

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

IN THE MATTER OF A PETITION OF
NORTHERN STATES POWER COMPANY
FOR APPROVAL OF A LIGHT EMITTING
DIODE (LED) STREETLIGHT RATE

DOCKET NO. EL17-____

PETITION

INTRODUCTION

Northern States Power Company, doing business as Xcel Energy, submits to the South Dakota Public Utilities Commission this Petition for approval of the addition of a Light Emitting Diode (LED) option to our existing Company-owned street lighting rate (Rate Code E30).

In December 2015, the Commission approved a new LED rate for customer-owned street lighting (Rate Code E31).¹ A number of our municipal customers are also interested in LED street lighting options for street lighting owned by the Company rather than the customer. We are therefore seeking approval to offer this voluntary service to street lighting customers. The LED street lighting rate has the potential to:

- reduce bills;
- decrease maintenance and other expense allocations;
- achieve greater efficiency;
- help to meet energy usage and greenhouse gas emissions reduction goals, and;
- improve lighting quality.

A typical street lighting customer in South Dakota may see an average monthly savings of three to four percent on their bill by switching to the LED street lighting service.² This service will be available for all Company-owned streetlight wattage options, so that the majority of our Company-owned high pressure sodium (HPS) streetlights could be converted to this LED rate within the next two years.

¹ Docket No. EL15-043, Order Approving Tariff Revision, December 2, 2015.

² The majority (95 percent) of cobra-head streetlights in South Dakota are 100W and 150W in size, which result in the highest monthly savings potential.

This rate would be an addition to our existing Street Lighting System Service, introducing LED fixture options at the 100-Watt, 150-Watt, 250-Watt, and 400-Watt equivalent levels, and therefore requires a change to our tariff. The legal standard of review for this petition is found in S.D. Codified Laws Chapter 49-34A-6, which states, “Every rate made, demanded or received by any public utility shall be just and reasonable.” We believe that our petition has met that standard. The LED rates proposed in the Street Lighting Service tariff are being offered to our Company-owned street lighting customers, incorporate the maintenance and other expense-allocated cost savings, and will likely result in overall customer cost-savings. The rates proposed are just and reasonable, satisfying the statutory requirements.

We respectfully request that the Commission approve the Company’s proposed tariff, including the proposed monthly rates and the terms and conditions of service. This Petition provides scoping of the rate offering, a description of the proposed tariff and rate design, and a proposal for making the LED street lighting system service available to customers in our South Dakota service territory.

The following attachments are included with this Petition:

- Attachment A: LED Street Lighting System Service Rate Design
- Attachment B: LED Street Lighting System Service Tariff Sheet
- Attachment C: LED Street Lighting Service Bill Mockup

REQUIRED INFORMATION

Following is information specified in S. D. Admin. R. 20:10:13:26 regarding the proposed tariff change.

(1) Name and Address of the Public Utility

Steve Kolbeck
Principal Manager
Northern States Power Company, doing business as Xcel Energy
500 West Russell Street
Sioux Falls, SD 57104
(605) 339-8350
steven.t.kolbeck@xcelenergy.com

We request that all communications regarding this proceeding, including data requests, also be directed to:

Carl Cronin
Regulatory Administrator
Xcel Energy
414 Nicollet Mall – 401 7th Floor
Minneapolis, MN 55401
Regulatory.Records@xcelenergy.com

(2) Section and Sheet Number of Tariff Schedule

Xcel Energy proposes to revise the following sheet in Section 5 of the Northern States Power Company South Dakota Electric Rate Book.

Sheet No. 5-56, revision 6 – Street Lighting System Service Rate Code E30

Attachment B contains the proposed tariff in Legislative and Non-Legislative format.

