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**RECEIVED**

**APR 11 2016**

**PUBLIC SERVICE  
COMMISSION**

April 11, 2016

*Via Hand-Delivery*

Executive Director  
Kentucky Public Service Commission  
P.O. Box 615  
211 Sower Boulevard  
Frankfort, KY 40602

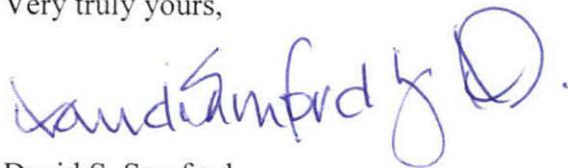
Re: PSC Case No. 2016-00056

Dear Executive Director:

On behalf of East Kentucky Power Cooperative, Inc. ("EKPC"), please find enclosed for filing in the record of the above-referenced case one (1) original and ten (10) copies of EKPC's Response to Commission Staff's First Request for Information propounded March 31, 2016.

Please do not hesitate to contact me if you have any questions or concerns.

Very truly yours,



David S. Samford

Enclosures

**COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION**

**RECEIVED**

**APR 11 2016**

**PUBLIC SERVICE  
COMMISSION**

**In the Matter of:**

**THE TARIFF FILING OF EAST KENTUCKY  
POWER COOPERATIVE TO IMPLEMENT A NEW  
DEMAND-SIDE MANAGEMENT PROGRAM**

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**CASE NO.  
2016-00056**

**RESPONSES TO COMMISSION STAFF'S FIRST REQUEST FOR  
INFORMATION TO EAST KENTUCKY POWER COOPERATIVE, INC.  
DATED MARCH 31, 2016**

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE TARIFF FILING OF EAST KENTUCKY )  
POWER COOPERATIVE TO IMPLEMENT A NEW ) CASE NO.  
DEMAND-SIDE MANAGEMENT PROGRAM ) 2016-00056

CERTIFICATE

STATE OF KENTUCKY )  
 )  
COUNTY OF CLARK )

Scott Drake, being duly sworn, states that he has supervised the preparation of the responses of East Kentucky Power Cooperative, Inc. to the Public Service Commission Staff's First Request for Information in the above-referenced case dated March 31, 2016 and that the matters and things set forth therein are true and accurate to the best of his knowledge, information and belief, formed after reasonable inquiry.

Scott Drake

Subscribed and sworn before me on this 11<sup>th</sup> day of April 2016.

Gwyn M. Willoughby #580144  
Notary Public

Gwyn M. Willoughby  
Notary Public  
State at Large  
Kentucky  
My Commission Expires Nov 30, 2017

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE TARIFF FILING OF EAST KENTUCKY )  
POWER COOPERATIVE TO IMPLEMENT A NEW ) CASE NO.  
DEMAND-SIDE MANAGEMENT PROGRAM ) 2016-00056

CERTIFICATE

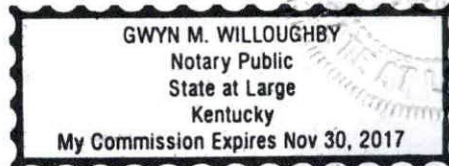
STATE OF KENTUCKY )  
 )  
COUNTY OF CLARK )

Isaac S. Scott, being duly sworn, states that he has supervised the preparation of the responses of East Kentucky Power Cooperative, Inc. to the Public Service Commission Staff's First Request for Information in the above-referenced case dated March 31, 2016 and that the matters and things set forth therein are true and accurate to the best of his knowledge, information and belief, formed after reasonable inquiry.

Isaac S. Scott

Subscribed and sworn before me on this 11<sup>th</sup> day of April 2016.

Gwyn M. Willoughby #500144  
Notary Public



COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE TARIFF FILING OF EAST KENTUCKY )  
POWER COOPERATIVE TO IMPLEMENT A NEW ) CASE NO.  
DEMAND-SIDE MANAGEMENT PROGRAM ) 2016-00056

CERTIFICATE

STATE OF KENTUCKY )  
COUNTY OF CLARK )

Patrick C. Woods, being duly sworn, states that he has supervised the preparation of the responses of East Kentucky Power Cooperative, Inc. to the Public Service Commission Staff's First Request for Information in the above-referenced case dated March 31, 2016 and that the matters and things set forth therein are true and accurate to the best of his knowledge, information and belief, formed after reasonable inquiry.

  
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Subscribed and sworn before me on this 11<sup>th</sup> day of April 2016.

  
Notary Public #500144

GWYN M. WILLOUGHBY  
Notary Public  
State at Large  
Kentucky  
My Commission Expires Nov 30, 2017

**EAST KENTUCKY POWER COOPERATIVE, INC.**  
**PSC CASE NO. 2016-00056**  
**FIRST REQUEST FOR INFORMATION RESPONSE**

**COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION DATED 03/31/16**  
**REQUEST 1**

**RESPONSIBLE PERSON: Scott Drake**

**Request 1.** Refer to East Kentucky's cover letter, page 1 of 2. Summarize any discussions or communications in which owner-members expressed to East Kentucky the attractiveness of other lighting options in comparison to light emitting diode ("LED") options, and state if or how they indicated that they required incentives to install LED options.

**Response 1.** At the time EKPC began developing this DSM tariff, only one (1) owner-member cooperative ("owner-member") had an LED-specific rate for their security lighting options, although several had installed a few LED lights as a trial. The owner-members indicated that an incentive to offset some of the additional up-front capital cost of LED security lights versus other less-expensive options was of interest and would positively influence the number of LED security lights installed.

