Introduction

Otter Tail Power Company (Otter Tail, the Company) presents for the South Dakota Public Utilities Commission's (PUC) consideration this 2017-2019 Energy Efficiency Plan (EEP, Plan) to market energy efficiency to South Dakota customers. The Energy Efficiency Plan, as proposed, includes projects for all customer classes and major end uses showing the greatest potential for energy savings. The Plan includes 11 projects intended to achieve approximately 3.8 million kWh in annual energy savings at an approximate cost of $449,000. The majority of these costs – approximately 66 percent, or $297,743, of the proposed budget – are expected to be customer incentives. The energy savings goal represents approximately 0.9 percent of South Dakota's 2015 retail energy sales. The budget represents approximately 1.4 percent of the State's 2015 retail revenue. The Company proposes launching these projects January 1, 2017.

South Dakota Data 2015 Statistical Report	
Customers	11,558
kWh sales	427,485,479
Retail revenue	$33,327,213

While Otter Tail is not offering any new projects in this plan, we have made various modifications to our projects to incorporate new technologies. An excellent example of this is our new LED offering in our residential lighting project. All projects are cost-effective. The 2017-2019 portfolio benefit/cost ratios are illustrated in the following table:

Utility Test	**Total Resource Test**	**Ratepayer Impact Test**	**Societal Test**	**Participant Test**
5.35	2.36	0.70	2.45	2.96

This plan will be evaluated on an ongoing basis, and any major modifications will be proposed to the PUC in a timely manner. Major modifications would include new projects, increases to the overall proposed plan budget by more than 10 percent, or closing projects.

The following sections provide specific details about the 2017-2019 EEP:

- Plan Summary – The Plan Summary includes an overview of the proposed plan, a list of the individual projects, and 2015 Company statistics as background information. A summary of the overall annual kWh savings goals, budgets, and proposed participation is also provided.
- Project Descriptions – This section presents the individual project descriptions and justifications, as well as kWh[1], kW[2], budget, and participation goals.

[1] Cost per kWh reflects first year energy savings and first year costs. Lifetime costs per kWh saved will be substantially less spread over the lifetime of the technology. For example, if lighting cost per kWh is $0.07 for first year savings, the lifetime cost would be less than $0.01 per kWh.

[2] DSMore modeling software provides coincident peak-load reduction information, which is reported for all projects. Coincident peak savings continues to be based on the summer season.

- Cost Recovery and Financial Incentive – Cost recovery methodology, carrying costs, tracker balances, and other accounting matters are addressed in this section. A discussion of the Company financial incentive for providing energy efficiency projects in South Dakota is also included.
- Evaluation – This section shows the cost effectiveness test results for the Plan and assumptions associated with the cost effectiveness evaluations.
- Summary – A brief conclusion and contact information is provided.

Plan Summary

In 2017-2019, Otter Tail is proposing to continue, with modifications, its portfolio of cost-effective energy efficiency projects in South Dakota. The portfolio includes the projects listed below, which are described in greater detail in following sections of this filing.

Residential

- Air source heat pumps (promotes efficient heating and cooling).
- Geothermal heat pumps (promotes efficient heating and cooling).
- Air conditioning control (promotes managing demand and energy of cooling systems).
- Lighting (promotes efficient lighting) and Pilot with students.

Commercial/Industrial

- Custom Efficiency Projects (promotes efficient energy use such as heat recovery, building envelope, and process improvements).
- DrivePower (promotes high efficient motors and adjustable speed drives).
- Lighting (promotes efficient lighting).
- Air source heat pumps (promotes efficient heating and cooling).
- Geothermal heat pumps (promotes efficient heating and cooling).

All sectors

- Advertising and Education.
- Development.

2017 South Dakota Energy Efficiency Plan				
Customer Class	**Budget**	**Annual kWh Savings**	**Annual kW Savings**	**Annual Participants**
Residential	$75,000	680,820	189.529	1,706
Commercial/Industrial	$337,000	3,123,271	525.630	130
Indirect impact (all sectors)	$37,000	N/A	N/A	400
Totals	$449,000	3,804,091	715.160	2,236

2018 South Dakota Energy Efficiency Plan				
Customer Class	**Budget**	**Annual kWh Savings**	**Annual kW Savings**	**Annual Participants**
Residential	$75,000	681,905	215.411	1,741
Commercial/Industrial	$337,000	3,123,271	525.630	130
Indirect impact (all sectors)	$37,000	N/A	N/A	400
Totals	$449,000	3,805,177	741.042	2,271