(3) Description of the Tariff Change

The Company proposes adding an LED fixture option to its existing Street Lighting System Service (Rate Code E30) for Company-owned streetlights in four wattage-equivalent replacement levels: 100-Watt, 150-Watt, 250-Watt, and 400-Watt. Today, the Company offers several street lighting options for customers:

- **Street Lighting System Service (HPS) – Rate Code E30**
Under this rate schedule the Company provides energy distribution, furnishes lighting equipment, and is responsible for all necessary maintenance for a flat monthly rate based on the wattage of the streetlight. Customers are also billed the applicable fuel clause rate for the dusk-to-dawn energy usage of the lights.
- **Street Lighting Energy Service (HPS, Mercury) – Rate Code E31**
The Company provides energy distribution and necessary maintenance for a flat monthly rate based on the wattage of the streetlight. The customer owns a Company-approved street lighting system. Customers are also billed the applicable fuel clause rate for the dusk-to-dawn energy usage of the lights.
- **Street Lighting Energy Service – Metered – Rate Code E32**
The Company provides energy distribution services and meter. Customer owns and maintains the lighting system. Customer is billed a customer charge per meter and a per kWh energy charge for the distribution of energy. Customers are also billed the applicable fuel clause rate for the dusk-to-dawn energy usage of the streetlights.

We have already implemented an LED rate for customer-owned fixtures; therefore customers on Rate Code E31 are not impacted by this new offering. Customers on Rate Code E32 also have the option to switch their fixtures to LEDs, as they are customer-owned. Because that rate is billed on a kWh basis already, there is no need to create an LED rate as they would see a savings reflected on their bill as soon as they replace the HPS fixtures, due to the reduced energy consumption of the LEDs.

The Company proposes to make the LED Street Lighting rate a permanent offering. Our proposed Street Lighting System Service tariff sheet incorporating an LED rate is included as Attachment B to this Petition.

(4) Reason for the Requested Change

This initiative is an effort to respond to customer interests by providing expanded choices of products and services. As LED technologies have experienced reductions in cost and advancements in performance, the Company believes that it is a prudent time to invest in the technology for use on our system since it can now deliver cost savings to customers. In addition, the LED streetlight fixtures provide improved light quality and color rendering. These features translate into decreased light trespass and better nighttime visibility for pedestrians and motorists, contributing to an enhanced sense of safety. As the owner of approximately 2,900 streetlights in South Dakota, this rate would enable the Company to play a key role in helping communities transition to more energy-efficient lighting options.

The proposed tariff rate change incorporates the maintenance savings and expense-allocated cost reductions, as well as the higher cost of LED fixtures. We expect the aforementioned cost reductions, along with the expected fuel charge savings, to more than offset the incremental cost of the LED fixtures, which are more expensive than their HPS counterparts.

(5) Present Rate

The existing rate for HPS luminaires is shown on the tariff sheet included in this filing as Attachment B. There is currently no set rate for LED fixtures under the affected E30 rate code.

(6) Proposed Rate

Customers participating in this service will pay a monthly rate that reflects savings in energy costs and maintenance, which help to offset increased capital costs. The proposed LED Streetlight charges are provided in Table 1 below.

Table 1
Proposed Monthly Rate per LED Streetlight

Designation of Lamps	Standard Service	
	Overhead	Underground
30-40W	\$14.25	\$23.35
50-75W	\$16.16	\$25.39
110-165W	\$21.41	\$30.94
200-250W	\$26.84	

We discuss the detailed rate design later in this Petition.

(7) Proposed Effective Date of Modified Rate

The Company proposes that the LED Street Lighting System Service tariff option become effective and available to customers immediately upon issuance of the Commission Order.

(8) Approximation of Annual Increase or Decrease in Revenue

Based on the proposed pricing and anticipated strong demand for this product, the Company expects to replace a large portion, if not all, of the Company-owned streetlights in South Dakota within the next one to two years. However, we do not anticipate a significant change in revenue as a result of this tariff over time since the new LED street lighting rate is similar to the HPS street lighting rate.

(9) Points Affected

This petition and these proposed changes will apply to all customers in South Dakota; however, this change will principally affect street lighting customers under Rate Code E30 who may choose this new rate option. There are approximately 32 communities using this rate code.

