EXHIBIT

Exhibit No.: _____
Issue(s): Market Potential Study/ Single Family Low-Income
Witness/Type of Exhibit: Marke/Surrebuttal
Sponsoring Party: Public Counsel
Case No.: EO-2019-0132

SURREBUTTAL TESTIMONY

OF

GEOFF MARKE

Submitted on Behalf of
The Office of the Public Counsel

KANSAS CITY POWER & LIGHT COMPANY

KCP&L GREATER MISSOURI OPERATIONS COMPANY

CASE NO. EO-2019-0132

September 16, 2019

OPC Exhibit No. 201
Date 9-23-19 Reporter MT
File No. EO-2019-0132
EO-2019-0133

EXHIBIT

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Kansas City Power & Light Company's Notice of Intent to File an Application for Authority to Establish a Demand-Side Programs Investment Mechanism	))))	File No. EO-2019-0132

AFFIDAVIT OF GEOFF MARKE

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

Geoff Marke, of lawful age and being first duly sworn, deposes and states:

1. My name is Geoff Marke. I am a Regulatory Economist for the Office of the Public Counsel.

2. Attached hereto and made a part hereof for all purposes is my surrebuttal testimony.

3. I hereby swear and affirm that my statements contained in the attached testimony are true and correct to the best of my knowledge and belief.

Geoff Marke
Chief Economist

Subscribed and sworn to me this 16th day of September 2019.

NOTARY PUBLIC NOTARY SEAL STATE OF MISSOURI

JERENE A. BUCKMAN
My Commission Expires
August 23, 2021
Cole County
Commission #13754037

Jerene A. Buckman
Notary Public

My commission expires August 23, 2021.

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SURREBUTTAL TESTIMONY

OF

GEOFF MARKE

KANSAS CITY POWER & LIGHT COMPANY
KCP&L GREATER MISSOURI OPERATIONS COMPANY
CASE NO. EO-2019-0132

I. INTRODUCTION

Q. Please state your name, title and business address.

A. Geoffrey Marke, PhD, Chief Economist, Office of the Public Counsel ("OPC"), P.O. Box 2230, Jefferson City, Missouri 65102.

Q. Are you the same Geoff Marke that filed rebuttal testimony?

A. Yes.

Q. What is the purpose of your surrebuttal testimony?

A. My testimony will respond to the rebuttal testimony of:

- Natural Resource Defense Counsel ("NRDC") witness Philip Mosenthal; and
- Missouri Division of Energy ("DE") witnesses Martin R. Hyman and Jane E. Epperson;

II. RESPONSE TO NRDC

Q. Can you please summarize NRDC's position?

A. NRDC witness Mr. Mosenthal filed testimony supporting an aggressive MEEIA application. That is, he supports the spirit of KCPL's application but argues that the budget and targets be expanded to reflect KCPL's 2016 market potential study's Maximum Achievable Potential ("MAP") scenario.

Mr. Mosenthal supports his position by claiming that the excess energy saved from MEEIA could be sold back into the Midcontinent ISO ("MISO") and the induced demand reductions could lead to reduced generation, transmission and distribution costs which could result in benefits to all ratepayers.

Mr. Mosenthal then states that additional non-energy benefits should be considered in the valuation of a MEEIA application and the cost-effectiveness ratios. Additionally, Mr. Mosenthal argues that if the Commission were to focus on the absence of benefits to non-participants the Commission would effectively be utilizing the Ratepayer Impact Measure ("RIM") test, a test that is not consistent with the MEEIA statute.

Finally, Mr. Mosenthal recommends a single-family low income program be included in the KCPL MEEIA application.

I will respond to Mr. Mosenthal's aforementioned positions/arguments in turn.

Market Potential Study and MAP Scenario

Q. What is a market potential study?

A. Per the Commission's most recent MEEIA rule revisions a "Market potential study means a quantitative analysis of the amount of energy and demand savings that may exist, is cost-effective, and could be realized through the implementation of demand-side programs, policies and rate design."[1] Additionally, according to the American Council for an Energy Efficiency Economy ("ACEEE"):

> An energy efficiency potential study is a tool to help states advance smart energy policies and programs by providing critical data resources to inform decision makers. . . . A study could support a number of state or utility needs for designing efficiency policies and programs, such as setting energy savings goals, incorporating energy efficiency into the integrated resource planning (IRP) process, or determining funding levels for efficiency programs and policies.[2]

A market potential study typically models at least four different scenarios from order of theoretically most aggressive to most realistic. In KCPL's 2016 market potential study those

[1] 4 CSR 240-20.092(1)CC)
[2] ACEEE (2016) Efficiency Potential and Market Analysis. https://aceee.org/topics/efficiency-potential-and-market-analysis

scenarios included the technical potential (if every end-use was fitted with an efficient measure),[3] the economic potential,[4] the maximum achievable potential ("MAP")[5] and the realistic achievable potential ("RAP").[6] A given study may model additional variations of realistic under certain sensitivity scenarios.[7] Typically, the RAP scenario is considered a reasonable proxy for a future MEEIA application.

Q. How is a market potential study different than a MEEIA application?

A. A market potential study is required for an electric utility's IRP modeling. Ideally, the study should help inform a MEEIA application, but, to date, a study's results have never been used as the actual targets in any approved MEEIA cycle.

Q. Why not?

A. The time lapse between a market potential study's results and an approved MEEIA application can be considerable (e.g., as much as two years). As a result, the market potential study loses its usefulness the greater the distance between the study data and the actual implementation.

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[3] **Technical Potential**: is the theoretical upper limit of energy efficiency potential, assuming that customers adopt all feasible measures regardless of cost or customer preference. At the time of existing equipment failure, customers replace their equipment with the most efficient option available. In new construction, customers and developers also choose the most efficient equipment option.

[4] **Economic Potential:** represents the adoption of all cost-effective energy efficiency measures. Cost-effectiveness is measured by the total resource cost (TRC) test, which compares lifetime energy and capacity benefits to the costs of delivering the measure. If the benefits outweigh the costs (the TRC ratio is equal to or greater than 1.0), a given measure is included in the economic potential. Customers are then assumed to purchase the most cost-effective option applicable to them at any decision juncture. Economic potential is still a hypothetical upper-boundary of savings potential as it represents only measures that are economic but does not yet consider customer acceptance and other factors.

[5] **Maximum Achievable Potential ("MAP")**: estimates customer adoption of economic measures when delivered through DSM programs under ideal market, implementation, and customer preference conditions and an appropriate regulatory framework. Information channels are assumed to be well established and efficient for marketing, educating consumers, and coordinating with trade allies and delivery partners. Maximum Achievable Potential establishes a maximum target for the savings that an administrator can hope to achieve through its DSM programs and involves incentives that represent a substantial portion of measure costs combined with high administrative and marketing costs.

[6] **Realistic Achievable Potential ("RAP")**: reflects expected program participation given DSM programs under more typical market conditions and barriers to customer acceptance, non-ideal implementation channels, and constrained program budgets. The delivery environment in this analysis projects the current state of the DSM market in KCP&L's service territory and projects typical levels of expansion and increased awareness over time.

[7] For example, there could be RAP + (10% increase) or RAP – (10% decrease). Additionally, there can be a further breakdown of market potential at the program level (as opposed to the portfolio—multiple program level).

Consequently, the actual MEEIA targets can be greater or smaller depending on the anticipated avoided costs expected, changes in the market and updates to the data sets utilized.

Q. What was the baseline year of data utilized for the 2016 market potential study?

A. 2015.

Q. When was primary data collected to inform the 2016 market potential study?

A. The spring of 2016.

Q. When was the 2016 market potential study finalized?

A. The spring of 2017.

Q. What is KCPL's MEEIA Cycle III timeframe?

A. If approved, KCPL's MEEIA Cycle III would begin in 2020 and end in 2022.

Q. What utilities' service territories were modeled in the 2016 market potential study?

A. The 2016 market potential study consists of three utilities in two states: Kansas City Power & Light, Missouri, KCP&L Greater Missouri Operations, and Kansas City Power & Light, Kansas.

Q. Were stakeholders involved in the creation of the KCPL market potential study?

A. Yes. Stakeholder involvement began in late 2015 through 2016. In general, the same parties to this case were the same parties involved in providing feedback in the creation of the market potential study.[8, 9]

Q. Mr. Mosenthal references MAP level scenario savings. How is the market potential MAP scenario different than its RAP scenario?

