DRAFT December 11, 2015

Mr. Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, Minnesota 55101

RE: LIGHT EMITTING DIODE {LED} STREET LIGHTING RATE COMMENTS ON DOCKET NUMBER: E002/M-15-920, dated October 15, 2015

Dear Mr. Wolf:

On December 11, 2015, the Minneapolis City Council approved the submittal of the follow letter and comments regarding the above Docket for Xcel Energy LED street lighting rate.

The Clean Energy Partnership consisting of Xcel Energy, CenterPoint Energy and City of Minneapolis have been collaborating in new ways to help Minneapolis achieve its clean energy goals. These goals include energy efficiency, renewable energy, greenhouse gas emissions, affordability and reliability. The Partnership's 2015-2016 Work Plan includes LED street lighting efforts. In addition, the City has requested and Xcel Energy has provided a rebate for the LED conversion of city owned street lights.

Overall, the City is supportive of providing better street lighting options that can result in many benefits to our citizens and visitors. We look forward to partnering with Xcel Energy to bring the public added benefits that LED can provide.

The Docket petition in general indicates Xcel Energy has made numerous efforts to analyze and put forth this rate case. The City greatly appreciates Xcel Energy's time and efforts in filing the above Docket.

The attached comments and questions seek to obtain further information that will allow the City to understand the Docket and take subsequent actions. We hope these requests for more information will be met.

If you have any questions, please call Jon Wertjes at 612-673-2614

Sincerely,

CITY OF MINNEAPOLIS

Steven A. Kotke, P.E.
City Engineer
Director of Public Works

LIGHT EMITTING DIODE (LED) STREET LIGHTING RATE
DOCKET NUMBER: E002/M-15-920,
Dated October 15, 2015

City of Minneapolis Questions and Comments

GENERAL ITEMS

Overall, the City supports providing better street lighting that can result in many benefits to our citizens and visitors. We understand that LED street lighting can result in reduced energy use, reduced light trespassing, plus improved light quality and uniformity to cite a few benefits. However, we are aware that LED technology has been evolving rapidly and not every product and/or their applications have been consistently successful or financial viable.

The City greatly appreciates Xcel Energy's efforts to discuss and meet several times with staff prior to filing the Docket. While education and understanding were obtained from these efforts, city staff had and continues to have a number of questions regarding this LED street lighting program and the proposed Docket information.

The attached comments and questions seek to obtain further information that will allow the City to understand the Docket and take subsequent actions. Such actions may include additional analyses and determinations whether this LED Docket and its pricing are in the best interest of Minneapolis citizens and visitors. Also, the City does not want to duplicate efforts and research already accomplished by Xcel Energy.

Finally, since the selection and conversion to LED street lighting will be a long-term decision, the City seeks to fully understand the options and implications of this Docket and its proposed LED parameters.

FIXTURE DETAILS AND SELECTION

Because cities will be making a long term decision by purchasing this LED service, it is vitally important to understand the product that will be provided along with its benefits and limitations. Thus, the City has numerous questions seeking greater understanding of the LED fixture details and selection.

1. Docket Table 1 provides the LED wattage and HPS equivalent wattage. However because the technology is still evolving, there can be significant differences among LED fixtures. A key criterion is actual light output. Thus, the City requests that the lumen output for all existing and proposed fixtures be provided in addition to the wattage equivalents, so direct light output comparisons can be made.

2. The City became aware of recent news and concerns about Kelvin rating "urban glow". See the attached NY Times article dated October 17, 2015. Also, we understand that some cities across the nation are stating that a 4000K rating is too high, and say LED lighting should be lower. We understand that HPS has an approximate rating of 2200K. The City requests that the Kelvin rating be provided as a key criterion along with wattage and lumens to allow cities and agencies to make better decisions.

Overall regarding Kelvin rating, how has this been considered as part of this Docket? What research will be accomplished for the Docket proposed LED fixtures? We request that Xcel Energy provide such research and analyses related to Kelvin rating.

3. The Docket's Background section indicates results from the West St. Paul Pilot which Xcel Energy has provided to the City. Other pilot efforts are cited in the Docket. We request that Xcel Energy provide the LED Pilot results from the "two other pilot installations across Xcel Energy's service territory" and the stated "technical review".

