to update DSM Rate tariff sheet number 73 in Section 5 of the Xcel Energy South Dakota Electric Rate Book. Attachment E4 includes the proposed tariff sheets with the updated DSM Rate.

## (3) Description of the change;

The proposed updated DSM Rate is designed to true up the cost recovery, which is over our forecasted budget in the time period of 2020-2021 timeframe, as well as recover all forecasted 2021 DSM expenditures and incentives.

## (4) Reason for the change;

As proposed in the South Dakota DSM Plan and described in the DSM Cost Adjustment Factor tariff sheet, the Company plans to update the DSM Cost Adjustment Factor on an annual basis in the May 1 Status Report filing. The updated DSM Rate is designed to true up any over-recovery or under-recovery that exists in the tracker as well as recover the forecasted DSM expenditures and incentives for the upcoming year.

**(5) Present rate;**

Pursuant to the Commission's December 12, 2019 Order,[1] Xcel Energy implemented the approved rate of $0.000477 per kWh effective January 1, 2020.

**(6) Proposed rate;**

Xcel Energy requests a new DSM Cost Adjustment Factor of $0.000527 per customer kWh.

**(7) Proposed effective date of modified rate;**

Xcel Energy requests this new DSM Cost Adjustment Factor of $0.000527 per customer kWh become effective with the first billing cycle of January 2021. We request this rate remain in effect through December 2021 or until the Commission approves a new DSM Cost Adjustment Factor.

**(8) Approximation of annual amount of increase or decrease in revenue;**

This new DSM Cost Adjustment Factor of $0.000527 per customer kWh is an increase of $0.00005 per kWh or 10.48 percent.

**(9) Points affected;**

The proposed updated DSM Rate would be applicable to all areas served by Xcel Energy in South Dakota.

**(10) Estimation of the number of customers whose cost of service will be affected and annual amounts of either increases or decreases, or both, in cost of service to those customers;**

The proposed electric tariff will apply to all customers throughout all customer classes as described within the filing. Xcel Energy presently serves just over 97,076 electric customers in 36 communities in eastern South Dakota.[2]

[1] Docket No. EL19-019
[2] Data current as of April 1, 2020.

**(11) Statement of facts, expert opinions, documents, and exhibits to support the proposed changes.**

A narrative for the calculation of the updated rate is included in the DSM Cost Adjustment Factor Report section of this filing. The following pages of this attachment include the forecasted 2020 and 2021 DSM Trackers, which are referenced in the narrative, along with the proposed customer bill onsert message and the proposed updated tariff sheets in both redline and clean versions.

**Northern States Power Company**
**State of South Dakota- Electric Utility**
**DSM Cost Recovery & Incentive Mechanism - Total**
**2020 Forecast**

| | 2020 | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EXPENSES | Actual | Actual | Actual | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | |
| | [CONFIDENTIAL DATA BEGINS | | | | | | | | | | | | | |
| 1. | Balance | | | | | | | | | | | | | |
| 2. | DSM Program Expenditures | | | | | | | | | | | | | |
| 3. | Total Incentive (Line 2 * 30%) | | | | | | | | | | | | | |
| 4. | Total Expenditures + Incentive (Line 2 + 3) | | | | | | | | | | | | | |
| | RECOVERY | | | | | | | | | | | | | |
| 5. | DSM Adjustment Factor ($/MWh) | | | | | | | | | | | | | |
| 6. | Calendar Month Sales Volume Forecast (MWh) | | | | | | | | | | | | | |
| 7. | Total Cost Recovery (Line 5*6) | | | | | | | | | | | | | |
| 8. | Sub-Balance (Over/Under Recovery) (Line 1 + 4 - 7) | | | | | | | | | | | | | |
| 9. | Accum Deferred Tax (Line 8 *21%) | | | | | | | | | | | | | |
| 10. | Net Investment (Line 8 - 9) | | | | | | | | | | | | | |
| 11. | Carrying Charge Rate | | | | | | | | | | | | | |
| 12. | Carrying Charge (Line 10 * carrying charge) | | | | | | | | | | | | | |
| 13. | 13. End of Month Balance (over)/under recovered (Line 8 + 12) | | | | | | | | | | | | | |
| | | | | | | | | | | | | CONFIDENTIAL DATA ENDS] | | |

Table 1: 2020 DSM Tracker Actual, With Cost Recovery in 2021

[CONFIDENTIAL DATA BEGINS

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**Northern States Power Company**
**State of South Dakota- Electric Utility**
**DSM Cost Recovery & Incentive Mechanism - Total**
**2021 Forecast**