[8] NRDC provided written feedback regarding the scope of the study on January 28, 2016, which predates any of study's results (see GM-1). I have no record of any further feedback from NRDC on KCPL's market potential study after that date.

[9] I have also included OPC's comments circulated on September 20th, 2016 (see GM-2) and AEG's response to OPC, Staff and DE's comments circulated on November 2nd, 2016 (see GM-3) for reference.

A. A MAP scenario assumes an ideal market setting with greater budgets and energy/demand targets, whereas a RAP scenario assumes a less-than-ideal setting that is more representative of typical market condition constraints.

Q. Would a MAP scenario save more energy?

A. Yes. For example, in 2019, the MAP scenario assumes approximately a 32% greater savings potential than the RAP scenario.

Q. Would a MAP scenario cost more?

A. Yes. For example that same 2019 MAP scenario assumes approximately a 64% increase in costs compared to the RAP scenario. Stated differently, the incremental savings cost twice as much to achieve.

Q. Does the MAP scenario cost increase result from diminishing returns?

A. Yes, at least in part. The law of diminishing returns suggests that at a certain level the incremental level of benefits gained will be less than the amount of costs invested. This has historically been experienced at the portfolio level (saturation of cheap, efficient "low hanging fruit" like lighting) and at the individual customer level (adding additional insulation on top of insulation produces diminishing savings). Achieving MAP level savings will cost more on a per unit basis than at the RAP level. Table 1 illustrates this by showing the results of the 2016 KCPL market potential study for program year 2019 at the Program RAP and MAP levels:

Table 1: 2016 KCPL Market Potential Study's Results for PY 2019 for all KCPL utilities (including KCPL Kansas)

All KCPL (+Kansas)	Budget ($)	Savings (MWh)	Cost per MWh saved
RAP Scenario	$36,323,000	177,284	$204.86
MAP Scenario	$59,724,000 + 64%	233,418 + 32%	$255.87 + 25%

To be clear, I am not saying that the law of diminishing returns is an argument to not pursue energy efficiency programs. Merely, that is a phenomenon that occurs and should be considered.

Q. You keep referencing the 2019 MAP scenario. It is 2019 now. Do you mean 2020?

A. No. Remember the study was completed in 2016 with the intent that it would inform a MEEIA Cycle III application that would begin in 2019. The 2019 numbers that I am referencing above were the first year results listed in the study. Due to KCPL's prolonged MEEIA Cycle III application we have long since missed that date.

Q. Mr. Mosenthal proposes that the 2016 market potential MAP results be used for KCPL's MEEIA application. Do you agree?

A. No. The KCPL market potential study overstates the demand-side management potential by not properly accounting for the passage of time, the changes in the SPP market and KCPL's planned capital investments. That is, it inappropriately assumes future supply-side deferral where no such deferral will occur. As such, the market potential study suggests a greater opportunity for energy and demand savings impact than actually exists today. If approved, there would be an eight-year gap between the Company's market potential assumptions and the final program year of its Cycle III programs. Although a market potential study is rarely in-synch with a MEEIA application, the discrepancy between theory (the data used to inform the study) and practice (when these programs would be operational) is too pronounced and will result in both regressive and suboptimal outcomes based on the current operating environment.

Simply put, the 2016 market potential study is no longer accurate or relevant and should be dismissed out-of-hand. Continued reliance on the study will result in further inefficiencies.

Q. Do you believe there are no opportunities (potential) for energy or demand savings in KCPL's service territory?

A. No. This can be a confusing point. So I would like to be as clear as possible here.

There is a lot of energy efficiency potential in the KCPL service territory. In fact, most of Missouri has plenty of energy efficiency potential because both new and historical building

stock is not been subject to strong building code standards. In fact, I believe both the market potential study and the KCPL application understate the potential energy and demand opportunities that could be reasonably obtained. There are many reasons for this, not least of which is that the Company picks its own targets. As such, there is clearly a perverse incentive for a utility to select the lowest target with the greatest return possible. In that respect, I do agree with Mr. Mosenthal.

However, the mere fact that there are many poorly insulated homes and many opportunities to promote efficient HVACs will not result in benefits to all customers in the customer class in which the programs are proposed, regardless of whether the programs are utilized by all customers, as the MEEIA statute requires. This is because spending millions of dollars to insulate 1% of the homes will not have any material impact on KCPL's planned capital investments. The avoided costs needed to justify a MEEIA are absent. As a result, MEEIA is not presently warranted and if approved will merely result in wealth transfers and yet more needless bill increases.

Q. What do you mean by more needless bill increases?

A. Needless bill increases are costs that were not incurred to meet customers' needs for energy or for services that the Company has failed to fully utilize. To provide just three illustrative examples: (1) the needless increase in FAC costs from entering into take or pay wind PPA's above and beyond the Renewable Energy Standards that have cost ratepayers hundreds of million dollars to date (as well as the fact that KCPL management failed to sell its excess Renewable Energy Credits ("RECs") as realized revenue for its customers); (2) the hundreds of millions of dollars in remaining book value currently recovered in rates and earning a return on investment for shareholders yet producing no power in the form of the self-imposed stranded asset of the Sibley Power Plant 20 years before the end of its useful life; and (3) that customers are paying hundreds of millions of dollars (with shareholders again earning a healthy return on investment) in AMI hardware and customer experience software that has not produced time-of-use rates for customers to date.

Q. Will the Company need to perform a new market potential study for future MEEIA approval?

A. Yes. They will have to do this anyway to comply with the Commission rules which requiring a study every three years. The Company has utilized its 2016 market potential study in its 2017 and 2018 IRP filings. For 2019, the Company asked and was granted a waiver from filing an IRP. I do not see how the Company would be in compliance with its 2020 IRP if it relied on the same study yet again.

Q. Has the Company contacted OPC about its next Market Potential Study filing?

A. No.

Off-System Sales and Avoided Costs

Q. Can savings be realized by selling excess energy into the MISO energy market as Mr. Mosenthal suggests?

A. First, I am fairly confident Mr. Mosenthal meant to reference the Southwest Power Pool ("SPP") and not the MISO energy market in his testimony. KCPL is a member of the SPP not MISO. Regardless, the answer is no. The revenues generated from excess energy are most definitely not enough savings to justify this MEEIA application.

Q. Mr. Mosenthal also argues that savings can be realized through the avoided costs of deferring future generation, transmission and distribution investment. Do you agree?

A. No. KCPL is deferring no generation, transmission or distribution investments with this application. This was addressed at length in my rebuttal testimony as well as the Staff's Rebuttal Report.

Non-Energy Benefits and the RIM Test

Q. Mr. Mosenthal believes additional non-energy benefits should be considered in the valuation of a MEEIA application and the cost-effectiveness ratios. Do you agree?

A. No, I do not. For regulatory objectives, non-energy benefits are at best a distraction and at worst an exercise that will grossly undermine efforts to value demand-side management

practices on an equivalent basis as supply-side investments.[10] Like Mr. Mosenthal, I believe the MEEIA cost-effective valuations are flawed, but for a different reason. That is, the present practice does not account for all costs incurred by ratepayers. To illustrate one example, the utility's earning opportunity is not included as an input in the cost-effectiveness tests despite the fact that a cost realized by customers and collected through the MEEIA surcharge. Ignoring these costs creates a more positive ratio than actually exists. The rationale for this position is simple; if the costs are realized on ratepayer's bills then the costs should be realized in any calculation. The same cannot be said for the non-energy benefit of "improved comfort."

Q. Mr. Mosenthal suggests that 1.4% of the state's entire workforce is employed in the energy efficiency field. Should this be a reason to approve the KCPL MEEIA?

A. No. HVAC systems and lightbulbs were sold before MEEIA and they will continue to be sold in the greater Kansas City area if no MEEIA is approved. Additionally, I take issue with the 1.4% figure Mr. Mosenthal cites from the Clean Jobs Midwest report. A cursory review of the report shows that it takes considerable liberty with its definition of both "clean jobs" and "energy efficiency" jobs. For example, 41% of all of the clean jobs in Missouri are listed under the designation "Traditional HVAC." Although no description is given as to what constitutes a "Traditional HVAC" job, it should be noted that the second largest category of clean jobs is in HVAC's as well, the "High Efficiency HVAC" category at 19%.[11] Based on this information one may surmise that any job working with air conditioners is being counted as a "clean job."

Beyond issues of appropriate classification as what constitutes a "clean job" or whether or not employment in the HVAC industry merits a default "clean job" designation, I struggle to see what exactly is "clean" if a customer's inefficient HVAC malfunctions and a "traditional HVAC" worker repairs it, extending its life for five years. Regardless, this line of questioning is beyond the scope of MEEIA and this application.