4. The City wants to understand the requirements used to select the proposed LED fixtures. We request that Xcel Energy provide "the Company completed technical specification stipulating performance requirements" and the previously cited "... extensive analysis of vendor conformance to this specification in all areas, including pricing"?

   Besides issuing an RFP, how was this pricing determined? How did Xcel Energy obtain "competitive LED street lighting fixture pricing"?

5. The City has its own streetlight systems. Will a city be allowed to directly purchase the proposed LED fixtures from the vendor bidded contract at the Xcel energy bid price?

6. The Docket petition cites a benefit as "improve lighting quality". While there appears to be anecdotal customer survey satisfaction results, what scientific and technical data and testing were actually collected and analyzed by Xcel Energy and their product vendors in reaching this conclusion?

7. The Docket's Program Development section states the LED streetlight fixtures provide:
   a. Improved light quality
   b. Color rendering
   c. Decreased light trespass
   d. Better nighttime visibility for pedestrians and motorists
   e. Enhance sense of safety

   The City requests any and all studies, testing, the RFP, vendor data submittals, Xcel RFP review documents, validation of fixture and illumination performance, brightness, appearance, visibility, warranty, etc. used by Xcel Energy and their vendors to allow us to understand the criteria used and the results generated to conclude and make these statements.

8. To ensure the public obtains the best value, it is expected that a city review and vetting process may be needed. How will cities be allowed to review, test, and validate the proposed fixture/lamp that will be used for this LED rate tariff? How will this vetting process occur over time when LED fixture(s) are changed or new fixtures are made available?

PROPOSED RATE CALCULATIONS

The Docket and its Table 2, Table 3, Attachments, and Summary of Filing Rate Code A30 present the rate design and its calculations. The following rate calculation questions and comments are:

1. Lifecycle & Warranty – The Docket does not present the assumed lifecycle or the vendor warranty provided for the LED products and other infrastructure (poles, wires, etc.) that were assumed in developing this Docket. (Note: Only for discussion and example purposes we have used a 15 year lifecycle assumption. Also, we understand that many LED fixtures are citing lifecycles above 20 years. Such assumptions are critical to the rate case and its cost/benefit analyses for converting to LED fixtures.) The City requests these vendor warranty commitments and lifecycle assumptions.

2. Maintenance Savings – We request an understanding of what is included in the Table 2 maintenance savings category. Do we understand correctly that the overall maintenance savings per fixture would be $0.91/month which equals about =$10.92/year and about $164 over 15 years or about $218 over 20 years?

3. Base Rate Energy and Demand Charge Savings – We understand this Table 2 category is the energy savings based on wattage reduction when comparing the existing HPS fixture directly to the proposed LED fixture. Is this understanding correct? If not, please clarify.

   We do not see a calculated electrical saving in Kilowatt/Hour. So as the kilowatt energy rates go up, which it will, our savings should also go up. With this rate tariff, the savings price is fixed. Is this understanding correct? What is the Kilowatt/Hour savings for each LED fixture proposed?

4. Incremental Capital Revenue Requirement – We understand this Table 2 category is the capital costs related to furnishing and installing the proposed LED fixture plus the interest charged for this capital expense. This capital category results in estimated lifecycle costs as follows:
   a. Table 2 presents the incremental cost of LED fixtures when compared to existing HPS. Using these rates and assuming both a 15 and 20 year lifecycle results in (monthly rate increase x 12 months x 15 years; or if 20 years) as follows:
      - 100W/39W at $1.91 equals $344 total for 15 years; $458 for 20 years
      - 150W/65W at $2.11 equals $380 total; $506
      - 250W/155W at $3.15 equals $567 total; $756
      - 400W/246W at $4.62 equals $832 total; $1109

      Are these calculations correct? Do the above calculations represent the incremental cost above the HPS rate? What percentage of the above lifecycle calculated costs exceed the total proposed fixed LED fixture and install cost elements only?

b. The Docket states "higher cost of LED Fixtures" and "more expensive than HPS counterparts". The City has recently procured a 93W LED fixture as a replacement to our 310W HPS equivalent fixture. Our estimated furnish and install cost is approximately $395. Thus our City experience does not match the above capital pricing. Therefore, why are the proposed Docket incremental capital costs significantly higher than our recent City experience?