| | 2020 | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EXPENSES | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | |
| | [CONFIDENTIAL DATA BEGINS | | | | | | | | | | | | | |
| 1. | Balance | | | | | | | | | | | | | |
| 2. | DSM Program Expenditures | | | | | | | | | | | | | |
| 3. | Total Incentive (Line 2 * 30%) | | | | | | | | | | | | | |
| 4. | Total Expenditures + Incentive (Line 2 + 3) | | | | | | | | | | | | | |
| | RECOVERY | | | | | | | | | | | | | |
| 5. | DSM Adjustment Factor ($/MWh) | | | | | | | | | | | | | |
| 6. | Calendar Month Sales Volume Forecast (MWh) | | | | | | | | | | | | | |
| 7. | Total Cost Recovery | | | | | | | | | | | | | |
| 8. | Sub-Balance (Over)/Under Recovery (Line 1 + 4 - 7) | | | | | | | | | | | | | |
| 9. | Accum Deferred Tax (Line 8 * 21%) | | | | | | | | | | | | | |
| 10. | Net Investment (Line 8 - 9) | | | | | | | | | | | | | |
| 11. | Carrying Charge Rate | | | | | | | | | | | | | |
| 12. | Carrying Charge (Line 10 * carrying charge) | | | | | | | | | | | | | |
| 13. | End of Month Balance (Line 8 + 12) | | | | | | | | | | | | | |
| | | | | | | | | | | | | | CONFIDENTIAL DATA ENDS | |

Table 2: 2021 DSM Tracker Forecast, With Cost Recovery in 2022

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# Proposed Customer Bill Onsert Language

## DSM Cost Adjustment Factor Increase
## Effective January 1, 2021

Xcel Energy offers a variety of load management and demand side management (DSM) programs to our South Dakota customers to help them reduce their home's usage. The South Dakota Public Utilities Commission has approved a new Demand Side Management Cost Adjustment Factor as a separate line item on your monthly electric bill to recover the cost of our load management and DSM programs. Beginning January 1, 2021, the rate factor will increase from $0.000477 per kWh to $0.000527 per kWh.

### Residential Electric Service — Winter Month Bill Example

This chart provides a comparison of customer bills by applying the prior DSM rate versus the new DSM rate. The table below shows the DSM Rider rate increase only and does not factor in any other rate change that may occur at the same time.

| | Prior Rates | | | | New Rates | | | | Amount of Bill Increase | Percent Increase |
|---|---|---|---|---|---|---|---|---|---|---|
| Usage (kWh) | Other Rates | Prior DSM Factor | Prior DSM | Prior Bill | Other Rates | New DSM Factor | New DSM | New Bill | | |
| 400 | $52.96 | $0.000477 | **$0.19** | $53.15 | $52.96 | $0.000527 | **$0.21** | $53.17 | $ 0.02 | 0.04% |
| 500 | $64.13 | $0.000477 | **$0.24** | $64.37 | $64.13 | $0.000527 | **$0.26** | $64.39 | $0.02 | 0.03% |
| 600 | $75.31 | $0.000477 | **$0.29** | $75.60 | $75.31 | $0.000527 | **$0.32** | $75.63 | $0.03 | 0.04% |
| 750 | $92.08 | $0.000477 | **$0.36** | $92.44 | $92.08 | $0.000527 | **$0.40** | $92.48 | $0.04 | 0.04% |
| 1000 | $120.02 | $0.000477 | **$0.48** | $120.50 | $120.02 | $0.000527 | **$0.53** | $120.55 | $0.05 | 0.04% |
| 2000 | $231.79 | $0.000477 | **$0.95** | $232.74 | $231.79 | $0.000527 | **$1.05** | $232.84 | $0.10 | 0.04% |

### For more information:

You may call **800.895.4999** with questions or examine the new rates by visiting our website at **xcelenergy.com/SDRates**.

# Legislative

Northern States Power Company, a Minnesota corporation
Minneapolis, MN 55401
**SOUTH DAKOTA ELECTRIC RATE BOOK - SDPUC NO. 2**

**DEMAND SIDE MANAGEMENT COST ADJUSTMENT FACTOR**

Section No. 5
~~7th~~8th Revised Sheet No. 73
Cancelling ~~6th~~7th Revised Sheet No. 73

**APPLICATION**
Applicable to bills for electric service provided under the Company's retail rate schedules.

**RIDER**
There shall be included on each customer's monthly bill a Demand Side Management Cost Adjustment, which shall be calculated by multiplying the monthly applicable billing kilowatt hours (kWh) by the Demand Side Management Factor (DSM Factor). This Demand Side Management Cost Adjustment shall be calculated before city surcharge and sales tax.

**DETERMINATION OF DSM FACTOR**
A DSM Factor shall be calculated by dividing the forecasted balance of the DSM Tracker Account (Tracker), including any True Up, by the Forecasted Retail Sales for the Next Recovery Period. The DSM Factor shall be rounded to the nearest $0.000001 per kWh.

The DSM Factor may be adjusted annually with approval of the South Dakota Public Utilities Commission (Commission). The DSM Factor is:

| | |
|---|---|
| All Customers | ~~$0.000477~~$0.000527 per kWh |

DSM Tracker shall include all annual expenses, costs and incentives associated with demand side management programs and that are approved by the Commission. All revenues recovered pursuant to the Demand Side Management Cost Adjustment shall be credited to the Tracker.

Forecasted Retail Sales shall be the estimated total retail electric sales for the Next Recovery Period.