[10] For further reference please see the surrebuttal testimony of Geoff Marke in Case No: EO-2018-0211, the Ameren Missouri MEEIA Cycle III application, p. 1-10.
[11] Clean Jobs Midwest: Missouri https://www.cleanjobsmidwest.com/state/missouri

Q. Did Mr. Mosenthal address the lack of benefits for non-MEEIA participants?

A. Not directly. Instead, he makes a sweeping statement that is traditionally made about energy efficiency that:

> "Virtually all efficiency programs will increase short term rates as a result of reducing electricity consumption. However they reduce customer's total bills, which is what they care most about."[12]

Q. Do you agree?

A. Not in this case.

All customers' rates will increase under an approved MEEIA. Nobody denies that.

Higher rates will translate to larger bills for customers, all else being equal.

In the short-term, the only scenario where increased rates results in a lower bill is if one's overall energy consumption is less than it otherwise would be. For simplified illustrative purposes consider the following bill impacts based on usage changes and rate increases:

> Pre-MEEIA customer consumes 1000 kWh at 10 cents = $100.00
>
> MEEIA participant consumes 900 kWh at 11 cents = $99.00
>
> MEEIA non-participant consumes 1000 kWh at 11 cents = $110.00

As can be seen above, nonparticipants bills *will* increase but participant bill increases "should" be offset through reduced consumption and result in a lower total bill.[13]

In the long term, nonparticipant's bills will only decrease *if* these demand-side investments reduce load and defer and/or avoid having to make future identified supply-side investments. Unfortunately, as stated previously, there are no future supply-side investments to avoid. The

[12] Rebuttal Testimony of Philip Mosenthal p. 13, 1-3.

[13] I say "should" because cost savings assumptions on the participant side need to consider variables above and beyond engineers' cost savings assumptions, these include: rebound effects (keeping the lights on longer now that they are "efficient"), diminishing returns from previous efficiency measures (adding efficient windows when the house is already efficient), future fixed cost increases (customer charge increases), and even indirect load building (buying an electric air purifier when you otherwise would not).

useful life of an efficient HVAC is shorter than the next planned generation investment (more than twenty years). We also know that KCPL plans on spending over a billion dollars over the next couple of years on planned T&D investments. So, there are no avoided costs to be found there either.

Q. Mr. Mosenthal argues that if the Commission focuses solely on the lack of benefits to non-participants then the Commission would be utilizing the Ratepayer Impact Measure ("RIM") test. What is the RIM test?

A. Within the context of demand-side management programs, the RIM test is designed to examine the impact of energy efficiency programs on utility rates. It has historically been employed in Missouri to examine the cost-effectiveness of load building programs. An example would be to examine the ratepayer impact of increased load from beneficial electrification programs. In the short run, increased energy sales can increase revenues and put a downward pressure on retail rates as the remaining fixed costs are spread over greater kWh. In the long run though, increases in energy sales will also lead to increases in planned capital investment and, in turn, future fixed costs.

Q. Do you agree with Mr. Mosenthal's argument for the RIM test?

A. No. At no point has our Office or any other party (to my knowledge) ever argued, in any proceeding, to apply the RIM test to a MEEIA application. At the risk of making this application more complicated than it already is, the RIM test is going to consider a utility's overall revenue requirement, level of revenue sufficiency, and the design and recovery of the utility's retail rates. The interplay between MEEIA, base rates (and other surcharges) is a complicated exercise that is beyond the scope of this testimony and can be subject to much disagreement. KCPL's MEEIA application does not fail because it doesn't pass the RIM test; it fails because it doesn't pass the Total Resource Cost Test ("TRC"). It fails because it does not produce benefits for all customers.

Single Family Low-Income Program

Q. Mr. Mosenthal recommends a low-income single family direct install program. Do you agree?

A. Not as he has proposed. The most direct, cost-effective way to implement energy efficiency measures in qualified low income households is through low income weatherization assistance programs ("LIWAP"). That can be accomplished outside of a MEEIA.

Q. Why is LIWAP more cost effective than Mr. Mosenthal's proposal?

A. Mr. Mosenthal does not provide many details on his proposal, but, in general, the reasons why a low income single family program is more cost effective within the context of LIWAP than MEEIA include:

- Greater energy savings from whole house weatherization than from direct-install measures (e.g., insulation over faucet aerators);
- Administrative cost savings from utilizing local non-profits rather than for-profit implementers;
- Cost savings by excluding throughput disincentive and an earnings opportunity; and
- Cost allocation to all ratepayers including those that can "opt-out" of MEEIA;

Above and beyond these reasons, if Mr. Mosenthal is serious about the energy burden to low income customers he should reconsider his support of KCPL's MEEIA application at this time. Approval of this proposal will merely compound the burdens of those least able to bare it. Alternatively, he could recommend that low-income customers be exempt from paying the MEEIA surcharge. Ameren Missouri currently engages in this policy. Of course, that means costs will be spread to those families just above the poverty line and those low income households that have not self-identified as low-income with KCPL.

III. RESPONSE TO DE

Q. What are DE witness Hyman's recommendations?

A. Mr. Hyman recommends that KCPL's application omit the word "weatherization" from the proposed "Heating, Cooling and Weatherization" program title. He also recommends that the Company's tariff be edited to include eligibility of customers who receive certain tax credits authorized by statute.

Q. Do you agree that future "whole house" programs omit the use of the word "weatherization" in the title to avoid confusion?

A. Yes. This should prevent potential confusion amongst regulatory stakeholders.

Q. Do you agree with his second recommendation to amend the tariff to explicitly include eligibility of customer who receive certain tax credits?

A. Yes, future MEEIA applications should account for this change in the law. I do not believe this was intentional on the Company's part. Rather, it is a byproduct of having an application that is approximately one-year old.

Q. What are DE witness Epperson's recommendations?

A. Ms. Epperson recommends the following combined heat and power ("CHP") deliverables be included in KCPL's Customer Business Rebate Program:

1. Complete a collaboratively-developed CHP-specific program guidance within one year;
2. Provide a collaboratively-developed CHP specific program guidance to registered contractors, business development representatives and customers (via website);
3. Include specific reference to CHP in future MEEIA filings; and
4. Adopt the goal of successfully assisting one customer to complete a CHP installation within three years of case completion.[14]

[14] EO-2019-0132 Rebuttal Testimony of Jane E. Epperson, p. 12, 13-21.

Q. Do you agree with these recommendations?

A. I have no issue with including a reference to CHP in future MEEIA filings if it is a cost effective measure (#3). Nor would I oppose setting internal goals (#4). I am less sure what exactly the specific "asks" are regarding the first two deliverables. Further inquiry is warranted on my end on the degree of collaboration and expected outcomes. As it stands, given my recommendations in rebuttal testimony, I struggle to see how CHP could be included in the "default MEEIA level" I advocated for when it is questionable whether it should be included in the presently filed application. As such, I would recommend that Ms. Epperson's recommendations be considered in future MEEIA filings rather than the present application.

Q. Does this conclude your testimony?

A. Yes.

Marke, Geoff

From: Henry Robertson <hrobertson@greatriverslaw.org>
Sent: Thursday, January 28, 2016 11:05 AM
To: Costenaro, David; Rogers, John; Warren, Henry; Eaves, Dana; Dietrich, Natelle; Kroll, Sharlet; Epperson, Jane; Meisenheimer, Barb; Marke, Geoff; Allison, Dustin; Opitz, Timothy; Payne, Whitney; Berlin, Bob; Mers, Nicole; Hyman, Martin; Fortson, Brad; 'Jason.huffman@psc.mo.gov'; 'Kory.Boustead@psc.mo.gov'; 'Marcella.Mueth@psc.mo.gov'; 'Andrew@renewmo.org'; 'jdlinton@reagan.com'; Antal, Alexander; 'Albert.Bass@kcpl.com'; 'Alan.Kean@kcpl.com'; 'Jennifer.Carpenter@kcpl.com'; 'Tim.Nelson@kcpl.com'; 'Kimberly.Winslow@kcpl.com'; 'Marisol.Miller@kcpl.com'; 'Carol.Sivils@kcpl.com'; 'Tim.Rush@kcpl.com'; 'Lois.Liechti@kcpl.com'; 'James.Dare@kcpl.com'; 'Mark.Leonard@kcpl.com'; 'Roger.Steiner@kcpl.com'; Rohmund, Ingrid; Stitz, Erin; Kester, Bridget; Nathan, Susan; 'Ahmad.Faruqui@brattle.com'; Duh, Josephine; Huber, Tammy; Gupta, Ashok; Phil Mosenthal; Cliff McDonald
Subject: Re: KCP&L DSM Potential Study - NRDC Stakeholder Input
Attachments: NRDC Potential study issues.pdf

NRDC submits the attached comments on scope of the potential study.

