Exhibit No.:	
Issue:	Rate design studies and rate case commitments, Rate Modernization Plan, Benefits of Advanced Metering Infrastructure, Transportation Electrification, Emergency Energy Conservation Plan, Lighting, Solar Subscription
Witness:	Bradley D. Lutz
Type of Exhibit:	Direct Testimony
Sponsoring Party:	Evergy Missouri Metro
Case No.:	ER-2022-0129
Date Testimony Prepared:	January 7, 2022

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO.: ER-2022-0129

DIRECT TESTIMONY

OF

BRADLEY D. LUTZ

ON BEHALF OF

EVERGY MISSOURI METRO

Kansas City, Missouri
January 2022

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DIRECT TESTIMONY

OF

BRADLEY D. LUTZ

Case No. ER-2022-0129

Q: Please state your name and business address.

A: My name is Bradley D. Lutz. My business address is 1200 Main, Kansas City, Missouri 64105.

Q: By whom and in what capacity are you employed?

A: I am employed by Evergy Metro, Inc. I serve as Director, Regulatory Affairs for Evergy Metro, Inc. d/b/a as Evergy Missouri Metro ("Evergy Missouri Metro"), Evergy Missouri West, Inc. d/b/a Evergy Missouri West ("Evergy Missouri West"), Evergy Metro, Inc. d/b/a Evergy Kansas Metro ("Evergy Kansas Metro"), and Evergy Kansas Central, Inc. and Evergy South, Inc., collectively d/b/a as Evergy Kansas Central ("Evergy Kansas Central") the operating utilities of Evergy, Inc.

Q: On whose behalf are you testifying?

A: I am testifying on behalf of Evergy Missouri Metro.

Q: What are your responsibilities?

A: My current responsibilities are focused on rates, regulatory operations and customer issues, providing support and oversight for a wide range of regulatory work including determination of retail revenues, load analysis, rate design, class cost of service, tariff administration, compliance reporting, response to customer complaints, docket management system administration, general tariff administration, and relationship

development for the Company's regulatory activities in the Missouri and Kansas jurisdictions.

Q: Please describe your education, experience and employment history.

A: I hold a Master of Business Administration from Northwest Missouri State University and a Bachelor of Science degree in Engineering Technology from Missouri Western State University.

I joined Evergy, then Kansas City Power & Light, in August 2002 as an Auditor in the Audit Services Department. I moved to the Company's Regulatory Affairs group in September 2005 as a Regulatory Analyst where my primary responsibilities included support of our rate design and class cost of service efforts. I was promoted to Manager in November 2010 and was promoted to my current position in March 2020.

Prior to joining Evergy, I was employed by the St. Joseph Frontier Casino for two years as Information Technology Manager. Prior to St. Joseph Frontier Casino, I was employed by St. Joseph Light and Power Company for nearly 14 years. I held various technical positions at St. Joseph Light and Power Company, including Engineering Technician-Distribution, Automated Mapping/Facilities Management Coordinator, and my final position as Senior Client Support Specialist-Information Technology.

Q: Have you previously testified in a proceeding before the Missouri Public Service Commission ("Commission" or "MPSC") or before any other utility regulatory agency?

A: Yes, I have testified multiple times before the Commission concerning tariff, class cost of service and rate design topics as part of various recent proceedings. Additionally, I have testified multiple times before the Kansas Corporation Commission.

Q: What is the purpose of your testimony?

A: I will address the following topics in my testimony:

I. Rate Design Studies and Rate Case Commitments

II. Rate Modernization Plan

III. Benefits of Advanced Metering Infrastructure

IV. Transportation Electrification

V. Emergency Energy Conservation Plan

VI. Lighting

VII. Solar Subscription

I. RATE DESIGN STUDIES & RATE CASE COMMITMENTS UPDATE

Q: Rate Design Studies were ordered in the 2018 Evergy Missouri Metro rate case. Can you explain what was ordered?

A: Yes. In the Company's last rate case ("ER-2018-0145"), there were several rate design studies and commitments made over four Stipulation & Agreements ("S&A's"). A full listing can be found in Table 1-Rate Case Commitments below. In the S&A filed on September 19, 2018 (pgs. 9-10), it included the following:

*"16. **CONSOLIDATION STUDY***

The Company will perform a study investigating the consolidation of KCP&L and GMO rates and will make a recommendation regarding consolidation of rates in these dockets within two years of the date of approval of this Stipulation. KCP&L and GMO will provide quarterly stakeholder updates concerning the study.

17. ***CUSTOMER BILLS***

The Company will work with stakeholders regarding customer bill presentation. The Company will meet to obtain stakeholder input no later than six months after the effective date of the tariff sheets approved by the Commission in these cases. The Company expects the new bill presentation to occur within 24 months from effective date of rates in these cases.

The Company commits to include a description of FAC, RESRAM, and DSIM in bills to customers at least annually. The Company shall send draft language to Staff, OPC, and DE prior to sending to its customers.

18. ***CUSTOMER PRIVACY***

The Company will adopt the Green Button platform no later than the second half of 2020.

The Company commits to producing a privacy policy statement and frequently asked questions ("FAQ") website section for customers regarding use of customer data. The Company will receive input from OPC, Staff, and DE on the privacy policy statement and FAQs. The Company will hold annual meetings with Staff, OPC, and DE regarding the results of third party privacy impact assessments. The meetings and any material discussed at the meetings may be designated as confidential by the Company."

Q: What is the status of these three studies or commitments?

A: All of the commitments have been met and completed.

1. Consolidation Study

In compliance with the Commission Order, the study was completed and filed on October 30, 2020, in File Nos. ER-2018-0145/0146 and explored topics and details that would be necessary for various levels of rate consolidation. The study focused on the combination of the Evergy Missouri Metro and Evergy Missouri West jurisdiction's rates and costs for rate making purposes. To better ensure success given the interrelated or shared nature of some costs between Evergy Missouri Metro and Evergy Kansas Metro, we explain important considerations as we explore the feasibility and ease of consolidation of rates between Evergy Missouri Metro and Evergy Missouri West. To the extent possible, the Company utilized learnings from past consolidations, including the 2012 Westar rate consolidation and the 2016 Greater Missouri Operations Company ("GMO") rate consolidation, as well as leveraged data and information gathered as part of their 2018 rate case in order to maximize efficiency and allow for utilization of in-house personnel, as preferred by the Commission and parties of this study. The objective of the study was to outline the current state of operations, costs, and rates, as well as the potential obstacles with immediate rate consolidation given the current state, and finally, the steps recommended to consolidate rates properly (leveraging past learnings) with a possible execution timeline. The timing and pace for consolidation was determined based on customer impact. Much of the plan outlined in that Consolidation study has been put in motion in this rate case, starting with the elimination of grandfathered rates, rate clean up, and cross jurisdictional alignment.

For the results of the study and how those learnings informed this rate case filing, see the Direct testimony of Company witness, Marisol Miller.

2. Customer Bills

The Company completed a bill redesign shortly after the completion of the merger forming Evergy. During the rebranding that followed the merger, the Company shared plans with Staff and OPC on June 5, 2019, addressing concerns parties had raised about having better clarity on the bill for a customer's rate jurisdiction. This commitment is complete.

Concerning the description of FAC, RESRAM, and DSIM in bills to customers, the Company worked jointly with Staff and OPC in late 2020 to establish the description document, a bill insert suitable for ongoing communications to customers. Going forward the insert is scheduled to be sent to customers each March with a draft shared prior to distribution. This commitment is complete and ongoing.

3. Customer Privacy

The Company held multiple meetings with of Staff, OPC, and the Division of Energy to discuss this commitment in late 2019 and early 2020. Each of the components of the commitment (Green Button data access, Privacy Policy, and Privacy Impact Assessments) was addressed in the meetings. This commitment is complete and ongoing.

Concerning Green Button, the deployment of this standard has required considerable planning, particularly since the deployment would include integration with protected Company data systems and account portal applications managed in part by third-party vendors. Given the structure of the account portal applications, the Green Button deployment took two paths, one for residential and smaller commercial & industrial

customers and one for large commercial & industrial customers. Access to data through the Green Button standard was enabled in Fall 2020 for residential and smaller commercial & industrial customers, accounting for approximately 96% of Evergy customers. Green Button access for large commercial & industrial customers, approximately 4% of customers, is pending. Deployment for large commercial & industrial customers will be completed as part of the Company's deployment of new account portal software. This new software will allow more account control, data access, and general functionality for all customers. As this new software environment is deployed, Green Button functionality will be included. Under the current plans the new software will be deployed for residential and smaller commercial & industrial customers first, with large commercial & industrial customers deployed later. During the interim, large commercial & industrial customers have the ability to directly download billing data or may request more detailed metering data from Company Customer Support representatives assigned to them. This commitment is ongoing.

Concerning the Privacy Policy, the Company shared the existing privacy policy and edits were discussed. This included revisions to the privacy policy frequently asked questions. After several iterations, a new privacy policy was posted to the Company website and made effective in April 2020. This commitment is complete.

Concerning the Privacy Impact Assessment, the Company has conducted an annual third-party privacy assessment and scheduled meetings to discuss its results with Staff, OPC and Division of Energy each December of 2019 2020, and 2021. This commitment is ongoing.

Q: Were there any rate design studies or rate or customer related commitments included in the S&A dated September 21, 2018?

A: No.

Q: Were there any rate design studies or rate or customer related commitments included in the S&A dated September 25, 2018?

A: Yes. The S&A(pg.7) included the following language:

"i. By June 30, 2020, KCP&L will file a rate design case limited to TOU issues. For GMO, signatories further agree the September 20, 2016 Non-Unanimous Stipulation and Agreement in ER-2016-0156 will be expanded to include TOU, with the TOU rate design case to commence by June 30, 2020.

j. KCP&L and GMO will submit a Residential TOU rate design in their next rate cases based on lessons learned from the TOU service."

Pgs. 11-19 outlined the following:

"*6. **REAL TIME PRICING & TWO PART TIME OF USE***

b. The Company will work with interested parties to develop RTP or similar tariff that is compatible with billing system by its next rate case.

*8. **LINE EXTENSION TARIFF-EV MAKE READY***

a. The Company agrees to establish and offer a standard construction allowance within the line extension process for EV "make ready" facilities.

*9. **OTHER RATE DESIGN-RELATED STUDIES***

a. The Company agrees to study alignment of billing seasons between KCP&L and GMO utilities.

b. The Company agrees to work with Staff to define and retain billing determinants for future rate designs.

c. The Company agrees to work with Staff to define data to support evaluation of the seasonal nature of demands on the transmission and distribution systems or the seasonal nature of the costs of capacity and energy to serve load.

*16. **LOAD RESEARCH***

a. For a future GMO rate case, the load research will reflect the new sample to reflect GMO consolidation."

Q: What is the status of these commitments?

A. 1., 2., & 3. TOU Rate Design Case & GMO C&I Rate Design Case

This rate case commitment is complete. Because TOU was only just offered on October 2019, the original timing for the TOU rate design case (June 30, 2020) would not have allowed for a full 12-month data set, inclusive of summer months in the TOU rate design case filing. As a result, the Company requested an extension to allow for meaningful review. After being granted extensions by the Commission, the TOU Rate Design Cases were filed on June 15, 2021, in File Nos. EO-2021-0349/0350.

The S&A also included a provision referencing a 2016 rate case (S&A dated September 20, 2016) commitment which required a GMO (now Evergy Missouri West) C&I Rate design case. Both the TOU rate design case (2018 rate case) and the GMO C&I rate design case filings (2016 rate case) were bundled together in the 2018 S&A in an effort to streamline filings for MO West. The 2018 S&A language anticipated that when the 2016 GMO C&I rate design case filing was filed on June 30, 2019, it would be concluded by June 30, 2020, to allow for the TOU rate design case filing to begin. However, the

Company filed for an extension of the 2016 GMO C&I rate design case on May 22, 2019, to file the rate design case by June 30, 2020. Once the timing for the TOU Rate Design Case and the GMO C&I Rate Design Case became largely separate, the Company addressed each separately and in separate filings.

The GMO C&I Rate Design Case was filed on June 30, 2020, in File No. EO-2020-0422. The original S&A language included the following,

> "*If GMO does not file a rate case including at least 12 months of resampled consolidated rate billing data by June 30, 2019, it shall file a rate design case by June 30, 2019 that includes 12 months consolidated rate billing data using the April 30, 2018 resample of load research as the basis of GMO's direct filing."*

The filing included analysis that used 12 months of resampled consolidated billing data required by the S&A. It relied on resampled load research and followed many of the steps expected in a typical rate case including, establishment of a test year, weather normalization, customer growth, and other adjustments, as well as cost analysis. It leveraged many of the learnings of the GMO consolidation collaborative meetings and analysis similar to what was reviewed in those meetings, including revenue analysis by class and $/kwh by class. The analysis contained in the Rate Design Case confirmed the appropriateness of the consolidation of GMO C&I rates made in the 2016 rate case.

Lastly, the TOU rate proposals being made in this rate case were designed based on learnings from the TOU offering that started in October of 2019. The Company took the learnings from that experience, customer feedback, and implementation success to develop a revised 3-period TOU rate, as well as a new 2-period TOU rate. These new rate

offerings will be further discussed later in my testimony, as well as the testimony of Company witness Kimberly H. Winslow.

4. Real Time Pricing ("RTP") alternative

This rate case commitment is complete. The Company believes this to be an important element in its overall Rate Plan. As such, the Company consulted with existing RTP customers and other C&I customers to understand how customers manage energy within their respective processes. It became clear that none of our customers adjust their operations specifically due to energy pricing. There might be some consideration of pricing when planning maintenance or other shutdowns, but other drivers dictate operation behavior. In general, customers are using the RTP rate only because of overall bill amount, not the real-time element of the rate. Evergy used this information to develop a rate that captured time-based elements in a way that could reflect a degree of the real time pricing and will work with the billing system and avoid manual billing. The rate development also sought to introduce a higher level of predictability to the rate to limit negative impacts from market volatility and subsequent negative impact to customer operations. The new Time-Related Pricing rate is being offered in this rate case. The Company proposes to implement the Time-Related Pricing rate in a limited fashion, restricting the number of participants, giving the Company the opportunity to verify the performance of the new rate. For more details on the rate design of this new rate, please see the Direct testimony of Company witness Marisol E. Miller.

5. Line Extension Tariff

This rate case commitment is complete. Evergy established a standard construction allowance within the line extension process for EV "make ready" facilities. The standard

construction allowance for line extensions to separately metered commercial EV charging stations was set at $4,500 per port for Level 2 charging stations and the greater of $27,000 per site or $4,500 per port for Fast Direct Current chargers. These allowances are applicable to the Evergy Missouri Metro and Evergy Missouri West jurisdictions. These details have been communicated to Evergy Field Design and Engineering personnel as these are the groups most likely to interact with customers installing these facilities and applying these allowances to the revenue justification step of the Evergy Line Extension Policy.

6. Other Rate Design Related Studies-

These commitments and studies have all been met and/or completed. These commitments included a study of the alignment of seasons for Evergy Missouri Metro and Evergy Missouri West, as well as agreements to work with Staff to define data for future rate designs and to support the evaluation of the seasonal nature of costs.

a. Seasonal Study

A study evaluating the potential alignment of Evergy Missouri Metro and Evergy Missouri West is filed as part of this rate case. Please see Schedule BDL-1 for the full study. The study explored seasonal rate periods of other utilities, as well as included the analysis of system peak loads to determine the typical and ideal seasons, as well as analysis of bill and revenue impacts to understand the total impact of the seasonal change. To determine the customer impacts of the change, actual billing determinants for each customer was pulled from billing system and customer bills were recalculated using the newly defined seasons. Then, comparisons of the total annual bill using the old season

and new season was performed to determine the change in billing. 99.9% of customers saw their bills impacted by less than 5% and almost two thirds of those customers seeing an impact of 0% to -5% on an annual basis. Overall, the study showed benefit to alignment of the dates for the summer and winter seasons. So, with the goal of simplification and alignment and in support of progress in rate modernization, the Company is proposing alignment of the dates for the summer and winter seasons, specifically, the change of the Evergy Missouri Metro jurisdiction to have the same summer season definition and start date of June 1- September 30 and winter for all remaining months, as its Evergy Missouri West jurisdiction. For the specific tariff changes resulting from that study and test year revenue impacts, please see the Direct testimony of Company witness, Marisol E. Miller.

b. Data

The Company had several discussions with Staff on this commitment. The first discussion was in the TOU stakeholder meeting held in December 2018 when Staff expressed interest in early discussion around this commitment. Staff followed up with an email including examples of the kind of data they might be looking for with the admission that they were not aware of what was possible. Follow up emails from Staff indicated that the initial request had been revised and "simplified" to include the retention of three years of every individual customer's 15-minute interval data configured to be further aggregated with extensive billing characteristics/needs previously communicated. The request was not just to retain, but to provide data for external use by Staff.