**EAST KENTUCKY POWER COOPERATIVE, INC.**  
**PSC CASE NO. 2016-00056**  
**FIRST REQUEST FOR INFORMATION RESPONSE**

**COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION DATED 03/31/16**  
**REQUEST 2**

**RESPONSIBLE PERSON:**           **Scott Drake**

**Request 2.**           Refer to East Kentucky's cover letter, page 1 of 2, which states that East Kentucky's proposed LED lighting program is similar to the Big Rivers Electric Corporation's ("Big Rivers") High Efficiency Outdoor Lighting Program. According to Big Rivers' filed tariff, Big Rivers' High Efficiency Outdoor Lighting Program provides that its members are eligible to receive an incentive payment of **up to \$70**.

**Request 2a.**           Explain whether East Kentucky explored offering a different incentive payment for different sizes of LED lights.

**Response 2a.**           EKPC and the DSM Steering Committee, including staff from each owner-member cooperative, briefly discussed different incentive levels. The committee reviewed the different and typical light sizes and the associated costs to purchase and install. The vast majority of lights the owner-members install and maintain for their membership are 100w High Pressure Sodium ("HPS"). The additional capital cost to purchase the LED equivalent to those lights was approximately \$70 per light. For program simplicity, the decision

was made by the DSM Steering Committee to offer the same incentive for all sizes because only a few of the larger sizes are installed and the \$70 incentive was adequate to influence the owner-member's decision for all sizes.

**Request 2b.** Explain why a member cooperative should receive the same \$70 incentive payment whether it installs an LED light having an installed cost of \$200 or an LED light having an installed cost of \$747.<sup>1</sup>

**Response 2b.** Please refer to response 2, above.

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<sup>1</sup> See East Kentucky's tariff scenarios 1 and 3.



**EAST KENTUCKY POWER COOPERATIVE, INC.**  
**PSC CASE NO. 2016-00056**  
**FIRST REQUEST FOR INFORMATION RESPONSE**

**COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION DATED 03/31/16**  
**REQUEST 3**

**RESPONSIBLE PERSON:** Patrick C. Woods

**Request 3.** Refer to East Kentucky's cover letter, page 2 of 2.

**Request 3a.** Provide the location of the notice posted on East Kentucky's website as referenced on this page.


**Response 3a.** The notice, referenced as *EKPC Proposed New Outdoor Lighting Program (DSM-11) - Notice to Members*, can be found at the following URL:  
<http://www.ekpc.coop/tariffsandfilings.html>

**Request 3b.** Provide a copy of one of the notices that was mailed to East Kentucky's members.

**Response 3b.** A copy of the notice to East Kentucky's owner-members is provided on pages 2 and 3 of this response.

MEMORANDUM

**TO:** Member System CEOs

**FROM:** Anthony S. Campbell 

**DATE:** December 30, 2015

**SUBJECT:** East Kentucky Power Cooperative, Inc. Section DSM 11 – Outdoor Lighting Program (New)

Today, EKPC filed with the Kentucky Public Service Commission (“PSC”), a new tariff regarding Section DSM-11, Outdoor Lighting Program.

Upon the recommendation of the East Kentucky Power Cooperative, Inc. (“EKPC”) Demand-Side Management (“DSM”) Steering Committee (“Steering Committee”), a committee of EKPC and owner-member cooperative (“owner-member”) staff, EKPC continues to expand its DSM program by offering the Outdoor Lighting Program, a common DSM program for utilities across Kentucky and the United States that offers incentives to owner-members to install Outdoor LED lights for end-use members.

LED bulbs use one-third the energy of high pressure sodium bulbs and last up to 10-times longer. As a result, over the past few years, high-efficiency LED outdoor lighting options have increased, while the unit cost for such fixtures has steadily decreased. Lower fixture purchase costs, along with improvements in the quality of light produced by LED lighting, is making LEDs a much more viable option when replacing and installing outdoor lighting. However, EKPC recognizes that the initial cost of LED lighting still causes other less energy-efficient options to be more attractive, and that the owner-members have many lighting options available to them when installing new security lights or repairing failed security lights. This program is designed to incentivize EKPC’s owner-members to install the more energy-efficient security lighting option – LEDs – for their end-use members, and is similar to the Big Rivers Electric Corporation’s High Efficiency Outdoor Lighting Program

A person may examine this tariff filing at the offices of EKPC located at 4775 Lexington Road, Winchester, Kentucky. This tariff filing may also be examined at the offices of the Public Service Commission located at 211 Sower Boulevard, Frankfort, Kentucky, Monday through Friday, 8:00 a.m. to 4:30 p.m., or through the Commission’s Web site at <http://psc.ky.gov>. Any comments regarding this tariff filing may be submitted to the Public Service Commission through its Web site or by mail to Public Service Commission, P. O. Box 615, Frankfort, Kentucky 40602.

Memorandum  
December 30, 2015  
Page Two

**PSC Request 3**

**Page 3 of 3**

The incentive contained in this notice is the incentive proposed by EKPC but the Public Service Commission may order an incentive that differs from the proposed incentive contained in this notice.

A person may submit a timely written request for intervention to the Public Service Commission, P. O. Box 615, Frankfort, Kentucky 40602, establishing the grounds for the request including the status and interest of the party. If the Commission does not receive a written request for intervention within thirty (30) days of the initial publication or mailing of the notice, the Commission may take final action on the tariff filing.

**EAST KENTUCKY POWER COOPERATIVE, INC.**  
**PSC CASE NO. 2016-00056**  
**FIRST REQUEST FOR INFORMATION RESPONSE**

**COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION DATED 03/31/16**  
**REQUEST 4**

**RESPONSIBLE PERSON: Scott Drake**

**Request 4.** Refer to the schedule showing the various benefit/cost ratios.

**Request 4a.** Provide workpapers or analyses, in Excel spreadsheet format with all cell formulas intact and unprotected and all rows and columns fully accessible, showing the calculation of the amounts shown on this page.