On 1/13/2016 10:56 AM, Costenaro, David wrote:

> Hello All,
> Attached are the slides we will plan to discuss in our meeting tomorrow about the 2016 KCP&L DSM potential study.
>
> For remote participants, webex screensharing and call-in information is below as well as in the meeting invitation. We will aim to be in the PSC lobby 10 or 15 minutes before 1pm if someone there can please escort us to the meeting room so we can get set up and dialed in?
>
> Thanks, and talk to you all tomorrow!
> -Dave
>
> Dave Costenaro
> *Senior Project Manager*
> Applied Energy Group, Inc.
> dcostenaro@appliedenergygroup.com • (314) 452-8534
>
> -----Original Appointment-----
> **From:** Costenaro, David
> **Sent:** Tuesday, December 15, 2015 5:28 PM
> **To:** Costenaro, David; John.Rogers@psc.mo.gov; 'henry.warren@psc.mo.gov'; 'dana.eaves@psc.mo.gov'; 'natelle.dietrich@psc.mo.gov'; 'Sharlet.Kroll@ded.mo.gov'; 'jane.lohraff@ded.mo.gov'; 'barb.meisenheimer@ded.mo.gov'; 'geoff.marke@ded.mo.gov'; 'dustin.allison@ded.mo.gov'; 'timothy.opitz@ded.mo.gov'; 'Whitney.Payne@psc.mo.gov'; 'bob.berlin@psc.mo.gov'; 'Nicole.Mers@psc.mo.gov'; 'martin.hyman@ded.mo.gov'; 'Brad.Fortson@psc.mo.gov'; 'Jason.huffman@psc.mo.gov'; 'Kory.Boustead@psc.mo.gov'; 'Marcella.Mueth@psc.mo.gov'; 'Andrew@renewmo.org'; 'jdlinton@reagan.com'; 'hrobertson@greatriverslaw.org'; 'Alexander.Antal@ded.mo.gov'; 'Albert.Bass@kcpl.com'; 'Alan.Kean@kcpl.com'; 'Jennifer.Carpenter@kcpl.com'; 'Tim.Nelson@kcpl.com'; 'Kimberly.Winslow@kcpl.com'; 'Marisol.Miller@kcpl.com'; 'Carol.Sivils@kcpl.com'; 'Tim.Rush@kcpl.com'; 'Lois.Liechti@kcpl.com';

'James.Dare@kcpl.com'; 'Mark.Leonard@kcpl.com'; 'Roger.Steiner@kcpl.com'; Costenaro, David; Rohmund, Ingrid; Stitz, Erin; Kester, Bridget; Nathan, Susan; 'Ahmad.Faruqui@brattle.com'; Duh, Josephine
Cc: Huber, Tammy
Subject: KCP&L DSM Potential Study - Kickoff of Stakeholder Input & Involvement
When: Thursday, January 14, 2016 1:00 PM-4:00 PM (UTC-06:00) Central Time (US & Canada).
Where: Room 130 of Governor's Office Building (MPSC Offices); Webex and Call-in Info inside Invitation

Hello All,
KCP&L is beginning a DSM Potential Study in all of its service territories with Applied Energy Group. Collectively, we would like to bring all of you into the process for your input and insights; and this meeting will act as a kickoff to that dialogue that will continue with the study throughout 2016.

We will meet in Room 130 of the MPSC Offices in Jefferson City, and webex/call-in info is below for those who would like to participate remotely.

We will also prepare a slide deck closer to the date, but the tentative agenda is as follows. Please reach out to Tim Nelson (tim.nelson@kcpl.com) or myself (dcostenaro@appliedenergygroup.com) with any questions or comments, as we are the respective project managers and main points of contact for this effort.

Tentative Agenda for Stakeholder Kickoff in Jefferson City:

- Introductions
- Update on KCP&L DSM
- Potential study objectives
- Scope of work
  - Market research surveys
  - Energy efficiency potential analysis
  - Demand response potential analysis
  - Demand-side rates potential analysis
  - Packaging into program potential
- Schedule & Next Steps

Thanks very much,
Dave

Dave Costenaro
Senior Project Manager
Applied Energy Group, Inc.
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-- Do not delete or change any of the following text. --

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IMPORTANT NOTICE: Please note that this WebEx service allows audio and other information sent during the session to be recorded, which may be discoverable in a legal matter. You should inform all meeting attendees prior to recording if you intend to record the meeting.

--
Henry B. Robertson
Great Rivers Environmental Law Center
319 N. 4th St., Suite 800
St Louis, MO 63102
314-231-4181
Fax 314-231-4184
www.greatriverslaw.org

NRDC Comments on the Potential Study Scope

In general, NRDC is happy with the current scope of the potential study. In particular, there are several items that we are happy to see included and hope they remain as stated:

- The potential study will holistically look at CHP, emerging technology, energy efficiency, renewables, demand response and rate structures, including capturing all synergies and interactions between the various resource categories.
- The baseline forecast takes into account both all known and established future codes and standards and incorporates naturally occurring efficiency.
- The potential study includes estimates of potential from technological advancements that are reasonably anticipated to occur during the planning horizon. NRDC recommends that this include not just new technologies, but expectations for price decreases and performance increases in current technology, such as LEDs. NRDC recommends this be done at an aggregated level recognizing past trends in technology advancement, and not be dependent on specific known potential improvements.
- The potential study will not rely on customer survey data to establish willingness to participate in programs. Further, it will not assume current participation levels represent MAP or RAP levels that could be pursued, given the significant budget and resource constraints on the current plans. Rather, it will consider the literature and the experiences of the best, most aggressive, not budget or policy constrained efforts elsewhere, when estimating what is achievable. NRDC notes there are examples of participation levels in the 80% or higher of eligible and marketed to customers, and the Pacific Northwest assumes 85% of economic potential ultimately achievable as a matter of policy.

However, notwithstanding these positive aspects, NRDC has the following concerns:

Potential Scenarios

In the past KCP&L has made numerous ex-post adjustments to its consultant's estimates of achievable potential based on codes and standards, net-to-gross ratios, and the time frame of the analysis. It is important that the potential study stand on its own and represent the contractor's best estimate of what is achievable so that these estimates can be directly used in IRPs and planning without additional adjustments. For example, all interactions and other adjustments appropriate should be incorporated in the study. MAP should be characterized as the best estimate of what is achievable without policy or budget constraints, and not as an unobtainable ideal circumstance. RAP should clearly state and justify exactly what constraints have been applied. This will ensure that the potential study produces useful, actionable results, and that the ratepayer money is well spent.

Further, energy efficiency potential studies do not typically assume that there is some "program potential" that is less than the achievable potential absent policy or budget constraints. If the potential is achievable, by definition there is some mix of programs that can achieve it. The potential study should

very clearly state the definition of the program level potential, all the reasons and assumptions for why the level of savings may be different from the level of savings in the achievable scenarios, and show the math performed to derive program level potential from the achievable scenarios. Further, any program potential scenarios should be modeled on portfolio of programs that AEG believes will best capture the achievable potential identified, rather than existing KCP&L programs.

Appliance Saturation Survey

NRDC is concerned that the significant effort going into the residential and C&I saturation surveys will not yield an improvement in accuracy that is commensurate with the large cost to be incurred with such an effort. First, the survey asks many highly specific questions that the respondent is unlikely to know. For example, the residential mail-in survey asks the size of the water heater, and the C&I phone survey asks what percentage of each type of motor has variable frequency drives. Further, the surveys are too long, and seem burdensome for the respondent, given the benefit they receive. For many of the questions being asked, it is not clear how the answers will ultimately be used to impact the potential analysis. The contractor needs to know and define exactly how each response will result in actual adjustments to the potential estimates.