Next Recovery Period shall be that period that begins January 1 and ends December 31 following the Company's most recent May 1 filing.

**TRUE-UP**
True Up shall include the difference between the revenues received from customers and actual expenditures for the most recent recovery period ending December 31.

A True Up will be included in each annual May 1 filing beginning with the May 1, 2013 filing. The 2012 DSM Factor calculation will not include a True Up due to no previous cost or revenue activity prior to implementation of the Demand Side Management Cost Adjustment in 2012. Beginning with the Company's request submitted on May 1, 2013, the DSM Factor may include a True Up.

# Non-Legislative

Northern States Power Company, a Minnesota corporation
Minneapolis, MN 55401
**SOUTH DAKOTA ELECTRIC RATE BOOK - SDPUC NO. 2**

| | |
|---|---|
| **DEMAND SIDE MANAGEMENT COST** | Section No. 5 |
| **ADJUSTMENT FACTOR** | 8th Revised Sheet No. 73 |
| | Cancelling 7th Revised Sheet No. 73 |

**APPLICATION**
Applicable to bills for electric service provided under the Company's retail rate schedules.

**RIDER**
There shall be included on each customer's monthly bill a Demand Side Management Cost Adjustment, which shall be calculated by multiplying the monthly applicable billing kilowatt hours (kWh) by the Demand Side Management Factor (DSM Factor). This Demand Side Management Cost Adjustment shall be calculated before city surcharge and sales tax.

**DETERMINATION OF DSM FACTOR**
A DSM Factor shall be calculated by dividing the forecasted balance of the DSM Tracker Account (Tracker), including any True Up, by the Forecasted Retail Sales for the Next Recovery Period. The DSM Factor shall be rounded to the nearest $0.000001 per kWh.

The DSM Factor may be adjusted annually with approval of the South Dakota Public Utilities Commission (Commission). The DSM Factor is:

| | |
|---|---|
| All Customers | $0.000527 per kWh |

DSM Tracker shall include all annual expenses, costs and incentives associated with demand side management programs and that are approved by the Commission. All revenues recovered pursuant to the Demand Side Management Cost Adjustment shall be credited to the Tracker.

Forecasted Retail Sales shall be the estimated total retail electric sales for the Next Recovery Period.

Next Recovery Period shall be that period that begins January 1 and ends December 31 following the Company's most recent May 1 filing.

**TRUE-UP**
True Up shall include the difference between the revenues received from customers and actual expenditures for the most recent recovery period ending December 31.

A True Up will be included in each annual May 1 filing beginning with the May 1, 2013 filing. The 2012 DSM Factor calculation will not include a True Up due to no previous cost or revenue activity prior to implementation of the Demand Side Management Cost Adjustment in 2012. Beginning with the Company's request submitted on May 1, 2013, the DSM Factor may include a True Up.

# Executive Summary Table - 2021

| 2021 | Electric Participants | Electric Budget | Generator kW | Generator kWh | Participant Test Ratio | Utility Test Ratio | Ratepayer Impact Measure Test Ratio | TRC Ratio |
|---|---|---|---|---|---|---|---|---|
| **Business Segment** | | | | | | | | |
| Lighting Efficiency | 591 | $414,226 | 591 | 5,181,197 | 2.54 | 5.84 | 0.40 | 1.02 |
| Business Saver's Switch | 10 | $25,250 | 28 | 39 | INF | 1.30 | 1.30 | 1.30 |
| Peak and Energy Control | 1 | $10,000 | 174 | 345 | INF | 8.37 | 8.05 | 8.37 |
| **Business Segment Total** | **602** | **$449,476** | **793** | **5,181,582** | **2.54** | **5.64** | **0.42** | **1.04** |
| | | | | | | | | |
| **Residential Segment** | | | | | | | | |
| Home Lighting | 4,999 | $99,655 | 413 | 3,011,712 | 20.48 | 10.42 | 0.29 | 4.13 |
| Heat Pump Water Heaters | 21 | $12,900 | 9 | 71,574 | 5.94 | 1.65 | 0.23 | 1.00 |
| Reidential Demand Response | 1,400 | $235,500 | 817 | 99,889 | 3.76 | 3.21 | 2.17 | 3.12 |
| Consumer Education | 68,000 | $21,165 | N/A | N/A | N/A | N/A | N/A | N/A |
| **Residential Segment Total** | **74,420** | **$369,220** | **1,239** | **3,183,176** | **12.71** | **4.92** | **0.45** | **3.34** |
| | | | | | | | | |
| **Planning Segment** | | | | | | | | |
| Regulatory Affairs | N/A | $10,000 | N/A | N/A | N/A | N/A | N/A | N/A |
| **Planning Segment Total** | N/A | **$10,000** | N/A | N/A | **N/A** | **N/A** | **N/A** | **N/A** |
| | | | | | | | | |
| | | | | | | | | |
| **PORTFOLIO TOTAL** | **75,022** | **$828,696** | **2,032** | **8,364,757** | **4.06** | **5.25** | **0.43** | **1.53** |

