

**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI**

In the Matter of Kansas City Power & Light            )  
Company’s Request for Authority to Implement        )  
A General Rate Increase for Electric Service        )        **Case No. ER-2018-0145**

In the Matter of KCP&L Greater Missouri            )  
Operations Company’s Request for Authorization to    )  
Implement A General Rate Increase for Electric        )  
Service    )        **Case No. ER-2018-0146**

**NOTICE**

COME NOW Kansas City Power & Light Company (“KCP&L”) and KCP&L Greater Missouri Operations Company (“GMO”) (collectively, the “Company”) and respectfully state as follows to the Missouri Public Service Commission (“Commission”):

1. On September 25, 2018, the Company filed a *Non-Unanimous Stipulation and Agreement Concerning Rate Design Issues* (“Rate Design-TOU Stipulation”) which included an agreement between the Company, Staff, the Office of the Public Counsel (“OPC”), Missouri Division of Energy (“DE”), and Renew Missouri Advocates (“Renew MO”) (collectively, the “Signatories”) on Time of Use (“TOU”) rates.<sup>1</sup>

2. On October 31, 2018, the Commission issued its *Order Approving Stipulations and Agreements* (“Order”) which approved the various settlements between the Signatories in these dockets, including the Rate Design-TOU Stipulation referenced above.

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<sup>1</sup> “e. When completed the Company will submit to the Commission the following documents on an ongoing basis: Customer research plan, business case for shadow billing, marketing and education plan, EM&V plan, Customer Feedback Mechanism, Customer Behavior Metrics, EM&V interim and final results and documentation shared at each stakeholder meeting.” See Rate Design-TOU Stipulation, p. 6, Section 2(e).

3. Pursuant to the provisions of the Rate Design-TOU Stipulation the Company is filing the attached *Missouri Stakeholder Meeting Residential Time of Use* (presented on February 27, 2019) and designated as **Exhibit A**.

WHEREFORE, the Company respectfully request the Commission take notice of the attached.

Respectfully submitted,

*/s/ Robert J. Hack*

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**ATTORNEYS FOR KANSAS CITY  
POWER & LIGHT COMPANY AND  
KCP&L GREATER MISSOURI  
OPERATIONS COMPANY**

**CERTIFICATE OF SERVICE**

I hereby certify that copies of the foregoing have been mailed, hand-delivered, transmitted by facsimile or electronically mailed to all counsel of record this 12<sup>th</sup> day of March 2019.

***Roger W. Steiner***

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Roger W. Steiner

# Missouri Stakeholder Meeting Residential Time of Use

*February 27, 2019*



# ***Safety Moment***

# Spring Safety

## Risk: Expensive and/or Harmful Equipment Failures

- Expensive equipment failures and/or other risks can occur when systems are not properly maintained

## AC Safety

- Get an AC tune-up 2x/year, it's as important as routine maintenance on your car
- Clean build up in and around your AC that can occur through winter
  - This should come as part of regular Tune-Up

### Spring is around the corner

Get your AC tuned up and ready for warmer weather





Getting an AC tune-up can help make sure it's running properly and efficiently, similar to how routine maintenance keeps your car at peak performance. Tune-ups can help prevent expensive equipment failures, while also cleaning out dust, mold, pollen and even bugs that can build up over the winter.

Plus, ACs that haven't been prepared for summer can cause unusual humidity changes, and older systems are at risk of rusting, leaking carbon monoxide, or worse, catching fire. Save time and money by making sure your system is operating at its best.