The Company researched the request with the technical experts in the Company to determine feasibility. While the data is already contained and housed as part of the Company's MDM and Billing systems, the process for extraction of this data for external use in the detail requested by Staff with the billing characteristics requested, required extensive reconfiguration of existing Company processes-which are set up primarily to allow for billing and intra-system communication and jobs.

Over three meetings held with Staff held on April 10, 2019; February 7, 2020; and June 4, 2020, the Company communicated challenges and obstacles to Staff's request. For example, using just a test extract (sample) of the data needed, it would take approximately 69 days, running on 10 different machines and would result in a 20TB extract zipped to 846GB for transfer and assumed no other necessary tasks would be run. That represented just part of the initial request, not to mention the reconfiguration that would be needed to layer in other extraneous fields that Staff was interested in including, assuming that it was available in the Company's existing systems. The Company also posed a number of questions and concerns including questions around: how Staff would handle data storage, what were their processing capabilities/limits, how data could be shared-since providing a flat file would not be possible given the sheer volume of the data being requested and how its housed in the Company's systems. Additionally, given the desire for individual customer data by Staff, the Company inquired about governance and customer privacy. As a result of those meetings, MPSC Staff agreed that due to the extensive operational impact

of their request, aggregated hourly loads by class would work for their needs. As part of that agreement, the Company has used nearly 100% AMI data for weather normalization and aggregated hourly loads by rate class are available.

10. Load Research

This rate case commitment is complete. This commitment outlined the expectation that any future Evergy Missouri West rate case include a new load research sample reflective of the GMO consolidation of the C&I rate structures made in 2016. A presentation of the new Load Research Sample was provided in a meeting held with Staff on April 10, 2019. Additionally, as part of the GMO C&I Rate Design case filing, Staff provided response that utilization of AMI metered customer load information could serve as a reasonable replacement for load research. As such, the Company has utilized near one hundred percent sampling of AMI metered customers in this rate case rather than traditional load research and that was used for weather normalization. For more details on the transition from load research to AMI data utilization, please see Direct testimony of Company witness Marisol E. Miller.

Additionally, and given the significance of this transition, Evergy retained Itron to examine the processes used by Evergy and evaluate them relative to practices observed elsewhere in the industry. Itron is an external consultant and metering system vendor who has been providing metering-related products and services to the utility industry since 1977. Itron found that Evergy's AMI load aggregation process benchmarks well with methods developed by other utilities with AMI systems and Evergy is well-positioned to utilize aggregated AMI data for cost of service studies and rate case weather estimates and

is making progress toward leveraging AMI data for additional use cases in the future. The full Itron report may be found in Schedule BDL-2 of this testimony.

Q. Were there any rate design studies or rate or customer related commitments included in the S&A dated September 27, 2018?

A: Yes. The S&A (pg.3) included the following language:

*"4. **CUSTOMER EDUCATION REGARDING RATE DESIGN***

a. The Company agrees to develop and implement a customer education plan regarding the rate design presented in this Stipulation. In the development of the education plan, the Company will examine and evaluate leading educational processes and practices on customer education of rate designs. The Company's rate design education plan may include various forms of tools, marketing and customer education such as mailings, outbound calling, utilization of their Interactive Voice Response Unit ("IVR"), text messaging, website information, media outlets and outreach through various company partners including community action agencies, senior housing centers and others.

b. The Company agrees to provide Staff, OPC, and DE with a report detailing its planned rate design education program within the Q2 of 2019. The Company and interested parties may further address the Company's rate design education program within the stakeholder meetings identified in the Time Of Use ("TOU") Non-Unanimous Stipulation and Agreement filed on September 25, 2018 in these cases."

Q: What is the status of these commitments?

A. These rate case commitments have been completed. The Company examined and evaluated leading educational processes from peer utilities, leveraging customer feedback from our own customer research and that of other companies to develop a customer rate education plan for our base rates. This plan was emailed and presented to parties in the TOU stakeholder meeting held on June 28, 2019. No feedback was received regarding the plan.

Table 1-Rate Case Commitments

Non-Unanimous Partial S&A-dated September 19, 2018	
Commitment	**Status**
1. Consolidated Study	1. **COMPLETE** - Filed on October 30, 2020 in Dockets ER-2018-0145 and ER-2018-0146.
2. Customer Bills	2. **COMPLETE** – Bill redesign ONGOING – Annual review of Rider description.
3. Customer Privacy	3. ONGOING – Green Button for Residential and Small/Medium Commercial Customers Deployed; Final deployment of Green Button for Large Customer scheduled. **COMPLETE** – New Privacy Policy ONGOING – Annual 3rd Party Privacy Assessment
Non-Unanimous S&A Regarding Pension and Other Post-Employment Benefits-dated September 21, 2018	
Commitment	**Status**
1. None	1. N/A

Non-Unanimous Partial S&A Concerning Rate Design-dated September 25, 2018	
Commitment	**Status**
1. TOU Rate Design Case (KCPL-MO & GMO)	1. **COMPLETE**- TOU Rate Design Case filings made on June 15, 2021 in Dockets EO-2021-0349 and EO-2021-0350.
2. 2016 GMO C&I Rate Design Case	2. **COMPLETE**- Evergy Missouri West Rate Design Case filing made on June 30, 2020 in Docket EO-2020-0422.
3. KCP&L and GMO Residential TOU rate design in their next rate cases based on lessons learned from the TOU service."	3. **COMPLETE**- Modified/New TOU rate designs were filed as part of the Rate Design Case filing made in #2 above, as well as in this 2022 rate case filing.
4. RTP or similar tariff that is compatible with billing system by its next rate case	4. **COMPLETE**- RTP replacement was proposed and filed in this 2022 rate case filing.
5. Line Extension Tariff-EV Make Ready	5. **COMPLETE**- Provisions added to Company Line Extension processes
6. Seasonal Study	6. **COMPLETE**- Seasonal study was performed and filed as part of this 2022 rate case filing.
7. Work with Staff to define data for future rate designs	7. **COMPLETE**- Aggregated hourly loads by class to be provided
8. Work with Staff to define data for evaluation seasonal nature of demands	8. **COMPLETE**-See #7 above.
9. Load Research	12. **COMPLETE**- Presented to Staff on April 10, 2019. In lieu of resampled load research, the Company has used AMI data to support weather normalization in this 2022 rate case filing.
Non-Unanimous Partial S&A Regarding Class Revenue-dated September 27, 2018	
Commitment	**Status**
1. Customer Education Regarding Base Rates	1. **COMPLETE**- The Customer Education Plan was emailed to parties' legal counsel and discussed as part of the TOU stakeholder presentation on June 28, 2019.

1

II. RATE MODERNIZATION PLAN

Q: Please describe your testimony concerning Evergy's Rate Modernization Plan.

A: I am sponsoring a series of topics designed to complement the testimony of other Company witnesses on the proposed efforts to update and expand our rate portfolio. Kimberly H. Winslow provides a discussion on Evergy's overarching programs and rates to progress towards greater customer choice to increase customer satisfaction, to enable customers to better manage their bill and to educate customers how their behavior can minimize grid impact. Charles A. Caisley provides testimony supporting how providing customers with more choices in the way they receive and pay for their electric service is in the public interest. My testimony, supported by the testimony and tariffs sponsored by Marisol E. Miller, serves to detail how the rate designs are executed. Specifically, I will address,

- Enhancement and Expansion of the Company TOU Rate for customers
    - Modification of the existing 3-period TOU rate
    - Proposal of new, 2-period TOU rate
    - TOU rates to appeal to Electric Vehicle drivers
        - Proposal of a Residential High Differential TOU rate
        - Proposal of Residential Separately Metered EV TOU Rate
        - Proposal of Business EV Charging Service TOU Rate
- Net Metering for TOU
- Subscription Pilot pricing ratemaking treatment

Q: Please describe Evergy's Rate Modernization Plan.

A: The testimony of Kimberly H. Winslow provides a detailed review of the plan but in summary, the Rate Modernization Plan ("Rate Plan") provides a framework for Evergy

that is both responsive to its historical regulatory obligations in Missouri and Kansas, but also provides a framework for the Company's future general rate case filings. The Rate Plan seeks to balance many objectives to increase overall customer satisfaction while recovering revenue requirements. The Rate Plan will be executed over several rate cases and will flex with changes in regulatory outcomes, industry developments and customer desires.

Q: What are the objectives of the Rate Plan?

A: The objectives are:

- Creating rates that are independent of end use requirements
- Bringing rate structures closer together across jurisdictions
- Enabling business growth
- Simplifying rates and increase pricing transparency
- Providing greater customer choice
- Increasing customer satisfaction
- Leveraging Customer Information System ("CIS") and Advanced Meter Infrastructure ("AMI") investments
- Developing price signals to increase grid efficiency

Q: Please describe your testimony concerning the Residential TOU rates.

A: Within my testimony I will describe Evergy's proposed enhancement and expansion of the TOU rates in its rate portfolio. More specifically I will describe the guiding principles of the proposal development, provide details of the analysis completed, and outline the proposed rate designs. On June 15, 2021, in File Nos. EO-2021-0349/0350, Evergy filed

a Time of Use Rate Design Report. I will leverage that report to support this testimony and provide it as an exhibit to my testimony as Schedule BDL-3.

Q: What enhancements and expansions are proposed?

A: Evergy is proposing the following with respect to its TOU rates:

For Residential customers:

Refine the existing 3-Period TOU rate - Although the majority of customers on the existing TOU rate are satisfied with the rate and on average have seen an overall decrease in their electric bills, the Company's analysis indicates that some refinement in the rate design is warranted. Evergy is proposing to adjust the summer and winter seasons to reflect a full, four-month period and to adjust the pricing differentials for the non-summer TOU periods. The pricing differential change is to better reflect the strong summer price observed by the Company's cost studies.

Add a 2-Period TOU rate – This is a new rate proposed that will provide customers an additional TOU rate option that have less ability to shift usage throughout the year and address the bill impact of the 3-Period TOU rate typically occurring for space heating customers. The seasons and on-peak period definition will match the 3-period TOU rate.

Add a High Differential TOU rate designed to appeal to Electric Vehicle ("EV") drivers – This 3-period rate will offer a high price differential between super off-peak (night) and on-peak time periods to better accommodate the charging patterns of EV drivers.

Add a Separately Metered EV TOU Rate – This 3-period rate allows a customer to use a TOU rate solely for the charging of their electric vehicle with the same pricing

structure as the High Differential TOU Rate but allows the customer's other home usage to remain on a non-TOU rate. This is accomplished by requiring the customer to have a separate meter for the EV usage.

For Commercial customers:

Business EV Charging Service – Originally proposed in the Company's Transportation Electrification filing, this rate would provide electric service for the exclusive use of charging electric vehicles by commercial customers.

Q: What steps did Evergy take in formulating these proposed rates?

A: To begin the Company considered the objectives mentioned earlier and then established a number of strategic considerations to complement these objectives. These considerations are more specific to TOU and intended to ensure the Company maintains focus on near term factors and goals. The considerations are:

- TOU remains an important part of Evergy's plans for today and in the future. Customer experience is identified as one of the four key elements of the Evergy Sustainability Transformation Plan. Giving customers a choice on their rate plan has been identified as a factor in ensuring the customer experience remains positive.
- It is appropriate to provide a broad selection of rates. Customers have expressed a preference for choice in their rate plan and seek a balance of risk and reward suitable for their situation. Customer relationships are critical in helping achieve this alignment. A growing portion of customers seek to be more involved in their energy experience. Others are seeking less involvement, instead seeking predictability and control. By providing choice and meeting customers where they

are, we expect to receive a more meaningful and lasting effect from the offered rate designs.

- The TOU approach implemented by Evergy is working. In the Agreements achieved in the ER-2018-0145/0146 rate cases, the Company and parties worked together to define "*a meaningful and successful process to establish alternative rate plans in the form of Time of Use ("TOU") rates for residential customers following accepted best practice and ensuring measured impact to customers within the class.*" The process was based on customer education and allowing customers to self-select, or opt-in to, the TOU rate. Evergy remains committed to the concept that a selected rate design approach by a utility is dependent on many factors and "one size does not fit all".
- Alignment of rate designs across Evergy is an appropriate goal. As Evergy brings together the various jurisdictions, having a common rate plan portfolio is a necessary goal. While Evergy will certainly look to do what is best for its customers and shareholders within its respective regulatory structures of the Missouri and Kansas jurisdictions, it recognizes that customers simply see Evergy as one company and our customers and shareholders will benefit from increasing consistency with all customer-facing elements of the Company's operations. This is a significant step and one that may take years to fully achieve.
- TOU rate designs present challenges and some issues cannot be resolved. At face value, TOU rate designs seem to be a good rate design for all customers. However, under closer examination it is evident that TOU rate designs are not well suited for customers with loads that cannot be shifted. Customers with continuously running

medical equipment or simply those with low levels of usage cannot shift usage to achieve the potential bill savings. Second, net metering presents a challenge. Issues with net metering and TOU are driven by statutory provisions that have not been updated to reflect dynamic rates. This issue is examined later in my testimony.

Q: With this guidance in place, what was the next step in preparing the proposal?

A: To begin, we considered the current TOU rates and how these rates were received from customers. This effort is detailed in Section 4 of Exhibit BDL-1 but in general included consideration of customer research providing qualitative and quantitative customer feedback on the TOU rate. The Company was also able to consider results from an interim[1] Evaluation, Measurement & Verification ("EM&V") report completed by Guidehouse, an external consultant. The EM&V provided valuable feedback on the performance of the TOU rate.

Next, the Company conducted research and benchmarking on TOU deployments across the electric utility industry. With the assistance of Brattle, an external consultant, the research analyzed dozens of TOU programs worldwide, examining the design features and when possible the results of each. Evergy also relied on internal studies and work performed to understand TOU and rate design trends. These efforts provided valuable insights around what works and does not work with respect to TOU rate design.

Lastly, Evergy, with continued support from Brattle, performed data analysis to provide inputs to the design. Analysis completed included TOU Season Analysis, TOU Time Period Analysis, and TOU Price Differential Analysis. This work was detailed and voluminous. Please see Section 5 of Schedule BDL-3 for those details.

[1] A final version of the TOU Evaluation, Measurement & Verification report was filed in the ER-2018-0145/0146 cases on December 29, 2021.

Q: Would you please summarize the results of that data analysis?

A: Yes. For the Season Analysis, Evergy examined annual daily peak, average, and minimum loads for each Missouri jurisdiction. This revealed that Evergy and each jurisdiction individually, exhibit the highest daily peak load in in the four months of June, July, August, and September. Further, looking at the individual hours shows that all hours in which the system load exceeds 75% of the annual system peak hour occur during the months of June through September.[2] Evergy also examined the SPP day-ahead average daily price[3] and the cooling degree days[4] for the past 10 years[5]. These data further support the summer season definition of June through September.