## LIGHTING EFFICIENCY — 2021 ELECTRIC — GOAL

**2021 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $465,293 | $465,293 | $465,293 | $465,293 |
| T & D | N/A | $284,455 | $284,455 | $284,455 | $284,455 |
| Marginal Energy | N/A | $1,668,763 | $1,668,763 | $1,668,763 | $1,668,763 |
| Environmental Externality | N/A | N/A | N/A | N/A | $0 |
| Subtotal | N/A | $2,418,511 | $2,418,511 | $2,418,511 | $2,418,511 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $5,557,723 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $380,000 | N/A | N/A | $380,000 | $380,000 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $5,937,723 | N/A | N/A | $380,000 | $380,000 |
| Total Benefits | $5,937,723 | $2,418,511 | $2,418,511 | $2,798,511 | $2,798,511 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $0 | $0 | $0 | $0 |
| Utility Administration | N/A | $30,226 | $30,226 | $30,226 | $30,226 |
| Advertising & Promotion | N/A | $4,000 | $4,000 | $4,000 | $4,000 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $380,000 | $380,000 | $380,000 | $380,000 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $414,226 | $414,226 | $414,226 | $414,226 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $5,557,723 | N/A | N/A |
| Subtotal | N/A | N/A | $5,557,723 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $2,096,461 | N/A | N/A | $2,096,461 | $2,096,461 |
| Incremental O&M Costs | $244,489 | N/A | N/A | $244,489 | $244,489 |
| Subtotal | $2,340,950 | N/A | N/A | $2,340,950 | $2,340,950 |
| Total Costs | $2,340,950 | $414,226 | $5,971,949 | $2,755,176 | $2,755,176 |
| Net Benefit (Cost) | $3,596,773 | $2,004,285 | ($3,553,439) | $43,335 | $43,335 |
| Benefit/Cost Ratio | 2.54 | 5.84 | 0.40 | 1.02 | 1.02 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 18.3 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 48.77% |
| Gross Load Factor at Customer | E | 49.23% |
| Transmission Loss Factor (Energy) | F | 4.873% |
| Transmission Loss Factor (Demand) | G | 5.640% |
| Societal Net Benefit (Cost) | H | $38 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 1.93 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 1.00 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 8,340 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 8,767 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 591 |
| **Total Budget** | K | **$414,226** |
| Gross kW Saved at Customer | ( J x I ) | 1,142.94 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **591 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 4,928,744 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **5,181,197 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$43,335** |
| **Utility Program Cost per kWh Lifetime** | | **$0.0044** |
| **Utility Program Cost per kW at Gen** | | **$701** |

**BUSINESS SAVER'S SWITCH** **2021 ELECTRIC** **GOAL**

**2021 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $20,358 | $20,358 | $20,358 | $20,358 |
| T & D | N/A | $12,428 | $12,428 | $12,428 | $12,428 |
| Marginal Energy | N/A | $13 | $13 | $13 | $13 |
| Environmental Externality | N/A | N/A | N/A | N/A | $0 |
| Subtotal | N/A | $32,800 | $32,800 | $32,800 | $32,800 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $44 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $0 | N/A | N/A | $0 | $0 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $44 | N/A | N/A | $0 | $0 |
| Total Benefits | $44 | $32,800 | $32,800 | $32,800 | $32,800 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $15,750 | $15,750 | $15,750 | $15,750 |
| Utility Administration | N/A | $7,000 | $7,000 | $7,000 | $7,000 |
| Advertising & Promotion | N/A | $2,500 | $2,500 | $2,500 | $2,500 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $0 | $0 | $0 | $0 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $25,250 | $25,250 | $25,250 | $25,250 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $44 | N/A | N/A |
| Subtotal | N/A | N/A | $44 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Costs | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $0 | N/A | N/A | $0 | $0 |
| Total Costs | $0 | $25,250 | $25,294 | $25,250 | $25,250 |
| Net Benefit (Cost) | $44 | $7,550 | $7,506 | $7,550 | $7,550 |
| Benefit/Cost Ratio | INF | 1.30 | 1.30 | 1.30 | 1.30 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 15.0 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 16.76% |
| Gross Load Factor at Customer | E | 0.00% |
| Transmission Loss Factor (Energy) | F | 4.872% |
| Transmission Loss Factor (Demand) | G | 5.640% |
| Societal Net Benefit (Cost) | H | $47 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 15.93 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 2.83 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 4 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 4 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 10 |
| **Total Budget** | K | **$25,250** |
| Gross kW Saved at Customer | ( J x I ) | 159.27 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **28 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 37 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **39 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$7,550** |
| **Utility Program Cost per kWh Lifetime** | | **$43.4116** |
| **Utility Program Cost per kW at Gen** | | **$893** |