   In addition, this total incremental capital category results in the overall LED fixture rate to be more expensive than the HPS fixture rate. Since this incremental capital category significantly offsets all of the maintenance and energy savings, we request greater details about the sub components that are included in the capital requirement.

   Because the technology is evolving, the LED fixture costs have steadily been reducing in price. The rate capitalization of the proposed LED fixtures appears to be fixed. If LED fixture cost decreases in price over time, then no further rate reduction is included. Is this conclusion correct?

   For clarity what has been included in the incremental capital category and/or the vendor RFP process that accounts for the ever-changing LED fixture price? Also, how will other substitute LED fixtures that are proposed or when new fixtures are specified be considered related to pricing?

5. <u>Pre Pay Option</u> –
   This is the first time the City has learned about a change to the pre-pay option, so we have several clarifying questions:
   a. How was the Table 2 Pre-Pay Option pricing determined?
      i. Similar to above the Table 2 Incremental Capital Revenue Requirement (monthly increase x 12 months x 15 years for LED; the bulleted items below show the savings over 15 years versus the HPS equivalent.)
         - 100W/39W reduces by $27 cost/year; $938 savings/15 years
         - 150W/65W reduces by $11 cost/year; $958 savings/15 years
         - 250W/155W reduces by $106 cost/year; $1276 savings/15 years
         - 400W/246W reduces by $204 cost/year; $1573 savings/15 years
      ii. The above sets of pre-pay LED numbers do not make sense relative to the Item #4 numbers above. We request that Xcel Energy provide the details on these differences and how these pre-pay calculations were determined?
   b. We have heard that this pre-pay option may apply to a separate rate tariff? If so, which tariff(s)?
   c. Will pre-pay apply to the A30 rate code? If so, how will it be applied?

d. Will cities be able to pay up front -- only the fixture and install capital costs without interest charges -- on any of the LED programs? If so, which programs? And at what rates?
e. The A30 Rate Code states "Pre-pay Option Surcharge". Please explain how this is used and will be applied.

6. Underground rate – Similar to the previous Item #5, this is first time the City has learned about a change to the underground rate or has seen these numbers, so we have clarifying questions: What creates the significant cost differences between the regular LED rates and these underground rates. We request Xcel Energy provide details on these differences.

7. Minnesota Power tariff format – The Minnesota Power LED rate tariff presented more details and breakdown of the various costs related to their proposed LED fixtures. These details and cost breakdowns can help cities and other agencies understand the LED rates and will assist with their decision making. We request this same format be used by Xcel Energy for this Docket and future petitions.

8. Fuel Clause – Docket Table 2 indicates that there is actually a rate increase for LED retrofitting, be it not for the fuel clause charge reduction. Our understanding is that the fuel clause is variable based on demand, coal price, etc. Thus, it appears entirely possible that the LED rate will be higher in comparison to keeping the HPS fixtures over both the short and long-term. Is this a correct understanding?

PROCESS AND MISCELLANEOUS ITEMS

For all cities to better understand the process steps and other items, we have developed the following clarifying questions:

1. As a voluntary service and if a city decides to opt-in, what are the requirements?
2. If a city decides to not opt-in to LED fixtures and continues with HPS, what are the implications?
3. To accomplish the proper city review processes and timelines, what are the implications if the LED opt-in occurs after the anticipated 5 year conversion timeline?
4. The Docket states "established a tentative plan for installing the LED fixtures that will follow our existing re-lamping schedule" for HPS fixtures. The City requests that this "tentative plan" be made available now so each city can anticipate and determine their efforts and next steps.

Attachment: "Ruining That Moody Urban Glow", New York Times, October 17, 2015.

This concludes the City of Minneapolis comments and questions to Docket Number: E002/M-15-920, dated October 15, 2015.