For the TOU Time Period Analysis, Evergy examined the system peak day and hour for the consolidated Evergy system and individual Missouri jurisdictions for each of the past five years. Although weather temperature dependent and varying throughout the months of July and August, the system annual Peak Hour consistently occurs from 4-5 pm in the late afternoon as increases in residential usage adds to the system load before the commercial and industrial loads begin to diminish.[6] Evergy then examined the peak load hours where total system load exceeded 90% of the 2019 annual system peak and found that while each of the Missouri jurisdiction load profiles varies somewhat, they all show 100% of peak load hours occurring between noon and 9 pm with over 80% of the peak load

[2] Section 5.4.1, pg. 39-43, Evergy Time of Use Rate (TOU) Rate Design Case Report, June 15, 2021
[3] Id. Pg. 44
[4] A degree day compares the mean (the average of the high and low) outdoor temperatures recorded for a location to a standard temperature, usually 65° Fahrenheit (F) in the United States. The more extreme the outside temperature, the higher the number of degree days. A high number of degree days generally results in higher levels of energy use for space heating or cooling. Cooling degree days (CDD) are a measure of how hot the temperature was on a given day or during a period of days. A day with a mean temperature of 80°F has 15 CDD. (https://www.eia.gov/energyexplained/units-and-calculators/degree-days.php)
[5] Section 5.4.1, pg. 45, Evergy Time of Use Rate (TOU) Rate Design Case Report, June 15, 2021
[6] Section 5.4.2.1, pg. 46, Evergy Time of Use Rate (TOU) Rate Design Case Report, June 15, 2021

hours occurring between 2 pm and 8 pm.[7] Evergy further confirmed the appropriateness of this time period by:

- Examining the hour of the monthly system peak loads finding a majority of the monthly system peak loads occur between 3 pm and 7 pm, but a few non-summer months experience a monthly system peak during the 7-8 am hour.[8]
- Examining SPP day-ahead average daily pricing, noting again significant differences in the daily price profiles between the summer and non-summer seasons. The monthly average hourly day-ahead energy prices displayed clear time-based pricing patterns, showing a year-round low pricing period between midnight and 6 am, a summer season (June-Sept) high price period generally between 1 pm and 8 pm with the highest price hours occurring between 3 pm and 6 pm, and non-summer months prices are generally elevated in the morning and evening hours and are softer between noon and 5 pm.[9]
- Examining the residential class loads shows that the residential class has a fairly symmetrical load profile around a 4-hour summer peak load period between the hours of 4 pm and 8 pm and while there are some variations all Missouri jurisdictions exhibit the summer average monthly peak hours occurring between 5 pm and 7 pm and the highest residential class load hours generally occurring between 4 pm and 8 pm.[10]

For the TOU Price Differential Analysis, Evergy analyzed the residential class cost components for generation, transmission, distribution, and energy. Driven by allocation,

[7] Id. Pg. 47
[8] Id. Pg. 48
[9] Section 5.4.2.2, pg. 51-52, Evergy Time of Use Rate (TOU) Rate Design Case Report, June 15, 2021
[10] Id. Section5.4.2.3 pg 52-55

the costs were allocated to generation based on analysis of the system load duration curve relative to the periods, transmission costs based on the peak period for each month of the year, distribution costs were based on a split between periods, and energy costs based on the SPP energy prices in each period. This analysis show that for calculating the prices for a year-round 3-period TOU, results in a rate that has a strong summer peak price and a significantly discounted Super Off-Peak price, with modest price differences in the other periods. From a differential perspective, summer would be 6x On-Peak, 2x Off-Peak, and 1x Super Off-Peak and non-summer would be 3x On-Peak, 1.5x Off-Peak, and 1x Super Off-Peak. Looking at a 2-period approach, Evergy calculated summer would be 4x On-Peak and 1x Off-Peak and non-summer would be 2x On-Peak and 1x Off-Peak. [11]

The analysis summarized in this testimony and detailed in the TOU Rate Design Report drove the proposed 3-period and 2-period rate designs and final pricing was based on data relevant to the test year of this case. Tariffs supporting the proposal are found on Sheet 7 and 7A for the 3-period TOU tariff and Sheet 7F and 7G for the 2-period TOU tariff of the Company filing sponsored by Marisol E. Miller's testimony. Details about the implementation of these proposed rates are provided for Kimberly H. Winslow's testimony.

Q: Please describe your testimony concerning the proposed TOU rates designed for the EV driver.

A: Evergy identified the need for more specific EV TOU rates during its Transportation Electrification ("TE") filing, File No. ET-2021-0151. It was enlightening that during the evaluation of the existing 3-period TOU rate that while there was some increase in EV

[11] Section 5.4.3, pg. 59-62, Evergy Time of Use Rate (TOU) Rate Design Case Report, June 15, 2021

driver enrollment to the rate, there was not more participation from these customers. Company witness Kimberly H. Winslow covers this more fully in her testimony and our proposal to offer rates specifically targeted to EV drivers. My testimony details the design of the two proposed EV targeted rates, the 3-period High Differential TOU rate and Separately Metered EV TOU rate. Testimony concerning the Business EV Charging Service rate is addressed separately and later in this testimony.

Q: How did Evergy design the proposed 3-period High Differential TOU Rate?

A: To design the 3-period High Differential TOU rate, Evergy began by producing TOU period billing determinants based on the Residential class billing determinants. This was accomplished by examining the hourly loads for the Residential class and subtotaling them by TOU period. This allowed Evergy to produce an allocation applied to the Residential General Use billing determinates to approximate TOU billing determinants. With the TOU determinants, Evergy structured a model to iteratively seek an outcome balancing the TOU period differential goals and a revenue neutral relationship with the Residential General Use rate. The model builds off of a base rate set at slightly more than the approximate rate for the average SPP price for off-peak hours plus other SPP costs that are allocated by MWH during the test year. It is an approximate price because a key goal of the rate design was to target specific period differentials and the starting price was allowed to shift to achieve revenue neutrality within that goal. Care was taken to make sure this base rate remained close but higher than the average SPP price.

For development of the Separately Metered EV TOU tariff, the primary need was to establish an option that can be utilized in conjunction with an existing residential rate schedule for the whole-house but allow the EV driver to apply the high price differential

TOU rate to EV charging only. Energy pricing for the Separately Metered EV TOU rate is identical to the pricing for the 3-period High Differential TOU rate, allowing for the customer to retain their existing residential rate for the home but install a meter to measure EV charging only usage. The Customer Charge reflects only the additional cost of the second meter at the premise. Priced at the difference between the Customer Charge of Residential General Use & Separate Meter Heating rate and the Residential General Use rate, the energy rate will be consistent for the Heating and EV applications; however with a different customer charge. Tariffs supporting the proposal are found on Sheet 7B and 7C for the 3-period High Differential TOU tariff and Sheet 7D and 7E for the Separately Metered EV TOU tariff of the Company filing sponsored by Marisol E. Miller's testimony.

Q: Please describe your testimony concerning net metering for TOU.

A: Evergy has been closely examining the statutes and regulations associated with net metering and has been attempting to devise an approach to accommodate net metering for its TOU customers. My testimony will detail that effort and our resulting proposal.

Q: To provide a basis for your testimony, what is net metering?

A: Net metering is a metering and billing arrangement designed to compensate distributed energy generation ("DG") system owners for any generation that is exported to the utility grid. Net metering allows utility customers with on-site DG to offset the electricity they draw from the grid throughout the billing cycle (e.g., one month). The utility customer pays for the net energy consumed from the utility grid.[12] Net metering is enabled by Section 386.890, RSMo Supp. 2008 and implemented by rule 20 CSR 4240-20.065.

[12] https://www.nrel.gov/state-local-tribal/basics-net-metering.html

Q: Why is net metering currently an issue for TOU customers?

A: Currently, TOU customers are not allowed to participate in net metering. Both the statute and the rule establish "billing period" as the time period for which the energy measurement and determination of net energy to occur. Billing period, as defined or inferred elsewhere in the statutes and rule or defined in our Company Rules & Regulations is a billing month, approximately 30 days.[13] In order to properly net usage for customers on a TOU rate, the measurement must occur for each of the TOU periods established by the applicable TOU rate schedule. This inhibits correct net metering and led Evergy to make net metering unavailable for customers choosing to be served under the TOU rates. Because of the current and growing prevalence of DG systems, this restriction has the potential to discourage adoption of the TOU rate designs.

Q: Has the Company explored ways that it might overcome this restriction?

A: Yes. Evergy consulted with its legal staff and internal subject matter experts to evaluate the current statutes and rules. The Company made inquiries to other utilities, vendors, and industry consultants to seek alternatives in other jurisdictions. Evergy also consulted with Ameren to understand their perspective on the issue. Ameren is similarly situated with their optional TOU rate deployment. In the end, only one approach proved to have any potential, proposing a separate tariff designed to mirror the existing net metering tariff, but inclusive of new language to address billing and measurement within the TOU structure. However, in the end, this approach also proved to be problematic.

[13] From the Evergy Missouri West Rules & Regulations: "8.01 BILLING PERIOD: Normally, the Company will read the Customer's meter monthly and bills based on such monthly readings will be rendered at intervals of approximately one month. For all customers the billing period shall normally be not less than 26 nor more than 35 days. The Company shall have the right to read meters and render bills more frequently. If bills are rendered more frequently than monthly, the total of the minimums of such bills for any one month shall not exceed the monthly minimum required under the applicable rate schedule. For all customers if a bill is rendered for less than 26 or more than 35 days the bill may be prorated."

Q: Please explain the approach further and share what emerged as the problems.

A: Relying on the Commission's general authority to approve tariffs, the approach consisted of duplicating the existing net metering tariff but replacing the Energy and Pricing section with language designed to accommodate the TOU structure. The net energy calculation would occur during the billing period for each of the time of use periods established by the applicable time-varying rate schedule applicable to the Customer-Generator's rate class in accordance with normal metering practices for customers taking service on time-varying rates in that same rate class. For excess energy, the Customer-Generator shall be credited an amount at least equal to the avoided fuel cost of the excess kilowatt-hours generated during that time of use period, with any net credit (net of all other charges as they are applied to non-customer-generators in the same rate class) applied to the following billing period. This approach would stand as an alternative to the existing net metering and since the existing net metering tariff was untouched, we believed we remained in compliance with the statute and rule.

Additionally, the approach seemed to work from a mathematical perspective but as we prepared a tariff draft, material concerns came to light. First, what would the alternative approach be called? If named "net metering" or some derivative, does that expose the tariff to legal challenge? Further, since the tariff approval is based on the Commission's general authority, there would be no constraint to the final structure of the alternate tariff. Other parties could introduce alternate approaches, prices, or terms that would distance the alternate approach from the original net metering design. At that point we could have two net metering style tariffs with very different designs. We then became very concerned about the potential for customer confusion.

Q: Why is the issue of potential customer confusion important?

A: Net metering, despite our many efforts to make it simple and straight-forward, is still a difficult step for most customers. Most customers historically gave little thought to their energy used except for the monthly bill amount. Those wishing to explore net metering are quickly exposed to new terms, new processes, and unfortunately, often conflicting information. It has been our experience that the net metering process has served to focus the customer experience and filter out much of the noise leading up to the execution of the respective DG system installation. Further, as the customer gets accustomed to the net metering processes in their billing, the net metering tariff and its application serves as a ready reference to address questions. As we contemplated a similar but separate process, particularly one that included some level of difference resulting from the regulatory process, we could see the potential for customer confusion. Customers on TOU rates would be subject to a different experience than those on the non-TOU rates. Our customer support and field personnel would now need to be aware of the customer rate before giving guidance. Additionally, if there were a legal challenge to the alternate approach that was ultimately found to be legitimate, we could be forced to move customers off the alternate rate.

Q: Did you explore questions about waivers or variances for the potential approach?

A: We did not. Given the Evergy decision not to propose the approach, we did not resolve our position on the need for waivers or variances.

Q: Ultimately, what is your recommendation concerning net metering for TOU?

A: Evergy believes that statutory changes are needed to properly address the change for net metering customers. Evergy is willing to lead this effort within a future legislative session.

A change of this nature would be best addressed jointly with the Commission and the electric utilities. We understand the risk of opening the statute to unwelcomed changes, but Evergy believes having clear guidance from the legislature provides for a better rule and better tariffs. Tariffs that ultimately provide customers just and reasonable treatment with the greatest possible clarity. All of the other non-legislative approaches considered introduced some level of concern for some stakeholder group. Given we expect TOU rates to be a key part of our rate portfolio and customer DG to be an important part of our system, it is important that we establish the relationship between them in a correct and stable manner.

Q: Please describe your testimony concerning the Subscription Pricing Pilot.

A: Evergy proposes offering a Subscription Pricing Pilot to its residential customers. This optional rate, implemented as a limited pilot, will provide customers with an entirely fixed monthly electricity bill. The Subscription Pricing offer includes a simple, no-risk financial incentive which rewards customers for limiting their energy use when enrolled in the rate. It also includes two optional add-ons, which are designed to encourage adoption of smart thermostats and the purchase of renewable energy credits. Evergy witness Ryan Hledik provides primary testimony detailing the design of the Subscription rate. Evergy Witness Kimberly H. Winslow provides testimony concerning the add-ons and the customer research completed to support the rate development. My testimony will further describe the treatment of revenues, riders and other costs of the subscription pricing offer relative to the standard rate.

Q: Please describe Evergy's proposed accounting treatment for revenues with the Subscription Pricing Pilot.

A: Evergy's proposal is to deploy the Subscription Pricing Pilot in a way that allows for the fixed bill but protects non-participants from the expected variability of the rate design and subsequent impact to their rates. To accomplish this, the Company is proposing to calculate the participant's monthly bill under the generally available residential rate and set that amount against the calculated fixed bill amount for that customer. The resulting difference, positive or negative, would be tracked below the line for regulatory accounting purposes. With this approach, revenues for customers opting into this program and considered in the next general rate case will be based on the generally available residential rate. This approach allows the Company to identify the actual costs for the customer in assessing the performance of the program but maintain the fixed monthly bill amount characteristic of this design. The approach also protects non-participating customer rates, ensuring they will not be impacted by profits or losses from this program.

Q: How will Riders be treated under this approach?

A: Riders, including the FAC, will be calculated and recorded in the books normally, based on actual usage and current rates. As noted in the testimony of Ryan Hledik, the monthly subscription amount is inclusive of the Riders, priced at the time of the subscription offer for a respective customer. Any differences between what is recorded on the books compared to the amount paid based on the subscription price would be accumulated as part of the below the line amounts. This would also capture differences from any change in base rates or riders during the timeframe of the subscription plan.

III. BENEFITS OF ADVANCED METERING INFRASTRUCTURE

Q: Please describe your testimony concerning Advanced Metering Infrastructure ("AMI").

A: Much discussion in past cases and other Commission interaction has revolved around the Company's investment in AMI technologies, specifically, certain parties' assertions that customers are not receiving full benefit for the AMI investment. My testimony details the various benefits provided for the Company and the Customer.

Q: What is AMI?

A: AMI are digital meters that measure and record electricity usage data hourly, or more frequently, and allow for two-way communication between electric companies and their customers.[14]

Q: Please describe the timing of Missouri AMI deployment at Evergy.

A: Deployment began in January of 2014 in the Evergy Missouri Metro jurisdiction and was completed in 2015. Deployment was started and completed in the urban areas of the Evergy Missouri West service territory in 2016. In 2017 there was no implementation due to implementation of a new Customer Care & Billing system. In 2018, Evergy began installations in the rural areas of the Evergy Missouri West service territory and completed deployment in early 2020.

Q: What were the original drivers behind this AMI investment?

A: The original need was driven by the need to replace the aging Cellnet, 1-way Automated Meter Reading ("AMR") system, that was coming to the end of life in 2014. End of life meant the Cellnet technology along with the meters on that system were no longer available

[14] https://www.edisonfoundation.net/-/media/Files/IEI/publications/IEI_Smart-Meter-Report_2019_FINAL.ashx

for purchase. Hastened by the 2010 Department of Energy Grant Project, the Company decided to go forward with AMI deployment.

In building the business case supporting the investment, the Company identified additional drivers or benefits to be gained from the conversion. Those drivers were:

- Improvement in data reliability as compared to AMR system - With AMI, the system can get directly to the meter and provide multiple sets of data per day such as voltage information, temperature alarms and outage information.
- More consistent meter reads - Two-way communication allows for meters to communicate through other meters not only network devices, improving the ability to receive a reading.
- Remote disconnect capabilities – allow expedited connect/disconnect in small commercial with self-contained metering and residential high move in/move out areas reducing the costs associated with dispatching trucks and crews.
- Improved outage management capabilities – communication from the meter provides both increasing the accuracy and timeliness of receiving outages and restoration events compared to waiting for customer notification.
- Improved meter maintenance – active communication with the meter allows the Company to become aware of issues with an AMI meter quickly.
- Reassignment of labor – allow the Company to transition meter reading staff to other service work.

Q: Has Evergy been able to experience other benefits or improvements?

A: Yes. The AMI system has been coupled with other technologies to unlock additional capabilities and benefits for customers and the Company. Those include:

- Enhanced revenue protection – meter analytics combined with the ability to get meter events, and timely meter usage allow the Company to identify theft, meter failure, and voltage issues to name some examples.
- Load Analysis – Evergy has transitioned away from statistical Load Research and is now utilizing AMI data aggregation for Load Analysis. In load research, daily and hourly rate class profiles are developed through designing and deploying customer samples, collecting, managing, and validating customer sample hourly load data, and applying statistical-based sample expansion methods. Under data aggregation the Company compiles the load information using data query and management techniques from the entire customer data set. Once in place and going forward, the data aggregation process is significantly less complex, requires less time to generate class load profiles, and is less costly than load research.
- Weather normalization – Isolating weather allows the Company to see rate class sales trends and calculate the basis for test-year sales and revenue. Weather normalization models based on measured customer use will be more accurate than models based on statistical-based load estimates. Improved weather normalization also provides for improved variance analysis through more accurate tracking of the sales and revenue forecast.
- Forecasting – AMI load aggregation provides a more accurate measure of current month sales use and as a result improved sales, revenue, and long-term energy demand forecasts. Models estimated directly from measured calendar month sales will have smaller variance and as a result an improved confidence interval around the forecast.

