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February 8, 2017

Daniel P. Wolf  
Executive Secretary  
Minnesota Public Utilities Commission  
121 7<sup>th</sup> Place East, Suite 350  
St. Paul, Minnesota 55101-2147

RE: **Comments of the Minnesota Department of Commerce, Division of Energy Resources**  
Docket No. E111/M-16-1028

Dear Mr. Wolf:

Attached are the Comments of the Minnesota Department of Commerce, Division of Energy Resources (Department) in the following matter:

A Request by Dakota Electric Association (DEA or the Cooperative) to Update Lighting Rate Schedules

The Petition was filed on December 9, 2016 by:

Douglas R. Larson  
Vice President of Regulatory Services  
Dakota Electric Association  
4300 220<sup>th</sup> Street West  
Farmington, MN, 55024

The Department recommends **approval, with modification**, of DEA's Petition. The Department is available to answer any questions the Minnesota Public Utilities Commission may have.

Sincerely,

/s/ DANIELLE WINNER  
Rates Analyst

DW/lt

**BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION****COMMENTS OF THE  
MINNESOTA DEPARTMENT OF COMMERCE  
DIVISION OF ENERGY RESOURCES**

DOCKET No. E111/M-16-1028

**I. SUMMARY OF FILING**

On December 9, 2016, Dakota Electric Association (Dakota Electric, DEA, or the Cooperative) filed with the Minnesota Public Utilities Commission (Commission) its *Petition to Update Lighting Rate Schedules* (Petition). The Petition included a proposal to close most of the Cooperative's high pressure sodium (HPS) lighting options and update the rates for its light-emitting diode (LED) options.

**II. BACKGROUND**

"Street Lighting," also called "Public Street Lighting," is a class of utility customer, in the same way that "Residential," "Commercial," and "Industrial" are classes of utility customers. Many street lighting customers are cities or municipalities; however, street lighting customers can also be private entities, such as a homeowner's association or a company. Street lighting is a unique type of electric service in that it may or may not be metered. When unmetered service is taken, customers pay a per-light monthly rate, and therefore unmetered street lighting rates depend on the wattage of each lamp.<sup>1</sup> Historically, street lighting needs have been met through high pressure sodium lights, mercury vapor lights, or incandescent lights, but increasingly these lamps are being replaced with light-emitting diodes (LEDs). Since LEDs are more efficient than other types of lamps, they are cheaper to operate, and so tend to correspond with cheaper monthly rates for street lighting customers.

The street lighting class comprises a small percentage of each regulated utilities' energy sales, dollar revenues, and number of customers, as shown in the tables below.

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<sup>1</sup> In commercial lighting, the term "lamp" is typically used rather than "bulb." A "luminaire," by contrast, is the entire lighting unit, including both the lamp and the fixture. Lamps also have an auxiliary component called a ballast, which draws a small amount of electricity in addition to that drawn for light.

**Tables 1, 2, and 3: Regulated Electric Utility Sales, Revenues, and Number of Street Lighting Customers<sup>2</sup>**

<b>Utility Sales (kWh)</b>	<b>Xcel</b>	<b>Otter Tail</b>	<b>Minnesota Power</b>	<b>Dakota Electric</b>
Total Retail Sales (kWh)	30,310,912,000	2,380,254,000	8,424,679,668	1,792,314,743
Public Street Lighting Sales (kWh)	137,555,000	10,449,000	15,801,113	10,455,057
Public Street Lighting Sales as Percentage of Total Retail Sales	0.45%	0.44%	0.19%	0.58%

<b>Utility Revenues (\$)</b>	<b>Xcel</b>	<b>Otter Tail</b>	<b>Minnesota Power</b>	<b>Dakota Electric</b>
Total Retail Revenue (\$)	2,962,057,809	192,753,000	528,805,775	191,376,062
Public Street Lighting Revenue (\$)	22,539,233	1,701,000	2,157,399	2,006,874
Public Street Lighting Revenue as Percentage of Total Revenue	0.76%	0.88%	0.41%	1.05%

<b>Utility Customer Number (monthly average)</b>	<b>Xcel</b>	<b>Otter Tail</b>	<b>Minnesota Power</b>	<b>Dakota Electric</b>
Total Ultimate Customers (mo avg)	1,259,609	60,945	1,740,401	104,057
Public Street Lighting Customers (mo avg)	4,245	149	8,080	222
Public Street Lighting Customers as Percentage of Total Customers	0.34%	0.24%	0.46%	0.21%

As seen in the above tables, in 2015 Dakota Electric Association's street lighting class comprised a larger portion of both the Cooperatives sales and revenue compared to other electric utilities, despite have the smallest percentage of utility customers.