ARUP
77 Water Street
New York NY 10005
United States of America
t +1 212 896 3000
f +1 212 229 1056
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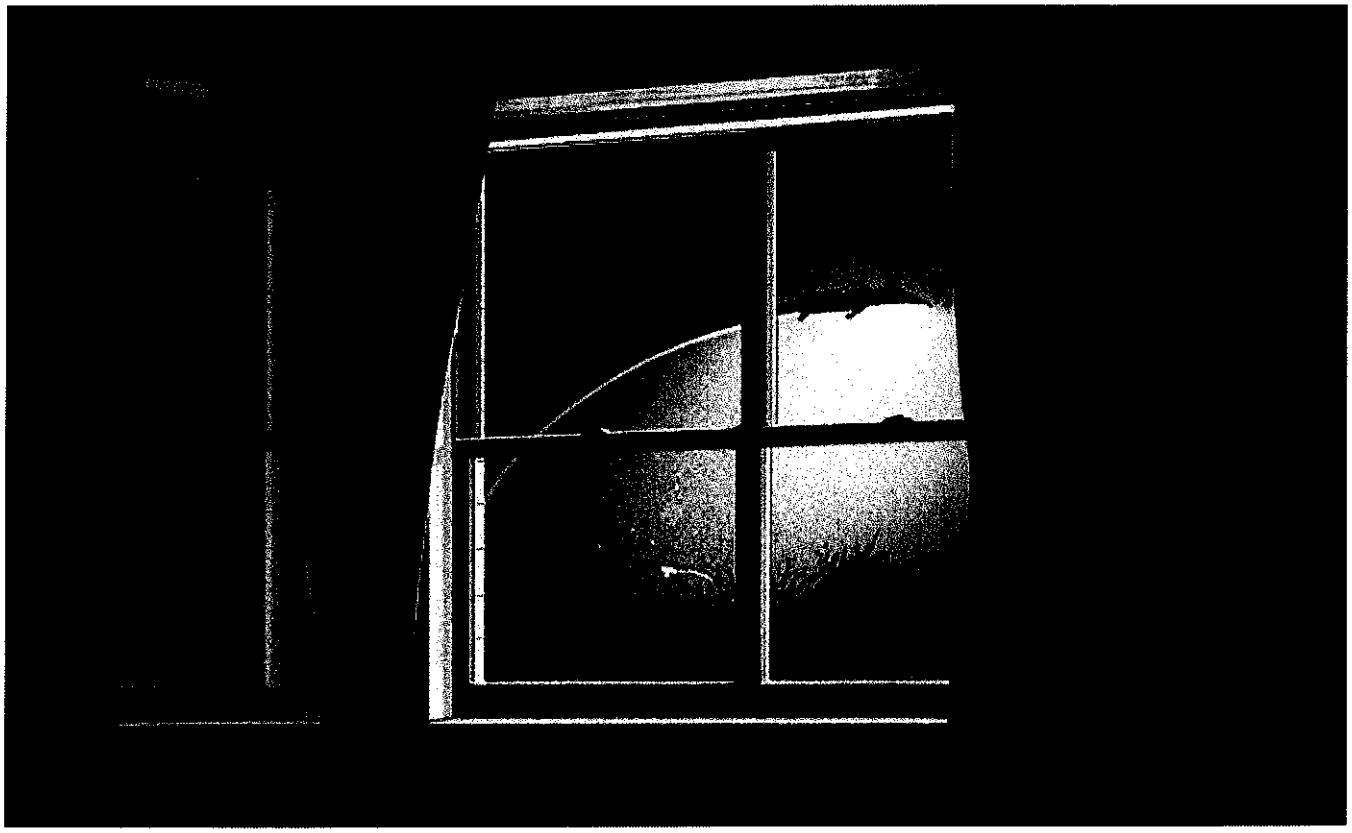
Ruining That Moody Urban Glow

By LIONEL SHRIVER

OCT. 17, 2015



AT 13, I covered multiple lamps in my bedroom with variously colored theatrical gels, the better to create a luminary ambience to suit my mood. When I felt sunny, I chose the yellow; when glum, the blue. And hey, I was a teenager. The blue got a lot of use.

In my repellently contented middle age, I don't seek blue light. Like most sane people, I spurn restaurants whose lighting glares. I recoil from mirrors under fluorescent tubes. I switch on an overhead only to track down a water bug while wielding a flip-flop. Yet each evening from March onward, in the Brooklyn neighborhood where I live part of the year, it seems as if the overhead is always on.

Along with other parts of South Brooklyn, Windsor Terrace is an early recipient of the Department of Transportation's new light-emitting diode streetlights. New Yorkers who have not yet been introduced to these lights: We are living in your future.

Our new street "lamps" — too cozy a word for the icy arrays now screaming through our windows — are meant to be installed across all five boroughs by 2017. Indeed, any resident of an American municipality that has money problems (and what city doesn't?) should take heed.