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

There are approximately 32 communities who may receive service under this rate code. The new LED street lighting rates have the potential to reduce the cost of service of these communities, but the Company expects that any reductions would be small relative to the cost of service under the currently existing HPS rates.

(11) Statement of Facts, Expert Opinions, Documents, and Exhibits to Support the Proposed Changes

A. Background

While LED streetlights have been available for some time, until recently the price and efficiency were not cost-competitive with current rate options. With increasing customer interest in LED street lighting, Xcel Energy issued an enterprise-wide Request for Proposals, leveraging the size of the Company's comprehensive streetlight fleet across all operating companies to obtain competitive LED street lighting fixture pricing. This initiative generated interest from a number of leading manufacturers and resulted in cost-competitive bids for LED fixtures. The combination of the pricing we are able to obtain by leveraging our bulk purchasing power and the expected impact of increased efficiency of the LED fixtures on Company operations makes LED street lighting a competitive option that can reduce customer bills.

Cobra-head fixtures are the most cost-effective utility-scale design at this time, so the Company is offering an attractive LED rate option to customers at four proposed wattage levels in that style. In selecting the type of fixtures for this offering, the Company completed a technical specification stipulating performance requirements, and performed an extensive analysis of vendor conformance to this specification in all areas, including pricing.

B. Description of the Proposed Program and Tariff

1. Subscription

In this Petition, we seek Commission approval of our proposed tariff, which will add four LED fixture options for those customers receiving Street Lighting System Service from Company-owned assets on Rate Code E30. Customer participation in this service is voluntary, and available for year-round illumination of public streets, parkways, and highways by LED fixtures supported on poles, where the facilities for this service are furnished by the Company. The Company proposes to provide four wattage-equivalent options in order to provide a full range of replacements for the existing HPS fixtures on the Street Lighting System Service Rate Code E30. See Table 2 for the corresponding LED fixture replacements.

Table 2
LED Streetlight Wattage

HPS Wattage	LED Equivalent Wattage³
100W	39W
150W	65W
250W	155W
400W	246W

2. *Rate Design*

The rate design calculations and resulting customer bill impacts are shown below in Table 3. A current street lighting customer with a 100-Watt HPS fixture would have that streetlight replaced with an equivalent 39-Watt LED fixture. Approximately 84 percent of the Company-owned streetlights in South Dakota are 100-Watt fixtures, so that rate is expected to be the most widely-applicable to customers. The LED equivalent wattages are reflective of the average wattages of LED streetlights the Company plans to initially install. However, over time we expect advancements in LED technology to achieve lower wattage requirements. Therefore, the tariff included in Attachment B includes a wattage range to accommodate current and future LED streetlights

As shown in Table 3 under the Rate Impact heading, the LED rates are based on the current monthly HPS overhead rates, adjusted for the reduction in maintenance costs, decrease in energy and demand-related costs, and increase in capital costs for the LED fixtures.

³ The LED equivalent wattage is a simple average across vendor fixtures that qualify for the Company's technical specification, at each size level. We recognize that LED technology will continue to evolve and perhaps become more efficient. For this reason the Company will monitor this evolution over time, and adjust accordingly.