**Response 4a.** The amounts shown on this page were calculated by using the outputs from the proprietary software called DSMore. Three scenarios were analyzed in DSMore. This sheet represents the aggregate results calculated by totaling up the fields from the three scenarios.

**Request 4b.** Explain why the incentive payments paid from East Kentucky to its member cooperatives are not included as a cost in the Total Resource Cost calculation.

**Response 4b.** EKPC relies on the California Standard Practice cost-benefit tests to evaluate its DSM programs. The California Standard Practice Manual defines the costs to be included in the TRC test: all equipment costs, installation, operation and maintenance, cost of removal (less salvage value), and administrative costs (no matter who pays them). Incentive costs are not included in the TRC test.

**Request 4c.** Provide a detailed explanation of how Utility Admin Costs of (\$4,911,947) as a component of Societal Costs were calculated.

**Response 4c.** Utility Admin Costs of \$4,911,947 as a component of Societal Costs, were calculated as follows: The net present value of the incremental investment by the member cooperative and the EKPC administrative costs were added together. This was done for each of the three scenarios analyzed. Then the totals for each scenario were summed to produce the aggregate total across the three scenarios. The discount rate used for the Societal Test is 5%. This is slightly lower than the discount rate used for the TRC, which is 6.5%.

**Request 4d.** Explain whether the amounts shown on this schedule are for the life of the program, or some other time frame.

**Response 4d.** The amounts shown on this schedule are the present value over a seventeen (17)-year time period. New participants are added to the program for three years; the

measure savings life is fifteen (15) years. Therefore the last year of program savings in this analysis is the seventeenth year, which represents the fifteenth year of savings for measures installed in the third year of participation.

**EAST KENTUCKY POWER COOPERATIVE, INC.**  
**PSC CASE NO. 2016-00056**  
**FIRST REQUEST FOR INFORMATION RESPONSE**

**COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION DATED 03/31/16**  
**REQUEST 5**

**RESPONSIBLE PERSON: Scott Drake and Isaac S. Scott**

**Request 5.** Refer to the three schedules showing the various scenarios.

**Request 5a.** The schedules show that the estimated life span of an LED light is 15 years. Explain whether East Kentucky expects each LED to stay in service for 15 years continuously.

**Response 5a.** EKPC and the owner-member cooperatives expect LED outdoor lights to have a life span of at least 15 years. For program evaluation purposes, the reasonable life span of 15 years was utilized.

**Request 5b.** Explain what happens in the event a customer chooses to discontinue security lighting service before 15 years have elapsed.

**Response 5b.** The end-use cooperative member's ("end-use member") outdoor light service will end when the end-use member requests it be ended. As with other DSM programs

offered by EKPC or any utility, an incentive being paid by the utility doesn't guarantee that the measure will continue to be utilized throughout the measure life.

**Request 5c.** When an LED light is no longer functioning due to having reached the end of its useful life, explain whether the entire fixture must be replaced, or if only the bulb must be replaced.

**Response 5c.** The decision to replace the entire fixture or only the lighting head will be made by the individual owner-member based on the brand of LED light installed, the light manufacturer's maintenance guidelines, and the cost of those options.

**Request 5d.** The scenarios provide a generation capacity cost of \$126.50 in 2015. Provide this cost for 2016.

**Response 5d.** The generation capacity cost used in 2016 for this analysis was \$128.02 per kW-year.

**Request 5e.** Explain whether Rate Schedule – Wholesale – East Kentucky ES-2 rate is East Kentucky's Section E tariff.



**Response 5e.** The reference in the scenario schedules to “Rate Schedule – Wholesale East Kentucky E-2 rate” is to EKPC’s Section E tariff, Option 2. The Section E tariff, Option 2, is often referred to internally as “E2” or “E-2”. EKPC’s environmental surcharge is identified in the tariff as “Rate ES”. However, EKPC does not have a tariff identified as “ES-2”.

**Request 5f.** If the response to part e. above is yes, explain why the Section E tariff is used in the analysis and whether it is applicable to both Options 1 and 2.

**Response 5f.** Currently no Member Cooperative takes service under EKPC’s Section A tariff. EKPC’s Section B and C tariffs require customers to contract for demands of 500 kW or greater and a monthly minimum energy usage equal to or greater than 400 hours per kW of contract demand. EKPC’s Section G tariff also requires a contract demand and provides for a minimum bill that includes a minimum energy usage equal to or greater than 400 hours per kW of contract demand. Consequently, EKPC’s Section B, C, and G tariffs would not be applicable to the provision of outdoor lighting. As noted in EKPC’s tariff, Section E is applicable to all power usage at the load center not subject to the provisions of Sections A, B, C, or G of the tariff.

Concerning Options 1 and 2 of EKPC’s Section E tariff, since January 1, 2015 no owner-member is taking service under Option 1. Thus, for the scenario analysis provided with the proposed Outdoor Lighting Program, it was appropriate to utilize the rates from Section E, Option 2 only.

**Request 5g.** Explain why East Kentucky chose to use only one tariff for the analysis.

**Response 5g.** As noted in the response to Request 5f, the only EKPC tariff that would correspond to the provision of outdoor lighting service would be Section E. Currently, all owner-members have elected Option 2 of the Section E tariff.

**Request 5h.** State the tariff under which each of East Kentucky's member cooperatives is served.

**Response 5h.** All 16 of EKPC's owner-members take service under Section E, Option 2. Further, depending on the needs of individual retail customers, most of the owner-members also take service under Sections B, C, and G. The table, on page 5 of this response, shows the tariffs each owner-member takes service under.