More importantly however, the end result of the saturation surveys will be a breakdown of energy use by end use for each customer segment. While this is valuable information in a potential study, the appliance saturation surveys will likely only provide marginal improvements in accuracy over existing data sources such as RECS and CBECS, and past Missouri and other Midwest potential study data. Further, the end use break down of energy use is only one of many uncertain and equally important estimates that go into a potential study. Other factors include measure feasibility, percent of measures not complete, penetration rates, and net to gross ratios. For example, while the saturation surveys will tell you what portion of energy use is consumed by refrigerators, it will not establish the portion of customers with inefficient refrigerators, or what portion of new units sold are Energy Star rated. In doing analyses, the uncertainty of the final estimate is dependent on the component factor with the highest uncertainty. Thus spending inordinate amounts of effort refining the accuracy of one component factor while significant uncertainty remains in other factors is not likely to yield significant benefits.

Hollstic Treatment of EE, DR, and rates

NRDC urges that energy efficiency, demand response, and rate schedules be looked at in a holistic, integrated manner. There are many instances where a single technology or practice can enable or support all of these activities. In these cases, the TRC ratio should include the benefits from all EE, DR and rate schedule savings. NRDC is concerned that, since the potential study will have very separate sections for each activity, each section will compare the cost of the technology to only some of the benefits. Take an example of a wi-fi thermostat that produces some efficiency savings, but also enables demand response and certain rate schedules. In this case, the potential study should compare the cost of thermostat to all of these benefits, as opposed to looking at the cost versus the EE benefits in the efficiency section, and the cost versus the DR benefits in the demand response section.

Non-Electric Benefits

In addition to ensuring that all applicable benefits from EE, DR, and rate schedules are included in the given TRCs for each technology, NRDC recommends that the potential study include other non-electric benefits that are typically included in the TRC ratio. These benefits include not just electric avoided costs, but avoided costs of any gas, oil, or water avoided, known operation and maintenance savings, and other NEBs such as emissions reduction and/or potential savings under the Clean Power Plan. Including this full range of benefits will give the most accurate and well-rounded results.

Rate Schedules

NRDC is concerned that the Brattle Group will re-invent the wheel by examining the potential for the same rate schedules that it looked at three years ago on behalf of Ameren. We believe that the Ameren results are reasonably transferable to KCP&L. Instead of looking at these same rate schedules, the Brattle Group should use the budget to examine new and innovative rate schedules, such as inclining block rates for the Commercial and Industrial Sectors. Further, the rate potential study should not limit itself to only rates typically seen elsewhere. For example, while Brattle noted that generally C&I inclining block rates don't exist, it agreed that there is no reason this type of rate is not theoretically achievable.

Scenarios Between RAP and MAP

In the past, KCP&L has examined scenarios between the realistically achievable potential (RAP) and the maximum achievable potential (MAP) in its IRPs. However, to derive these scenarios, KCP&L has relied on a linear extrapolation of costs and savings – so the costs and savings in a scenario halfway between RAP and MAP would fall both exactly midway between the two. In reality, however, the costs are more of an exponential function. This is because MAP assumes that the incentives cover 100% of the incremental costs for every single measure rebated. This may be necessary to get the last few holdouts to participate, but the vast majority of potential participants will participate at an incentive amount far lower than 100%. For example, it may be the case that 95% of potential participants will participate with incentives at 85% the incremental cost. In this case, in order to get full participation, incentives would have to be raised to the full incremental cost for every measure – including those participants who would have participated at far lower levels of incentives. So as you approach MAP, costs begin to increase much faster than savings, making a linear interpolation between scenarios inaccurate.

To solve this problem, NRDC recommends that the potential study explicitly include scenarios between RAP and MAP. This would be very useful during the IRP process, and allow KCP&L to examine a wider range of efficiency options during its planning process.

Marke, Geoff

From: Marke, Geoff
Sent: Tuesday, September 20, 2016 1:53 PM
To: File Brian; Crumpton Clarissa; Nelson Tim; 'john.rogers@psc.mo.gov'; Eaves, Dana; Dietrich, Natelle; Kroll, Sharlet; Epperson, Jane; Meisenheimer, Barb; Opitz, Timothy; Payne, Whitney; Mers, Nicole; Berlin, Bob; Hyman, Martin; Fortson, Brad; 'Kory.Boustead@psc.mo.gov'; 'Marcella.Mueth@psc.mo.gov'; Huber, Tammy; 'patrick.mahon@psc.mo.gov'; Luebbert, J; 'Andrew@renewmo.org'; 'jdlinton@reagan.com'; 'hrobertson@greatriverslaw.org'; Antal, Alexander; 'dcostenaro@appliedenergygroup.com'; 'Walter, Kenneth'; 'Stitz, Erin'; Winslow Kimberly; Sivils Carol; Rush Tim; Alexander Tia; Owen, James; Burdge, James Rich
Cc: 'Linton, David'; Rogers, John
Subject: RE: KCPL GMO Potential Study and Collaborative Meeting - Call in #1 (669) 224-3412, Access Code: 922-674-029
Attachments: WP253R (1).pdf; Common Inquiries about PAYS - 6.1.2016.pdf; Consumer advocate Q-A for PAYS®.pdf; Model PAYS® tariff.pdf; Summary of Terms for Opt-in Tariff for EE Investments.pdf; Utility Q-A for PAYS®.pdf; Summary of Terms for Opt-in Tariff for EE Investments-2.pdf; KCPL AEG MEMO.docx

Attached are OPC's comments regarding KCPL's potential study as well as a copy of the article I referenced in yesterday's meeting on the impact of energy efficiency labels. I have also included literature regarding the PAYS tariff which was also discussed. As it stands, we do not have any definitive comments regarding the collaborative program review. We are in general agreement with the Company over the targeted activities that warrant further review and reserve our right to comment in the future.

Thanks,

Geoff Marke
Economist
Missouri Office Of Public Counsel
(573) 751-5563 office
(314) 956-4487 cell

From: File Brian [mailto:Brian.File@kcpl.com]
Sent: Sunday, September 18, 2016 5:17 PM
To: Crumpton Clarissa; Nelson Tim; 'john.rogers@psc.mo.gov'; Eaves, Dana; Dietrich, Natelle*; Kroll, Sharlet; Epperson, Jane; Meisenheimer, Barb; Marke, Geoff; 'dustin.allison@ded.mo.gov'; Opitz, Timothy; 'Whitney.Payne@psc.mo.gov'; 'Nicole.Mers@psc.mo.gov'; Berlin, Bob; Hyman, Martin; 'Brad.Fortson@psc.mo.gov'; 'Kory.Boustead@psc.mo.gov'; 'Marcella.Mueth@psc.mo.gov'; 'tammy.huber@psc.mo.gov'; 'patrick.mahon@psc.mo.gov'; 'j.luebbert@psc.mo.gov'; 'Andrew@renewmo.org'; 'jdlinton@reagan.com'; 'hrobertson@greatriverslaw.org'; Antal, Alexander; 'dcostenaro@appliedenergygroup.com'; 'Walter, Kenneth'; 'Stitz, Erin'; Winslow Kimberly; Sivils Carol; Rush Tim; Alexander Tia
Cc: 'Linton, David'; Rogers, John
Subject: RE: KCPL GMO Potential Study and Collaborative Meeting - Call in #1 (669) 224-3412, Access Code: 922-674-029

Good Afternoon Stakeholders,

Please find the attached documents for the 2 sessions tomorrow, 9/19, for KCP&L GMO.

Session #1: DSM Potential Study
Powerpoint
Session #2: MEEIA 2 Collaborative Program proposals
Powerpoint
Draft memos
Evaluation Matrix

Look forward to seeing you at 9 AM tomorrow in Jeff City..