- Outage communication – customer may enroll in an outage notification service that is enabled by AMI. The service allows Evergy to proactively tell customers that we are aware of their outage and give them restoration times, updates final confirmation that lights are back on, and the cause of the outage. These outbound notifications begin earlier in the process, and in a manner more likely to be received by the customer. There are multiple notifications for the customer in danger of having service interrupted, allowing the customer to seek assistance and combat any other fraudulent notifications that may exist. As of the end of 2021, Evergy has over 622,000 customers enrolled in the outage notification service.
- Reduced Truck Rolls – AMI with disconnect and reconnect capabilities allows the Company to utilize electronic communications and deploy remote procedures that eliminate the need for Company personnel to make physical contact. These changes result in lower costs, better collections, fewer on-premise incidents, collection errors, and fewer disconnections. In addition, disconnection and reconnection fees can be drastically reduced for customers with this AMI meter capability.

  Evergy currently has a variance to knock and collect rules for its Kansas service territories and will be proposing a similar variance to Missouri's knock and collect rules to unlock these benefits.
- Reconnection - Once disconnected, the customer no longer has to call back into the contact center to request service restoration. When a minimum payment is received a reconnection order is sent immediately, and the customer's service is typically

back on within 15 minutes. This includes during after hours, weekends, and holidays.

- Energy education - Evergy has partnered with a digital solution provider to help customers manage their energy usage, provide energy savings tips, and perform a rate comparison to ensure that they are on the rate that provides them with the lowest bill, or determine if time-of-use rates would be a good fit for their home.
- Safety - Reduced safety risks for employees conducting manual reading activities or debt collection resulting from hostile interactions at the premise. Evergy's employees operating in Kansas already are seeing these reduced safety risks with the variance for Kansas knock and collect rules. Evergy will be proposing a similar variance to Missouri's knock and collect rules in the near future. Also, the AMI meters have on-board temperature sensing and alarm capability. This alerts the Company to issues on the premise which cause heating at the meter, reducing the potential for meter socket fires.
- End use disaggregation - Evergy is using AMI data to disaggregate energy usage so that the Company can better design/develop programs for its customers, educate customers on their usage and market to customers for increased program enrollment. One particular use is electric vehicle charging detection. This capability will allow us to understand the impact of electric vehicles charging demand on the system and create rate options from this information.
- Power Quality – AMI meters provide visibility to line and load side voltage as well as voltage sag and swell, improving operational abilities.

Many of these benefits were also identified by Itron as part of their evaluation of the Company's transition to AMI data aggregation. Please see Schedule BDL-2 for more information from the industry perspective.

Q: Has Evergy identified areas that show potential for future benefit?

A: Evergy is constantly reviewing how our AMI network can continue to enable future state operations. One of the biggest components of the network is not the physical hardware in the field, it is the data sets that accompany each one of those physical assets. Although we are just starting investigations into the architecture, tools and skill sets needed to further advanced analytics on AMI data, we believe the following use cases show promise:

- Prepay – AMI meters allow customers to see in nearly real time their usage and remaining balance on their prepaid utility account providing customers with more information as they make decisions to control their energy usage. A prepay program (Advance Easy Pay) has been proposed in this case with details found in the testimony of Kimberly H. Winslow.
- Network capabilities – ability to integrate the radio to other devices such as streetlights for control, maintenance, and asset location/verification for billing. Integrate with Distributed Energy Resources devices as well as battery storage and charging applications. The AMI network can be used to communicate with other distribution devices such as capacitor bank controls and voltage regulators.
- Using AMI data to understand the current state of distribution transformers and apply predictive algorithms to predict when they might fail.

- Using AMI event and usage information to validate the Geographic Information System (the Company mapping system) connectivity model and to identify incorrect phase mappings in the model.
- Usage data from AMI meters can be tied to the specs and performance of distribution transformers to find overloaded transformers
- Home Energy Insights – While Evergy has begun to tap disaggregation capabilities using AMI data, increased disaggregation sophistication will only increase the ability for customers to use whole home usage disaggregation to make more informed home energy management decisions. For example, the ability for a customer to see their washer and dryer usage, HVAC system energy use and alerts for appliances left on.
- Behavioral Conservation (Home Energy Calculator) – Assists customers with evaluation of private solar options. Customers can access a solar calculator that leverages their smart meter recorded energy usage history, rate and solar exposure.
- Usage Alert Tools – Through new web capabilities, utilities can use smart meters to create alerts for customers throughout the month if their bills are projected to be higher than normal and could impact the customers expected bill at the end of the month.
- Voltage Load Profile Data - Ability to gain system insight for better energy delivery options. This may drive construction designs and future planning of the system. That data can be used to identify faulty transformers and capacitor banks as well.
- Distributed Energy Resources ("DERs") and FERC Order 2222 – as the use of DERs grow and are influenced by policy changes like FERC Order 2222, the AMI

network can help the Company manage these resources and comply with the developing requirement.

Q: Does AMI offer the ability to offer more advanced or alternate rate designs?

A: Absolutely. AMI enabled Evergy to introduce TOU rates for its residential customers in 2019. Further expansion of the TOU rates is proposed in this rate case. Without question, AMI is instrumental in allowing the Company to deploy TOU and other advanced or alternate rate design options. As customers adopt these various rate design, we expect they will better meet the needs of customers and help them efficiently manage their energy use or simply have a better energy experience. The benefit of supporting new rate design is a critical benefit, but it is far from the only benefit.

Q: Given the benefits listed here, would you say Evergy and its customers are receiving appropriate value for the investment made in the AMI network?

A: Yes.

IV. TRANSPORTATION ELECTRIFICATION

Q: Please describe your testimony concerning Transportation Electrification.

A: At the time of this filing, the Company is awaiting the final order in File No. ET-2021-0151[15] but has closely monitored the Commission discussion on the matter. In the December 22, 2021 Agenda Meeting, the Commission gave indication that it was not going to approve the Business EV Charging Service Rate but would look forward to further detail as part of the forthcoming case. I am sponsoring testimony seeking approval of the Business EV Charging Service, Sheet No. 54 and 54A of the Company filing sponsored by Marisol E. Miller's testimony.

[15] *Application of Evergy Missouri Metro and Evergy Missouri West for an Order Related to the Approval of a Transportation Electrification Portfolio*. Filed February 24, 2021

Q: Please describe the Business EV Charging Service rate.

A: Evergy proposes a new Business EV Charging Service ("BEVCS") pilot rate option for commercial customers to increase EV adoption, meet workplace employee and fleet EV charging needs, support public electric vehicle service providers networks, and maximize grid benefits of EV charging load at commercial locations. Any commercial customer with an EV charging station is eligible for this rate. While the rate was designed using actual costs and charging patterns at workplace and fleet charging sites, the new rate would be suitable for any commercial EVSP including highway corridors, multi-family dwellings, and other public destinations.

The BEVCS tariff is a TOU rate with three time periods designed to address commercial rate challenges for electric vehicle service providers and encourage workplace and fleet charging during off-peak times when system costs and grid utilization are lower. The BEVCS rate eliminates the demand charge while retaining a facility demand charge in order to incentivize managed charging. Customers must separately meter their EV charging station to participate in the rate and all rate riders and surcharges will apply.

The BEVCS rate was developed to be revenue neutral for a commercial customer with similar annual consumption on the Large General Service ("LGS") rate schedule. The BEVCS customer and facility charges are equal to the charges in the LGS rate schedule. The BEVCS rate does not include a demand charge and will recover these costs in the energy charges. The energy charges were determined by setting the off-peak energy charge equivalent to the third block of the LGS rate which typically represents "third shift" usage. This off-peak energy charge is relatively low but still exceeds Evergy's marginal energy cost. Evergy then calculated the on-peak and off-peak energy charges such that the

combination of customer, facility, on-peak, and off-peak energy charges are revenue neutral when compared to a LGS customer with similar annual consumption and the average LGS customer load profile. In this way, the rate design mirrors many features of the existing LGS rate, while still meeting the anticipated needs of commercial fleets and electric vehicle service providers.

Q: What are the expected benefits of the BEVCS rate?

A: The BEVCS rate will encourage customers to shift EV charging to off-peak times while better aligning the cost of charging EV with the cost causation from the grid. The rate offers customers potentially lower and more predictable fuel costs, which will help customers maximize operational savings of EVs. The rate will also allow Evergy to better understand where EV charging is occurring on the system, which will enable further load analysis to support grid management efforts at a time when EV adoption is expected to grow. The TOU rate mitigates adverse grid impacts from new EV charging load, while increasing grid utilization at off-peak periods.

Q: Are there other customer benefits for the rate?

A: Yes. The proposed BEVCS rate aligns with Evergy's equity commitment by directly supporting the electrification of commercial customer vehicles and reducing the cost of commercial EV charging to benefit underserved communities. Additional benefits of this rate for commercial customers include:

- Lower Total Cost of Ownership ("TCO") for public fleets in a position to serve all customers, which will reduce the cost of providing public services through school buses, municipal service fleets, paratransit, rural transit, and public assistance vehicles;

- Lower TCO for commercial EV fleets, which will indirectly lower the cost of goods and services for all customers; and
- Affordable commercial charging, which will benefit all customers who charge away from home.

Commercial rates, which typically include demand charges, have been identified as significant financial obstacles for electric vehicle service providers and customers looking to electrify their fleets. Direct Current Fast Chargers ("DCFC"), which can draw large amounts of power to quickly charge vehicles, are especially susceptible to the impacts of high demand charges when utilization is low. The combination of high power and extremely low load factor is typical for commercial and industrial use cases and can subject fast charging stations to significant demand-based charges. Without substantial utilization and sales, commercial rates with relatively high fixed costs and demand charges inhibit the ability of charging stations to earn profits or fleets to be electrified economically.

In addition to an overall reduction in the cost of operations, many commercial fleet operators expect fleet electrification to provide a reduction in their fleet's carbon emissions. Evergy has included a Carbon Free Energy Option in the BEVCS tariff for customers that want their fleet's EV charging to be carbon free. Under this option, Evergy will procure RECs to offset energy provided from non-carbon free sources.

Q: Can you offer a detailed example of how the BEVCS rate might be used?

A: Yes. The State of Missouri is a beneficiary of the Volkswagen Diesel Emissions Environmental Mitigation Trust. The Trust was formed after the 2016 settlement with the United States of complaints against Volkswagen AG, et al. The settlement resolved claims that Volkswagen violated the Clean Air Act. As the lead agency, the Missouri Department

of Natural Resources developed a 10-year Beneficiary Mitigation Plan for awarding more than $41 million to Missouri-specific projects by October 2027. One of the projects is School Bus Replacement. Evergy has been made aware that the 2022 awards for Volkswagen School Bus Replacement Program were announced on November 9, 2021[16] by the Missouri Department of Natural Resources. There will be six new all electric buses in Evergy's Missouri service area[17]. These school districts and the contractor are aware of the proposed BEVCS rate and have expressed interest. If approved, these customers could rely on the rate design to reduce the cost of charging and the ongoing cost of operating these new vehicles. Success of these initial bus replacements would likely lead to the deployment of additional buses in the future.

Q: Did Staff offer a recommendation on the BEVCS rate in Docket ET-2021-0151?

A: Yes. Staff recommended the Commission reject the Company's proposed BEVCS and Electric Transit Service ("ETS") rate schedules absent a general rate proceeding. Further, Staff raised three specific concerns about the rate design,

1. The rate values contemplated require additional study and refinement, as do the terms of service including the Renewable Energy Credit ("REC") acquisition/retirement program.
2. The Company has calculated the rate values using the assumptions that an EV charging station is similar to that of a Large General Service ("LGS") customer and will cause no additional transmission and capacity costs and seeks to implement these rate schedules outside of the context of a general rate proceeding and without evaluating all relevant factors.

[16] https://dnr.mo.gov/document-search/fiscal-year-2022-volkswagen-school-bus-awardees-alternates
[17] One bus each for Princeton and South Harrison. Four buses for First Student in Park Hill (a bus contractor).

3. It is not reasonable to develop a rate schedule based on applying assumed revenue levels from a given size of customer to customers of significantly different sizes, let alone to do so in the absence of billing determinants, cost of service data, and other vital information determined only in the context of a general rate proceeding.

Q: Do you agree with Staff's contention that the proposed BEVCS rate requires additional study and refinement?

A: Not entirely. I believe these rates were appropriate for use in the pilot and would have provided just and reasonable pricing for customers receiving service under these rates when proposed in the ET-2021-0151 case. However, now that we have available additional cost studies, we can confirm the proposed pricing. As noted in my surrebuttal testimony in the ET-2021-0151 case, I expect these rates will mature as the pilot progresses and I anticipate further refinement.

Q: What is your response to the Staff concerns raised in File No. ET-2021-0151 about using the LGS rate as the basis for the proposed BEVCS rate?

A: I understand the uncertainty, but the Company feels the LGS rate offers the best model for development of the BEVCS rate. Although the various charging stations have a wide range of demands, the LGS rate is situated near the upper middle of that range. Presuming that stations will tend to be larger to facilitate shorter charging times, this positioning is well suited. Further, the LGS rate provided for Customer and Facilities Demand charges more appropriate to the expected loads than the Medium General Service rate. I would also note that in the December 22, 2021 Agenda meeting, the Commission appeared to support the Electric Transit Service Rate that was designed using an identical approach.

Q: Do you believe it was appropriate to design the proposed BEVCS rate based on the LGS rate?

A: Yes. The LGS rate provides a reasonable foundation for the BEVCS rate design.

Q: In File No. ET-2021-0151, Staff further asserted that the Company's proposed BEVCS rate schedule does not prohibit separately metered EV charging stations from being served on one of Evergy's existing rate schedules and, therefore, the BEVCS rate schedules are not needed for EV charging stations to be served. Do you agree with assessment?

A: The point is true, but the existing rate schedule designs are poorly suited for EV charging. As noted in the Company Report filed in File No. ET-2021-0151, the use of a demand charge is commonly discouraged for EV charging as it creates a significant financial obstacle for customers. The combination of high power and extremely low load factor is typical for commercial and industrial use cases and can subject charging stations to significant demand-based charges.

Q: In proposing the BEVCS rate as part of this rate case did you consider additional information in determining the appropriateness of the designs?

A: Yes. The rate designs for the BEVCS rate were reviewed again and evaluated considering the Transportation Electrification proceedings in Missouri and Kansas occurring since the designs were originally completed. The approaches and assumptions used in the design remain appropriate and produce a reasonable rate. The pricing was adjusted to reflect the revenue increase proposed in this case and to remain revenue neutral with the Large General Service reference rate.

V. EMERGENCY ENERGY CONSERVATION PLAN

Q: Please describe your testimony concerning the Emergency Energy Conservation Plan.

A: The Emergency Energy Conservation Plan is a section of the Evergy General Rules and Regulations. For Evergy Missouri Metro the primary language is in Section 17 found on Sheet 1.59 through 1.63. A related portion is found in Section 3.10 on Sheet 1.12. These Sections detail the company process for conservation, curtailment, interruption, or suspension of service, particularly during emergency conditions.

In February 2021 an unprecedented cold weather event (commonly referred to as Winter Storm Uri) occurred causing operational and market disturbances that led to interruptions for some Evergy customers. As part of the discovery associated with AO-2021-0264, the Commission's investigation into the *Matter of the Cause of the February 2021 Cold Weather Event and its Impact on Investor Owned Utilities* issued February 24, 2021, the topic of the Emergency Energy Conservation Plan was raised[18]. In response to that discovery, Evergy detailed that the Company had followed operating instructions from the Southwest Power Pool ("SPP") and followed an Evergy Emergency Operations Plan ("EOP") during the Cold Weather Event. Although the EOP is asserted to be consistent with the intent captured in the Emergency Energy Conservation Plan, the Company indicated it would review and consider updates to the Emergency Energy Conservation Plan. I am detailing the proposed changes to that portion of the Evergy tariffs.

Q: Are you aware of the genesis of the Emergency Energy Conservation Plan?

A: Yes. The Emergency Energy Conservation Plan was established in 1978 in response to a lengthy United Mine Workers strike. According to a May 1, 1979 Missouri Public Service

[18] Staff Data Requests 0002, 0045, 0065, 0067 and 0068

Commission Annual Report to the Governor when describing the Commission response to the strike,

> "As a result of the emergency, all twelve regulated electric utilities, under a Commission directive, filed curtailment plans which outline how the utilities will cut back electricity if necessary. Three elements included in all curtailment plans are, an exemption for customers who provide essential public services, specifics on the order of curtailment in the event it becomes necessary, and language that requires Commission approval before there is significant curtailment that will significantly effect customers".