Dakota Electric first implemented rates for LED lighting options in Docket No. E111/M-15-694. At that time, the Cooperative had been monitoring LED lighting technology developments for several years and had funded and tested several LED lights on a designated street in Apple Valley, allowing the city to evaluate the characteristics of LED lighting in real-world conditions on an existing city street. Further, in 2013 and 2014 DEA tested 36 different light fixtures from several different companies in DEA's pole yard behind the Cooperative's headquarters. DEA used these tests to determine the best options available for LED street lighting and to determine costs of various fixtures. In Docket No. E111/M-15-694, the Commission granted the Cooperative approval to expand its LED rate options to the Cooperative's entire service territory. Since that time, the Cooperative has been monitoring the costs of lighting services. Most recently, in Docket No. E111/M-16-859, the Commission approved DEA's request to remove its only remaining mercury vapor lighting option from its tariff, which had previously been closed to new customers.

<sup>2</sup> Source: Each regulated electric utility's 2015 Electric Jurisdictional Annual Report, as filed in Docket No. E999/PR-16-4. The figures do not include non-retail sales such as sale-for-resale.

### III. DEPARTMENT ANALYSIS

#### A. MINNESOTA RULES

Minn. Rule 7825.3200 requires that utilities serve notice to the Commission at least 90 days prior to the proposed effective date of modified rates. DEA is not proposing to implement the LED street lighting rates prior to Commission approval. Therefore, the Department recommends that, if approved, the Cooperative's proposed rate changes be implemented as soon as practicable after the Commission issues its Order in this matter, but no earlier than March 9, 2017 (90 days after the *Petition's* filing date).

#### B. PROPOSED TARIFF SCHEDULES

The following table shows Dakota Electric's current street lighting offerings.

**Table 4: Dakota Electric Association's Street Lighting Schedules**

Schedule	Schedule Name/Description
44	Security Lighting
44-1	Street Lighting Service (Member-Owned)
44-2	Street Lighting Service (DEA-Owned Equipment)
44-3	Custom Residential Street Lighting (DEA-Owned, Contribution by Member)
44-4	LED Security Lighting
44-5	LED Street Lighting (Member-Owned)
44-6	LED Street Lighting (DEA-Owned, Contribution by Member)

Schedules 44-1 and 44-5 apply to member-owned lighting. In these cases, the customer owns, operates, and maintains the light fixtures in question, and the customer chooses their own lamp. DEA's member-owned street lighting rates are not impacted by the Cooperative's current *Petition*.

The remaining rate schedules apply to DEA-owned lighting. Under Schedules 44-2, 44-3, and 44-6, the customer owns the street to be illuminated, but Dakota Electric owns, operates, and maintains the lighting, and offers different lamp options for the customer to choose from. Customers pay a monthly per-light fee based on the specific lamps used. Customers are required to provide a contribution in aid of construction (CIAC) for initial installation and also when additional upgrades or construction is needed. If a customer wishes to upgrade to an LED before the end of the current lamp's useful life, the customer pays for the remaining undepreciated lamp cost, minus any salvage value.<sup>3</sup>

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<sup>3</sup> The stipulation originated from a Department recommendation in Docket No. E111/M-15-694. The Department made this recommendation after reviewing results of a similar filing for Minnesota Power in Docket No. E015/M-14-675. In that case, the Department recommended that Minnesota Power reduce the undepreciated costs charged to customers replacing existing sodium vapor lights with LED fixtures by the salvage value of the facilities. The Commission approved this methodology in its January 9, 2015 *Order*.

Additionally, Dakota Electric offers private security lighting attached to existing utility-owned poles under Schedules 44 and 44-4. Security lights are also DEA-owned, and have similar terms and conditions as street lights. The difference is that security lights are not necessarily located on a street, but are often on private property, such as on a farm, parking lot, or a company campus. Additionally, CIACs are not required for initial installation, but only for upgrades or additional construction.