# Agenda



Evaluation, Measurement, and Verification (EM&V) Plan

 Draft  
 Other

Online Rate Analysis Tool Demo

Q1 2019 TOU Focus Groups – Key Findings

Next Steps

General Discussion + Action Item Summary

# *EM&V Plan Draft*



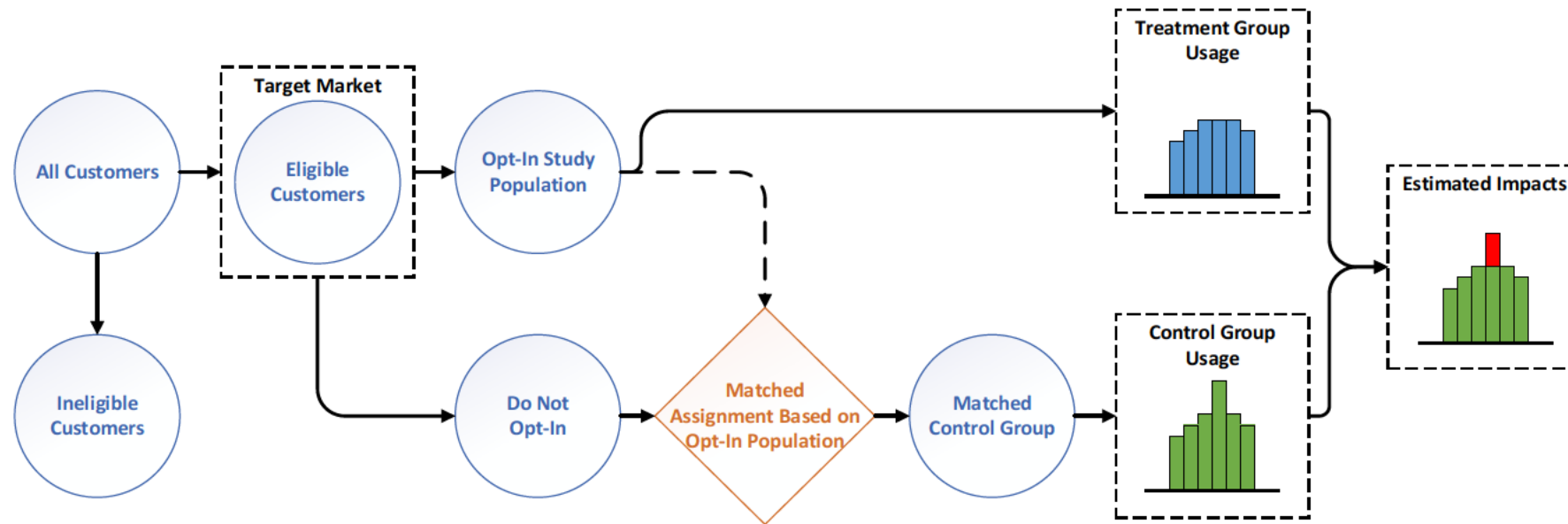
# *EM&V Introduction*

**M&V activities will assess key **Customer Behavior Metrics** and analyze customer research information to achieve the following objectives:**

- Assess how various customer groups within the Residential class change their consumption behavior in response to the TOU rate
- Attempt to understand, with statistical significance, how the TOU rate affects identified population segments
- Analyze how impacts may differ depending on household characteristics, demographics, and end use technologies and how these characteristics potentially impact the efficacy of the TOU rate
- Quantify the relative impacts of the TOU rate on customers' bills and the Company's revenue recovery
- Assess customer satisfaction, retention, customer preferences, attitudes, understanding and drivers for participation, as well as customer acceptance of the TOU rate

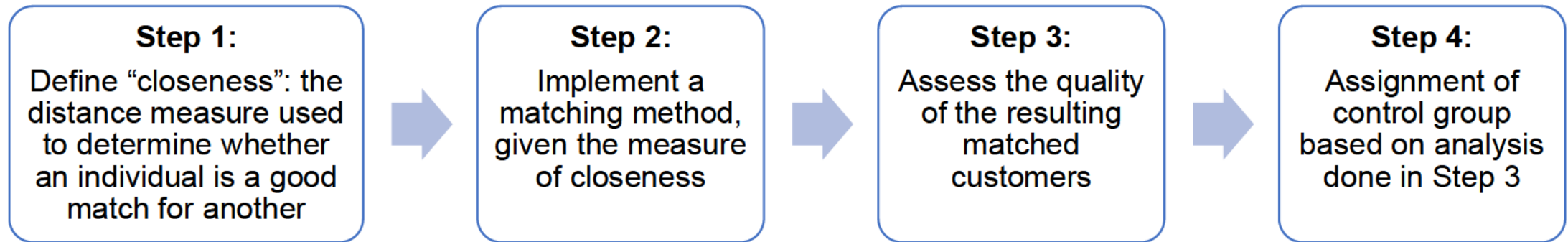
# *Experimental Design and Sample Analysis*

# Experimental Design



- Opt-In Recruitment with Quasi-Experimental Matched Control Group
- All eligible customers will be able to enroll and participate on the TOU rate
- The control group will be made up of non-participants that are matched with participants using pre-enrollment consumption data

# Control Group Matching

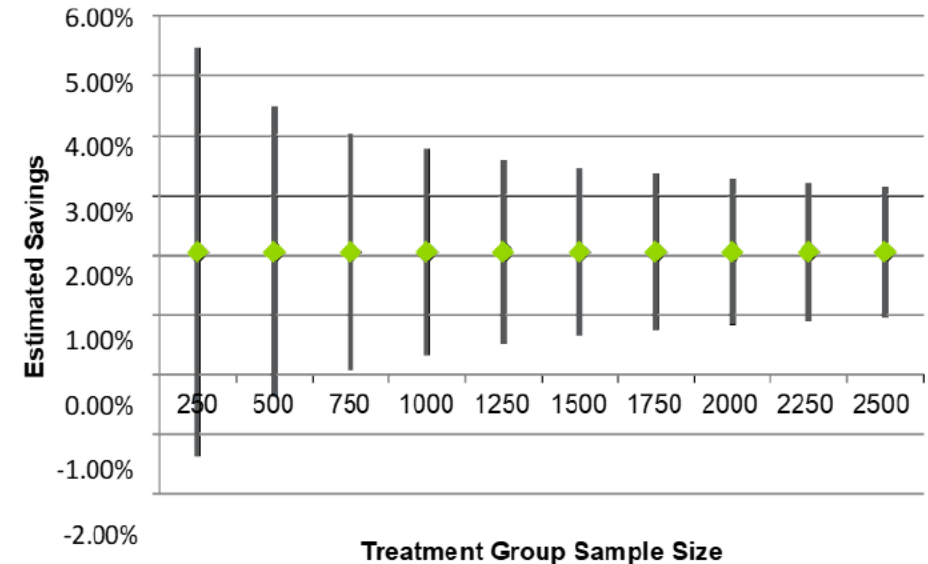


- The initial definition of closeness will be the mean squared difference in energy consumption over a 12-month period from 15 months to 3 months prior to enrollment.
- After the initial matches have been calculated, the quality of the matches will be assessed using the consumption data for the 3 months preceding enrollment.
- The testing period ensures that the matches persist outside of the months used in matching and can be reasonably believed to be unbiased after enrollment.
- Matches that are shown to be reasonably unbiased in the 3 months prior to enrollment will be the final control group assignments.