Owner-Member Cooperative	Section B	Section C	Section E	Section G
Big Sandy RECC	X		X	
Blue Grass Energy	X		X	X
Clark Energy			X	
Cumberland Valley Electric			X	
Farmers RECC		X	X	
Fleming-Mason Energy		X	X	X
Grayson RECC	X		X	
Inter-County Energy	X		X	
Jackson Energy	X	X	X	
Licking Valley RECC			X	
Nolin RECC	X		X	X
Owen Electric	X		X	
Salt River Electric	X		X	
Shelby Energy	X		X	
South Kentucky RECC	X	X	X	
Taylor County RECC	X	X	X	

Please note that Fleming-Mason Energy, Owen Electric, and Taylor County RECC each provide service to one retail customer under the terms of a Commission-approved special contract whose rates are different than those included in EKPC's tariffs.

**Request 5i.** The scenarios state that "Savings [will be] provided through the rate." Explain how savings will be measured and verified given that a large number of security lights are unmetered.

**Response 5i.** Annual kWh savings will be calculated using a deemed savings method that is based on the kW savings of the LED luminaire compared to the less-efficient luminaire,

multiplied by the annual operating hours of the outdoor light fixture (deemed to be 4100 hours per year based on sunset and sunrise times by month).

**Request 5j.** The scenarios explain that there are no free riders since there are no rebates to participants; however, 12 of East Kentucky's 16 member cooperatives currently offer LED lights to their members.<sup>2</sup> Explain why there would be no free riders to this program given the fact that a majority of East Kentucky's member cooperatives already offer LED lights absent this proposed DSM program.

**Response 5j.** The purpose of this program is to encourage the installation of LED luminaires for outdoor lighting applications. At the time this program was being designed, there were very low levels of penetration of LED luminaires in the outdoor lighting market in EKPC's service territory. This program has been designed to accelerate the adoption of LED lighting for this application. Over time, EKPC is hopeful that the market is transformed so that at some point in the future an incentive is no longer needed. The owner-member is analogous to a trade ally in a market transformation program, much the way a manufactured home provider or a retail big box chain would be. The program incentivizes the provider to work with its end-use members to encourage them to choose the more efficient option. In this regard, the existence of the LED

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<sup>2</sup> Clark Energy Cooperative, Inc., Cumberland Valley Electric, Inc., Farmers Rural Electric Cooperative Corporation, Fleming-Mason Energy Cooperative, Inc., Grayson Rural Electric Cooperative Corporation, Inter-County Energy Cooperative Corporation, Jackson Energy Cooperative Corporation, Nolin Rural Electric Cooperative Corporation, Owen Electric Cooperative, Inc., Salt River Electric Cooperative Corporation, Shelby Energy Cooperative, Inc., and South Kentucky Rural Electric Cooperative Corporation.

option on the outdoor lighting tariff of an owner-member is similar to a manufactured home provider offering the EnergyStar model or a big box retail store agreeing to include efficient lighting in its product offering. In fact, an owner-member including the LED option on its security or outdoor lighting tariff is a threshold requirement for participation in this program. Without that, there would be no opportunity for end-use members to make the choice of LED (with or without the EKPC incentive in the mix). Free rider shares are used to capture the share of the end-use member market which would have chosen the efficient technology even in the absence of the utility program. It is also entirely possible that this program will also produce spillover effects in the future. This would occur when EKPC no longer offers the incentive and end-use members continue to opt for the LED technology because it has been effectively promoted and is more widely available. All that said, as EKPC indicated on its assumptions sheet, it will be examining the market conditions and economics of LED outdoor lighting periodically to make the determination as to whether the incentive is still needed to increase the penetration of LED luminaires in its outdoor and security lighting market.

**Request 5k.** South Kentucky Rural Electric Cooperative Corporation's ("South Kentucky") Tariff Schedule OL, P.S.C KY. No. 7, 4<sup>th</sup> revised Sheet No. T-17 states: "Since the seller intends to eventually provide only LED lighting fixtures, mercury vapor, sodium and metal halide will only be used until present supply is exhausted or until the existing lighting configuration is retired." Because South Kentucky intends to eventually provide only LED lights

absent any incentive payment, explain how South Kentucky would not be considered a free rider with respect to East Kentucky's proposed LED lighting program.

**Response 5k.** South Kentucky's statement in its recently approved tariff expresses its long-term goal to eventually provide only LED lighting fixtures. East Kentucky is proposing this incentive now in order to accelerate the pace at which South Kentucky and its other owner-members accomplish this goal. Again, free riders are end-use members who would have installed the measure even in the absence of utility marketing. At this point, EKPC remains convinced that South Kentucky along with the other owner-members will be much more likely to promote LED outdoor and security lighting when they are assured of receiving an incentive for so doing. But South Kentucky's case in particular deserves watching as they are an early adopter among EKPC owner-members, and EKPC can learn from their experience in particular when it revisits the design and continuation of this program in the future.

**EAST KENTUCKY POWER COOPERATIVE, INC.**  
**PSC CASE NO. 2016-00056**  
**FIRST REQUEST FOR INFORMATION RESPONSE**

**COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION DATED 03/31/16**  
**REQUEST 6**

**RESPONSIBLE PERSON:**           **Scott Drake**

**Request 6.**           Refer to Scenario Assumption 1.

**Request 6a.**           Provide the average useful life of a typical high pressure sodium bulb ("HPS") that is used in the comparison.

**Response 6a.**           EKPC used a high-pressure sodium lamp life of 24,000 hours. With 4,100 operating hours per year, that equates to just under 6 years.