2019 South Dakota Energy Efficiency Plan				
Customer Class	**Budget**	**Annual kWh Savings**	**Annual kW Savings**	**Annual Participants**
Residential	$75,000	682,991	241.293	1,776
Commercial/Industrial	$337,000	3,123,271	525.630	130
Indirect impact (all sectors)	$37,000	N/A	N/A	400
Totals	$449,000	3,806,262	766.924	2,306

AIR CONDITIONING CONTROL
(Existing, Residential)

A. PROJECT DESCRIPTION

The Air Conditioning Control project targets residential customers with central air conditioning systems. Customers who enroll in the Air Conditioning Control project receive a $7 bill credit for each of the summer months – June, July, August, and September – in exchange for Otter Tail cycling the air conditioner. A controller is installed to cycle a customer's cooling load on a schedule of 15 minutes on followed by 15 minutes off throughout control periods. Otter Tail cycles load to maintain customer satisfaction and minimize customer discomfort during control periods. In 2015, the Company controlled air conditioning on 24 occasions, totaling 39 hours and 16 minutes, well within the 300-hour control limit approved for the air conditioning control rider.

B. PROJECT JUSTIFICATION

The Air Conditioning Control project continues to add to Otter Tail's extensive portfolio of demand and price response projects. About one-third of the Company's residential and small commercial customers are participating in one of the Company's demand response projects. Through these projects, the Company maintains system reliability, reduces the need to purchase high-priced spot market electricity, and meets our regulated resource adequacy requirements. Although historically winter peaking, the Company is a member of the summer peaking Midwest Independent Transmission System Operator (MISO) region. Projects and rates that reduce summer energy and capacity needs are particularly valuable.

C. LONG TERM DEMAND SIDE MANAGEMENT GOALS

Air Conditioning Control			
	2017	**2018**	**2019**
kWh – at the generator	5,489	6,574	7,660
Cost / kWh	$2.55	$2.13	$1.83
kW – at the generator	130.9	156.8	182.7
Cost / kW	$107	$89	$77

D. PROJECT BUDGET & PARTICIPATION

Air Conditioning Control			
	2017	**2018**	**2019**
Project Delivery & Administration	$14,000	$14,000	$14,000
Incentives	N/A	N/A	N/A
Total	$14,000	$14,000	$14,000
Participation	177	212	247

LIGHTING
(Existing, Residential)
(Pilot to include LED distribution to students)

A. PROJECT DESCRIPTION

The Residential Lighting project is an extension of the Commercial Lighting project and will continue to focus on replacing inefficient lighting with new, more efficient products. Through the Residential Lighting project, residential customers will have access to the same lighting products and rebates as commercial customers, although target marketing will focus primarily on light-emitting diode (LED) lighting. Residential customers must meet the same eligibility criteria as commercial customers including a cap on rebates at 75 percent of the total project cost and a minimum rebate of $20. Project criteria are established to maximize benefits.

Otter Tail proposes a pilot portion of the project which will work in conjunction with our Advertising and Education project's Energy Tours. As described below in the Advertising and Education section, the Minnesota Science Museum offers the Energy Connection program to participating schools. We plan to have staff from the Minnesota Science Museum provide a hands-on learning opportunity for the students by handing out LED bulbs to each student, regardless of their energy provider. We believe this will be an informative demonstration of efficient lighting and will lead to home energy savings. Otter Tail understands not all students live in homes served by Otter Tail, but we are requesting permission from the Commission to allow unassociated energy savings to be claimed in our annual Status Report and recovery of the costs of the bulbs. We see this as a great opportunity to include all students, regardless of energy provider, to participate in energy savings at a very low cost.

B. PROJECT JUSTIFICATION

The United States Department of Energy indicates a typical household spends about $90 per year, or 10 to 15 percent of its annual electric bill on lighting. Market saturations of compact fluorescent lamps (CFLs) and LEDs are still very low. Otter Tail's 2015 Residential End-Use Survey (REUS) indicates 15 percent of homes had no CFL's and 42 percent had no LED's. Another 33 percent only had one to five CFLs and 21 percent had one to five LEDs. An LED saves 85 percent of energy use over incandescent and a CFL saves 75 percent of energy use over incandescent. A CFL lasts up to ten times longer than a standard incandescent bulbs and a LED lasts up to 25 times longer. LEDs and CFLs also generate much less heat than incandescent bulbs and are less of a fire hazard.

MARKETING

The Residential Lighting project will be marketed through the following resources: bill inserts, website materials, and all SD EEP promotional materials as well as through our Energy Tour program.