The predecessor company of Evergy was part of the utility group mentioned.

Q: Did Evergy review the adequacy of the Emergency Energy Conservation Plan?

A: Yes. Evergy has found that the Emergency Energy Conservation Plan is no longer applicable to the operations of the Company. The Company is now subject to operational and reliability requirements set by North American Electric Reliability Corporation ("NERC") and SPP. Evergy had documented plans consistent with guidance from those groups and will utilize those plans to respond to emergency conditions of the nature contemplated by the Emergency Energy Conservation Plan. As a result, Evergy proposes to revise the applicable Sections of its General Rules and Regulations.

Q: Please describe the proposed revision?

A: Evergy proposes to eliminate much of the language from 1978 and instead identify the reliance on a Load Management and Manual Load Shed Plan (formerly the Emergency Operations Plan). The Load Management and Manual Load Shed Plan complies with NERC Standard EOP-011-1 concerning Emergency Operations, establishing processes to respond to predefined Energy Emergency Alert Levels and is reviewed by the SPP Reliability Coordinator. Evergy proposed to highlight key contents of the Load Management and Manual Load Shed Plan within the tariff, but to keep the Load

Management and Manual Load Shed Plan itself outside of the tariff. This approach will allow for more timely response and compliance with NERC and SPP guidance.

Q: Will the Commission retain appropriate visibility to the Emergency Energy Conservation Plan under the proposed revision?

A: Yes. The Commission and/or Commission Staff will be notified as soon as practical when the Emergency Energy Conservation Plan is initiated and completed. The Commission Staff will be notified when the Emergency Energy Conservation Plan is revised.

VI. LIGHTING

Q: Please describe your testimony concerning Lighting.

A: My testimony will give additional context to the rate design approaches used for unmetered lighting proposed in this case. Unmetered lighting is the general categorization of our municipal street lighting service and private area lighting service. As detailed by Company witness Marisol E. Miller, not all lighting components were priced similarly in the Evergy application of the requested revenue increase.

Q: What approach was taken to apply the requested increase?

A: The increase for Lighting was applied as follows:

- The adder components (i.e., additional poles, wire spans, etc.) that are common between LED and non-LED rates have been equalized.
- Non-LED lighting components were allotted the balance of the increase at 4.7% with the mercury vapor lighting getting the highest percentage increase at 6.25%.
- LED and traffic lighting were not increased.

Q: Why was this approach taken?

A: Beginning in 2017, the Company began a systematic conversion of its Municipal Street Lighting to LED technology. Rates for the LED luminaires were set at the time based on costs, but the rates for non-LED fixtures were pre-existing and often lower than the observed costs. To facilitate the conversion and avoid additional bill impacts, rates for non-LED fixtures were left as they were. Now that the conversion is complete, the Company is finding that customers are hesitant to leave these obsolete non-LED technologies in part because of the unbalanced pricing. Beginning with this case, the Company proposes to increase the rates of non-LED fixtures and related components at a higher amount than the LED luminaires to eliminate the unbalanced pricing and remove the irrational incentive to maintain the obsolete lighting options.

Q: Did the obsolescence of non-LED lighting impact any other part of this filing?

A: Yes. There are a significant number of items on the lighting tariffs that are obsolete following the conversion to LED and are no longer used for service to customer. They are related to mercury vapor or high-pressure sodium bulb technologies and unused optional equipment. The Company is removing these obsolete options from the various lighting tariff sheets.

VII. SOLAR SUBSCRIPTION

Q: Please describe your testimony concerning Solar Subscription.

A: Evergy has been monitoring developments with Ameren's Community Solar Program in File No. ER-2021-0240 and is aware of a number of changes offered in a Unanimous

Stipulation and Agreement to convert the pilot program to a permanent program.[19] The Stipulation and Agreement states:

> **M. Community Solar.**
> 24. The permanent Community Solar Program as proposed by the Company should be approved, but with the following modifications to the Company's proposal: (1) Language will be added to the proposed tariff allowing transfer of the Community Solar pilot program resource to the extent pilot participants desire to participate under the permanent program terms; (2) permanent program resource construction cannot begin until 70% of a resource for the permanent program is subscribed; (3) shareholders to bear the risk for any undersubscribed portion of the permanent Community Solar program to a 50% undersubscribed threshold, provided, that if the subscription rate falls below 50%, non-participant ratepayers would shoulder the costs; and (4) Market costs and revenues for any undersubscribed portion of a permanent program resource will be allocated to shareholders and not flow through the FAC.

As Ameren's Community Solar Program is similar to the Evergy Solar Subscription Pilot Rider in most regards, Evergy would like to propose similar terms be applied to the Solar Subscription Pilot Rider.

Q: What changes are you proposing for the Solar Subscription Pilot Rider?

A: Consistent with the changes made to the Ameren program, the following are proposed:

- Convert the Solar Subscription Pilot Rider to a permanent program. With this change we would rename the program to "Solar Subscription Rider" and the Schedule designation from "SSP" to "SSR".
- Reduce the subscription threshold required to construct from 90% subscribed to 70% subscribed. Given the timeframe for approvals and subsequent construction after a 90% threshold is achieved, today customers have a long wait time for the process to complete. Reducing the threshold would shorten that period. It is realistic to expect

[19] ER-2021-0240, Unanimous Stipulation and Agreement, November 24, 2021 Approved by the Commission on December 22, 2021.

that enrollment rates would achieve full enrollment by the time this process ends if it can start at lower threshold.

- Establish a threshold for shareholder responsibility of unsubscribed portions of the resource. The Company proposed to set the threshold at 50% where Evergy will bear full responsibility for unsubscribed, consistent with the Ameren approach. Currently, Evergy is responsible for 75% of all unsubscribed amounts.

Q: Are you proposing any additional changes?

A: Yes. Consistent with the intent of converting the tariff to a permanent program but due to differences in the Solar Subscription Pilot Rider tariff, we have other changes. The following changes are proposed:

- Eliminate the requirements limiting the system size to one 5.0 MW system or two 2.5MW systems located in each of the Evergy Missouri jurisdictions for increased flexibility to respond to customer preferences.
- Remove limitations for non-residential participation. The tariff is currently limited to 50% non-residential participation. The Company is aware of one commercial customer who was interested in participating but their need could not be met under the current jurisdictional cap with the requirement for pre-enrollment. More so than a residential customer, business customers typically prefer to purchase their energy from a direct renewable resource, as provided for in the Solar Subscription Pilot Rider versus a green renewable program. Evergy is proposing green renewable program (Green Pricing REC Program), which only allows the customer (residential or business) to claim the benefits of renewable electricity without actually buying it.

- Remove section defining Pilot Evaluation terms. As the program would no longer be a pilot, this additional evaluation is not relevant. Evergy would commit to provide the identified reporting in the Pilot Evaluation section for the resource currently being developed under the existing tariff.
- Remove constraints on program expansion. Currently the tariff requires the Company demonstrate 90% subscription of the initial system for two years before allowing additional subscriptions. In practice, the two-year delay would become three years when adding the construction time for a subsequent system. This language serves only to delay the Company's ability to respond to customer demand for solar energy.

Q: This tariff was approved in 2018 and the Company is in the early stages of making this service available to customers. Why do you believe the tariff should be revised now?

A: As we observe developments in the state, it is clear that the concept of a solar tariff is becoming more accepted by the Commission and parties than it was in 2018 when the Evergy tariff was established. Compared to other tariffs, the current Evergy design is restrictive and incorporates a number of provisions that would constrain expansion of the program. Since revision of the tariff is best addressed within a general rate proceeding, opportunities are limited and the time required to achieve changes is long, we prefer to address this now, improving the potential to respond in a timely way to future customer interest in the program.

Q: Will these proposed changes materially impact the efforts underway to execute the first solar resource under the existing tariff?

A: No, due to the progress made to this point, many of the criteria, particularly the enrollment thresholds and system size limitations have been met. The most significant changes will be the removal of delay for future expansion. As previously stated, Evergy commits to still provide the identified reporting in the Pilot Evaluation section for the proposed solar facility currently being developed under the existing tariff, following two years of operation.

Q: Are any of the pricing elements of the Solar Subscription tariff being changed?

A: Yes. Solar Block Subscription Charge will be changed to $0.1308 per kWh to reflect the new cost of the resource, of which the Solar Block Cost is $0.0908 per kWh. The Service and Access charge will be increased according to the terms of the tariff by the average percentage change to volumetric rates as established by the current tariff language or 5.65%. This would change the charge of $0.038 per kWh to a charge of $0.040 per kWh.

Tariffs supporting the proposal are found on Sheet 39 through 39E of the Company filing sponsored by Marisol E. Miller's testimony.

Q: Does that conclude your testimony?

A: Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Evergy Metro, Inc. d/b/a Evergy Missouri Metro's Request for Authority to Implement A General Rate Increase for Electric Service	))))	Case No. ER-2022-0129

AFFIDAVIT OF BRADLEY D. LUTZ

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

Bradley D. Lutz, being first duly sworn on his oath, states:

1. My name is Bradley D. Lutz. I work in Kansas City, Missouri, and I am employed by Evergy Metro, Inc. as Director – Regulatory Affairs.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Evergy Missouri Metro consisting of fifty-six (56) pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

Bradley D. Lutz

Subscribed and sworn before me this 7th day of January 2022.

Notary Public

My commission expires: 4/26/2025

ANTHONY R. WESTENKIRCHNER
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 26, 2025
PLATTE COUNTY
COMMISSION #17279952

Missouri

Seasonal Study
Evergy Missouri Metro
Final Report
1/7/2022

Table of Contents

I Introduction & Purpose

In the most recent Evergy ("Company") Missouri rate cases filed in Dockets ER-2018-0145 and ER-2018-0146, a non-unanimous partial stipulation and agreement was reached concerning rate design issues. In this agreement, the Company agreed to study the alignment of billing seasons between their two Missouri jurisdictions - Metro and West. The purpose of this report is to outline the results of the study and make a recommendation.

The Study begins by summarizing the current state of seasonal billing periods across the Missouri jurisdictions to highlight the jurisdictional differences. With differences identified, a solution is proposed to better align the jurisdictions and demonstrate how the seasonal billing period alignment can affect customer bills. To support the reasonableness of the proposal, a summer season billing period analysis was then conducted to compare the proposed summer season to similar utilities, and the seasonal relationship to system peak. Finally, a revenue impact analysis is performed to size the annual effect of implementation to expected Company revenues. The results of the study serve as a basis for the Company's recommendation to align the Missouri Metro jurisdiction's seasonal billing periods with the seasonal billing periods used in the Missouri West jurisdiction.

II Glossary

Term	Description	Example
Billing Determinant	A value or quantity on a bill that determines the bill total: *Billing Determinant X Price = Bill Total ($)*	The kilowatt hours of usage associated with a bill represent the billing determinants for the energy component of a bill, whereas the peak kilowatt demand associated with the bill represents the billing determinants for the demand component of a bill.
Seasonally Differentiated Rate Component	The parts of the bill that charge different rates based on the season the associated billing determinants are categorized under	An energy charge is often a seasonally differentiated rate component because most tariffs apply different energy charges based on the season, whereas a customer charge is often not a seasonally differentiated rate component because most tariffs do not apply different customer charges based on the season.
Seasonal Proration	A method used to proportionately apply both seasonal rates to the same type of billing determinants based on the number of billing days associated with each season	If a 30-day bill has a billing period where 15 days fall under the winter season and 15 days fall under the summer season, then a seasonally differentiated rate component such as an energy charge will price half (15/30) of its determinants at the winter rate and the other half (15/30) at the summer rate.

III Current State of Billing Periods

Across both Missouri jurisdictions, most retail tariffs contain seasonally differentiated rate components. Seasonal differentiation works by categorizing customer billing determinants as either "Summer" or "Winter". However, the date range that defines a season, as well as the application, differs across jurisdictions. Each jurisdiction defines their seasons as follows:

> Missouri West – "For the determination of Seasonal periods, the four (4) summer months shall be defined as the four (4) monthly billing periods of June through September. The eight (8) winter months shall be defined as the eight (8) monthly billing periods of October through May."
>
> Missouri Metro – "The Summer Season is four consecutive months, beginning and effective May 16 and ending September 15, inclusive. The Winter Season is eight consecutive months, beginning and effective September 16 and ending May 15. Customer bills for meter reading periods including one or more days in both seasons will reflect the number of days in each season."

As shown above, there are two jurisdictional differences regarding the application of a seasonal component on billing. First, there is a difference in the dates used to define the summer and winter seasons. For instance, Missouri Metro defines the summer season as May 16 to September 15, whereas Missouri West defines the summer season as June through September billing months.

The second difference pertains to proration. Proration is a process used within the Company billing system to manage customer bill calculations occurring at transitions of the billing period and rate changes. If a bill's billing period contains days that fall within both the summer and winter season, as defined by the corresponding tariff, the rates are currently applied differently across the jurisdictions. In Missouri Metro, a seasonal proration is applied by calculating how many billing days fall under the summer period relative to the total number of billing days, and how many billing days fall under the winter period relative to the total number of billing days. The resulting fractions are used to determine how many billing determinants should be calculated using the summer versus winter tariff rate. In Missouri West, there are no seasonal prorations applied. Without seasonal proration, a bill that contains days that fall within both the summer and winter season is calculated using either the summer or winter tariff rate depending on which month the bill is categorized under. For example, if a billing period contains 20 days within May, and 10 days within June, with a statement date of June 10th, the bill without seasonal proration will apply summer rates across the entire bill because June 10th falls within the summer season, regardless of whether the 20 days in May were during the winter season.

The differences are summarized in the following table on Figure 1 (Note - The corresponding winter date range includes all days not included in the summer season):

FIGURE 1: SUMMER SEASON & PRORATION METHOD JURISDICTIONAL COMPARE

	Summer Season		
	Start Date	End Date	Proration Method
MO West	June 1	September 30	No Proration
MO Metro	May 16	September 15	Proration by Days

IV Proposed State of Billing Periods

In an effort to align Missouri jurisdictions, the Company proposes a change in the summer season billing period in Missouri Metro from "May 16 – September 15" to "June 1 – September 30" which would align the summer billing months across both the Missouri jurisdictions. The change in the summer season date range would be coupled with a change in the winter season date range in Missouri Metro from "September 16 – May 15" to "October 1 – May 31" which would align the winter billing months across the Missouri jurisdictions.

The effect of the proposed seasonal billing period change in Missouri Metro is demonstrated by an example on Figure 2. The example uses a single bill requiring proration at the start of the summer season. The table on the left calculates billing determinants and bill amounts under the current seasonal billing periods. The table on the right calculates billings determinants and bill amounts under the proposed seasonal billing periods. By calculating the same bill side by side using the current and proposed seasonal billing periods, Figure 2 examines how a bill could be calculated differently by changing the seasonal dates in Missouri Metro to align with the seasonal dates in Missouri West. The outcome in the Figure 2 example shows a decrease in a customer's bill from $203.20 to $179.52. However, keep in mind that the billing period change would have an opposite impact on a customer's bill if we looked at a bill being prorated at the end of the summer season versus the start. For more information on the net impact caused by the change in seasonal billing period dates, review Section VII Customer Bill and Revenue Impact Analysis.

FIGURE 2: BILL CALCULATION EXAMPLE FOR PROPOSED CHANGE

Bill Details & Tariff Rates

Billing Start Date	5/10/2021
Billing End Date	6/9/2021
Total kWh Usage	1,109.28

	Summer	Winter
Customer	$11.47	$11.47
Energy	$0.17951	$0.13949

Calculation Under Current Seasonal Periods

Because the Summer Season begins on **May 16**, this bill contains 5 winter days and 25 summer days.