# Power Analysis

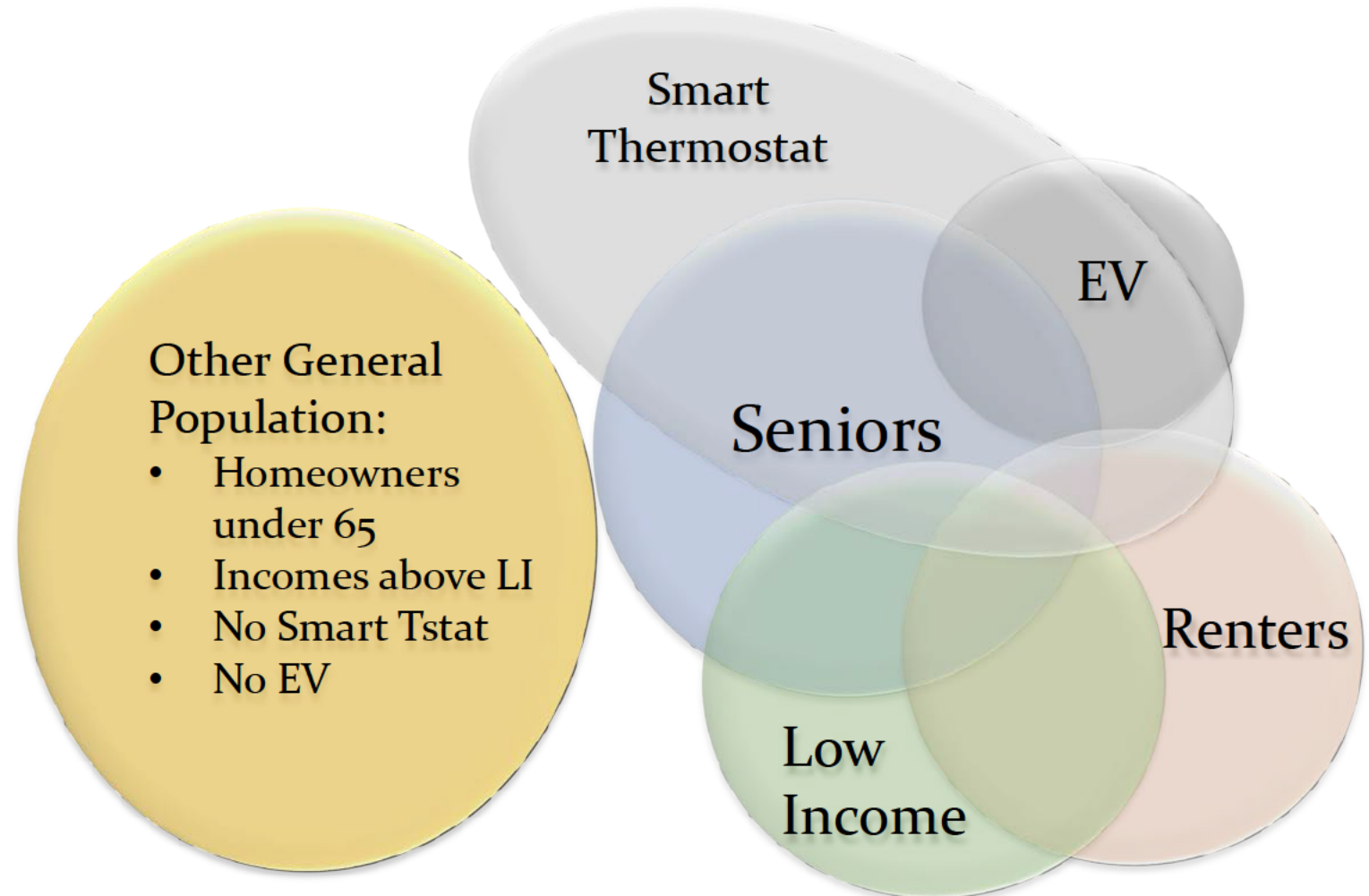


- To assess whether it is likely to find statistically significant savings from regression analysis, Navigant utilizes a statistical technique called power analysis.
- A power analysis uses an estimate of rate impacts and the variance in consumption to predict the confidence bound that will be found with a given sample size.
- When the confidence bound (indicated by the gray vertical lines in the figure) includes zero, it means that the estimate of impacts is not statistically significant (different than zero).
- Power analysis will estimate the necessary number of participants (overall and within segments) to achieve statistically significant impact estimates with a regression analysis.