C. LONG TERM DEMAND SIDE MANAGEMENT GOALS

Residential Lighting			
	2017	**2018**	**2019**
kWh – at the generator	55,349	55,349	55,349
Cost / kWh	$0.20	$0.20	$0.20
kW – at the generator	6.5	6.5	6.5
Cost / kW	$1,703	$1,703	$1,703

D. PROJECT BUDGET & PARTICIPATION

Residential Lighting			
	2017	**2018**	**2019**
Project Delivery & Administration	$4,250	$4,250	$4,250
Incentives	$6,750	$6,750	$6,750
Total	$11,000	$11,000	$11,000
Participation	1,500	1,500	1,500

HEAT PUMPS
(Existing, Residential, Commercial and Industrial)

A. PROJECT DESCRIPTION

The Heat Pump project targets residential and commercial customers currently using or considering the installation of standard efficiency resistance heating and cooling systems. The project offers rebates to customers for replacing standard efficiency electric systems with qualifying higher efficiency heat pump systems or for purchasing higher efficiency systems for new installations. Qualifications for project rebates will be based on Energy Star standards.

The definition of a heat pump is a device that extracts energy from one substance and transfers it to another at a higher temperature. A heat pump takes low-temperature heat from an outdoor source (such as the air, ground, groundwater, or surface water) and mechanically concentrates it to produce high-temperature heat. Since most of the heat is simply moved (pumped) from the outdoor source to the indoors, the amount of electricity required to deliver it is typically less than would be required if using electric heat directly.

Otter Tail has structured the Heat Pumps project with separate energy, demand, and cost effectiveness goals for the following market segments:

- Residential air source heat pumps.
- Commercial air source heat pumps.
- Residential geothermal heat pumps.
- Commercial geothermal heat pumps.

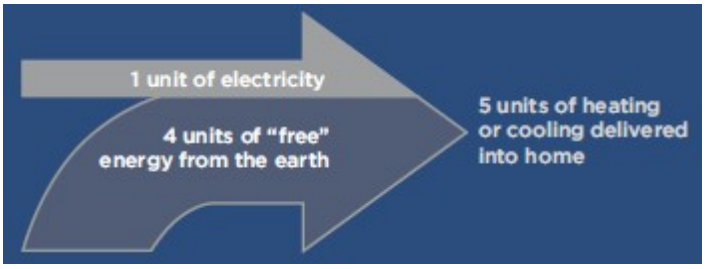
B. PROJECT JUSTIFICATION

Space heating accounts for approximately 9 percent of total energy use in the U.S. and represents significant potential for improved efficiency. In the residential sector, energy use for space heating accounts for nearly half of household energy consumption. Based on Otter Tail's REUS, 28 percent of South Dakota residential customers rely on electricity as their primary energy source for heating their homes. Approximately 75 percent of these residences use electric resistance heat as their primary heating system.

Over 90 percent of Otter Tail's South Dakota customers have air-conditioning in their home. According to the 2015 REUS, approximately 68 percent of homes have cooling systems that are electric central air-conditioners or window/wall air-conditioners.

Space heating in the commercial and industrial sectors also offers an opportunity for energy savings. In any typical year, the total amount of energy used for commercial space heating nearly triples that used for cooling, accounting for heating 25 percent of all commercial floor space.

Otter Tail's heat pump project provides both residential and commercial customers with a much more energy efficient heating and cooling option than traditional resistance heating and central air-conditioning units. According to the United States Environmental Protection Agency (EPA), geothermal heat pumps are among the most efficient and comfortable heating and cooling technologies currently available, because they use the earth's natural heat to provide heating, cooling, and often, water heating.[3] They use the constant temperature of the earth which allows the system to reach fairly high efficiencies (300% to 600%) on the coldest winter nights.[4] The illustration below is an example of the energy efficiency capabilities of geothermal heat pumps. The geothermal heat pump delivers more than four units of heat for each unit of energy used. As a result, it can reduce annual heating and cooling costs by 70 percent.



[5]