If 5 out of 30 days are winter, then 5/30 or 17% of the bill's total seasonal determinants are considered winter determinants:

*Winter kWh Usage = Total kWh Usage * Winter Proration*
*Winter kWh Usage = 1,109.28 * 17%*
Winter kWh Usage = 184.88

If 25 out of 30 days are summer, then 25/30 or 83% of the bill's total seasonal determinants are considered summer determinants:

*Summer kWh Usage = Total kWh Usage * Summer Proration*
*Summer kWh Usage = 1,109.28 * 83%*
Summer kWh Usage = 924.40

Winter seasonal determinants are priced at the winter rate:

*Winter Energy Bill Amount = 184.88 * $0.13949*
Winter Energy Bill Amount = $25.79

Summer seasonal determinants are priced at the summer rate:

*Summer Energy Bill Amount = 924.40 * $0.17951*
Summer Energy Bill Amount = $165.94

The bill amount from each season of a seasonal bill component can be summed together to get the total seasonal bill component bill amount:

Energy Bill Amount = $25.79 + $165.94
Energy Bill Amount = $191.73

The bill amount from each bill component can be summed together to get the total bill amount:

Total Bill Amount = Customer Bill Amount + Energy Bill Amount
Total Bill Amount = $11.47 + $191.73
Total Bill Amount = $203.20

Calculation Under Proposed Seasonal Periods

Because the Summer Season begins on **June 1**, this bill contains 21 winter days and 9 summer days.

If 21 out of 30 days are winter, then 21/30 or 70% of the bill's total seasonal determinants are considered winter

*Winter kWh Usage = Total kWh Usage * Winter Proration*
*Winter kWh Usage = 1,109.28 * 70%*
Winter kWh Usage = 776.50

If 9 out of 30 days are summer, then 9/30 or 30% of the bill's total seasonal determinants are considered summer determinants:

*Summer kWh Usage = Total kWh Usage * Summer Proration*
*Summer kWh Usage = 1,109.28 * 30%*
Summer kWh Usage = 332.78

Winter seasonal determinants are priced at the winter rate:

*Winter Energy Bill Amount = 776.50 * $0.13949*
Winter Energy Bill Amount = $108.31

Summer seasonal determinants are priced at the summer rate:

*Summer Energy Bill Amount = 332.78 * $0.17951*
Summer Energy Bill Amount = $59.74

The bill amount from each season of a seasonal bill component can be summed together to get the total seasonal bill component bill amount:

Energy Bill Amount = $108.31 + $59.74
Energy Bill Amount = $168.05

The bill amount from each bill component can be summed together to get the total bill amount:

Total Bill Amount = Customer Bill Amount + Energy Bill Amount
Total Bill Amount = $11.47 + $168.05
Total Bill Amount = $179.52

V Scope and Methodology of Analysis

The analytical approach for this study starts by determining the optimal seasonal billing period based on system capacity. To assess the reasonableness and appropriateness of modifying the existing seasonal billing period, the study assembled and reviewed system load data from July 2020 to June 2021. The analysis went further by reviewing the seasonal periods used by other utilities as a reference point.

The study incorporates the following seasonal billing period analyses to recommend a change in the determination of seasonal billing periods:

1. Seasonal Billing Periods at Other Utilities
2. System Peak Load Analysis

After a seasonal solution is determined, customer impact and overall revenue impact analysis was conducted. Customer billing data was used to calculate bill determinants and revenues under the current seasonal period, and again after the proposed seasonal date alignment is applied to compare the effects. The billing data utilized for these analyses falls within the test year of July 2020 to June 2021 to provide an annual view. Unlike the system peak load analysis which looks at both Missouri jurisdictions, the bill and revenue impact analyses only include data for Missouri Metro because only Missouri Metro bills will be impacted by the recommended seasonal alignment.

The study incorporates the following bill and revenue impact analyses to observe the estimated effects caused by the seasonal period alignment:

1. Annualized Bill Impact by Customer
2. Normalized, Annualized Revenue Impact

VI Summer Season Billing Period Analysis

1. Seasonal Billing Periods at Other Utilities

A review of other regional utilities residential tariffs was conducted to determine how other electric providers address seasonality and determine if there may be appropriate pricing period alternatives for the Company to consider. For the utilities with summer seasons, seven (7) of the thirteen (13) define the summer season as the billing months of June through September or June 1 through September 30. Two utilities (Alliant-IPL and Liberty) define a four-month Summer Seasons with mid-month transitions.

Based on this review, the most common summer season adopted by regional utilities is a four-month period defined as the billing months June-September or calendar period June 1 through September 30. A summary of the Seasonal Billing Periods at Other Utilities is shown on figure 3.

FIGURE 3: RESIDENTIAL RATES SUMMER SEASON SUMMARY

STATE	UTILITY	Summer Period Definition	Whole Month Period
IL	Ameren-IL	June, July, Aug & Sept. monthly periods	x
MO	Ameren-MO	June 1 through Sept 30, prorated (2021)	x
IA	MidAmerican	4 monthly billing periods June through September	x
IA	Alliant-IPL	May 16 to September 15	
WI	Alliant-WPL	Calendar months June, July & August	x
OK	OG&E	5 Revenue Months June through October	x
OK	AEP-PSO	Billing months June through October, inclusive	x
MO	Liberty	4 monthly billing periods on or after June 16	
KS	Liberty	No Summer Season	
AR	Entergy-AR	June - September	x
CO	Xcel-CO	June 1 through September 30	x
NE	OPPD	June 1 through September 30	x
MN	Xcel-MN	June - September	x

2. System Peak Load Analysis

In this section, we present the review of the Company's July 2020 to June 2021 system load data, which indicates a seasonal pattern. In figures 4 and 5 below, excluding the month of February which contained a cold weather event, each jurisdiction exhibited highest daily peak loads in the four (4) months of June, July, August, and September, the range that falls between the two vertical red lines shown on the graphs. Because a customer's contribution to system peak load is a significant cost factor, the results support a June-September summer season alignment between both Missouri jurisdictions.

FIGURE 4: JULY 2020 – JUNE 2021 MO METRO DAILY PEAK, AVERAGE & MINIMUM LOADS (MW)

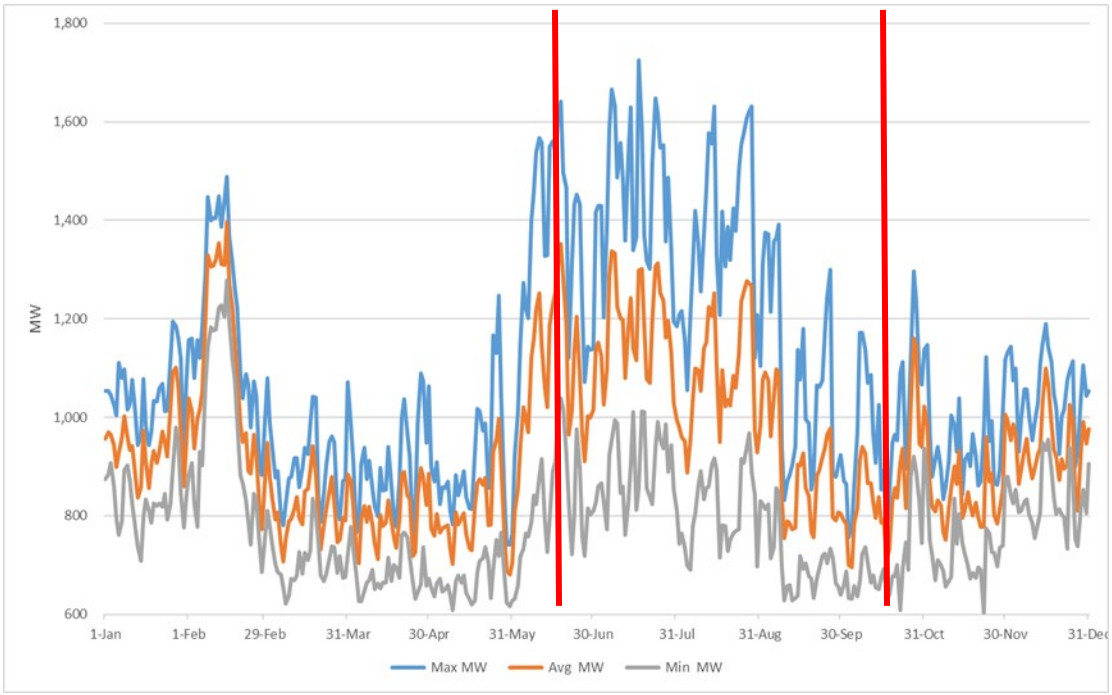
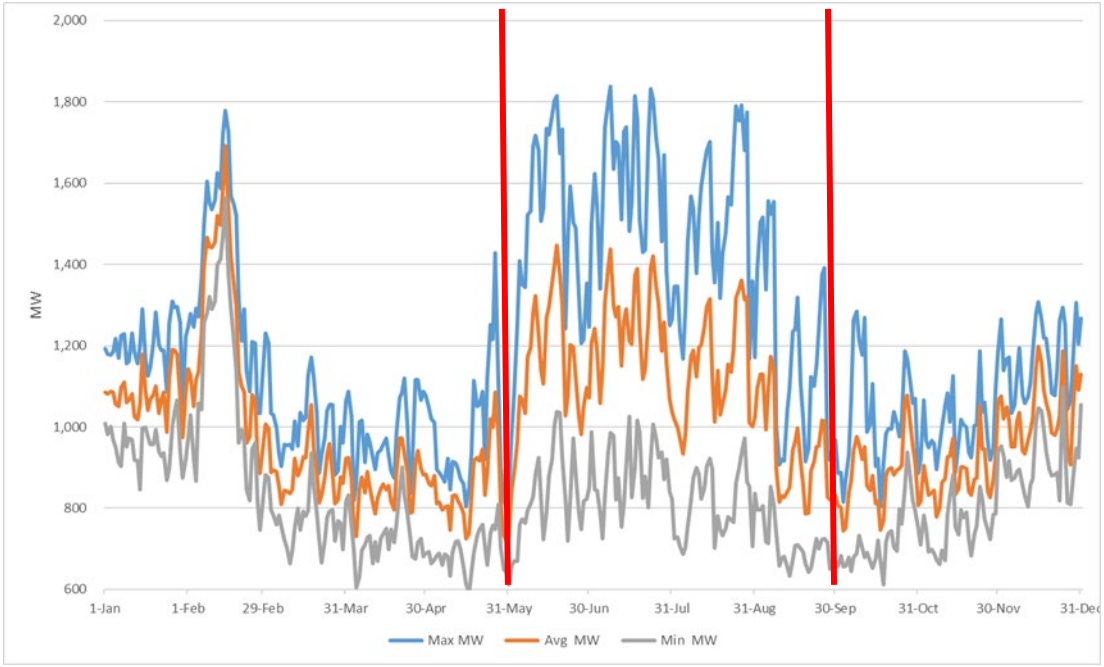


FIGURE 5: JULY 2020 – JUNE 2021 MO WEST DAILY PEAK, AVERAGE & MINIMUM LOADS (MW)



VII Customer Bill and Revenue Impact Analysis

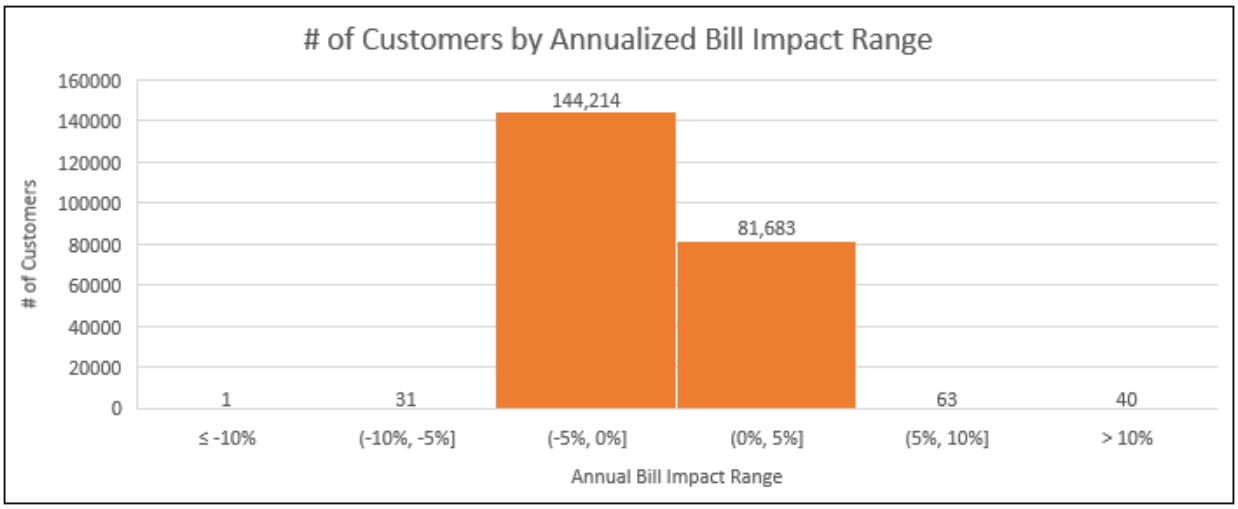
The analysis summarized in this section utilizes Missouri Metro customer billing data within the test year of July 2020 to June 2021. The billing data has been recalculated to allow for individual bills and overall revenue effects to be observed before and after the seasonal date change is implemented.

1. Annualized Bill Impact by Customer

The Annualized Bill Impact by Customer analysis is based on actual determinants and only includes data for customers who have 12 months of billing history within the test year to ensure the results reflect the annual effects by customer. Customers included in analysis would have to reside on a rate that applies seasonal differentiation and that would be impacted by the seasonal change. Therefore, customers on rates that do not differentiate rates based on season, such as those in the Lighting class, were not included in the Annualized Bill Impact by Customer analysis. With all the above factors considered, 226,032 of our 288,521 customers were analyzed.

An overwhelming majority, or 99.9%, of the 226,032 customers analyzed are estimated to see their bills increase or decrease by less than 5% on an annual basis. The median customer is estimated to see their bill change by -0.07% on an annual basis. In other words, a typical customer should expect to see their bill (taxes, riders, & credits excluded) change by -$0.70. The range of impact on customers can best be visualized in Figure 6.

FIGURE 6: NUMBER OF CUSTOMERS BY ANNUALIZED BILL IMPACT RANGE



2. Normalized, Annualized Revenue Impact

The Normalized, Annualized Revenue Impact analysis utilizes Missouri Metro test year billing determinants that have been annualized and normalized to represent a normal year, comparable to what one would observe in a rate case filing. The study utilizes two separate billed revenue models, both of which represent the Company's current rate structure. One document is based on the billing determinant and revenue data without any seasonal changes being applied. The second billed revenue document is based on the billing determinant and revenue data with the seasonal date alignment applied. The two billed revenue documents are compared to one another to measure the estimated total effect on revenues. The aggregated effects are summarized in the tables below. Based on the degree of change in total and by class, a change in the seasonal dates appears to have minimal impact to overall revenues.

FIGURE 7: TOTAL NORMALIZED, ANNUALIZED REVENUE IMPACT

Normalized, Annualized Revenue Impact	
Before Change	$843,294,974.64
After Change	$842,942,891.74
Total Change	-$352,082.90
Total Change %	-0.04%

FIGURE 8: TOTAL NORMALIZED, ANNUALIZED REVENUE IMPACT BY CLASS

Class	Before Change	After Change	Diff	Diff %
RES	$341,159,142.81	$341,072,261.89	-$86,880.92	-0.0255%
SGS	$68,617,737.48	$68,558,084.73	-$59,652.76	-0.0869%
MGS	$121,656,929.77	$121,612,062.48	-$44,867.29	-0.0369%
LGS	$180,373,757.71	$180,236,999.24	-$136,758.46	-0.0758%
CCN	$74,563.92	$74,563.92	$0.00	0.0000%
LPS	$121,482,208.12	$121,458,284.64	-$23,923.47	-0.0197%
Lighting	$9,930,634.83	$9,930,634.83	$0.00	0.0000%

VIII Conclusion

Based on the analysis summarized in this report, it is recommended that the Company adopt a summer season billing period aligned with the calendar period June 1 through September 30 in the Missouri Metro jurisdiction. This will provide the proper alignment of the summer season with the 4-month period of greatest system demand. Furthermore, the study concludes that this proposal would have a minimal annual impact on individual customer bills and company revenue. The Company has incorporated this recommendation as part of the 2022 Evergy MO Metro Rate Case, Docket ER-2022-0129. The effective date for the recommendation is contingent on commission order and expected to be no later than 12/7/2022.

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Advanced Metering Infrastructure (AMI) Study

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December 2021

Contents

1. Overview

Recently, Evergy has transitioned from Load Research to AMI-based analysis. The first steps included replacing load research customer samples collected from load research meters with customer sample points from the AMI (Advanced Meter Infrastructure) database. The next step was a full transition to AMI. This entailed replacing sample-based hourly load profiles with 100% AMI load aggregation.

As part of this transition effort, Itron was contracted to review Evergy's AMI aggregation process, evaluate Evergy's load aggregation results, and compare these against peer utilities who are also utilizing AMI data for load analysis. The study and results offered in this report, entailed reviewing the development of AMI data for load analysis, interviewing other electric utilities about their AMI effort, issues, and applications, and assessing Evergy's AMI roll-up effort.