Thanks,
Brian

-----Original Appointment-----
From: Crumpton Clarissa
Sent: Thursday, September 01, 2016 9:05 AM
To: Crumpton Clarissa; Nelson Tim; File Brian; 'john.rogers@psc.mo.gov'; 'dana.eaves@psc.mo.gov'; Natelle Dietrich MO PSC; 'Sharlet.Kroll@ded.mo.gov'; 'jane.lohraff@ded.mo.gov'; 'barb.meisenheimer@ded.mo.gov'; 'geoff.marke@ded.mo.gov'; 'dustin.allison@ded.mo.gov'; 'timothy.opitz@ded.mo.gov'; 'Whitney.Payne@psc.mo.gov'; 'Nicole.Mers@psc.mo.gov'; 'bob.berlin@psc.mo.gov'; 'martin.hyman@ded.mo.gov'; 'Brad.Fortson@psc.mo.gov'; 'Kory.Boustead@psc.mo.gov'; 'Marcella.Mueth@psc.mo.gov'; 'tammy.huber@psc.mo.gov'; 'patrick.mahon@psc.mo.gov'; 'j.luebbert@psc.mo.gov'; 'Andrew@renewmo.org'; 'jdlinton@reagan.com'; 'hrobertson@greatriverslaw.org'; 'Alexander.Antal@ded.mo.gov'; 'dcostenaro@appliedenergygroup.com'; 'Walter, Kenneth'; 'Stitz, Erin'; Winslow Kimberly; Sivils Carol; Rush Tim (Tim.Rush@kcpl.com); Alexander Tia
Cc: 'Linton, David'; Rogers, John
Subject: FW: KCPL GMO Potential Study and Collaborative Meeting - Call In #1 (669) 224-3412, Access Code: 922-674-029
When: Monday, September 19, 2016 9:00 AM-4:00 PM (UTC-06:00) Central Time (US & Canada).
Where: Harry S. Truman Building, Conference Room 750, 301 W. High Street, Jefferson City, Missouri, 65102

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From: Crumpton Clarissa
Sent: Tuesday, August 30, 2016 11:55 AM
To: Crumpton Clarissa; 'john.rogers@psc.mo.gov'; 'dana.eaves@psc.mo.gov'; Natelle Dietrich MO PSC; 'Sharlet.Kroll@ded.mo.gov'; 'jane.lohraff@ded.mo.gov'; 'barb.meisenheimer@ded.mo.gov'; 'geoff.marke@ded.mo.gov'; 'dustin.allison@ded.mo.gov'; 'timothy.opitz@ded.mo.gov'; 'Whitney.Payne@psc.mo.gov'; 'Nicole.Mers@psc.mo.gov'; 'bob.berlin@psc.mo.gov'; 'martin.hyman@ded.mo.gov'; 'Brad.Fortson@psc.mo.gov'; 'Kory.Boustead@psc.mo.gov'; 'Marcella.Mueth@psc.mo.gov'; 'tammy.huber@psc.mo.gov'; 'patrick.mahon@psc.mo.gov'; 'j.luebbert@psc.mo.gov'; 'Andrew@renewmo.org'; 'jdlinton@reagan.com'; 'hrobertson@greatriverslaw.org'; 'Alexander.Antal@ded.mo.gov'; 'dcostenaro@appliedenergygroup.com'; 'Walter, Kenneth'; 'Stitz, Erin'
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When: Monday, September 19, 2016 9:00 AM-4:00 PM (UTC-06:00) Central Time (US & Canada).
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KCP&L GMO Potential Study and Collaborative Meeting

Mon, Sep 19, 2016 9:00 AM - 5:00 PM Central Daylight Time
Please join my meeting from your computer, tablet or smartphone.
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You can also dial in using your phone.
United States : +1 (669) 224-3412

Access Code: 922-674-029
First GoToMeeting? Try a test session: http://help.citrix.com/getready

MEMORANDUM

To: Missouri Public Service Commission Official Case File,
Case No. EO-2015-0240 & EO-2015-0241

From: Geoff Marke, Economist
Office of the Public Counsel

Subject: OPC Comments on KCP&L's Collaborative Program Review
Date: Sept. 20, 2016

The Office of Public Counsel ("OPC") has nine suggestions/recommendations for KCP&L, AEG and stakeholders to consider regarding its forthcoming Market Potential Study and welcomes a continued dialogue on the feasibility, expectations, and agreed to parameters on any of these items. We appreciate the opportunity to provide comments and look forward to the feedback.

Energy Efficiency Potential Study:

1.) Please provide a list of all triangulated data utilized for the take rate assumptions.

- Additionally, does AEG plan on updating the take rate assumptions based on KCPL/GMO carryover programs that occurred in 2016?

2.) Please breakdown all potential information at the KCPL-GMO, KCPL-MO and KCPL-KS levels.

3.) Please present a graphical representation (and/or narrative) that shows the impact on EE potential due to known and expected "opt-out customers" by service territory and general rate class (e.g., commercial and industrial). PSC Staff may be able to provide the latter estimated number if necessary.

4.) Please provide any and all updates to the commercial and industrial sector based on the inclusion of the carryover projects from Cycle I—particularly in regards to lighting.

Demand-Side Rates Potential Study:

4.) Please provide any and all known examples of an IOU's residential customer charge set at $21.88 (or a similar high value) where an inclining block rate is also in place.

- What would be the impact if the customer charge were set at $11.88 like the rest of the demand-side rate options modeled?

5.) Please provide a breakdown of the opt-in assumptions for the demand-side rate options.

6.) Please provide any and all secondary sources that were utilized in the demand-side rate options if applicable (e.g., PG&E, ComEd, etc…).

7.) What dollar value(s) was assigned for "education and/or administration" for the demand-side rate options?

Other considerations:

8.) Potential for Commercial and Industrial curtailment contracts. How much could be obtained and at what cost?

9.) Sensitivity analysis that considers a reasonable bandwidth to account for:

- Increased heating and/or cooling degree days;
- Impact due to a stimulated/depressed economy;
- Co-delivery of programs with other utilities;
- The impact on market potential due to changes in rate design (e.g., IBR); and
- Probable environmental compliance scenarios

Marke, Geoff

From: Costenaro, David <dcostenaro@appliedenergygroup.com>
Sent: Wednesday, November 2, 2016 10:07 AM
To: File Brian; Crumpton Clarissa; Nelson Tim; 'john.rogers@psc.mo.gov'; Eaves, Dana; Dietrich, Natelle; Kroll, Sharlet; Epperson, Jane; Meisenheimer, Barb; Marke, Geoff; 'dustin.allison@ded.mo.gov'; Opitz, Timothy; Payne, Whitney; Mers, Nicole; Berlin, Bob; Hyman, Martin; Fortson, Brad; 'Kory.Boustead@psc.mo.gov'; 'Marcella.Mueth@psc.mo.gov'; Huber, Tammy; 'patrick.mahon@psc.mo.gov'; Luebbert, J; 'Andrew@renewmo.org'; 'jdlinton@reagan.com'; 'hrobertson@greatriverslaw.org'; Antal, Alexander; Walter, Kenneth; Stitz, Erin; Winslow Kimberly; Sivils Carol; Rush Tim; Alexander Tia; Rohmund, Ingrid; 'Linton, David'; Rogers, John; Kean Alan
Subject: AEG Responses to Comments --- RE: KCPL GMO 2016 Potential Study
Attachments: KCPL 2016 DSM Potential Study - AEG Response to Stakeholder Comments from 9-19 mtg.docx; DR_Input_Generator_KCPL_2016-10-10 - AEG confidential.xlsx; EmPOWER Maryland Potential Study_Volume 2 Customer Surveys_04 28 2016.pdf; Ameren MO DSM Potential Study Vol 2 Market Research Final.pdf; Ameren IL Potential_Final Report_Vol 2 Market Research_2016-04-18.pdf

Hello Missouri DSM Stakeholders,

When we met on Sep 19 to discuss the preliminary results of the KCP&L DSM potential study, you had some questions and follow-up items. Please see the attached memo and materials for AEG's responses:

1. MS Word Memo with Stakeholder questions in black font and AEG responses in blue font
2. MS Excel Input Generator from our Demand Response and Demand Side Rates analysis. This contains all the assumptions, details, and source notes by program in the tabs to the right of the file. **Please treat this file as confidential**, as it is part of AEG's modeling suite and intellectual property.
3. Three PDF Market Research reports containing take-rate development which are publicly available: EmPower Maryland, Ameren MO, Ameren IL

Regarding the remaining project timeline, we are finalizing the analysis based on your feedback and have a few additional tasks to wrap up. We plan to have final results and report in early 2017. We can touch base closer to that time to see if an additional in-person or webinar meeting makes sense.