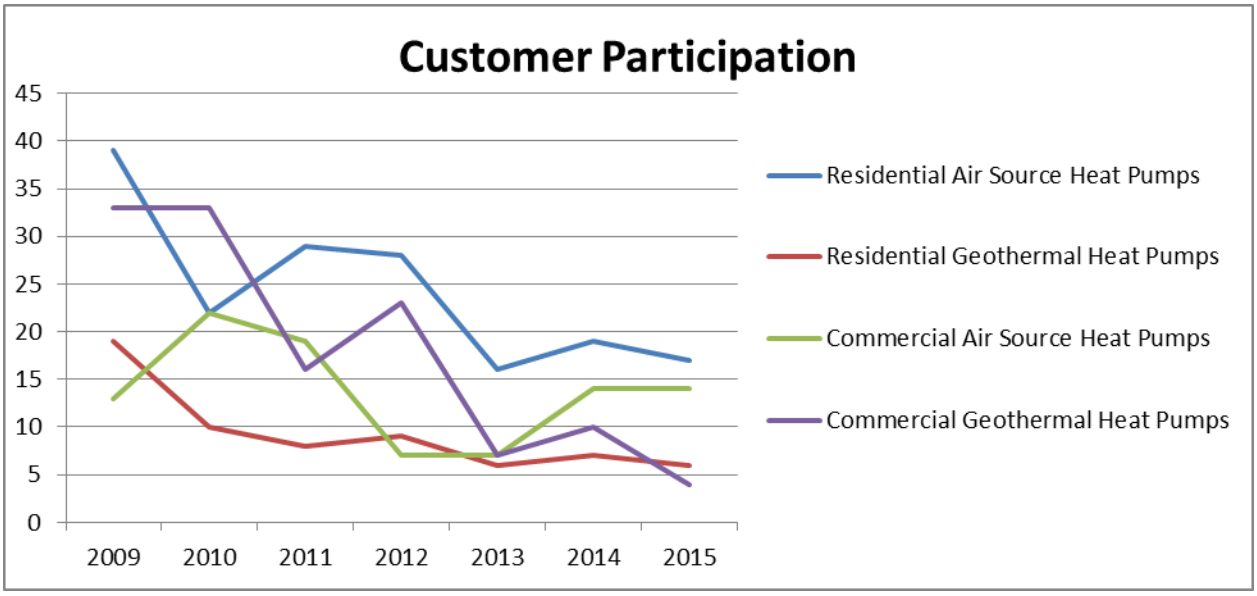
[3] https://www.energystar.gov/products/heating_cooling/heat_pumps_geothermal

[4] http://energy.gov/energysaver/geothermal-heat-pumps

[5] Figure courtesy of Waterfurnace™

An air-source heat pump operates at more than 200 percent efficiency. Even when it operates with supplemental electric heating that helps out during the coldest weather, the system can reduce your total heating costs by 30 to 50 percent.

While Otter Tail has seen success in growing our heat pump project in South Dakota, we also realize challenges ahead. Our service territory is very rural and depends on a strong agricultural economy to drive economic activity. The current state of low agricultural commodity prices has reduced or delayed customer investments in heat pumps. Heat pumps offer customers immense energy savings; however, their up-front capital investment can be large for many customers, especially for geothermal heating and cooling. The chart below shows the decline of customer's participation in Otter Tail's heat pump project by year.



The potential elimination of the 30 percent federal tax credit for geothermal heating set to expire at the end of 2016 provides another challenge for the heat pump project. This tax credit has been very influential in steering customers to learn and to buy into a complex technology. Otter Tail is still hopeful the credit will be phased-out and not completely eliminated and plans to maximize customer incentives and customer education to maintain the relevance of this sound energy savings technology. While the heat pump project will experience some challenges ahead, our proposed project is still cost-effective.

C. LONG TERM DEMAND SIDE MANAGEMENT GOALS

Residential Air Source Heat Pumps			
	2017	**2018**	**2019**
kWh – at the generator	298,204	298,204	298,204
Cost / kWh	$0.07	$0.07	$0.07
kW – at the generator	28.3	28.3	28.3
Cost / kW	$706	$706	$706

Residential Geothermal Heat Pumps			
	2017	**2018**	**2019**
kWh – at the generator	321,779	321,779	321,779
Cost / kWh	$0.09	$0.09	$0.09
kW – at the generator	23.9	23.9	23.9
Cost / kW	$1,258	$1,258	$1,258

Commercial Air Source Heat Pumps			
	2017	**2018**	**2019**
kWh – at the generator	291,112	291,112	291,112
Cost / kWh	$0.06	$0.06	$0.06
kW – at the generator	25.6	25.6	25.6
Cost / kW	$704	$704	$704

Commercial Geothermal Heat Pumps			
	2017	**2018**	**2019**
kWh – at the generator	730,265	730,265	730,265
Cost / kWh	$0.10	$0.10	$0.10
kW – at the generator	93.0	93.0	93.0
Cost / kW	$785	$785	$785

D. PROJECT BUDGET & PARTICIPATION

Residential Air Source Heat Pumps			
	2017	**2018**	**2019**
Project Delivery & Administration	$7,500	$7,500	$7,500
Incentives	$12,500	$12,500	$12,500
Total	$20,000	$20,000	$20,000
Participation	20	20	20

Residential Geothermal Heat Pumps			
	2017	**2018**	**2019**
Project Delivery & Administration	$7,500	$7,500	$7,500
Incentives	$22,500	$22,500	$22,500
Total	$30,000	$30,000	$30,000
Participation	9	9	9