1.1 Transition from Load Research to AMI

Utility load research has long been the primary means of developing customer class and rate code hourly load estimates to support utility analytics including cost of service studies, rate design, evaluating energy efficiency programs, weather normalization, financial analysis, and forecasting. Load research involves designing and implementing rate class samples, managing, and validating sample interval data, and utilizing complex statistical-based expansion methods to translate a sample into system-level rate class hourly loads. The load research process is complex requiring systems and staff expertise in sample design, data processing and validation, and statistical sample expansion methods. Organizations including the Association of Edison Illuminating Companies (AEIC) Load Research Subcommittee and the Western Load Research Association have focused on load research methods, training, and applications for decades.

Customer interval data collected through AMI makes possible the replacement of load research with load aggregation. While AMI load aggregation is beginning to replace load research, the transition has been slow. Meter Data Management Systems (MDMS) where AMI data is stored, were designed for processing and validating meter input data, and using the data for calculating customer bills; the MDMS was never designed for aggregating customer interval data, let alone analysis. This has required developing new applications, many that remain constrained by computing resources and associated costs as aggregating hundreds of thousands of interval data requires significant computer processing capacity. Yet utilities are making progress taking advantage of improvements in existing database applications, new database

applications, declining computer processing costs, and technologies allowing utilities to utilize cloud-based servers and software.

The value of AMI data for load analysis is significant. AMI data provides improved clarity on how our customers use electricity, smaller error variance when compared with load research that in turn results in more accurate forecast, and ultimately, improved confidence in the data used in basing utility financial analysis, resource planning, rate cases, and overall business activity.

Utilities that have built out load aggregation capabilities are utilizing AMI data for numerous applications that include:

- Developing rate class hourly load profiles for cost of service and rate design
- Calculating unbilled sales and revenue
- Forecasting calendar-month/booked sales
- Developing end-use load shapes for long-term planning forecasts
- Estimating daily weather-response models
- Tracking forecast performance
- Tracking COVID's impact on loads and revenue

While utilities have been collecting customer interval data since as early as 2000, the aggregation of AMI data for load analysis is relatively recent. The process for aggregating load data across thousands, if not millions of customers has been difficult with little industry standardization. Utilities basically have had to figure out how to aggregate AMI data on their own, learning from mistakes made along the way. Factors that have made load aggregation difficult include:

- Meter data management systems (MDMS) meant to capture data and not designed for adding up large volumes of customer interval data
- Linkage to customer information data systems that aren't readily or automatically compatible
- Data complexity
- Lack of cost-effective software and hardware solutions
- Lack of staff with big data skills or familiarity with new distributed base software applications.
- Poor value proposition – failure to internally "sell" the value of AMI load

These impediments are slowly diminishing as utilities implement processes for exporting and linking interval and customer information data, computer processing

costs decline, and new software and computing approaches make possible the aggregation of millions of customer interval read data.

Utility management and regulators are beginning to see the value of aggregated AMI data for load analysis and learning that current AMI metering investments and supporting MDMS systems are not enough to realize full potential of AMI data. New software, computer resources, and staff with big data analytics skills will be needed.

2. A Little History

AMI systems have been rolling out since early 2000 with a large increase in the number of systems around 2010. The jump in AMI deployment was a result of government incentives paid to encourage smart meter adoption through the 2009 American Recovery and Reinvestment Act (ARRA). In 2009, Evergy (at the time KCP&L) applied and was granted funding for their first smart meter deployment: Evergy installed 14,000 AMI meters as part of the Green Impact Zone[1]. Since 2010, there has been a steady increase in AMI adoption and coverage. Evergy reached a 100% AMI coverage beginning in 2020. According to the Energy Information Administration (EIA) U.S. electric utilities had installed roughly 103 million AMI meters by the end of 2020[2]. The *Institute for Electric Innovation* (part of the Edison Foundation) estimates that 75% of households now have AMI meters[3]. The number of AMI meters is continuing to expand with major projects at Excel Energy, Duke Energy, Tampa Electric, First Energy, American Electric Power, and Puget Sound Energy. By the end of 2021, the Institute for Electric Innovation projects there will be 115 million smart meters in place.

AMI is an integrated system designed to collect interval and daily energy reads at the end-use point (the electric or gas meter) and send this data through the communication network to the utilities Meter Data Management System (MDMS). At the MDMS, daily load reads, and hourly interval data are used in developing customer billing determinants that feed into customer information system (CIS) and billing system. The initial applications were largely focused on reducing customer data collection costs and more accurately measuring customer usage and generate bills (meter to cash).

[1] https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935682078
[2] https://www.eia.gov/tools/faqs/faq.php?id=108&t=3
[3] https://www.edisonfoundation.net/-/media/Files/IEI/publications/IEI_Smart_Meter_Report_April_2021.ashx

Prior to AMI, many utilities including Kansas City Power & Light, an Evergy predecessor company, implemented Automated Meter Read (AMR) systems. AMR systems were primarily designed to replace manual meter reading. In a typical AMR system, a van driving or person walking down the street or a series of pole-mounted collector devices "pings" the meter which in turn returns the meter registry read. This information combined with location, pulse multiplier, and timing of the meter read are then used to generate kWh and kW billing units. Utilities realized significant savings by replacing manual meter reading with AMR. Many utilities today still utilize AMR systems.

AMI opened a whole new world as it allows for two-way meter communication and can collect interval reads (generally 5 minute or 15 minute) as well as daily total and maximum demand reads. The first utilities that implemented AMI never had AMR – their meters were still manually read. This was because AMI system costs were much easier to justify when meter reading cost savings were factored in. Some utilities with legacy AMR systems are still facing headwinds with justifying AMI implementations. States including Massachusetts, Virgina, New Mexico, and Kentucky have rejected utility AMI proposal for not demonstrating project cost-effectiveness[4]. These utilities are refocusing on the value of two-way meter communication in an environment with increasing distributed generation, renewables, and potential impact of electric vehicle charging on the distribution system.

Where the first phase of AMI data use was for developing accurate bills, the second phase of AMI data use has been in applications associated with monitoring load changes at the meter for low voltage, outages, and theft detection. Utilities are also taking advantage of AMI two-way communication where applications include remotely turning on and off meters, controlling end-use loads such as air conditioning, water heaters, implementing voltage-reduction programs, and controlling electric vehicle charging. Other applications include internet-based portals that allow customers to view their daily and hourly load consumption, applications that can disaggregate and present end-use level loads, and customer service applications that allow utility customer service representatives to view customer usage to better address high bill complaints. Evergy is currently using AMI data for:

- Call center high-bill analysis
- Identifying and predicting meter failure
- Theft and fraud detection

[4] https://www.greentechmedia.com/articles/read/why-most-u-s-utilities-arent-making-the-most-of-their-smart-meters

- Outage and power restoration detection
- Customer load presentation through online portal
- For large Tier 1 customers, the ability to monitor loads across multiple locations

Despite increasing number of applications, a recent ACEEE report (*Leveraging Advanced Metering Infrastructure to Save Energy, Report U2001*[5]) found utilities are underutilizing AMI systems for improving energy efficiency. The study identified where AMI could be used or expanded to improve energy efficiency including implementing TOU rates, providing customer feedback information, pay for performance programs, more robust energy efficiency program evaluation, and grid-interactive efficient buildings.

3. The Third Phase – Load Analysis

The third phase of AMI data applications is relatively recent and is still developing. This phase entails utilizing aggregated AMI data for rate design, cost of service studies, designing and evaluating energy efficiency programs, financial analysis and planning, and forecasting.

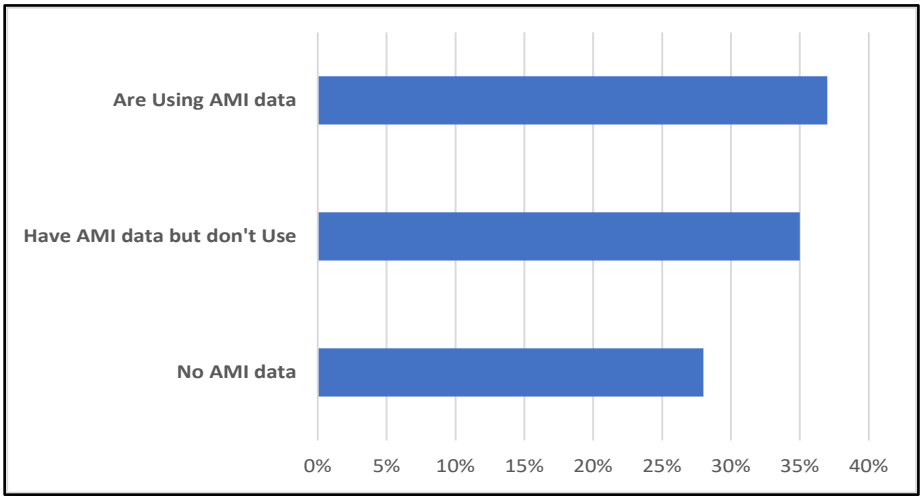
Traditionally, load analysis has been the responsibility of load research groups. Load research has been a utility activity that goes back to the early 1940's when the Association of Edison Illuminating Companies (AEIC) formed the first load research committee. In load research, daily and hourly rate class profiles are developed through designing and deploying customer samples, collecting, managing, and validating customer sample hourly load data, and applying statistical-based sample expansion methods. The profile development work is complex and time-consuming requiring strong data processing, sample design, and statistical skills and associated software. While AMI data aggregation has its challenges and requires a different set of skills, once in place, the data aggregation process is significantly less complex, requires less time to generate class load profiles, and is less costly than load research.

What are Utilities doing Now

Itron conducts an annual survey of utility forecasters. In the 2020 survey, Itron asked respondents if they are using AMI data for load analysis. Figure 1 shows survey results.

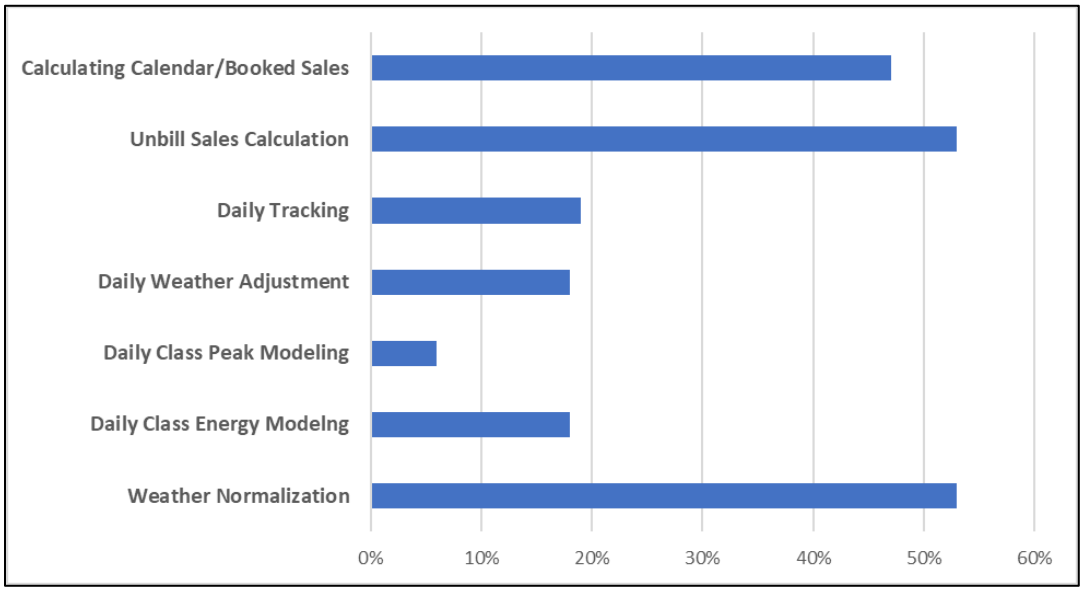
[5] https://www.aceee.org/research-report/u2001

Figure 1: 2020 Itron Utility Survey: AMI Data Use Response



Over 70% respondents reported having AMI systems, but just 37% reported using AMI data for load analysis; representing a little over half of those that had AMI systems in place. While the survey shows that a large share of utilities are still not utilizing AMI data for load analysis, the number of respondents that are utilizing AMI data is up from 23% reported in the 2019 survey. Those utilizing AMI data were further asked about how they were using the data. Figure 2 shows the responses.

Figure 2: AMI Data Applications



The largest responses are for calculating calendar-month or booked sales, weather normalization, and calculating unbilled sales. Of those utilities using AMI data, nearly

25% are using AMI data for load modeling (daily class energy and daily class peak modeling).

Utility Interviews

As part of the AMI study, we conducted a number of interviews with companies that either had AMI systems in place or are currently implementing systems. The interviews focused on applications of AMI data for load analysis, processes, software used for aggregating AMI data, and issues faced in developing load aggregation capabilities. We interviewed staff from load research, forecasting, and IT groups supporting the AMI aggregation process.

In addition to Evergy, companies interviewed include:

- DTE Energy
- San Diego Gas & Electric
- NV Energy
- CenterPoint Energy
- CPS Energy
- Lakeland Electric
- Burlington Electric Department
- Green Mountain Power
- AES Indiana
- Xcel Energy
- Salt River Project
- TECO Energy

The companies interviewed ranged from companies that are still evaluating and designing AMI roll-up capabilities to companies that are implementing second generation load aggregation schemes in the cloud. The companies are fairly evenly split between three groups:

- Still implementing systems and designing process
- Aggregating data on an “Ad Hoc” basis for analysis requirements
- Aggregating data on a near real-time basis (within two days).

As a point of reference, Evergy falls in the second group.

Reported applications include:

- Weather normalization
- Variance reporting
- Daily budget tracking
- Daily COVID-19 impact tracking
- Cost of service studies and rate design
- Hourly load forecasting
- Unbilled sales calculation
- Behind the meter solar load analysis
- Heat pump program impact analysis
- Targeting energy efficiency programs
- Settlement and load profiling

Evergy is utilizing AMI data for cost of service studies, rate design in all of its jurisdictions, and calculating unbilled sales in the Evergy Kansas Central jurisdiction. Evergy is looking at using AMI data for calculating unbilled sales in all of its jurisdictions.

Complex Process. A common theme across the companies, is that rate-class load data aggregation process is complex and had taken several years to develop. Nearly every company stated that the process was hard. The problem is the MDMS applications are not designed to aggregate interval or even daily load reads. Each company has had to figure out and implement their own process for aggregating interval data (other than Burlington Electric) with applications outside the MDMS. There are no vendors that offer an AMI load aggregation product, and little industry information as to how and what applications can be used for aggregating AMI data.

Evergy's path to load aggregation has been similar to the other companies. Staff from several different groups spent well over a year to develop and implement a process for linking customer information data with AMI data, defining data channels for load aggregation, writing aggregation code, and validating load aggregation, and developing detailed data processing and validation documentation.

The general approach is the utility exports the interval data and daily registry read from the MDMS to a parallel or "shadow" database for load aggregation. Customer information data such as location, rate code, business-type code, and other identifiers are also exported to the shadow database. Database queries are then used to join customer information data with customer interval data and to then aggregate customer interval data over the target identifier such as rate code. The shadow database is

generally updated once a day, in some companies the shadow data base is updated once a month or on a "request basis".

There is some progress to building load aggregation capabilities within the MDMS. Burlington Electric was the one utility that aggregates to rate class within their MDMS. Burlington's MDMS can handle the aggregation process as they are aggregating interval data load for approximately 20,000 customers. SDG&E reported having the capability to aggregate loads with their new MDMS application but had not yet implemented that feature. The latest Itron MDMS (IEE) release now has a module for aggregating AMI data.

Reported database applications used for AMI load aggregation include SAS, Microsoft SQL Server, Oracle SQL, Hadoop, Python, Tableau, Google BigQuery, SAP/Hana, and DataBrick.

Most companies started by aggregating loads using relational database applications including Microsoft SQL Server and Oracle SQL This often turned out to be a problem as aggregation queries would take too long and even fail to complete because of computing capacity constraints. Some companies addressed the problem by adding additional computing capacity, but a number of utilities moved to distributed database management systems (DBMS) with Hadoop being the most popular solution. Distributed database applications spread the data processing across multiple sites significantly increasing processing and calculation speed.

Both DTE and CenterPoint have migrated their aggregation process to cloud-based solutions. DTE started with SAS but is now using Databricks on Azure and CenterPoint went from an SAP/Hana appliance to Google BigQuery.
The advantage of these solutions is the aggregation is extremely quick and cloud-based computing capacity is utilized only when its needed. Non cloud-based options are also improving Itron recently added an aggregation module as part of their MDMS (IEE). Oracle which is used by Evergy is improving their roll-up application with their new Oracle Exadata Platform.