**Request 6b.**           Provide the average useful life of a typical HPS fixture excluding the bulb.

**Response 6b.**           EKPC did not explicitly define a useful life for the fixture in this analysis, other than the assumption that the fixture would not need to be replaced once installed during the 15 year duration representing the savings lifetime.

**Request 6c.** Provide a detailed breakdown showing the components of the estimated \$200 installed cost of the LED luminaire.

**Response 6c.** EKPC based its luminaire cost assumptions on contractor quotes to its member cooperatives. No further detail was provided.

**Request 6d.** Provide a detailed breakdown showing the components of the estimated \$80 installed cost of the HPS luminaire.

**Response 6d.** EKPC based its luminaire cost assumptions on contractor quotes to our owner-members. No further detail was provided.

**Request 6e.** Provide a detailed breakdown showing the components of the estimated \$170 present value maintenance costs avoided due to lamp replacements.

**Response 6e.** EKPC used an average cost of a crew visit to a fixture of \$125 per event. That value was increased at a rate of 2% per year. EKPC assumed visits in year 7 and year 13. Finally, EKPC calculated the present value of those costs back to the present using a 6.5% discount rate.



**Request 6f.** Explain why an extra incentive of \$70 is needed given that a member cooperative would stand to save \$50 by choosing an LED light over HPS when taking into account the avoided maintenance costs, and the marginal cost of the LED light.

**Response 6f.** The extra incentive is needed because the first cost is higher. The avoided maintenance costs would accrue many years in the future. This is analogous to ENERGY STAR appliance incentives provided to end-use members to help offset the additional upfront costs of the appliance even though the energy savings over the life of the appliance is more than the additional upfront cost.

**Request 6g.** Provide separately the dollar amount of savings per year a member cooperative will realize for avoided energy cost and avoided capacity costs if it installs an LED luminaire instead of an HPS luminaire.

**Response 6g.** An owner-member will save an estimated \$1.30 per year on the capacity portion of the wholesale bill and \$16.92 per year on the energy portion of the wholesale bill if it installs an LED luminaire instead of an HPS luminaire. However, that owner-member would also lose an estimated \$19.80 per year in foregone retail revenue.

**Request 6h.** Combining the savings described in parts f. and g., as well as the \$70 incentive payment, explain whether East Kentucky believes its member cooperatives would replace existing lights before the end of their useful life.

**Response 6h.** EKPC thinks it is unlikely that the economics alone would drive owner-members to replace existing lights before the end of their useful life. In the first year, the owner-member would pay an additional \$120 in luminaire costs, and receive a \$70 incentive. That would be a net \$50 loss. The owner-member would continue to lose a small amount of net revenue in years 2 through 6. Only in year 7 would that turn into a net gain with the first installment of avoided maintenance costs. This is supported by research EKPC conducted last year with 4 sample owner-members, where only one indicated it might replace existing lights before the end of their useful lives, and even that one owner-member thought it would be at a rate of only 5% of its total installations. Overwhelmingly the owner-members stated that their mindset would be to only replace upon failure.

**Request 6i.** Explain how the "Typical security lighting rate" of \$7.30 plus \$0.06 per kWh was determined.

**Response 6i.** The "Typical security lighting rate" of \$7.30 plus \$0.06 per kWh was determined by comparing metered and non-metered tariff rates from several of EKPC's owner-members, for the 100 watt high-pressure sodium fixture. First, EKPC derived an average cents

per kWh at which the electricity was priced. That turned out to be approximately \$0.06 per kWh. Next, EKPC calculated the electricity costs per month for the fixture using monthly kWh figures. Finally EKPC subtracted the electricity costs from the average of the unmetered rates to determine the equipment cost or fixed portion of the rate.

**Request 6j.** The line "Participation" shows that year by year 2015-2017 participation is estimated to be 8,000. Explain whether East Kentucky projects this program will last beyond 2017.

**Response 6j.** The three-year analysis period of 2015-2017 is what EKPC typically uses when evaluating the cost-effectiveness of a program recommended for a new tariff. At this time, EKPC thinks that it will probably be important for the incentive to last beyond 2017 (which at this point is at the end of 2 years) in order for this Owner-Member Outdoor Lighting program to accomplish deep market penetration. After three years, EKPC plans to analyze the market penetration and the economics of LED outdoor lighting, and decide at that time whether or not an incentive is still needed to further increase the adoption of LED outdoor and security lights.

**Request 6k.** Explain how the 8,000 number of participants was chosen.

**Response 6k.** EKPC used 10,000 participants total across the scenarios for ease of determining per-participant factors in its review of the economics of the program as designed.

From there, EKPC assumed that 80% of the installations would fall under scenario 1. EKPC based this assumption on information it had about the inventories of existing outdoor lights. These values were established for cost-effectiveness testing only, and should not be interpreted to represent a forecast for actual future participation by year.

**EAST KENTUCKY POWER COOPERATIVE, INC.**  
**PSC CASE NO. 2016-00056**  
**FIRST REQUEST FOR INFORMATION RESPONSE**

**COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION DATED 03/31/16**  
**REQUEST 7**

**RESPONSIBLE PERSON: Scott Drake**

**Request 7.** Refer to Scenario Assumption 2.

**Request 7a.** Provide the average useful life of a typical metal halide ("MH") bulb that is used in the comparison.

**Response 7a.** EKPC used a metal halide lamp life of 18,000 hours. With 4,100 operating hours per year, that equates to 4.4 years, which EKPC rounded up to 5 years.

**Request 7b.** Provide the average useful life of a typical MH fixture excluding the bulb.

**Response 7b.** EKPC did not explicitly define a useful life for the fixture in this analysis, other than the assumption that the fixture would not need to be replaced once installed during the 15 year duration representing the savings lifetime.