Commercial Air Source Heat Pumps			
	2017	**2018**	**2019**
Project Delivery & Administration	$5,500	$5,500	$5,500
Incentives	$12,500	$12,500	$12,500
Total	$18,000	$18,000	$18,000
Participation	25	25	25

Commercial Geothermal Heat Pumps			
	2017	**2018**	**2019**
Project Delivery & Administration	$13,000	$13,000	$13,000
Incentives	$60,000	$60,000	$60,000
Total	$73,000	$73,000	$73,000
Participation	16	16	16

LIGHTING
(Existing, Commercial and Industrial)

A. PROJECT DESCRIPTION

The Commercial Lighting project provides incentives for customers replacing inefficient lighting systems with retrofit systems based on more efficient technology. Typical retrofit applications include the following:

- Inefficient incandescent bulbs replaced by screw-in compact fluorescent and/or LED lamps.
- Inefficient fluorescent systems replaced by high efficiency fluorescent systems (electronic ballasts with T5 and T8 lamps).
- LED lighting.
- Occupancy and daylight sensors.

B. PROJECT JUSTIFICATION

The U.S. Energy Information Administration (EIA) estimates that in 2014, about 412 billion kWh of electricity were used for lighting by the residential and commercial sectors in the United States. This consumption represented about 15 percent of the total electricity consumed by both of these sectors and about 11 percent of total U.S. electricity consumption. Further, the commercial sector, including commercial and institutional buildings and street and highway lighting, consumed about 262 billion kilowatt-hours of electricity for lighting, or 19 percent of commercial sector electricity consumption in 2014.

The Department of Energy's (DOE) Energy Star Building Manual reports similarly that lighting consumes close to 35 percent of the electricity used in commercial buildings in the U.S. and affects other building systems through its electrical requirements and the waste heat

that it produces. Large buildings that are dominated with internal heat-generating processes and loads often use far more air conditioning than heating. As a result, these are excellent candidates for lighting efficiency upgrades as they can experience a site HVAC energy-savings bonus of 40 percent or more in addition to efficiency gains from the actual lighting efficiency improvements.

LED lighting is a technology that has experienced very recent increases in market share across the U.S. and in Otter Tail's South Dakota service area. By 2030, U.S. DOE estimates that LEDs could potentially cut national lighting electricity use nearly in half. Energy.gov similarly reports that by 2027, widespread use of LEDs could save about 348 terawatt-hours of electricity, compared to no LED use: This is the equivalent annual electrical generation of 44 electric power plants rated at 1,000 megawatts each.

Potential energy savings data from the U.S. DOE for LED lighting provide reason for optimism, while the Company's 2015 Electric DSM Market Potential Study (Study) illustrates the importance of customer incentives for energy-efficient technologies. The Study also points out that 42 percent of non-residential customers still state that lowest first cost is the most important part of making purchasing decisions around energy efficiency. Incentives available through the EEP project, along with working closely with commercial and industrial customers to enhance awareness, play a key role in shifting customer purchasing behavior toward more efficient lighting products, including LED lamps and fixtures.

PROJECT MODIFICATIONS

For 2017-2019, Otter Tail proposes no modifications in the Commercial Lighting project, but the Company is paying close attention to a market study focusing on continued penetration of inefficient T12 fluorescent lighting. The Minnesota Department of Commerce—Division of Energy Services (DER) has awarded Franklin Energy Services with funds from the DER's Conservation Applied Research and Development (CARD) grant program to examine the continued market presence of this inefficient fluorescent lighting technology and potential for energy savings through continued incentives available to customers for retrofitting to more efficient fluorescent and LED technologies. Pending results of this study, Otter Tail will evaluate the feasibility of a project modification to provide incentives for customers to remove inefficient T12 fluorescent systems and retrofit to more efficient lighting systems.

C. LONG TERM DEMAND SIDE MANAGEMENT GOALS

Commercial Lighting			
	2017	**2018**	**2019**
kWh – at the generator	957,826	957,826	957,826
Cost / kWh	$0.13	$0.13	$0.13
kW – at the generator	205.6	205.6	205.6
Cost / kW	$618	$618	$618

D. PROJECT BUDGET & PARTICIPATION

Commercial Lighting			
	2017	**2018**	**2019**
Project Delivery & Administration	$29,292	$29,292	$29,292
Incentives	$97,708	$97,708	$97,708
Total	$127,000	$127,000	$127,000
Participation	38	38	38

DRIVEPOWER
(Commercial and Industrial)

A. PROJECT DESCRIPTION

The DrivePower project offers incentives for efficient motor and variable frequency drive (VFD) installations. For 2017-2019, Otter Tail proposes to continue offering a prescriptive rebate for VFDs and motors as part of a combined DrivePower project. In other states, Otter Tail has experienced success in achieving market penetration with a similar strategy, and customers express appreciation for a simplified, more expedient process for VFD incentives.