Hope you all had a Happy Halloween!
Thanks,
Dave

Dave Costenaro
Managing Director
Applied Energy Group, Inc.
dcostenaro@appliedenergygroup.com • (314) 452-8534

From: File Brian [mailto:Brian.File@kcpl.com]
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To: Crumpton Clarissa <Clarissa.Crumpton@kcpl.com>; Nelson Tim <Tim.Nelson@kcpl.com>; 'john.rogers@psc.mo.gov'; 'dana.eaves@psc.mo.gov' <dana.eaves@psc.mo.gov>; Natelle Dietrich MO PSC <natelle.dietrich@psc.mo.gov>; 'Sharlet.Kroll@ded.mo.gov' <Sharlet.Kroll@ded.mo.gov>; 'jane.lohraff@ded.mo.gov' <jane.lohraff@ded.mo.gov>;

'barb.meisenheimer@ded.mo.gov' <barb.meisenheimer@ded.mo.gov>; 'geoff.marke@ded.mo.gov' <geoff.marke@ded.mo.gov>; 'dustin.allison@ded.mo.gov' <dustin.allison@ded.mo.gov>; 'timothy.opitz@ded.mo.gov' <timothy.opitz@ded.mo.gov>; 'Whitney.Payne@psc.mo.gov' <Whitney.Payne@psc.mo.gov>; 'Nicole.Mers@psc.mo.gov' <Nicole.Mers@psc.mo.gov>; 'bob.berlin@psc.mo.gov' <bob.berlin@psc.mo.gov>; 'martin.hyman@ded.mo.gov' <martin.hyman@ded.mo.gov>; 'Brad.Fortson@psc.mo.gov' <Brad.Fortson@psc.mo.gov>; 'Kory.Boustead@psc.mo.gov' <Kory.Boustead@psc.mo.gov>; 'Marcella.Mueth@psc.mo.gov' <Marcella.Mueth@psc.mo.gov>; 'tammy.huber@psc.mo.gov' <tammy.huber@psc.mo.gov>; 'patrick.mahon@psc.mo.gov' <patrick.mahon@psc.mo.gov>; 'j.luebbert@psc.mo.gov' <j.luebbert@psc.mo.gov>; 'Andrew@renewmo.org' <Andrew@renewmo.org>; 'jdlinton@reagan.com' <jdlinton@reagan.com>; 'hrobertson@greatriverslaw.org' <hrobertson@greatriverslaw.org>; 'Alexander.Antal@ded.mo.gov' <Alexander.Antal@ded.mo.gov>; Costenaro, David <dcostenaro@appliedenergygroup.com>; Walter, Kenneth <kwalter@appliedenergygroup.com>; Stitz, Erin <EStitz@appliedenergygroup.com>; Winslow Kimberly <Kimberly.Winslow@kcpl.com>; Sivils Carol <Carol.Sivils@kcpl.com>; Rush Tim <Tim.Rush@kcpl.com>; Alexander Tia <Tia.Alexander@kcpl.com>
Cc: 'Linton, David' <DLinton@Quanta-Technology.com>; Rogers, John <John.Rogers@psc.mo.gov>
Subject: RE: KCPL GMO Potential Study and Collaborative Meeting - Call in #1 (669) 224-3412, Access Code: 922-674-029

Good Afternoon Stakeholders,

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- Powerpoint

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- Powerpoint
- Draft memos
- Evaluation Matrix

Look forward to seeing you at 9 AM tomorrow in Jeff City..

Thanks,
Brian

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Cc: 'Linton, David'; Rogers, John
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KCP&L GMO Potential Study and Collaborative Meeting

Mon, Sep 19, 2016 9:00 AM - 5:00 PM Central Daylight Time
Please join my meeting from your computer, tablet or smartphone.
https://global.gotomeeting.com/join/922674029

You can also dial in using your phone.
United States : +1 (669) 224-3412

Access Code: 922-674-029
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AEG
Applied Energy Group

MEMORANDUM

To: Tim Nelson (KCP&L) and Alan Kean (KCP&L)

From: Dave Costenaro (AEG)

CC: Missouri DSM Stakeholders

Date: Nov 2, 2016

Re: **KCP&L 2016 DSM Potential Study – AEG Response to Stakeholder Comments from 9/19/2016 preliminary results meeting in Jefferson City**

Below we list the questions received in regards to the KCP&L 2016 DSM potential study from the preliminary results meeting in Jefferson City on September 19, 2016. At the beginning of each question or request, we identify the authoring stakeholder in parentheses. Afterwards, we provide our response in blue font.

ENERGY EFFICIENCY POTENTIAL:

1. (OPC) Please provide a list of all triangulated data utilized for the take rate assumptions.
   - AEG estimated adoption rates for measure categories by triangulating data from:
     - KCP&L's existing programs
     - Benchmark data from other comparable programs (E-Source, ACEEE 2015 Scorecard), and
     - Proprietary market research conducted in the Midwest and around the U.S. Three such reports are publicly available and we are providing as attachments; namely those for: Ameren Missouri, Ameren Illinois, and EmPower Maryland.
2. (OPC) Additionally, does AEG plan on updating the take rate assumptions based on KCPL/GMO carryover programs that occurred in 2016?
   - We handle this by reducing the number of purchase decisions that are available to occur in the future when calibrating to past program achievements. The take rates stay the same, but apply to an adjusted base. This is based on the assumption that peoples' likelihood to adopt measures during a future purchase decision will not be affected by purchase decisions of other, unrelated people that have occurred in the past.
3. (OPC) Please breakdown all potential information at the KCPL-GMO, KCPL-MO and KCPL-KS levels.
   - AEG will include these results in our next version of the results and in the final reporting.
4. (OPC) Please present a graphical representation (and/or narrative) that shows the impact on EE potential due to known and expected "opt-out customers" by service territory and general rate class (e.g., commercial and industrial). PSC Staff may be able to provide the latter estimated number if necessary.
   - AEG will include these results in our next version of the results and in the final reporting.
5. (OPC) Please provide any and all updates to the commercial and industrial sector based on the inclusion of the carryover projects from Cycle I—particularly in regards to lighting.

- AEG has implicitly accounted for pre-2019 accomplishments with a top-down adjustment as follows:
    - Modify residential baseline purchase shares to have RAP levels of adoption for 2016-2018 in Lighting, Heating, and Cooling, the major areas of MEEIA and KEEIA savings.
    - Modify C&I baseline purchase shares to have RAP levels of adoption for 2016-2018 in Lighting.
    - Modify C&I baseline saturation for Strategic Energy Management and Retrocommissioning efforts upward by 10%.

  The carryover impacts from Cycle 1 are not significant relative to the total DSM portfolio over the 20 year time horizon of the study such that they need to be accounted for in explicit detail. The above calibration is deemed to be an appropriate level of precision, considering that the initial conditions of the model must necessarily embed a level of uncertainty and flexibility in order to integrate many disparate data elements with different time stamps (such as: base year and customer data from 2015, market research and saturation studies from 2016, etc) and project analysis results that do not start until 2019.

6. (PSC STAFF) requested information on quantifying naturally occurring energy efficiency.
    - AEG will add a new sensitivity case for "Minimum Codes & Standards Only" in the model. The delta between this new case and the Reference Baseline Projection will represent naturally occurring EE. AEG will include these results in our next version of the results and in the final reporting.

DEMAND RESPONSE AND DEMAND-SIDE RATES POTENTIAL:

7. (OPC) Please provide any and all known examples of an IOU's residential customer charge set at $21.88 (or a similar high value) where an inclining block rate is also in place.
    - There is a wide range of residential monthly customer fixed charges around the nation that are determined through detailed rate cases that consider each utility's unique circumstances.

      Recently, "Utilities in at least 24 states have requested higher fees, according to the Environmental Law & Policy Center in Chicago."[1] Among those with current or planned fixed customer charges at $20 or more are: Connecticut Light & Power[2], Omaha Public Power District,[3] Central Hudson Gas & Electric, Rochester Gas and Electric, Modesto Irrigation District, and Rocky Mountain Power.[4]

      When Brattle designed the Inclining Block Rate for this potential study, Kansas City Power & Light expressed concerns that an Inclining Block Rate without a customer charge more reflective of the fixed costs to serve the customer would be unbalanced, and if suggested through the potential study process, would set an incorrect impact expectation and increase instability for the revenues produced by those rates. Referring to a recent class cost of service study, the additional amount needed to cover a portion of the fixed cost was approximated at $10 as a reasonable, round number; but this would need to be refined in an actual rate case proceeding before further deployment could be considered.

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[1] "As Conservation Cuts Electricity Use, Utilities Turn to Fees" Wall Street Journal, Oct 2015. http://www.wsj.com/articles/as-conservation-cuts-electricity-use-utilities-turn-to-fees-1445297729

[2] Ibid.

[3] "OPPD Board Approves Rate Restructuring Plan & 2016 Budget," Omaha Public Power District website, Dec 2015. http://www.oppd.com/news-resources/news-releases/2015/december/oppd-board-approves-rate-restructuring-plan-2016-budget/

[4] BRATTLE GROUP REPORT ON FIXED CHARGES IN RESIDENTIAL TARIFFS SUBMITTED BY PACIFIC GAS AND ELECTRIC COMPANY FOR WORKSHOP ON NOVEMBER 2, 2016 http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M160/K811/160811075.PDF

It is also worth noting that, as part of the GMO rate case stipulation and agreement, further research and analysis will be conducted under a separate effort regarding rate designs and related matters.