**Request 7c.** Provide a detailed breakdown showing the components of the estimated \$625 installed cost of the LED luminaire.

**Response 7c.** EKPC based its luminaire cost assumptions on contractor quotes to its owner-members. No further detail was provided.

**Request 7d.** Provide a detailed breakdown showing the components of the estimated \$360 installed cost of the MH luminaire.

**Response 7d.** EKPC based its luminaire cost assumptions on contractor quotes to its owner-members. No further detail was provided.

**Request 7e.** Provide a detailed breakdown showing the components of the estimated \$182 present value maintenance costs avoided due to lamp replacements.

**Response 7e.** EKPC used an average cost of a crew visit to a fixture of \$125 per event. That value was increased at a rate of 2% per year. EKPC assumed visits in year 6 and year 11. Finally, EKPC calculated the present value of those costs back to the present using a 6.5% discount rate.

**Request 7f.** Provide separately the dollar amount of savings per year a member cooperative will realize for avoided energy cost and avoided capacity costs if it installs an LED luminaire instead of an MH luminaire.

**Response 7f.** An owner- member will save an estimated \$3.25 per year on the capacity portion of the wholesale bill and \$44.74 per year on the energy portion of the wholesale bill if it installs an LED luminaire instead of a MH luminaire. However, that owner-member would also lose an estimated \$56.69 per year in foregone retail revenue.

**Request 7g.** Explain how the "Typical security lighting rate" of \$10.77 plus \$0.06 per kWh was determined.

**Response 7g.** The "Typical security lighting rate" of \$10.77 plus \$0.06 per kWh was determined by comparing metered and non-metered tariff rates from several of EKPC owner-members, for the 400 watt HPS fixture. First, EKPC derived an average cents per kWh at which the electricity was priced. That turned about to be approximately \$0.06 per kWh. Next, EKPC calculated the electricity costs per month for the fixture using monthly kWh figures. Finally, EKPC subtracted the electricity costs from the average of the unmetered rates to determine the equipment cost or fixed portion of the rate.

**Request 7h.** The line "Participation" shows that year by year 2015-2017 participation is estimated to be 1,000. Explain whether East Kentucky projects this program will last beyond 2017.

**Response 7h.** The three-year analysis period of 2015-2017 is what EKPC typically uses when evaluating the cost-effectiveness of a program recommended for a new tariff. At this time, EKPC thinks that it will probably be important for the incentive to last beyond 2017 (which at this point is at the end of 2 years) in order for this Owner-Member Outdoor Lighting program to accomplish deep market penetration. After three years, EKPC plans to analyze the market penetration and the economics of LED outdoor lighting, and decide at that time whether or not an incentive is still needed to further increase the adoption of LED outdoor and security lights.

**Request 7i.** Explain how the 1,000 number of participants was chosen.

**Response 7i.** EKPC used 10,000 participants total across the scenarios for ease of determining per-participant factors in its review of the economics of the program as designed. From there, EKPC assumed that 10% of the installations would fall under scenario 2. EKPC based this assumption on information it had about the inventories of existing outdoor lights. These values were established for cost-effectiveness testing only, and should not be interpreted to represent a forecast for actual future participation by year.



**EAST KENTUCKY POWER COOPERATIVE, INC.**  
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**REQUEST 8**

**RESPONSIBLE PERSON:**           **Scott Drake**

**Request 8.**                   Refer to Scenario Assumption 3.

**Request 8a.**                Provide the average useful life of a typical HPS bulb that is used in the comparison.

**Response 8a.**            EKPC used a high-pressure sodium lamp life of 24,000 hours. With 4,100 operating hours per year, that equates to just under 6 years.

**Request 8b.**                Provide the average useful life of a typical HPS fixture excluding the bulb.

**Response 8b.**            EKPC did not explicitly define a useful life for the fixture in this analysis, other than the assumption that the fixture would not need to be replaced once installed during the 15 year duration representing the savings lifetime.

**Request 8c.** Provide a detailed breakdown showing the components of the estimated \$747 installed cost of the LED luminaire.

**Response 8c.** EKPC based its luminaire cost assumptions on contractor quotes to its owner-members. No further detail was provided.

**Request 8d.** Provide a detailed breakdown showing the components of the estimated \$307 installed cost of the HPS luminaire.

**Response 8d.** EKPC based its luminaire cost assumptions on contractor quotes to its owner-members. No further detail was provided.

**Request 8e.** Provide a detailed breakdown showing the components of the estimated \$171 present value maintenance costs avoided due to lamp replacements.

**Response 8e.** EKPC used an average cost of a crew visit to a fixture of \$125 per event. That value was increased at a rate of 2% per year. EKPC assumed visits in year 7 and year 13. Finally, EKPC calculated the present value of those costs back to the present using a 6.5% discount rate.

**Request 8f.** Provide separately the dollar amount of savings per year a member cooperative will realize for avoided energy cost and avoided capacity costs if it installs an LED luminaire instead of an HPS luminaire

**Response 8f.** An owner-member cooperative will save an estimated \$4.05 per year on the capacity portion of the wholesale bill and \$59.71 per year on the energy portion of the wholesale bill if it installs an LED luminaire instead of a HPS luminaire. However, that owner-member would also lose an estimated \$75.65 per year in foregone retail revenue.

**Request 8g.** Explain how the "Typical security lighting rate" of \$10.77 plus \$0.06 per kWh was determined.

**Response 8g.** The "Typical security lighting rate" of \$10.77 plus \$0.06 per kWh was determined by comparing metered and non-metered tariff rates from several of EKPC's owner-members, for the 400 watt HPS fixture. First, EKPC derived an average cents per kWh at which the electricity was priced. That turned out to be approximately \$0.06 per kWh. Next, EKPC calculated the electricity costs per month for the fixture using monthly kWh figures. Finally EKPC subtracted the electricity costs from the average of the unmetered rates to determine the equipment cost or fixed portion of the rate.