The goal of the DrivePower project is to educate dealers and customers on the benefits of installing VFD motor controls as well as new and replacement electric motors that meet or exceed the National Electrical Manufacturers Association (NEMA) Premium® efficiency requirements. Rather than simply isolating opportunities for electric motor efficiency upgrades, the DrivePower project offers incentives to make the entire motor systems more energy efficient by encouraging the installation of VFD's to more efficiently control motor loads.

B. PROJECT JUSTIFICATION

Induction motors are the workhorses of industry, used widely in virtually every manufacturing plant and office building across the country. The Industrial Efficiency Technology Database states that over 300 million motors are used in industry, in large buildings and in infrastructure globally, and 30 million new electric motors are sold each year for industrial purposes alone. Electric motor systems in industry are estimated to be responsible for approximately 29 percent of overall global energy consumption and 69 percent of industrial electricity consumption.

Electric motors convert electrical power into mechanical power within a motor-driven system. The vast majority of the electricity used in an electric motor-driven system is consumed by the electric motor itself. In electric motor-driven systems, some energy losses occur in the motor itself, but energy losses are greater in the rest of the mechanical system to which the motor is coupled. In a typical electric motor-driven system, the three major routes to achieving energy savings include:

1. Use of properly sized, energy-efficient motors—Motor Decisions Matter.org reports that 96 percent of the cost-of-ownership of an electric motor is the cost of electricity.

2. Use of adjustable speed drives to match motor speed and torque to the system mechanical load requirements. A VFD reduces motor speed to match a driven load by controlling the electrical frequency supplied to the motor. In pump and fan applications with centrifugal load, reducing motor speed by half to match a reduced load in turn reduces energy consumption by a factor of eight. E Source reports that the single most potent source of energy savings in induction motor systems lies not in the motor but, rather, in the controls that govern the motor's operation. VFDs can provide significant benefits in matching a motor's performance to the requirements of the process load.

3. Optimization of the complete system, including correctly sized motor, pipes and ducts, efficient gears and transmissions, and efficient end-use equipment.

C. LONG TERM DEMAND SIDE MANAGEMENT GOALS

Drive Power			
	2017	**2018**	**2019**
kWh – at the generator	1,013,339	1,013,339	1,013,339
Cost / kWh	$0.08	$0.08	$0.08
kW – at the generator	156.2	156.2	156.2
Cost / kW	$506	$506	$506

D. PROJECT BUDGET & PARTICIPATION

Drive Power			
	2017	**2018**	**2019**
Project Delivery & Administration	$17,715	$17,715	$17,715
Incentives	$61,285	$61,285	$61,285
Total	$79,000	$79,000	$79,000
Participation	44	44	44

CUSTOM ENERGY EFFICIENCY PROJECT
(Existing, Commercial and Industrial)

A. PROJECT DESCRIPTION AND JUSTIFICATION

The Custom Energy Efficiency project incentivizes commercial and industrial customers for energy-saving equipment installations and process changes that improve energy efficiency. The Custom Energy Efficiency project is a comprehensive project that is designed to cover

energy-saving applications that are not served by the Company's other prescriptive rebate projects.

Impact savings estimates from Custom Energy Efficiency projects are provided to Otter Tail by the customer in a project proposal. The proposal presents detailed demand and energy savings for each proposed measure that are reviewed and verified by Otter Tail engineering staff. If necessary, modifications are made to the proposal and an iterative process takes place with the customer to ensure accuracy of savings calculations and appropriate documentation of proposed improvements. Otter Tail offers assistance to commercial and industrial customers to help them determine the energy and demand savings necessary in developing a custom efficiency project proposal.

In addition, the customer often works with internal or third party engineers to determine and verify savings. End-use metering may also be used for verifying impact savings.

B. LONG TERM DEMAND SIDE MANAGEMENT GOALS

Custom Energy Efficiency			
	2017	**2018**	**2019**
kWh – at the generator	130,729	130,729	130,729
Cost / kWh	$0.31	$0.31	$0.31
kW – at the generator	45.297	45.297	45.297
Cost / kW	$883	$883	$883

C. PROJECT BUDGET & PARTICIPATION

Custom Energy Efficiency			
	2017	**2018**	**2019**
Project Delivery & Administration	$15,500	$15,500	$15,500
Incentives	$24,500	$24,500	$24,500
Total	$40,000	$40,000	$40,000
Participation	7	7	7

ADVERTISING AND EDUCATION
(Existing, Residential, Commercial and Industrial)

A. PROJECT DESCRIPTION AND JUSTIFICATION

The goal of advertising and education efforts is to inform, persuade, remind, and add value. Advertising and education makes individuals aware of product options, energy efficiency choices, informs them about those options, and assists the individual in making decisions about a course of action or purchase. Effective advertising and education prepares an individual to respond when a need or opportunity arises. This likely does not occur

simultaneously with the message being received, but has an effect, none-the-less, on decisions made.