## PEAK AND ENERGY CONTROL — 2021 ELECTRIC — GOAL

**2021 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $52,045 | $52,045 | $52,045 | $52,045 |
| T & D | N/A | $31,612 | $31,612 | $31,612 | $31,612 |
| Marginal Energy | N/A | $40 | $40 | $40 | $40 |
| Environmental Externality | N/A | N/A | N/A | N/A | $0 |
| Subtotal | N/A | $83,696 | $83,696 | $83,696 | $83,696 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $392 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $0 | N/A | N/A | $0 | $0 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $392 | N/A | N/A | $0 | $0 |
| Total Benefits | $392 | $83,696 | $83,696 | $83,696 | $83,696 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $0 | $0 | $0 | $0 |
| Utility Administration | N/A | $10,000 | $10,000 | $10,000 | $10,000 |
| Advertising & Promotion | N/A | $0 | $0 | $0 | $0 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $0 | $0 | $0 | $0 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $10,000 | $10,000 | $10,000 | $10,000 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $392 | N/A | N/A |
| Subtotal | N/A | N/A | $392 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Costs | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $0 | N/A | N/A | $0 | $0 |
| Total Costs | $0 | $10,000 | $10,392 | $10,000 | $10,000 |
| Net Benefit (Cost) | $392 | $73,696 | $73,304 | $73,696 | $73,696 |
| Benefit/Cost Ratio | INF | 8.37 | 8.05 | 8.37 | 8.37 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 5.0 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 100.00% |
| Gross Load Factor at Customer | E | 0.02% |
| Transmission Loss Factor (Energy) | F | 4.873% |
| Transmission Loss Factor (Demand) | G | 5.640% |
| Societal Net Benefit (Cost) | H | $449 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 164.29 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 174.11 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 329 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 345 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 1 |
| **Total Budget** | K | **$10,000** |
| Gross kW Saved at Customer | ( J x I ) | 164.29 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **174 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 329 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **345 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$73,696** |
| **Utility Program Cost per kWh Lifetime** | | **$5.7902** |
| **Utility Program Cost per kW at Gen** | | **$57** |

**BUSINESS SEGMENT TOTAL** **2021 ELECTRIC** **GOAL**

**2021 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $537,696 | $537,696 | $537,696 | $537,696 |
| T & D | N/A | $328,495 | $328,495 | $328,495 | $328,495 |
| Marginal Energy | N/A | $1,668,816 | $1,668,816 | $1,668,816 | $1,668,816 |
| Environmental Externality | N/A | N/A | N/A | N/A | $0 |
| Subtotal | N/A | $2,535,007 | $2,535,007 | $2,535,007 | $2,535,007 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $5,558,159 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $380,000 | N/A | N/A | $380,000 | $380,000 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $5,938,159 | N/A | N/A | $380,000 | $380,000 |
| Total Benefits | $5,938,159 | $2,535,007 | $2,535,007 | $2,915,007 | $2,915,007 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $15,750 | $15,750 | $15,750 | $15,750 |
| Utility Administration | N/A | $47,226 | $47,226 | $47,226 | $47,226 |
| Advertising & Promotion | N/A | $6,500 | $6,500 | $6,500 | $6,500 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $380,000 | $380,000 | $380,000 | $380,000 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $449,476 | $449,476 | $449,476 | $449,476 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $5,558,159 | N/A | N/A |
| Subtotal | N/A | N/A | $5,558,159 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $2,096,461 | N/A | N/A | $2,096,461 | $2,096,461 |
| Incremental O&M Costs | $244,489 | N/A | N/A | $244,489 | $244,489 |
| Subtotal | $2,340,950 | N/A | N/A | $2,340,950 | $2,340,950 |
| Total Costs | $2,340,950 | $449,476 | $6,007,635 | $2,790,426 | $2,790,426 |
| Net Benefit (Cost) | $3,597,209 | $2,085,531 | ($3,472,629) | $124,581 | $124,581 |
| Benefit/Cost Ratio | 2.54 | 5.64 | 0.42 | 1.04 | 1.04 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 18.3 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 51.03% |
| Gross Load Factor at Customer | E | 38.37% |
| Transmission Loss Factor (Energy) | F | 4.873% |
| Transmission Loss Factor (Demand) | G | 5.640% |
| Societal Net Benefit (Cost) | H | $85 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 2.44 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 1.32 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 8,188 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 8,607 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 602 |
| **Total Budget** | K | **$449,476** |
| Gross kW Saved at Customer | ( J x I ) | 1,466.50 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **793 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 4,929,109 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **5,181,582 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$124,581** |
| **Utility Program Cost per kWh Lifetime** | | **$0.0047** |
| **Utility Program Cost per kW at Gen** | | **$567** |