8. (OPC) What would be the impact if the customer charge were set at $11.88 like the rest of the demand-side rate options modeled?

   - The impact in terms of energy savings per customer would be higher, and the impact in terms of rate and revenue risk to the company would also be higher. The Company has expressed concerns that an Inclining Block Rate would not be proposed without reasonable protections that the Company could recover its Commission authorized revenues through its rates.

9. (OPC) Please provide a breakdown of the opt-in assumptions for the demand-side rate options.

   - See assumed participation levels below from slide 63 in the appendix of the 9/19 presentation. These are the participation rates applied in the Standalone case, which are decremented if appropriate according to the participation hierarchy when mutually exclusive program & customer combinations are stacked in the Integrated case.

Option	Program	Steady State Participation Rate	
		RAP	MAP
Residential	DLC Central AC	7.0%	8.0%
Residential	DLC Space Heating	15.0%	22.5%
Residential	DLC Water Heating	15.0%	22.5%
Residential	DLC Smart Thermostats	18.0%	22.0%
Residential	DLC Smart Appliances	5.0%	7.5%
Residential	DLC Room AC	15.0%	22.5%
Residential	Battery Energy Storage	1.0%	1.5%
Residential	DLC Elec Vehicle Charging	20.0%	30.0%
Residential	Time-Of-Use	28.0%	85.0%
Residential	Time-Of-Use w EV	85.0%	100%
Residential	Demand Rate	28.0%	85.0%
Residential	Demand Rate w EV	84.0%	100.0%
Residential	Inclining Block Rate	100.0%	100.0%
Small C&I	DLC Central AC	3.0%	4.5%
Small C&I	DLC Space Heating	3.0%	30.0%
Small C&I	DLC Water Heating	3.0%	4.5%
Small C&I	DLC Smart Thermostats	5.0%	7.5%
Small C&I	Ice Energy Storage	1.5%	2.3%
Small C&I	Battery Energy Storage	1.0%	3.0%
Small C&I	Time-Of-Use	13.0%	74.0%
Small C&I	Real Time Pricing	18.0%	31.0%
Large C&I	Curtail Agreements	20.0%	30.0%
Large C&I	Battery Energy Storage	1.0%	3.0%
Large C&I	Time-Of-Use	13.0%	74.0%
Large C&I	Real Time Pricing	18.0%	31.0%

10. (OPC) Please provide any and all secondary sources that were utilized in the demand-side rate options if applicable (e.g., PG&E, ComEd, etc...).

    - AEG is providing the DR and Rates Input Generator file that contains all the assumptions, details, and source notes by program in the tabs to the right of the file. Please treat this file as confidential, as it is part of AEG's modeling suite and intellectual property.

11. (OPC) What dollar value(s) was assigned for "education and/or administration" for the demand-side rate options?

- AEG is providing the DR and Rates Input Generator file that contains all the assumptions, details, and source notes by program in the tabs to the right of the file. Please treat this file as confidential, as it is part of AEG's modeling suite and intellectual property.

COMBINED HEAT & POWER POTENTIAL:

12. (DED) Please provide a description of how the CHP analysis was done, particularly the economics.

Treatment of the total resource cost (TRC) economic analysis of CHP systems is similar to that of traditional energy efficiency and peak demand measures, but with some added complexity. Significant non-energy costs and benefits must be considered as well as natural gas fuel inputs. The equation below summarizes all benefits and costs currently analyzed in CHP analysis for the KCP&L potential study.

$$TRC\ B/C\ Ratio = \frac{CHP\ Electricity\ Benefits + Displaced\ Boiler\ Benefit + Federal\ Tax\ Credits}{CHP\ System\ Costs + CHP\ Fuel\ Consumption + Utility\ Administration\ Costs}$$

We describe each of the components below. Also note that all streams of annual costs or benefits past the first year are annualized to 2015$ utilizing KCP&L's real discount rate.

CHP Electricity Benefits include the value of the electric energy and peak demand resources that are generated by the CHP system. Both benefits are calculated from an annual stream of impacts over the system's lifetime, utilizing equivalent value streams from KCP&L's avoided cost of energy ($/MWh) and avoided cost of capacity ($/kW) projections over the same lifetime.

Displaced Boiler Benefit refers to the reduction in consumption of a natural gas-fired boiler used for heating or process. This unit is assumed to be preinstalled on-site, and is the recipient of waste heat recovery from the electricity generation process on the analyzed CHP system. These annual natural gas benefits are monetized in a similar process to the CHP Electricity Benefits described above, but utilize wholesale natural gas pricing projections ($/MCF) as the per-unit avoided costs instead. Note that the displaced boiler stream of benefits does not apply to steam turbine systems as these are assumed to capture waste heat from an upstream boiler instead.

Federal Tax Credits are currently available for select CHP and renewable technologies. These are listed as a percent of first year project cost and intended to offset part of the large capital investment required to install the CHP system. Available tax credits are 10% for reciprocating engines, combustion turbines, and microturbines and 30% for fuel cells. No tax credit is available for steam turbine systems. Because AEG modeled this as a benefit in the TRC test, this means the society is defined as the utility plus its ratepayers.

CHP System Costs refer to the incremental measure costs necessary to install and maintain a CHP system. This consists of a first-year capital installation cost and ongoing annual non-fuel O&M costs necessary to keep the CHP system in operation.

CHP Fuel Consumption represents the natural gas supply required to operate onsite CHP generation equipment over its lifetime. These annual natural gas benefits are valued in a similar process to the CHP Electricity and Displaced Boiler Benefits described above, utilizing wholesale natural gas pricing projections ($/MCF). This value is smaller for steam turbines compared to other types of generation since upstream waste heat is used to preheat water in the turbine.

Utility Administration Costs are first year costs which account for time spent by utility program staff for involvement in both implementation and interconnection of the CHP system as well as processing of rebate paperwork.

OTHER CONSIDERATIONS:

13. (OPC) Potential for Commercial and Industrial curtailment contracts. How much could be obtained and at what cost?

- See assumed participation levels in slide 63 of the appendix and in table above. As discussed in the meeting, the MAP case is the highest level of participation that can be expected given KCP&L's customer base, opt-out situation, and cost structure. The customer incentive for Curtailment Agreements is assumed to be $50/kW in RAP and $75/kW in MAP

14. (OPC) Sensitivity analysis that considers a reasonable bandwidth to account for:

- Increased heating and/or cooling degree days;
- Impact due to a stimulated/depressed economy;
- Co-delivery of programs with other utilities;
- The impact on market potential due to changes in rate design (e.g., IBR); and
- Probable environmental compliance scenarios

    - We will be conducting a sensitivity analysis with the CO2 avoided cost which will address the final item regarding environmental compliance.

    The first three items are not in the project scope of work, but we suggest that the range of values provided by the RAP and MAP construct is an adequate sensitivity bandwidth.

    Regarding the impact on potential due to changes in rate design, and interactions among EE, DR, CHP, and DS Rates – we will combine the relevant subset of measures and initiatives from each resource class in the program potential for a consolidated and integrated analysis perspective in the final results and report.

    Even still, there are additional interactions and uncertainties that may come about as a result of this. For example, a home on an inclining block rate may have less usage and therefore lower savings per EE measure; but conversely would be more motivated to participate in EE programs due to the rate structure. These effects may even cancel each other out, making it a moot point. Rather than try to explicitly deal with them - in a way that would be complex and uncertain - we suggest that they are also adequately dealt with in the range of values provided by the RAP and MAP construct.

15. (DED) asked for definition of and data on low income customers.

- AEG defined low income customers as those with an annual household income less than $30,000. This is based on the eligibility for KCP&L's Income-Eligible Weatherization Program, which is about 200% of the Federal Poverty Income Guideline (see table below). Our average home from the survey had 2.2 people per home so we rounded down to $30,000 since that was the closest $10,000 increment in the survey question. AEG has already provided the raw survey data to stakeholders, so more data and detail is available there as needed.

Family Size	Federal Poverty Level Guideline Income per Year	Federal Poverty Level Guideline Income per Month
1	$23,760	$1,980
2	$32,040	$2,670
3	$40,320	$3,360
4	$48,600	$4,050
5	$56,880	$4,740
6	$65,160	$5,430
7	$73,460	$6,122
8	$81,780	$6,815