The range and complexity of energy related decisions consumers make continue to multiply. This is due to the variety of energy-powered technologies used in modern life; the variety of construction materials available; the number of construction techniques represented in today's housing stock; and the number of options available for heating, cooling, and ventilation systems.

The primary purpose of this project is educational outreach targeting residential customers and children across economic groups from within the Otter Tail customer base. The project objective is to promote consumer awareness of energy-saving practices and to educate both today's consumers and future consumers to help prepare them to make lifestyle choices and buying decisions that maximize energy efficiency and savings.

Components of the Advertising and Education project include presenting educational assemblies to students and their teachers, as well as providing educational materials such as newsletter articles, bill inserts, and other literature, and web-based educational information.

- **Educational assemblies for students and teachers.**
  The Energy Connection program is a production and tour offered by the Minnesota Science Museum. Similar programs are offered by other organizations and may be considered. We plan to continue offering an energy tour as a free service to selected schools in South Dakota in the spring of 2017, 2018, and 2019. The goal will be to provide the assembly program to at least four schools each year. The assembly program targets students in fourth through sixth grades with interactive displays and activities to develop an understanding of energy, alternative fuels and energy resources used to generate electricity, and energy conservation methods to use at home and at school. The program is supplemented with materials for teachers to assist them in meeting their energy education requirements for fourth through sixth grades. Our plans also include the distribution of LED bulbs for the students to take home and install. This will be in conjunction with our residential lighting program.

- **General information literature.**
  Appropriate materials will be developed and produced as companion pieces to support the programs and technologies offered in this portfolio and the general energy efficiency education effort. Customers will be offered educational materials as free resources online, as a part of the advertising campaigns, and through a bimonthly newsletter for residential customers.

- **Internet based resources**
  Materials developed through this project will direct customers to www.otpco.com where they will find a variety of conservation tips and resources. The most significant tool available to customers on the web is an energy feedback tool that provides an online energy audit and bill analysis tool. Called Home Energy Analyzer, this tool helps individuals understand their individual energy consumption patterns, identify

causes for changes in consumption, compare their use to other similar households, and to be guided to actions to reduce their personal energy use. Studies show that energy feedback programs are successful in driving household energy savings of two percent or more through behavior and prescriptive changes. This tool is available for web self-service and through contact with customer service center representatives.

The annual objective of the Advertising and Education project is to educate approximately 400 students on energy use, its impact on the environment, and how behavior and technology interact; to drive customers to participate in the Bill Analyzer project; and to distribute energy efficient literature to customers. The project will also support other advertising efforts in specific projects.

B. LONG TERM DEMAND SIDE MANAGEMENT GOALS

This project is not a direct impact project; therefore no estimates have been made to determine any effects on peak demand or energy consumption.

C. PROJECT BUDGET & PARTICIPATION

Advertising and Education			
	2017	**2018**	**2019**
Project Delivery & Administration	$12,000	$12,000	$12,000
Total	$12,000	$12,000	$12,000
Participation	400	400	400

EEP DEVELOPMENT AND PLANNING
(Existing)

A. PROJECT DESCRIPTION

Research and development are critical steps in ensuring that Otter Tail's Energy Efficient Plan in South Dakota remains relevant and effective to South Dakota Customers over the long term. The Development and Planning project is designed to allow for both long-term and near-term management and development of the EEP at Otter Tail.

The project will encompass analyzing new trends and technologies, conducting EEP-related strategic planning (economic and impact), and EEP-related regulatory coordination and compliance. Analysis activities will focus on national, state, and other utility trends; demand side management potential, load research, legislative and regulatory activity; and private sector development of new technologies and programs aligned with energy efficiency efforts.

B. LONG TERM DEMAND SIDE MANAGEMENT GOALS

This project is not a direct impact project; therefore, no estimates have been made to determine any effects on peak demand or energy consumption.

C. PROJECT BUDGET & PARTICIPATION

Development and Planning			
	2017	**2018**	**2019**
Development and Planning	$25,000	$25,000	$25,000

Cost Recovery and Financial Incentive

Otter Tail has established a balancing account to track South Dakota conservation costs, including a carrying charge for the time value of the money invested in energy efficiency projects incurred by the Company. The tracker also accounts for amounts collected from customers through the conservation cost recovery charge. The conservation cost recovery charge is collected monthly based on the applicable adjustment factor multiplied by the Customer's monthly energy (kWh) usage. For billing purposes, the cost recovery charge is combined with other charges as part of the energy adjustment that appears on customers' electric service bills.