## HOME LIGHTING — 2021 ELECTRIC — GOAL

**2021 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $229,359 | $229,359 | $229,359 | $229,359 |
| T & D | N/A | $139,934 | $139,934 | $139,934 | $139,934 |
| Marginal Energy | N/A | $669,305 | $669,305 | $669,305 | $669,305 |
| Environmental Externality | N/A | N/A | N/A | N/A | $0 |
| Subtotal | N/A | $1,038,598 | $1,038,598 | $1,038,598 | $1,038,598 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $3,430,236 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $79,944 | N/A | N/A | $79,944 | $79,944 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $3,510,180 | N/A | N/A | $79,944 | $79,944 |
| Total Benefits | $3,510,180 | $1,038,598 | $1,038,598 | $1,118,542 | $1,118,542 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $6,608 | $6,608 | $6,608 | $6,608 |
| Utility Administration | N/A | $10,190 | $10,190 | $10,190 | $10,190 |
| Advertising & Promotion | N/A | $2,471 | $2,471 | $2,471 | $2,471 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $79,944 | $79,944 | $79,944 | $79,944 |
| Other | N/A | $442 | $442 | $442 | $442 |
| Subtotal | N/A | $99,655 | $99,655 | $99,655 | $99,655 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $3,430,236 | N/A | N/A |
| Subtotal | N/A | N/A | $3,430,236 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $171,429 | N/A | N/A | $171,429 | $171,429 |
| Incremental O&M Costs | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $171,429 | N/A | N/A | $171,429 | $171,429 |
| Total Costs | $171,429 | $99,655 | $3,529,891 | $271,084 | $271,084 |
| Net Benefit (Cost) | $3,338,750 | $938,943 | ($2,491,293) | $847,458 | $847,458 |
| Benefit/Cost Ratio | 20.48 | 10.42 | 0.29 | 4.13 | 4.13 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 12.0 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 18.14% |
| Gross Load Factor at Customer | E | 15.36% |
| Transmission Loss Factor (Energy) | F | 5.600% |
| Transmission Loss Factor (Demand) | G | 7.092% |
| Societal Net Benefit (Cost) | H | $401 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 0.42 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 0.08 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 569 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 602 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 4,999 |
| **Total Budget** | K | **$99,655** |
| Gross kW Saved at Customer | ( J x I ) | 2,113.06 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **413 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 2,843,067 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **3,011,712 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$847,458** |
| **Utility Program Cost per kWh Lifetime** | | **$0.0028** |
| **Utility Program Cost per kW at Gen** | | **$242** |

## HEAT PUMP WATER HEATERS — 2021 ELECTRIC — GOAL

**2021 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $4,990 | $4,990 | $4,990 | $4,990 |
| T & D | N/A | $3,039 | $3,039 | $3,039 | $3,039 |
| Marginal Energy | N/A | $13,312 | $13,312 | $13,312 | $13,312 |
| Environmental Externality | N/A | N/A | N/A | N/A | $0 |
| Subtotal | N/A | $21,341 | $21,341 | $21,341 | $21,341 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $81,818 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $6,300 | N/A | N/A | $6,300 | $6,300 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $88,118 | N/A | N/A | $6,300 | $6,300 |
| Total Benefits | $88,118 | $21,341 | $21,341 | $27,641 | $27,641 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $0 | $0 | $0 | $0 |
| Utility Administration | N/A | $6,600 | $6,600 | $6,600 | $6,600 |
| Advertising & Promotion | N/A | $0 | $0 | $0 | $0 |
| Measurement & Verification | N/A | $0 | $0 | $0 | $0 |
| Rebates | N/A | $6,300 | $6,300 | $6,300 | $6,300 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $12,900 | $12,900 | $12,900 | $12,900 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $81,818 | N/A | N/A |
| Subtotal | N/A | N/A | $81,818 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $12,841 | N/A | N/A | $12,841 | $12,841 |
| Incremental O&M Costs | $1,995 | N/A | N/A | $1,995 | $1,995 |
| Subtotal | $14,836 | N/A | N/A | $14,836 | $14,836 |
| Total Costs | $14,836 | $12,900 | $94,718 | $27,736 | $27,736 |
| Net Benefit (Cost) | $73,282 | $8,441 | ($73,377) | ($95) | ($95) |
| Benefit/Cost Ratio | 5.94 | 1.65 | 0.23 | 1.00 | 1.00 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 10.0 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 100.00% |
| Gross Load Factor at Customer | E | 88.69% |
| Transmission Loss Factor (Energy) | F | 5.950% |
| Transmission Loss Factor (Demand) | G | 7.220% |
| Societal Net Benefit (Cost) | H | ($11) |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 0.41 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 0.44 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 3,206 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 3,408 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 21 |
| **Total Budget** | K | **$12,900** |
| Gross kW Saved at Customer | ( J x I ) | 8.66 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **9 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 67,316 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **71,574 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **($95)** |
| **Utility Program Cost per kWh Lifetime** | | **$0.0180** |
| **Utility Program Cost per kW at Gen** | | **$1,381** |