In interviews with the media, my fellow experimental subjects have compared the nighttime environment under the new streetlights to a film set, a prison yard, "a strip mall in outer space" and "the mother ship coming in for a landing" in "Close Encounters of the Third Kind." Although going half-blind at 58, I can read by the beam that the new lamp blasts into our front room without tapping our own Con Ed service. Once the LEDs went in, our next-door neighbor began walking her dog at night in sunglasses.

Medical research has firmly established that blue-spectrum LED light can disrupt sleep patterns. This is the same illumination that radiates in far smaller doses from smartphone and computer screens, to which we're advised to avoid exposure for at least an hour before bed, because it can suppress the production of melatonin. The tribute to "the city that never sleeps" was meant to celebrate a vibrant cultural night life — not a town of hollow-eyed "Walking Dead" insomniacs.

While the same light has also been associated with increased risk of breast cancer and mood disorders, in all honesty my biggest beef with LEDs has nothing to do with health issues. These lights are ugly. They're invasive. They're depressing. New York deserves better.

Yet the substitution of LEDs for traditional high-pressure sodium bulbs, whose familiar tangerine glow would have suited my rare upbeat humor at 13, is proving irresistible to many cities because of the economic benefits. Chicago, Seattle, Boston, Philadelphia, Detroit and Los Angeles have all undertaken mass retrofits. Although three to four times more expensive, the new bulbs are supposed to last two

to four times longer than their predecessors, reducing energy costs between 30 and 70 percent.

Thus the advance of this technology has an inexorable quality. Rather than stand in the way and get mowed down, we urban aesthetes are probably better off focusing on the fact that all LEDs are not created equal.

Color temperature is measured in Kelvin units. Lower temperatures are warm, in the yellow range; higher temperatures are cool, in the blue. Sodium bulbs are around 2,200 Kelvin — light in which one might fall in love. The brutal LED outside our house is 4,000 — light more conducive to dismembering a corpse.

New York's D.O.T. has also opted for lights that penetrate lower-floor residential properties like ours with rude, invasive lateral glare. Though the D.O.T. claims to have adjusted the angles slightly in disgruntled neighborhoods, our street's lights appear untouched.

But LEDs come in warmer spectra. Even fiscally and environmentally conscientious California has compromised on this point. Berkeley, Oakland and San Francisco have all opted for yellow-rich LEDs. These cities have willingly made the modest 10-15 percent sacrifice in efficiency for an ambience that more closely embodies what Germans call Gemütlichkeit and Danes call hygge: an atmosphere of hospitality, homeyness, intimacy and well-being.

Other municipalities have worked successfully with citizens to reconcile energy savings with a more pleasing nocturnal landscape. In Berlin, in response to outcry over a similar conversion, engineers designed LEDs that imitate the qualities of gaslight. After enough complaints, Davis, Calif., sponsored a variety-pack test street, from which residents ultimately selected not only a lower color temperature fixture, but one with a lower wattage, thus saving the city yet more money.

For New York, it may not be too late to marry practicality and aesthetics. Specifications could still be revised — though LEDs may last up to 20 years, and once they're installed citywide it will be too late. So even if you don't live in a south Brooklyn neighborhood, call 311 to support:

— Limiting, per a stalled City Council bill, streetlights to no more than 3,000 Kelvin (think an incandescent "soft white");

— Installing some kind of shade or lens cover to reduce lateral glare;

— Exploring ways of dimming lighting in residential neighborhoods;

— Suspending further installation until specifications are refined.

My husband claims that everyone will eventually "get used to" these grisly blue-spectrum diodes, and he's probably right. But then, we've "gotten used to" garish big box stores and the foreshortening blight of fast-food franchises that make so many American cities look fungibly frightful. Parents "get used to" a clutter of kitschy plastic toys. Just because one is capable of becoming dully inured to something doesn't make it desirable.

As currently conceived, the D.O.T.'s streetlight plan amounts to mass civic vandalism. If my focus on aesthetics makes this issue sound trivial, the sensory experience of daily life is not a frivolous matter. Even in junior high school, I understood that lighting isn't only about what you see, but how you feel.

Lionel Shriver is a novelist whose most recent book is "Big Brother."

A version of this op-ed appears in print on October 18, 2015, on page SR5 of the New York edition with the headline: Ruining That Moody Urban Glow. Today's Paper|Subscribe

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