# Customer Segmentation

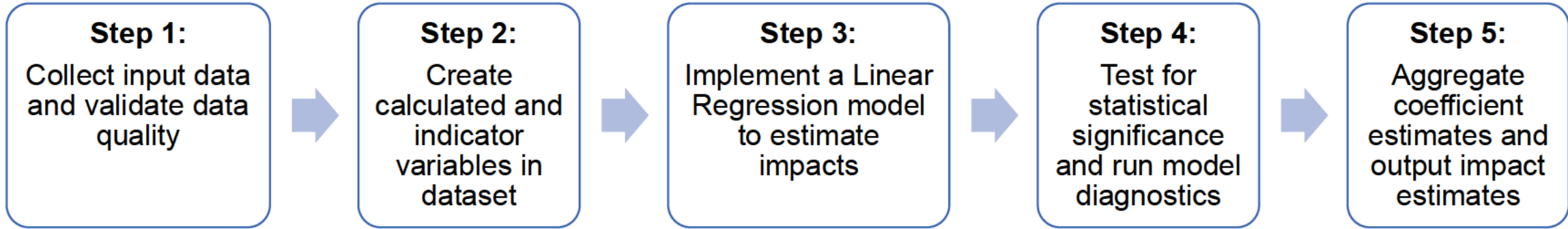
- Customer segments represent factors that influence a customer's perspective on energy.
- Individual customers represent a combination of characteristics.
- Rate study participants can provide insights into the impacts on more than one segment they represent.



# *Impact Analysis*



# Impact Analysis



- The independent variables investigated in regression analysis are as follows:
  - Pricing periods (on-peak, off-peak, and super off-peak)
  - Weather (cooling degree hours and heating degree hours)
  - Season, month, and day of week
  - Customer segment characteristics (including household characteristics, demographics, and end use technologies)
- Illustrative regression model specification:

$$kWh_{it} = \beta_S Seasonal + \beta_{WX} WX + \beta_P Part + \beta_{TP} TimePart + \beta_{CHAR} CHAR + \epsilon_{it}$$

Consumption of customer *i* in period *t*

Seasonal Effects (Month, Day of Week, Holidays, etc.)

Seasonal Effects (Month, Day of Week, Holidays, etc.)

Participant Treatment Effects

Interacted Participant and Pricing Period Effects

Characteristic Effects (Household characteristics, demographics, and end use technologies)

# Impact Analysis



Model Dependent Parameter	Questions
<b>Consumption Impacts (kWh)</b>	<ul style="list-style-type: none"> <li>• Is there an overall conservation effect?</li> <li>• What is the bill impact from changes in consumption?</li> <li>• Do certain customer segments or household characteristics affect conservation?</li> <li>• Does conservation persist and/or change over time?</li> <li>• Are customers shifting consumption from peak to off-peak periods?</li> <li>• How much does peak to off-peak shifting impact billing?</li> <li>• Do certain customer segments or household characteristics affect the ability to shift consumption?</li> <li>• Do shifts in consumption persist and/or change over time?</li> </ul>
<b>Customer Demand Impacts (kW)</b>	<ul style="list-style-type: none"> <li>• Are customers reducing their peak demands (peak period and overall)?</li> <li>• Do certain customer segments or household characteristics affect the ability to reduce demand?</li> <li>• Do peak demand impacts persist and/or change over time?</li> </ul>
<b>Coincident Peak Demand Impacts (kW)</b>	<ul style="list-style-type: none"> <li>• Are customers reducing their demands coincident with the system?</li> <li>• Do the tariffs result in a significant demand impact that is coincident with the system peak?</li> <li>• Are the impacts of certain customer segments or household characteristics more coincident with the system than others?</li> <li>• Do coincident peak demand impacts persist and/or change over time?</li> </ul>

# *Customer Research Analysis and Journey Mapping*

# Customer Research Overview



**Reminder:** Customer Research Plan reviewed with Stakeholders 12/20/2018

**KCP&L Role:** KCP&L to lead and execute Customer Research Plan activities below

**EM&V Role:** Provide guidance/feedback on survey instruments and focus group guides; summarize findings in evaluation report, pair data with impact findings and journey maps, and form process improvement recommendations.

## Objectives:

1. Analyze Customer's peak time usage and behaviors
2. Understand Customer's reaction to the TOU rate offering
3. Identify Customers who are most likely to participate
4. Test Messaging
5. Get Feedback on tools, language, billing, etc.
6. Measure Customer Satisfaction post-enrollment
7. Study Opt-Out Customers
8. Assess Customers who were interested but didn't enroll
9. Monitor Behavior Changes

## Qualitative Approach

- Focus Groups

## Quantitative Approach

- Online Panels
  - KCP&L's Customer Advisory Panel
  - Third-party panels
- Online Survey
  - Randomly Selected KCP&L Customers (with Email Address)
  - Participants/Opt-Outs
- Phone Survey
- Postal Mail Survey