## RESIDENTIAL DEMAND RESPONSE — 2021 ELECTRIC — GOAL

**2021 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $455,486 | $455,486 | $455,486 | $455,486 |
| T & D | N/A | $277,708 | $277,708 | $277,708 | $277,708 |
| Marginal Energy | N/A | $23,849 | $23,849 | $23,849 | $23,849 |
| Environmental Externality | N/A | N/A | N/A | N/A | $0 |
| Subtotal | N/A | $757,043 | $757,043 | $757,043 | $757,043 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $113,016 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $50,000 | N/A | N/A | $50,000 | $50,000 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $363,741 | N/A | N/A | $363,741 | $363,741 |
| Subtotal | $526,757 | N/A | N/A | $413,741 | $413,741 |
| Total Benefits | $526,757 | $757,043 | $757,043 | $1,170,783 | $1,170,783 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $131,000 | $131,000 | $131,000 | $131,000 |
| Utility Administration | N/A | $37,500 | $37,500 | $37,500 | $37,500 |
| Advertising & Promotion | N/A | $7,000 | $7,000 | $7,000 | $7,000 |
| Measurement & Verification | N/A | $10,000 | $10,000 | $10,000 | $10,000 |
| Rebates | N/A | $50,000 | $50,000 | $50,000 | $50,000 |
| Other | N/A | $0 | $0 | $0 | $0 |
| Subtotal | N/A | $235,500 | $235,500 | $235,500 | $235,500 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $113,016 | N/A | N/A |
| Subtotal | N/A | N/A | $113,016 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $140,000 | N/A | N/A | $140,000 | $140,000 |
| Incremental O&M Costs | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $140,000 | N/A | N/A | $140,000 | $140,000 |
| Total Costs | $140,000 | $235,500 | $348,516 | $375,500 | $375,500 |
| Net Benefit (Cost) | $386,757 | $521,543 | $408,527 | $795,283 | $795,283 |
| Benefit/Cost Ratio | 3.76 | 3.21 | 2.17 | 3.12 | 3.12 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 10.0 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 37.93% |
| Gross Load Factor at Customer | E | 0.54% |
| Transmission Loss Factor (Energy) | F | 5.950% |
| Transmission Loss Factor (Demand) | G | 7.220% |
| Societal Net Benefit (Cost) | H | $398 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 1.43 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 0.58 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 67 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 71 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 1,400 |
| **Total Budget** | K | **$235,500** |
| Gross kW Saved at Customer | ( J x I ) | 1,998.47 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **817 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 93,946 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **99,889 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$795,283** |
| **Utility Program Cost per kWh Lifetime** | | **$0.2355** |
| **Utility Program Cost per kW at Gen** | | **$288** |

## RESIDENTIAL SEGMENT TOTAL — 2021 ELECTRIC — GOAL

**2021 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $689,835 | $689,835 | $689,835 | $689,835 |
| T & D | N/A | $420,681 | $420,681 | $420,681 | $420,681 |
| Marginal Energy | N/A | $706,466 | $706,466 | $706,466 | $706,466 |
| Environmental Externality | N/A | N/A | N/A | N/A | $0 |
| Subtotal | N/A | $1,816,982 | $1,816,982 | $1,816,982 | $1,816,982 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $3,625,069 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $136,244 | N/A | N/A | $136,244 | $136,244 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $361,745 | N/A | N/A | $361,745 | $361,745 |
| Subtotal | $4,123,059 | N/A | N/A | $497,989 | $497,989 |
| Total Benefits | $4,123,059 | $1,816,982 | $1,816,982 | $2,314,971 | $2,314,971 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $158,773 | $158,773 | $158,773 | $158,773 |
| Utility Administration | N/A | $54,290 | $54,290 | $54,290 | $54,290 |
| Advertising & Promotion | N/A | $9,471 | $9,471 | $9,471 | $9,471 |
| Measurement & Verification | N/A | $10,000 | $10,000 | $10,000 | $10,000 |
| Rebates | N/A | $136,244 | $136,244 | $136,244 | $136,244 |
| Other | N/A | $442 | $442 | $442 | $442 |
| Subtotal | N/A | $369,220 | $369,220 | $369,220 | $369,220 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $3,625,069 | N/A | N/A |
| Subtotal | N/A | N/A | $3,625,069 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $324,270 | N/A | N/A | $324,270 | $324,270 |
| Incremental O&M Costs | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $324,270 | N/A | N/A | $324,270 | $324,270 |
| Total Costs | $324,270 | $369,220 | $3,994,289 | $693,490 | $693,490 |
| Net Benefit (Cost) | $3,798,789 | $1,447,762 | ($2,177,308) | $1,621,481 | $1,621,481 |
| Benefit/Cost Ratio | 12.71 | 4.92 | 0.45 | 3.34 | 3.34 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 11.8 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 27.92% |
| Gross Load Factor at Customer | E | 8.32% |
| Transmission Loss Factor (Energy) | F | 5.619% |
| Transmission Loss Factor (Demand) | G | 7.154% |
| Societal Net Benefit (Cost) | H | $394 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 0.06 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 0.02 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 40 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 43 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 74,420 |
| **Total Budget** | K | **$369,220** |
| Gross kW Saved at Customer | ( J x I ) | 4,120.20 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **1,239 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 3,004,328 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **3,183,176 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$1,621,481** |
| **Utility Program Cost per kWh Lifetime** | | **$0.0098** |
| **Utility Program Cost per kW at Gen** | | **$298** |