In the instant docket, the Cooperative proposed to close to new customers all of the existing HPS luminaire options in Schedules 44 (Security Lighting Service) and 44-2 (Street Lighting Service: DEA-Owned Equipment), and all but one of the existing HPS luminaire options in Schedule 44-3 (Custom Residential Street Lighting: DEA-Owned, Contribution by Member). The following table shows the rates impacted by the proposed changes:

**Table 5: Street Lighting Lamps and Rates Proposed to be Closed to New Customers by Dakota Electric Association, with Corresponding Schedules**

Schedule	Lamp	Monthly Rate Per Luminaire
44	100 Watt High Pressure Sodium	\$10.10
	150 Watt High Pressure Sodium	\$11.99
	250 Watt High Pressure Sodium	\$15.79
44-2	100 Watt High Pressure Sodium	\$12.27
	150 Watt High Pressure Sodium	\$14.16
	250 Watt High Pressure Sodium	\$17.95
44-3	50 Watt High Pressure Sodium	\$6.70
	150 Watt High Pressure Sodium	\$10.30
	250 Watt High Pressure Sodium	\$14.09

The Cooperative stated that closing the above rate options to new customers will increase the efficiency of its lighting fleet, as new customers will only be able to sign up for LEDs. Additionally, closing the above rates will reduce the amount of inventory for installation and maintenance that the Cooperative would have to retain. DEA stated that the proposal to close the above rates will not affect service to customers with existing HPS security and street lighting. The Cooperative also clarified that it is not proposing to close to new customers either its HPS lighting options in Schedule 44-1 (which is a Member-Owned schedule), or its 100 Watt HPS lighting option in Schedule 44-3. Additionally, any developments currently in progress using HPS lighting will be considered existing rather than new service, and so will not be affected by the proposed changes.

In addition to closing the above lighting options to new customers, the Cooperative also proposed to reduce the monthly rate per fixture of all LED luminaire options in Schedules 44-4 (LED Security Lighting Service) and 44-6 (LED Street Lighting: DEA-Owned, Contribution by Member). The Cooperative's present LED rates were originally approved in Docket No. E111/M-15-694. In that docket, the Cooperative stated that they would review the costs of LEDs and provide periodic updates as the rates change. The rates of LEDs have declined since the time of that filing, as reflected in the proposed rates. The following table shows the rates impacted by the proposed changes:

**Table 6: Present and Proposed LED Street Lighting Rates of Dakota Electric Association, with Corresponding Schedules**

Schedule	Luminaire	Present	Proposed
44-4	LED Security Light	\$7.80	\$7.63
44-6	LED Coach Light (Post)	\$12.27	\$10.60
	LED Acorn Light (Post)	\$16.40	\$11.24
	LED Cobra Light (Mast)	\$8.69	\$8.31
	LED Shoebox Light (Mast)	\$13.16	\$10.71

The Cooperative has noted that the proposed rates are either lower than or very close to the equivalent HPS rates. The Department was unable to definitively verify this, as it is unclear which LED lights and HPS lights are considered equivalent; however, based on a general review of the current HPS rates, the Department agrees that the proposed LED lights appear to be either lower than or close to the current HPS rates. However, the Department notes that the 50-Watt HPS light, which is the lowest-usage available HPS light, is billed at a monthly rate of \$6.70 per luminaire in Schedule 44-3. In the Cooperative’s table labeled “LED Lighting Cost Analysis (DEA-Owned) *Determination of Lighting Power Supply Energy Costs*,” the lowest-usage LED street light is the Acorn Light, which is associated with a monthly rate of \$11.24 per luminaire in Schedule 44-6. If the 50-Watt HPS is the equivalent of the LED Acorn light, Department is concerned that customers desiring low-wattage lamps may be required to pay significantly more than under the current 50-Watt HPS rate. Of course, a new customer would not be aware that there used to be a lower-cost option, and an existing customer switching to an LED option would do so by choice. Nevertheless, the Department recommends that DEA include the wattage or wattage range for each lamp in the LED tariff sheets to provide additional clarity to street lighting customers.<sup>4</sup>

**C. DAKOTA ELECTRIC’S LED LIGHTING COST ANALYSIS**

As it has in past street lighting filings, Dakota Electric presented a series of tables representing the Cooperative’s LED Lighting Cost Analysis. The tables calculate the following costs for each type of lamp: Power supply costs (both for energy and demand), allocated distribution costs (both consumer and capacity), capital recovery of the fixture and lamp, and maintenance costs.