# Customer Research Overview



## TOU Rate

### Customer Research Plan

	2019												2020											
Research Description	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Focus Groups	█																							
Initial Customer Reaction		█																						
Customer Segments			█																					
Customer Tools & Billing							█																	
Post Enrollment										█	█	█	█	█	█	█	█	█	█	█	█	█	█	
Opt-Out										█	█	█	█	█	█	█	█	█	█	█	█	█	█	
Non-Enrollment Follow-up										█	█	█	█	█	█	█	█	█	█	█	█	█	█	
Focus Groups														█										
Behavior Changes																█	█	█	█	█	█	█	█	█

**Notes:**

- January activities complete, February activities in progress
- April, May, June, August and September – team will be applying learnings from the collected data

# Customer Journey Mapping

- **Definition**

- Customer journey mapping is a process of researching and documenting the customer's expectations, strategies, knowledge, actions, interactions and emotions in response to the rate over time

- **Goal**

- Provide important **qualitative** insights about customer expectations, preferences, attitudes, and understanding of the TOU rate and processes

- **Activities – 2 Journey Maps**

- 1 now to inform and document process design
- 1 in 2020/2021 to evaluate customers' journeys through processes and on the rate and learn new opportunities for improvement

## Example Journey Map of KCP&L Thermostat Program

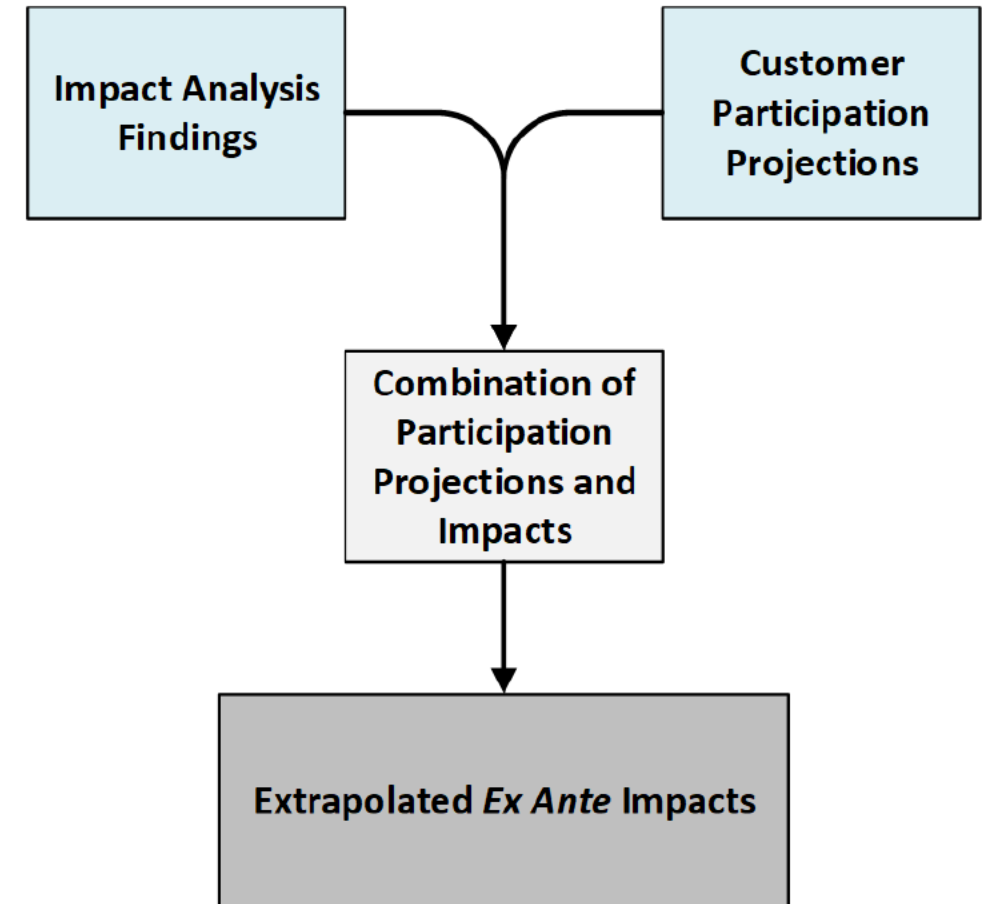


# *Rate Impact Extrapolation*



# Rate Impact Extrapolation

- **Goal:** At the conclusion of the study, develop an understanding of what the impacts would be as the number of participants increases and customer segments evolve.
- Extrapolating results from the tested TOU rate will depend on three main factors:
  - **Sample Representativeness.** The degree to which the participants exhibit characteristics that are represented within the broader customer base
  - **Customer Information.** The information available to characterize the makeup of the broader customer base with regards to characteristics that affect the impact of the rate and likelihood of enrollment
  - **Tariff Modifications.** Degree to which the TOU rate is modified following the study
- Analysis will provide Ex Ante estimates (forecasted) of expanded opt-in participation and impacts on demand, energy consumption, and revenue.