**Request 8h.** The line "Participation" shows that year by year 2015-2017 participation is estimated to be 1,000. Explain whether East Kentucky projects this program will last beyond 2017.

**Response 8h.** The three-year analysis period of 2015-2017 is what EKPC typically uses when evaluating the cost-effectiveness of a program recommended for a new tariff. At this time, EKPC thinks that it will probably be important for the incentive to last beyond 2017 (which at this point is at the end of 2 years) in order for this Owner-Member Outdoor Lighting program to accomplish deep market penetration. After three years, EKPC plans to analyze the market penetration and the economics of LED outdoor lighting, and decide at that time whether or not an incentive is still needed to further increase the adoption of LED outdoor and security lights.

**Request 8i.** Explain how the 1,000 number of participants was chosen.

**Response 8i.** EKPC used 10,000 participants total across the scenarios for ease of determining per-participant factors in its review of the economics of the program as designed. From there, EKPC assumed that 10% of the installations would fall under scenario 3. EKPC based this assumption on information it had about the inventories of existing outdoor lights. These values were established for cost-effectiveness testing only, and should not be interpreted to represent a forecast for actual future participation by year.

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**REQUEST 9**

**RESPONSIBLE PERSON:**           **Scott Drake**

**Request 9.**           Explain why East Kentucky only provided scenario testing results for three types of luminaires.

**Response 9.**           There are several reasons why EKPC chose to provide scenario testing results for the three types of luminaires indicated. EKPC's goal was to use a representative set of luminaires to see whether to program was cost-effective across different luminaire types and sizes. EKPC needed to keep the scenarios to a manageable number in order to facilitate review by different parties and also to examine different program designs as directed by EKPC's design team. In the end, EKPC decided to use luminaires that (a) represented a sizable share of the current installed base; (b) would continue to be available in the future; and (c) had a clearly-specified comparable LED replacement with reliable cost and savings data (which meant in practice either that EKPC could verify that contractors were recommending the LED light as a suitable replacement, or that Technical Reference Manuals listed the measure). Since mercury vapor ballasts are no longer being manufactured (per the 2005 Energy Policy Act), EKPC did not consider mercury vapor luminaires as baseline alternatives for future installations.

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**REQUEST 10**

**RESPONSIBLE PERSON:**           **Scott Drake**

**Request 10.**           Provide similar scenario testing results for the following which are all commonly offered in the member cooperative tariffs: 175 watt mercury vapor; 400 watt mercury vapor; 1,000 watt mercury vapor; 250 watt HPS; and 1,000 watt HPS.

**Response 10.**           While mercury vapor lights still appear on utility tariffs, mercury vapor ballasts are no longer being manufactured. Also, in our technology review, EKPC was unable to locate a well-documented specification for an LED replacing a 1,000 watt HPS. EKPC stands ready to run the analysis for the 1,000 watt HPS should the necessary specifications become available. EKPC has specified and performed cost-effectiveness testing for the 250 watt HPS case. The benefit-cost test results can be found in the table below and on pages 2 and 3 of this response.

TRC	3.92
Cooperative RIM	1.02
EKPC RIM	0.73
Societal Test	4.19

Security Lighting program , new case for PSC review: compared to 250 watt HPS

Distribution System Benefits		Distribution System Costs	
Power Bill Declines	\$ 13,325,827	Revenue Declines	(\$15,703,869)
Rebates From EK	\$2,012,517	Incremental capital investment	(\$4,053,785)
Avoided fixture maintenance	\$ 4,897,542	Rebates Paid To Consumers	\$0
<b>Total Benefits</b>	<b>\$20,235,887</b>	<b>Total Costs</b>	<b>(\$19,757,654)</b>
Benefit / Cost Ratio: 1.02			

Participant Benefits		Participant Costs	
Electric Bill Declines	\$10,614,328	Up Front Investment	\$0
Rebates From Distribution System	\$ -		
<b>Total Benefits</b>	<b>\$10,614,328</b>	<b>Total Costs</b>	<b>\$0</b>
Benefit / Cost Ratio: #DIV/0!			

Total Resource Benefits		Total Resource Costs	
Avoided Energy Costs	\$10,977,412	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$0	Coop Incr. Capital investment	(\$4,053,785)
Avoided Transmission Expense	\$241,450	EK Administrative Costs	(\$57,500)
Avoided fixture maintenance	\$ 4,897,542		
<b>Total Benefits</b>	<b>\$16,116,404</b>	<b>Total Costs</b>	<b>(\$4,111,285)</b>
Benefit / Cost Ratio: 3.92			

EK Benefits		EK Costs	
Avoided Energy Costs	\$10,977,412	Decrease In Revenue	(\$13,325,827)
Avoided Gen Capacity Costs	\$0	Rebates Paid	(\$2,012,517)
Avoided Transmission Expense	\$241,450	Administrative Costs	(\$57,500)
<b>Total Benefits</b>	<b>\$11,218,862</b>	<b>Total Costs</b>	<b>(\$15,395,845)</b>
Benefit / Cost Ratio: 0.73			

Societal Benefits		Societal Costs	
Avoided Energy Costs	\$12,201,711	Up Front Customer Investment	\$0
Avoided Gen Capacity Costs	\$0	Utility Admin Costs	(\$4,168,596)
Avoided Transmission Expense	\$268,028		
Avoided Fixture maintenance	\$4,984,824		
<b>Total Benefits</b>	<b>\$17,454,563</b>	<b>Total Costs</b>	<b>(\$4,168,596)</b>
Benefit / Cost Ratio: 4.19			