**PORTFOLIO TOTAL** | **2021** | **ELECTRIC** | **GOAL**

**2021 Net Present Cost Benefit Summary Analysis For All Participants**

| | Participant Test ($Total) | Utility Test ($Total) | Rate Impact Test ($Total) | Total Resource Test ($Total) | Societal Test ($Total) |
|---|---|---|---|---|---|
| Benefits | | | | | |
| **Avoided Revenue Requirements** | | | | | |
| Generation | N/A | $1,227,531 | $1,227,531 | $1,227,531 | $1,227,531 |
| T & D | N/A | $749,176 | $749,176 | $749,176 | $749,176 |
| Marginal Energy | N/A | $2,375,281 | $2,375,281 | $2,375,281 | $2,375,281 |
| Environmental Externality | N/A | N/A | N/A | N/A | $0 |
| Subtotal | N/A | $4,351,988 | $4,351,988 | $4,351,988 | $4,351,988 |
| **Participant Benefits** | | | | | |
| Bill Reduction - Electric | $9,183,229 | N/A | N/A | N/A | N/A |
| Rebates from Xcel Energy | $516,244 | N/A | N/A | $516,244 | $516,244 |
| Incremental Capital Savings | $0 | N/A | N/A | $0 | $0 |
| Incremental O&M Savings | $117,257 | N/A | N/A | $117,257 | $117,257 |
| Subtotal | $9,816,729 | N/A | N/A | $633,501 | $633,501 |
| Total Benefits | $9,816,729 | $4,351,988 | $4,351,988 | $4,985,489 | $4,985,489 |
| Costs | | | | | |
| **Utility Project Costs** | | | | | |
| Customer Services | N/A | $174,523 | $174,523 | $174,523 | $174,523 |
| Utility Administration | N/A | $111,516 | $111,516 | $111,516 | $111,516 |
| Advertising & Promotion | N/A | $15,971 | $15,971 | $15,971 | $15,971 |
| Measurement & Verification | N/A | $10,000 | $10,000 | $10,000 | $10,000 |
| Rebates | N/A | $516,244 | $516,244 | $516,244 | $516,244 |
| Other | N/A | $442 | $442 | $442 | $442 |
| Subtotal | N/A | $828,696 | $828,696 | $828,696 | $828,696 |
| **Utility Revenue Reduction** | | | | | |
| Revenue Reduction - Electric | N/A | N/A | $9,183,229 | N/A | N/A |
| Subtotal | N/A | N/A | $9,183,229 | N/A | N/A |
| **Participant Costs** | | | | | |
| Incremental Capital Costs | $2,420,731 | N/A | N/A | $2,420,731 | $2,420,731 |
| Incremental O&M Costs | $0 | N/A | N/A | $0 | $0 |
| Subtotal | $2,420,731 | N/A | N/A | $2,420,731 | $2,420,731 |
| Total Costs | $2,420,731 | $828,696 | $10,011,925 | $3,249,427 | $3,249,427 |
| Net Benefit (Cost) | $7,395,998 | $3,523,292 | ($5,659,936) | $1,736,062 | $1,736,062 |
| Benefit/Cost Ratio | 4.06 | 5.25 | 0.43 | 1.53 | 1.53 |

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

**Input Summary and Totals**

| **Program "Inputs" per Customer kW** | | |
|---|---|---|
| Lifetime (Weighted on Generator kWh) | A | 15.9 years |
| Annual Hours | B | 8760 |
| Gross Customer kW | C | 1 kW |
| Generator Peak Coincidence Factor | D | 33.91% |
| Gross Load Factor at Customer | E | 16.21% |
| Transmission Loss Factor (Energy) | F | 5.156% |
| Transmission Loss Factor (Demand) | G | 6.761% |
| Societal Net Benefit (Cost) | H | $311 |

| **Program Summary per Participant** | | |
|---|---|---|
| Gross kW Saved at Customer | I | 0.07 kW |
| Net coincident kW Saved at Generator | ( I x D ) / ( 1 - G ) | 0.03 kW |
| Gross Annual kWh Saved at Customer | ( B x E x I ) | 106 kWh |
| Net Annual kWh Saved at Generator | ( B x E x I ) / ( 1 - F ) | 111 kWh |

| **Program Summary All Participants** | | |
|---|---|---|
| Total Participants | J | 75,022 |
| **Total Budget** | K | **$828,696** |
| Gross kW Saved at Customer | ( J x I ) | 5,586.70 kW |
| **Net coincident kW Saved at Generator** | **( I x D ) / ( 1 - G ) x J** | **2,032 kW** |
| Gross Annual kWh Saved at Customer | ( B x E x I ) x J | 7,933,437 kWh |
| **Net Annual kWh Saved at Generator** | **( ( B x E x I ) / ( 1 - F ) ) x J** | **8,364,757 kWh** |
| **Societal Net Benefits** | ( J x I x H ) | **$1,736,062** |
| **Utility Program Cost per kWh Lifetime** | | **$0.0062** |
| **Utility Program Cost per kW at Gen** | | **$408** |