The Cooperative calculated each lamp’s energy costs by first assuming monthly and annual usage of each type of lamp, then adjusting for 3% line losses to determine monthly and annual purchases of each type of lamp. These figures were multiplied by a blended cost-per-kWh figure to produce final \$/month and \$/year energy costs per lamp.

To determine each lamp’s demand costs, the Cooperative’s engineers first calculated each lamp and accompanying ballast’s instantaneous electricity draw. These figures were then classified as either non-coincident demand or coincident demand, based on the

<sup>4</sup> The Commission approved the Department’s similar recommendation regarding Xcel Energy’s street lighting rates in Docket No. E002/M-15-920.

Cooperative's seasonal coincidence factor assumptions.<sup>5</sup> The Cooperative then calculated the coincidental demand charge based on wholesale costs from Great River Energy, and adjusted for line losses. This demand charge was then multiplied by the appropriate coincident demand for each lamp to produce Summer, Winter, and Other demand costs for each lamp. Finally, those seasonal demand costs were weighted to produce a final \$/month demand cost for each type of lamp.

DEA included both consumer-related and capacity-related costs. The Cooperative first determined allocated distribution costs using results from its Cost of Service Study from the Cooperative's most recent rate case in Docket No. E111/GR-14-482. These costs were then determined as either consumer-related or capacity costs based on a percentage of distribution-related costs that have been classified as consumer related.

To calculate the capital recovery factor, DEA first determined the installed capital cost of each lamp type, less an estimated salvage value of 10%. The resultant figure is the capital cost to be recovered through rates. To determine annual and monthly costs, DEA multiplied the recoverable capital cost by a calculated annual capital recovery factor. The annual capital recovery factor assumed a 16-year depreciation life and used DEA's allowed rate of return (ROR) of 6.47%, and used the following formula:

$$\text{Annual Capital Recovery Factor} = \frac{\text{ROR}\% * ((1 + \text{ROR}\%)^{\text{Life}})}{(1 + \text{ROR}\%)^{\text{Life}} - 1}$$

Finally, to determine maintenance costs, DEA assumed that each light will be on 3,930 hour per year and 327.5 hours per month, with a maintenance check at 8 years and lamp replacement at 16 years. Labor costs were then multiplied by a trips/light/year figure to get annual maintenance costs per light.

The Department concludes that DEA's LED lighting cost analysis is reasonable.

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<sup>5</sup> The seasonal coincidence factor assumptions correspond to a coincident peak of 7:00 pm year-round, producing coincidence factors of 0% for Summer months (June, July, August), 100% for Winter months (January, February, December), and 50% for Other months. In other words, there is a 0% chance the light will be on at 7:00 pm in Summer months, a 100% chance in Winter months, and a 50% chance during Other months.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

The Department concludes that DEA's proposal to close all but one HPS rate to new customers is reasonable, as it would reduce the Cooperative's inventory and improve the efficiency of the Cooperative's lighting fleet. Additionally, closing these rates would not preclude all new customers entirely from choosing HPS options in the future, as these would be available both through the 100 Watt Light option in Schedule 44-3 and through Member-Owned rates.

The Department also reviewed the Cooperative's LED Lighting Cost Analysis and concludes that the tables, assumptions, and resulting rates are correctly calculated based on the Cooperative's data. The Department also reviewed the details of all affected schedules and concludes that they are generally reasonable. However, to help provide additional clarity to customers, the Department recommends that Dakota Electric incorporate wattage or wattage range information with each LED option in Schedules.

Therefore, the Department recommends that the Commission approve the Company's Petition, as modified to include wattage or wattage range information, and require that DEA implement the proposed rates as soon as practicable following the Commission's Order, but no earlier than March 9, 2017.

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## **CERTIFICATE OF SERVICE**

I, Sharon Ferguson, hereby certify that I have this day, served copies of the following document on the attached list of persons by electronic filing, certified mail, e-mail, or by depositing a true and correct copy thereof properly enveloped with postage paid in the United States Mail at St. Paul, Minnesota.

**Minnesota Department of Commerce  
Comments**

**Docket No. E111/M-16-1028**

Dated this **8<sup>th</sup>** day of **February 2017**

**/s/Sharon Ferguson**

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