Combined RIM:			
Benefits:	\$16,116,404	Costs:	(\$19,815,154)
Benefit / Cost Ratio: 0.81			

Outdoor Lighting, Security, cooperative-owned: **comparison is 250 watt HPS replaced at end of useful life of existing luminaire**  
 Apr-16  
 Converting from High Pressure Sodium to Light Emitting Diode (LED) luminaires results in improved lighting quality, maintenance cost savings, and energy savings

Class: *Commercial* Change  
 #: Record

<u>Assumption</u>	<u>Source</u>	kWh	Win kW	Sum kW
<b>Load Impacts</b>				
Before Participant 1210 kWh, 0.30 kW (winter coinc.), 0.0 kW (summer coinc)	One high pressure sodium luminaire, 295 watts measured input, 4100 operating hours per year. Dusk to dawn load profile.	1210	0.3	0
After Participant 459 kWh, 0.11 kW (winter peak), 0.0 (summer peak)	One LED luminaire, 110 watts measured input, 4100 operating hours per year. Specification from Fleming Mason supplier. Dusk to dawn load profile.	459	0.11	0
	<b>savings:</b>	<b>751</b>	<b>0.19</b>	<b>0</b>
<b>Lifetime of savings</b>	15 Years (conservative - estimated life is 80,000 - 100,000 hours)			
<b>Generation Capacity Cost - EE = combined cycle, 100% summer \$126.50 in 2015</b> <b>Avoided Electricity Energy Costs - PJM Market</b>	Combined Cycle Baseload unit. 100% allocation to summer based on ACES July 1 2014 energy forward curve for AEP_Dayton. DSMore Scenario 1, 0.724 esc in 2015			
<b>Participant Costs \$ 0.00</b>	no outlay for the participating customer; pays fixed monthly rate for lighting service			
<b>Administrative Cost</b> EK \$ 20,000 fixed annual (2015-2017), 2% escalation \$0 per new participant	Includes setup, rebate processing, program mgt, monitoring & eval.		625	360
Co-op : - \$ 30 per new participant	installed cost of LED luminaire (\$441) less the installed cost of the HPS luminaire (\$300) and present value of maintenance costs (\$ 171) avoided - lamp replacements		<b>83</b>	<b>182</b>
<b>Rate Schedule - Retail</b> Typical security lighting rate: \$8.88 per month plus \$0.06 per kWh	modeled with fixed charge (for equip and maint) and variable charge (for kWh) Current rates in effect as of June, 2011.			
<b>Rate Schedule - Wholesale</b> East Kentucky E-2 rate.	Current rates in effect as of June, 2011.			
<b>Participation - Year by year, 2015 to 2017: 10,000 0% Free riders</b>	10,000 per year for simplicity. Technically, there are no free riders because there are no rebates to participants. However, the same principle must be evaluated with respect to the need for EKPC to continue to provide an incentive to the member cooperatives.			
<b>Rebates</b> Co-op to Participant \$0 EK to Co-op \$70 per fixture	No rebate. Savings provided through the rate To offset higher upfront capital costs of the LED fixture.	0.015	112.65	10



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REQUEST 11**

**RESPONSIBLE PERSON: Scott Drake**

**Request 11.** Provide an estimate of the total number of lights that are eligible to receive an incentive payment under the proposed tariff.

**Response 11.** Approximately 190,000 existing security lights would be eligible for this DSM program incentive.

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**REQUEST 12**

**RESPONSIBLE PERSON:**           **Scott Drake**

**Request 12.**           Explain whether any of East Kentucky's member cooperatives will need to amend their lighting tariffs if this program is approved.

**Response 12.**           EKPC believes that amendments to existing owner-members LED security light rates will not be required. DSM program incentives are always designed to incentivize the owner and decision-makers to choose higher energy-efficient measures (i.e. LED lights instead of less expensive HPS). This DSM program is designed for owner-member-owned security lights only. Thus, the incentive is not passed to the end-use members and amendments to existing owner-member LED security lights rates are not required.

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REQUEST 13

RESPONSIBLE PERSON: Scott Drake

**Request 13a.** Confirm whether the proposed LED lighting program is available to all of the member cooperatives regardless as to whether a member cooperative has outdoor or security LED lighting tariffs or not.

**Response 13a.** The proposed LED lighting program is available to all owner-members of EKPC. EKPC believes that each participating owner-member should have a Commission-approved LED security light rate. Obtaining a Commission-approved LED light rate is the responsibility of each owner-member cooperative.

**Request 13b.** If the proposed LED lighting program is available to all of the member cooperatives, explain whether the program will be administered differently for those member cooperatives that currently have an outdoor or security LED lighting tariff compared to those member cooperatives that currently do not provide outdoor or security LED lighting.

**Response 13b.** While the program will be available to all owner-members, EKPC will ensure that individual owner-members have a Commission-approved LED light rate prior to their participation in this program.

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**REQUEST 14**

**RESPONSIBLE PERSON:**           **Scott Drake**

**Request 14.**           Describe East Kentucky's plan to monitor the cost of LED lighting fixtures, and to evaluate whether an incentive payment is still needed.

**Response 14.**           The cost data was provided to EKPC by the owner-member cooperatives. Annually, EKPC will review the current cost data and the program benefit/cost analysis. EKPC will petition the Commission to end this program when warranted.

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REQUEST 15**

**RESPONSIBLE PERSON: Scott Drake**

**Request 15.** Provide the meeting minutes from each board meeting where the LED lighting program tariff was discussed.

**Response 15.** The LED security light DSM program was not discussed by the EKPC Board of Directors.