We are not currently recovering any of these costs in base rates. The conservation cost recovery mechanism is an appropriate means to recover costs associated with developing and implementing the South Dakota Energy Efficiency Partnership.

On May 1 of each year the Company plans to file a Status Report detailing the previous year's EEP results, including energy savings and expenses. In addition, the Company will request approval of a financial incentive, an update to the amount of the conservation cost recovery charge, and approval to continue the adjustment charge on customers' bills, effective July 1, of that year.

Otter Tail requests a financial incentive for the 2017-2019 EEP consistent with the incentive proposal filed on May 1. The following table shows the proposed incentive for 2017, 2018, and 2019 capped at 30 percent of budgeted annual EEP expenses. The financial incentive realized by the Company would be based on the lesser of the budget or actual expenses, and filed annually in the May 1 Status Report.

SD Energy Efficiency Financial Incentive	**2017**	**2018**	**2019**
Proposed EEP Budget	$449,000	$449,000	449,000
Percent of Budget	30%	30%	30%
Financial Incentive (cap)	**$134,700**	**$134,700**	**$134,700**

Evaluation

Otter Tail uses DSMore™ software to analyze programs and to calculate benefit-cost test results for each direct-impact project and for the aggregate EEP portfolio including indirect impact project costs. A summary of the cost effectiveness of the portfolio is presented in the following table for each year of the 2017-2019 EEP and for both years combined.

2017 Energy Efficiency Plan - Benefit / Cost Results				
Participant Test	Ratepayer Impact Test	Total Resource Test	Societal Test	Utility Test
2.92	0.68	2.26	2.35	5.10
2018 Energy Efficiency Plan - Benefit / Cost Results				
Participant Test	Ratepayer Impact Test	Total Resource Test	Societal Test	Utility Test
2.97	0.70	2.36	2.45	5.35
2019 Energy Efficiency Plan - Benefit / Cost Results				
Participant Test	Ratepayer Impact Test	Total Resource Test	Societal Test	Utility Test
3.01	0.72	2.45	2.54	5.59
2017 - 2019 Energy Efficiency Plan - Benefit / Cost Results				
Participant Test	Ratepayer Impact Test	Total Resource Test	Societal Test	Utility Test
2.96	0.70	2.36	2.45	5.35

Externality values are typically included in the Societal Test. For this analysis, the Company excluded externality values in the Societal and Total Resource Test.

DSMore™ incorporates data from the Company's Integrated Resource Plan, transmission cost models, and financial parameters to model our customer load profiles, system peaks, line losses, customer rates, marginal energy costs, avoided capacity costs, and avoided transmission and distribution costs. Results for the individual projects are provided in Appendix A along with benefit/cost test results for each project. Compared to Otter Tail's 2014-2016 EEP plan benefit/cost ratios are consistently lower. This is a reflection of lower avoided generation capacity and energy costs. As these costs decline, the avoided costs decline resulting in lower benefits achieved from conservation. However, the EEP conservation plan is still cost-effective and continues to add value and reduce costs for South Dakota customers.

Otter Tail used the following discount rates as inputs to DSMore™ for the 2017-2019 analysis. The Societal Test discount rate and the Residential Participant Test discount rate use the 20-year T-bill rate as of March 1, 2016.

Participant Test Residential	Participant Test Commercial	Ratepayer Impact Test	Total Resource Test	Societal Test	Utility Test
2.28%	8.50%	8.50%	2.92%*	2.28%	8.50%

* The costs used in the Total Resource Test include both utility administration costs and participant costs. Otter Tail applied a weighted discount rate for each measure based on total administration costs and total participation costs.

Summary

Otter Tail's 2017-2019 Plan presents projects for all customer classes and major end uses. The Plan includes projects intended to achieve approximately 3.8 million kWh in annual energy savings at an approximate total cost of $449,000. DSMore™ results demonstrate that the Plan passes all required cost effectiveness tests.

Otter Tail proposes launching these projects January 1, 2017. Following the Plan's implementation and evaluation, the Company will provide reviews to the Commission of the Company's performance compared to the budgets every year by May 1. The Company aims to achieve a financial incentive for providing energy savings and net benefits to South Dakota customers. This incentive is proposed as 30 percent of actual EEP expenses, capped at 30 percent of proposed budget.

We respectfully request the Commission approve the 2017-2019 Energy Efficiency Portfolio and incentive plan.