Table 3
Company-Owned LED Street Lighting Rate Design

RATE IMPACT	NSP-SD			
	Per HPS/LED Street Light Equivalent			
	100W/39W	150W/65W	250W/155W	400W/246W
Current HPS Street Lighting Overhead Rate	\$14.06	\$16.00	\$20.68	\$25.45
<i>Maintenance Savings</i>	(\$0.91)	(\$0.91)	(\$0.91)	(\$0.91)
<i>Base Rate Energy Charge Savings</i>	(\$0.58)	(\$0.78)	(\$1.12)	(\$1.75)
<i>Incremental Levelized Capital Revenue Requirement</i>	\$1.68	\$1.85	\$2.76	\$4.05
<i>LED Fixture Rate Impact - Company Owned Street Lights ¹</i>	\$0.19	\$0.16	\$0.73	\$1.39
Proposed Monthly LED SL Overhead Rates¹	\$14.25	\$16.16	\$21.41	\$26.84
BILL IMPACT (Estimated)	100W/39W	150W/65W	250W/155W	400W/246W
Current HPS Monthly Average Bill Per Street Light - Overhead	\$15.08	\$17.49	\$23.36	\$29.66
<i>LED Fixture Impact on HPS Street Lighting Rate</i>	\$0.19	\$0.16	\$0.73	\$1.39
<i>Fuel Clause and Resource Adj. Savings Estimate</i>	(\$0.69)	(\$0.92)	(\$1.33)	(\$2.08)
Total Monthly Bill Impact	(\$0.50)	(\$0.76)	(\$0.60)	(\$0.69)
Proposed LED Monthly Average Bill Per Street Light - Overhead	\$14.59	\$16.74	\$22.76	\$28.97
<i>Percentage Savings (increase)</i>	3.3%	4.3%	2.6%	2.3%

¹ Adjustment will also be applied to Underground HPS rates to create Underground LED street lighting rates

As Table 3 illustrates, the Company expects LED streetlights will decrease maintenance expenses. The Company would no longer need to change a lamp approximately every five to six years or replace malfunctioning ballasts or broken glass lamp coverings, which are common maintenance requirements of HPS fixtures. The eliminated maintenance translates into a savings expectation of \$0.91 per month per light, as shown in the Maintenance Savings line above.

The projected Base Rate Energy and Demand Charge Savings shown in the table are the result of the reduction in energy and demand usage when HPS fixtures are replaced with LEDs, which reduces the allocation of system resources to street lighting. This results in a reduction in the proposed LED Street Lighting System Service monthly rate.

In spite of their associated energy and maintenance savings, the LED fixtures are more expensive than their HPS counterparts, and hence require an incremental investment. Therefore the revenue requirement associated with the LED fixture is higher than that of the HPS fixture, which is included in the table above as Incremental Capital Revenue Requirement. The revenue requirement associated with the capital cost does more than offset the energy and maintenance savings. The result

is a slight increase in the monthly tariff rate, shown as LED Fixture Rate Impact - Company Owned Streetlights in the table, but we expect the HPS fixture replacement will still result in an overall bill savings for all wattages when combined with fuel savings.

The lower energy usage of the LED fixtures, in addition to yielding some base rate energy savings for customers as described above, results in a reduction in the fuel clause cost. As noted above, this impact is not included in the monthly rate, but customers will see the saving reflected in the fuel clause cost line of their bill. This is illustrated in the Fuel Clause Savings Estimate line in the Bill Impact section of the table which is driven by the currently effective street lighting fuel clause rate and the kWh savings. The anticipated Bill Impact is estimated in the bottom section of Table 3.

In addition, fuel clause costs account for only approximately 10 percent of the street lighting bill, so these cost savings impact only 10 percent of the bill. Therefore, if LED streetlights achieve a 60 percent reduction in usage, we could expect a 6 percent bill reduction. When factoring in the fuel savings driven by LED streetlights, along with the small increase in the monthly rate, the Company expects customers to see an average of three to four percent savings on their bill. A more detailed version of the rate design calculations can be found in Attachment A.

C. Proposed Implementation of the Program

If approved, we plan to offer the LED option for all street lighting system service customers in our South Dakota service territory over approximately the next year. The program is voluntary, meaning we will offer the service to all customers scheduled for re-lamping, with the option to opt-out if they want. As customers convert to LED fixtures via the System Service or the metered Energy Service, the Company will work to make the transition as seamless as possible from an internal accounting and billing perspective. An example bill illustrating the LED Street Lighting Rate is included as Attachment C.

CONCLUSION

The Company respectfully requests that the Commission approve the addition of an LED option to our existing Street Lighting System Service (Rate Code E30). This rate addition responds to increasing customer interest in LED street lighting options.

Dated: April 20, 2017

Northern States Power Company