# *EM&V Budget*

# EM&V Budget



## Estimated Budget by Task

Task	Total
Task 1: Project Preparation and Initiation	
Task 2: Experimental Design and Sample Management	
Task 3: Customer Research Analysis and Journey Mapping	
Task 4: Impact Analysis	
Task 5: Reporting	
Task 6: Stakeholder Engagement	
Task 7: Opt-in TOU Extrapolation	
<b>TOTAL</b>	

Note: This is an estimated not-to-exceed budget

# *Online Rate Analysis Tool Demo*

# *Q1 2019 TOU Focus Groups – Key Findings*

# ***TOU Focus Groups***

***January 29-31, 2019***

# TOU Focus Groups

**Objective:** Understand peak usage behaviors and initial customer reactions to the TOU rate.

## Six Customer Groups

1. With Kids
2. No Kids
3. EV Owners
4. Low-Income
5. Elderly
6. Elderly - Fixed Income



# Peak Usage Periods










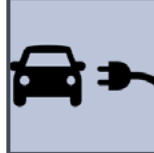
## Peak Period Usage (4-8pm)

- ✓ The different consumer groups had different **capabilities** to make behavior/usage changes:
  - ✓ **Elderly.** Many elderly are home all day and **could conceivably shift** electrical usage earlier in the day, although they are very resistant to change.
  - ✓ **Low-Income.** This group is doing the most already to reduce usage. They set the thermostat to “savings” or completely turn it off more often, leave fewer lights on in the house, and try to cut back on appliance use. They are less likely to have a dishwasher and dryer than higher-income HHs. Many live in smaller houses or apartments. This group is very interested in finding more changes to make, but **may have less electrical usage to shift or reduce.**
  - ✓ **Families – kids under 18.** This group has kid activities that must happen between 4-8pm due to school and bedtime schedules: homework, dinner, baths, afterschool TV/gaming/charging. Many parents are trying to do laundry that is needed for the next day. With more people in the house, it will be harder to get compliance from all family members. Families with kids under 18 would have a **very hard time making changes** to their electrical usage.
  - ✓ **Working Adult Households (HHs).** All-adult HHs are smaller so have fewer members who are using peak time electricity. Many said that their schedule is flexible or that *their* peak time is later in the evening already. This is the group that is **best suited to make changes** to their schedule to accommodate the TOU rate plan.
  - ✓ **EV Owners.** While some EV owners charge their cars at work, many are charging them at home and **could easily make use of their timers to schedule charging during the low rate night time hours** of 12-6am. Those with cars that have a small battery were more likely to say that they wouldn’t want to leave their battery on low until midnight. Those with high capacity batteries were already scheduling their charging for the later, non-peak, hours.

# Behavior Changes

## What Activities Could You Shift or Change?

*Shifting dishwasher later and laundry to another time were the most frequent suggestions by customers*

<p><b>Run Dishwasher later</b></p>  <p>Easy, low effort</p> <p>Load it, but turn it on later, or right before bedtime</p> <p>A few would program it (although only one person does this currently)</p> <p><b>Pain:</b> low</p>	<p><b>Do laundry some other time</b></p>  <p>Easy for most</p> <p>Would shift to another time of weekday or to the weekend</p> <p><b>Pain:</b> Some don't like leaving laundry in machine; <b>Pain:</b> don't like to leave house with dryer on; <b>Pain:</b> some like to complete in one day</p>	<p><b>Turn out some Lights</b></p>  <p>Already try to do this</p> <p><b>Pain:</b> Takes some effort to remind/convince other family members</p>	<p><b>Thermostat to "Savings"</b></p>  <p>Possible</p> <p><b>Pain:</b> Causes discomfort; <b>Pain:</b> source of family disagreement; <b>Pain:</b> must dress accordingly; <b>Pain:</b> requires daily action unless it's programmed</p>	<p><b>Bathe some other time</b></p>  <p>Possible</p> <p><b>Pain:</b> Usually children taking baths/showers between 4-8 pm.</p>	<p><b>Reduce TV and Gaming</b></p>  <p>Possible</p> <p><b>Pain:</b> Monitoring children</p>	<p><b>Cook some other time</b></p>  <p>Possible</p> <p>Could cook on weekends – "meal prep"</p> <p>Could cook in crockpot during other hours</p> <p><b>Pain:</b> Takes a lot of planning</p>	<p><b>Charge car later at night</b></p>  <p>Easy to schedule</p> <p>Gets car warm for the morning drive</p> <p><b>Pain:</b> If battery is low, prefer to charge asap</p>
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# Reaction to TOU Rate plan



If I can save money, I'm in!

My wife would never let me turn up the thermostat

This is too hard to figure out...all these different rates

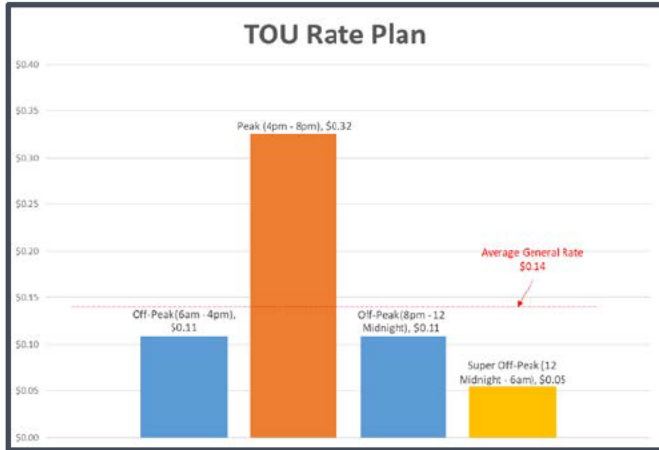
- ✓ **Most respondents were interested in learning more** after hearing about the **idea** of the TOU Rate Plan. They were excited about the ability to save money on their electric bill by shifting some of their electric activities away from the 4-8pm peak hours. The **Elderly groups** (fixed and no-fixed income) **were more wary about the idea** of the new rate plan.
- ✓ After seeing the visual where the peak period was **32¢** (vs. 14¢ with the current rate), **some became much less interested**. These respondents didn't feel that they could ever make up the loss from being charged 32¢ during peak hours.
  - ✓ 2 of the 6 groups were shown a visual where the 32¢ rate visually appeared to apply to ¼ of all days, and the other 4 groups saw a visual where the 32¢ rate appeared to apply to 1/6 of only weekdays. The first visual drew a much more negative reaction.
- ✓ The **appeal** of the TOU Rate is that HHs could potentially **save money** on their KCP&L bill. After going through the exercise of determining which things could be shifted in their HH, most had some ideas for things they could do to reduce usage during the 4-8pm weekdays.
- ✓ There were several **questions and hesitations** about the TOU rate plan:
  - ✓ I might end up paying more - top concern
  - ✓ It's not worth the discomfort for small savings – top concern
  - ✓ My HH can't change their behaviors or change *enough* of their behaviors
  - ✓ Suspicious of KCP&L Motivations/Intentions
  - ✓ Too complicated to figure out if savings are possible
  - ✓ Will I regret switching plans? Will I be able to unenroll? Will I even know if I'm losing money? Are there guarantees? What if my circumstances change? What if I can't sustain my changes? Will there be a different peak time after this rate plan is enacted?
  - ✓ My HH members won't change their behavior

It will cost me more

I'm not going to sweat everyday to save \$10

KCP&L is just trying to get rich off me

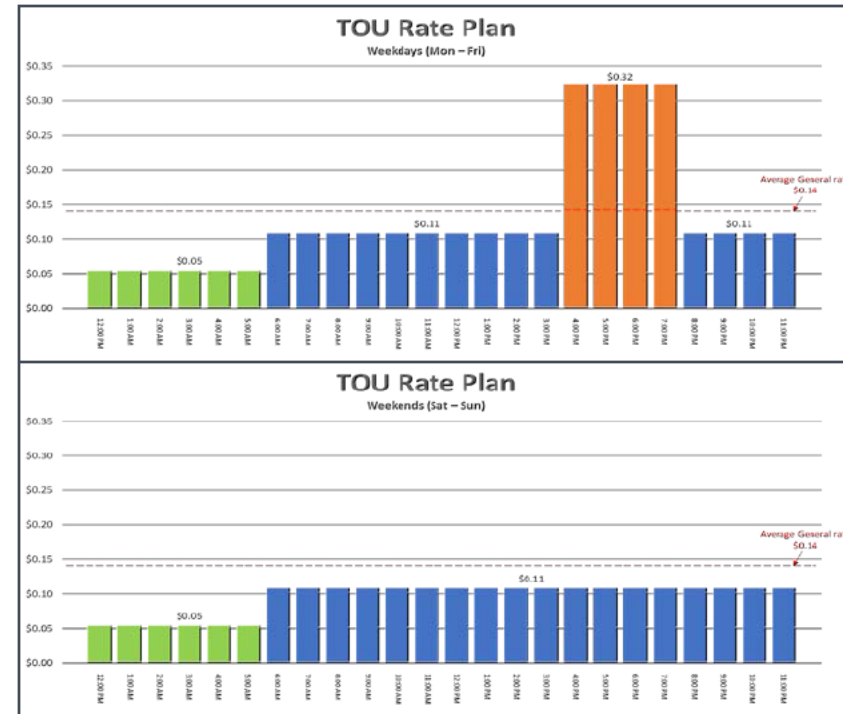
# TOU Rate Charts



- Initial Stimuli: TOU peak rate looks like it lasts ¼ of each day
- No one who saw this visual was “very interested” in the TOU rate plan

## Visual Influenced Reaction

- Very different reaction to TOU rate plan when peak rate looks like it lasts for ¼ of each day vs 1/6 of each weekday.
- The 32¢ peak rate is more than double the average flat rate. Some said that 32¢ seems more punitive than encouraging. A few suggested that 20¢ would seem more reasonable
  - Hypothesis: Some pointed out that the off-peak rate was only 3¢ lower than the average flat rate. If the average flat rate had been shown higher, the total TOU Rate Plan would have probably seemed more palatable.
- Interestingly, the 5 cent nighttime rate did not motivate many to suggest moving usage to nighttime.



- Revised Stimuli: TOU peak rate looks like it lasts 1/6 of each weekday or for 4 hours/day
- 18 of 22 who saw this were “very interested” in the TOU rate plan

# Customer Interest



**Elderly Fixed & Non-Fixed Income**

**Very Suspicious**

Most are willing to read data showing the benefits and may be late adopters after others try it out

Able to make shifts and many already have peak usage during the daytime hours

*It's just a way to get a rate increase without having a rate increase. – Elderly Fixed*

*I don't think it would effect my bill personally that much one way or the other. – Elderly Fixed*



**Families with kids under 18**

**Willing, but Schedules Inflexible**

Willing to try things to reduce bill, but have trouble finding ways to reschedule their HH

Possible to reschedule dishwasher and clothes washing

Hard to convince kids & spouse to shift usage

*There's really not a lot that we can adjust there.*

*If I just told them, do certain things at certain times, I don't know if that would help.*



**Low Income HHs**

**Willing, but May Already be Doing Everything They Can**

Currently making many sacrifices in comfort

Open to information on how to reduce electrical bill

*I will adjust my thermostat before I leave, then when I get home I'll just turn it back up. I try to remember that everyday, every time I'm leaving.*

*I use the dishwasher, try to use it just once a week. Laundry at the most twice a week.*



**Working Adult HHs**

**Open to Change**

Flexible schedules

Have time to investigate and understand how rate works and how it can work for them

Single or dual HHs mean fewer people who need to adapt

*Me and my wife, we're retired. Yes, we could move it earlier.*

*I do most of the stuff between eight and midnight, but sometimes we'll do things between four and eight and I could just move them.*



**Electric Vehicle Owners**

**Many Think They'd Benefit from the Rate**

5 of 8 already charge their car during off-peak (or outside the house). Others would be willing to change charging.

Those who charge at home thought they'd save money just by charging during the 5C rate time period.

Those who charge at work were not sure they'd benefit.

Very interested in the science of using electricity differently (to save money). Would use charts, apps, interactive tools.

*[TOU] gives those of us who pay attention to this stuff a little more control.*

# Reaction to TOU Rate Plan



- ✓ After hearing about the **idea and also seeing the actual visuals** of rate plans, **almost all except the elderly were very interested** in the TOU Rate Plan. The interested consumers were motivated by the ability to make changes that would lower their KCP&L bill.
  - ✓ The two **elderly groups** (both fixed and non-fixed income) are **very hesitant** to adopt the TOU rate plan. They were hesitant to change, worried about whether they would be stuck paying more, and suspicious of KCP&L's motivations. However, the elderly respondents seem to have the same or greater capacity to shift behaviors as other adult HH customers and may be willing to change after other early adopters show that the rate plan can be beneficial.
  
- ✓ Respondents were asked the perceived benefits of TOU to both the consumer and to KCP&L:
  - ✓ All agreed that the **benefit to the consumer** was to **save money** by helping KCP&L reduce peak electricity demand. When probed, a few consumers suggested that the new rate would mean **fewer power outages** for Kansas Citians.
  - ✓ Most felt that **KCP&L was going to profit** from the new rate – *“Why would they offer it otherwise?” “They would save money.” They would capitalize off of peak time.”*
  - ✓ When probed, a few consumers felt that KCP&L would have to **build fewer power plants, saving money**; and a few suggested that by building fewer power plants, the **cost savings would be passed on** to Kansas Citians.
  
- ✓ Respondents offered lots of **ideas for tools and information** that would help them make a decision about whether to switch to TOU. Most frequently suggested:
  - ✓ **Data by HH** that shows 1) costs under current rate, 2) costs under TOU rate, 3) costs under TOU with electricity usage changes
  - ✓ **A way to self-monitor** electrical usage as frequently as daily
  - ✓ Information about the **impact of behavior changes** on monthly bill

# Recommendations



- ✓ **Target these HHs:**
  - ✓ **Adult working HHs**, especially those with incomes above \$40K and adults under age 65. These are the HHs with the most flexibility.
  - ✓ **HHs with EV owners**, particularly those that charge their cars at home.
  - ✓ Any HHs where the rate plan will give automatic savings without any behavior changes.
  
- ✓ During the launch, message and communication will be important:
  - ✓ Be **clear and upfront about the reasons why** KCP&L is offering the rate and that the cost of not changing behavior will be passed on to consumers.
  - ✓ Understand that the **primary consumer motivation** is to **reduce** their monthly KCP&L bill and market to this need.
  - ✓ Offer a way to **unenroll from the rate or guarantee** a reduced bill.
  
- ✓ Arm consumers with tools to help them:
  - ✓ **Make an informed decision** about whether the TOU rate plan will work for them
  - ✓ **Monitor** their usage daily and progress on the rate
  - ✓ **Understand how their behavior affects their electricity usage** and subsequent bill.
  
- ✓ **Long term**, KCP&L should plan to **market the rate plan to the Elderly**. Elderly HHs have the **capability to shift behavior**. A campaign to Elderly HHs should focus on 1) the reasons KCP&L is offering the plan, 2) success testimonials from happy early adopters, and 3) the ability to unenroll if dissatisfied.



# Next Steps



Begin EM&V Plan

Continue Customer Research Plan

Continue other TOU activities (technical work, etc.)

Next meeting: Marketing and Education Plan Review

File Today's Presentation With The Commission

# *General Discussion + Summary*