What has Worked. The most successful companies had dedicated staff for managing, validating, and aggregating AMI load data. Staff generally had strong database and programming skills. For NVEnergy, the load research department morphed into the load analysis group; NVEnergy no longer does traditional load research work relying entirely on AMI data aggregation to support company analysis requirements. DTE, CenterPoint, and GMP have dedicated AMI analysts. TECo that

has just implemented their AMI system is discussing roll-up options with several vendors. They expect the current load research team to ultimately be responsible for AMI data aggregation for load analysis. Several companies indicated that they are still working to identify the group that should be responsible for supporting AMI load analysis.

What Hasn't Worked. What hasn't worked well is where there is no person or group responsible for load aggregation. At one utility, analyst groups had to do their own queries, data validation, and profile adjustments; often the profiles developed by one group didn't look like the profiles developed by another group even though they were pulling from the same data source. At another utility miscommunication between the analysis group and IT group that was executing the data roll-up resulted in aggregated rate class loads that were clearly wrong.

The initial reason for rolling-up AMI data varied by company. For GMP, the initial use of aggregated load data was to build out a daily tracker that allowed management to assess forecast performance and later to track COVID-19 impacts. For SDG&E the driving factor was the need to support load settlement for Community Choice Aggregation program. For NV Energy it was to support designing behind-the-meter solar cost of service and standby rates. For Lakeland Electric aggregated AMI data was utilized to track COVID-19 by business activity.

These and other utilities with established roll-up processes are expanding their use of AMI data. Companies are using AMI data for variance analysis, estimating unbilled sales, weather normalization, rate making, and developing calendar month or booked sales and revenue forecasts. For DTE, nearly all rate design, cost of service and financial analysis and reporting is now based on AMI aggregated data.

4. Benefits of AMI

Load research based hourly and daily use rate-class profiles have long been the backbone of utility analytics. Evergy, like most utilities, has had a load research department dedicated to developing and maintaining rate class hourly loads. Utilities has been utilizing statistical methods to develop rate class profiles from customer samples that meet industry-established confidence levels. While load research has served utilities well, AMI aggregation has the potential to provide even higher level of accuracy across all hours as AMI aggregation is measured (though still needs adjustment for the small amount of load that does not flow through AMI meters) vs load research based profiles that are statistical estimates. The benefits of AMI roll-up capabilities are outlined below:

Cost Savings. Once built out, the AMI aggregation process should be less costly than maintaining a load research program. AMI aggregation will require fewer staff with specialized statistical skills and free-up staff for more analysis and less data validation and processing work. Where it often takes several months to process and construct hourly loads through load research, AMI roll-up applications can generate class-level hourly loads within days. The build out process would require some of what has been mentioned throughout this report including, dedicated and specialized staff, hardware, software, and significant computing resources.

Unbilled Sales Estimation. For most utilities customer's meters are read across the month, even where AMI systems are in place. For customers whose meters are "read" at the beginning of the month, most of their usage falls in the prior month where most of the usage for customers read at the end-of the month fall within the same calendar month. As a result, billed sales for any given month generally includes half the sales in the current month and half the sales of the prior month. Given meter read timing, it's not unusual to see billed sales that include not only last month's usage but even usage two-months prior. Financial revenues and operating costs are reported on a calendar month; this requires untangling the monthly billed sales across months and estimating the portion of sales delivered but not yet billed (unbilled sales). Most utilities use an accounting approach to estimate the unbilled sales and revenues. The accounting approach can result in large over and under estimation of unbilled sales and revenues. While the process ultimately corrects over time, management and shareholders are not always getting the most accurate picture of current revenues and resulting margins. AMI data can significantly improve unbilled and calendar-month sales and revenue estimates; Unbilled and calendar-month sales no longer have to be estimated but can be calculated. The mystery often associated with large unbilled sales variance simply goes away and in turn provides more clarity on utility revenue and profitability for management, shareholders, and regulators.

Cost of Service Studies and Rate Design. Replacing load research with AMI load aggregation will overall provide a more accurate measurement of rate class hourly loads and as a result improved cost allocation when compared with statistical-based load profiles. While we can build strong sample-based profiles, sample-based profiles will never be as accurate as the aggregation of the actual load data. This is particularly true for commercial rate classes, where a sample cannot totally capture the wide variation in customer load use. Similarly rate design based on AMI data provides that much more confidence that the data used in constructing new rates and modifying existing rates is accurate; a stronger foundation for rate calculations reduces the risk of revenue shortfalls.

Weather normalization. Weather normalization is a core utility activity. Isolating weather allows us to see rate class sales trends, track forecast performance, and calculate the basis for test-year sales and revenue. Weather normalization models based on measured customer use will be that much more accurate than models based on statistical-based load estimates.

Variance analysis. Variance analysis utilizes results from weather normalization to track sales against the budget forecast and to identify deviations from budget that may require addressing. Improvements in the weather-sales estimates (from weather normalization) will lead to more accurate tracking of the sales and revenue forecast. AMI data further allows for daily tracking; this can be used to gauge where sales will likely be by the end of the month or quarter. AMI data provides greater clarity on sales trends and expected near-term sales and revenue.

Forecasting. AMI load aggregation provides a more accurate measure of current month sales use and as a result improved sales, revenue, and long-term energy demand forecasts. Customer sales forecasts are generally based on historical monthly billed sales. Billed sales can vary significantly over the estimation period not only because of weather but also because of billing adjustments and variation in the number of meter-read days. Modeling billed sales is complex and further requires additional simulations to translate billed sales forecast to a calendar-month forecast required by Finance and Resource Planning. Models estimated directly from measured calendar month sales will have smaller variance and as a result an improved confidence interval around the forecast.

5. Evergy's Transition to AMI for Load Analysis

Evergy began the transition from load research to total AMI load aggregation after completing systemwide AMI deployment in 2020. Evergy established a transition team that included staff from IT, accounting, regulatory affairs, forecasting, and customer analytics. This team has been responsible for documenting the process, building out the aggregation application, validating results, and building the use-case for AMI data. Evergy's current plan is to utilize AMI data for supporting cost of service, rate design, and weather normalization. New AMI applications will require additional development work and computer/software resources for automating the roll-up process and improving processing speed.

As part of the implementation, the transition team documented the AMI data aggregation and validation process. The document has been updated several times to reflect issues that were discovered and corrected as part of the aggregation process. Evergy expects the process document to continue to evolve as new methods are implemented and data issues are addressed. The latest update was completed in October 2021. Itron reviewed this document as part of the Study. The process is described below:

Build Initial Rate Class Profiles. Data flows from the AMI collection system into the MDM. Data validation algorithms within the MDM are used to ensure the quality of the data for billing purposes. The aggregation process entails firsts exporting data to a shadow database that's called the Data Hub. The Data Hub is an Oracle relational database application. Customer attribute data (such as location and rate code) are also imported into the Data Hub and joined with customer interval data through a common identifier variable. Rate class hourly load profiles are then generated by executing a set of maintained queries that aggregate the interval data across customers and rate codes.

Validate Rate Class Loads Against Daily Registry. The initial validation compares the sum of the hourly loads against the sum of the daily registry kWh; the daily registry is what is used for billing customers and is validated in the MDM. Any significant deviation is flagged and investigated. The collection process minimizes investigation requirements as the AMI collection system will repeat interrogation of the meters over several days to collect any initial missing intervals. Interval data updates in the MDM are exported to the Data Hub. The process also monitors the row count between the MDM and Data Hub to ensure that the Data Hub includes all the collected interval and daily scalar (registry) data.

Scale to Total Number of Customers. Rate class profiles are adjusted to account for the small number of customers with missing interval data. By the end of the test-year period only 0.1% of customers were missing data. A scaling factor is generated by dividing the total number of customers by the number of interval meter customers. The scaling factor is then applied to the initial class hourly load estimate.

Validate Rate Class Loads Against System Load. Rate class hourly loads are aggregated to generate total system-delivered loads. Delivered loads are compared against system loads. Differences between system and delivered loads are line losses. Line losses are compared against expected line losses based on the Companies line loss study. Any significant deviation from line losses is investigated.

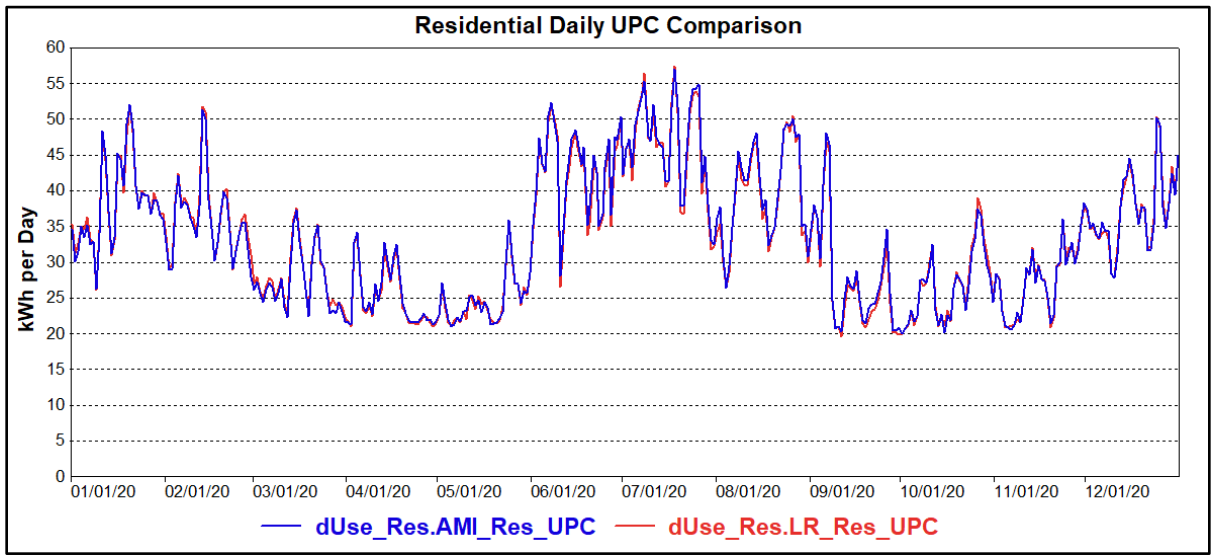
Validate AMI Loads Against Billed Sales. AMI derived monthly sales are compared against billed sales. While differences in timing between the billing-month period and calendar month makes monthly comparisons difficult. On an annual basis, sales should be close. Any significant differences are investigated.

Evergy has made a significant effort to build out the AMI data aggregation application, incorporate data checks, and validate resulting rate class hourly loads. The process is well documented and should generate accurate rate class hourly load profiles.

6. Use of AMI Data Aggregation for Current Rate Cases

Evergy plans to file rate cases in Missouri and Kansas. For the first time, Evergy will use aggregated AMI-based rate class loads to replace sample-based rate class loads for cost of service, rate design, and weather normalization as well as an adjustment for COVID load impact. To evaluate the effectiveness of this transition, 2020 AMI generated, rate class profiles were compared against load research profiles. Figure 3 compares residential daily use per customer for the Evergy Missouri West operating (EMW) service area. The AMI profile is blue, and the load research profile is red.

Figure 3: EMW Residential AMI Vs Load Research



The load research profile is based on interval data derived from 263 sample customers that are equally split between electric heat and non-electric heat customers.

Differences in estimated daily use and total annual use are relatively small. Table 1 compares AMI aggregated residential sales with load research sales estimate. AMI data shows average use of 12,213 kWh against 12,165 kWh for load research.

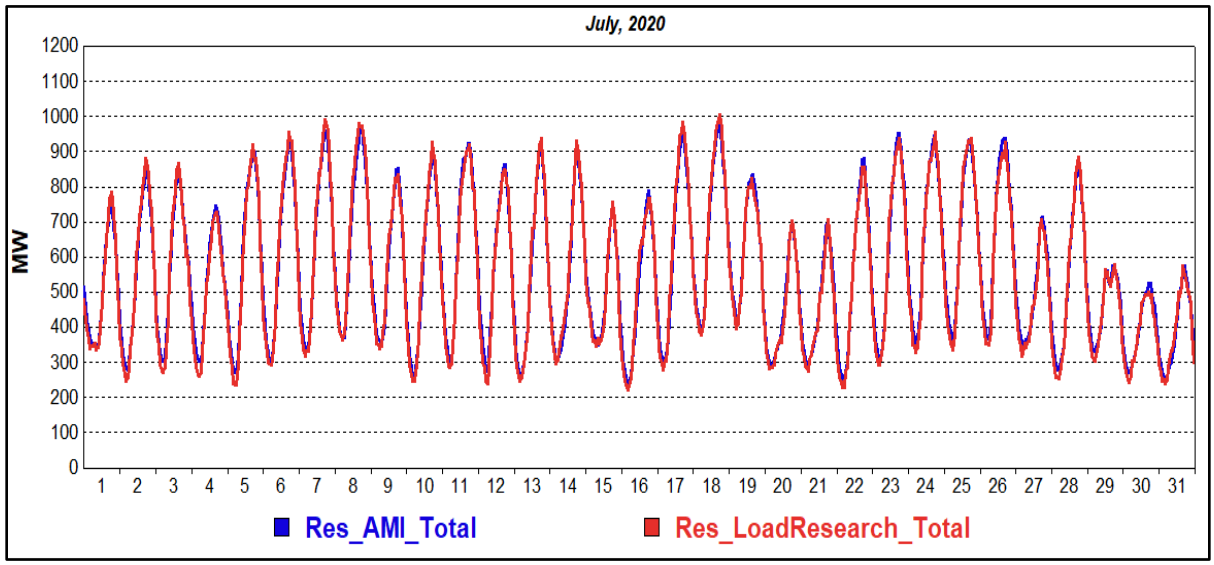
Table 1: EMW Residential Sales Comparison

2020				
	AMI	Load Research	Difference	Pct
Sales (MWh)	3,530,738	3,516,716	14,022	0.4%
Average Use (kWh)	12,213.0	12,164.5	48.5	

On a total sales basis, differences in AMI and load research based sales estimate is just 0.4%; while this shows accurate load profiles can be developed from load research (at least in the residential sector), statistical based profiles are significantly more complex in construction.

As class peak contributions are key parameters in allocating costs, we also compared class hourly loads. Figure 4 compares EMW residential hourly loads for July.

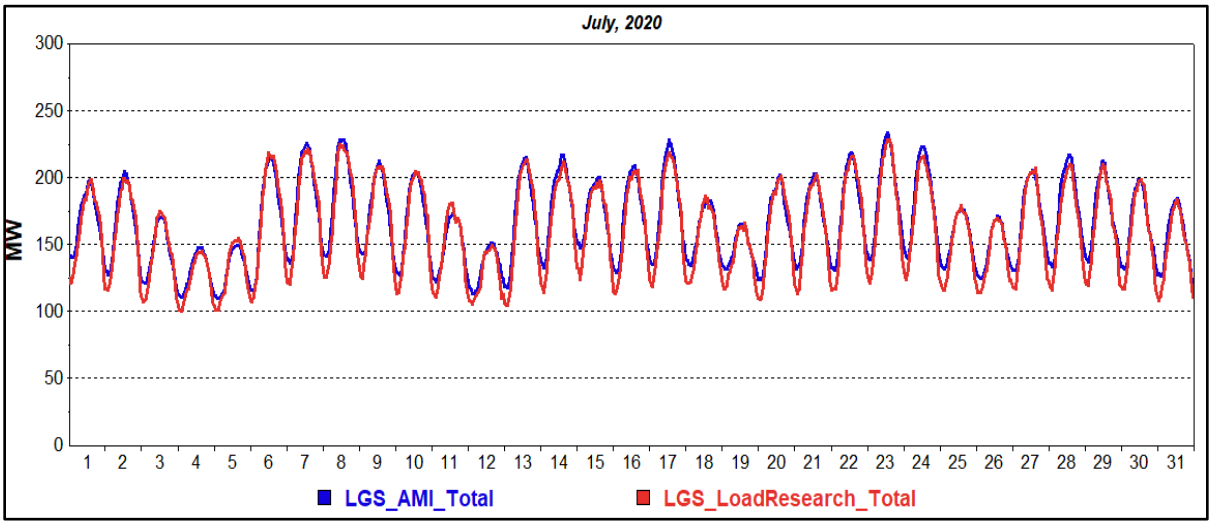
Figure 4: EMW Residential July Hourly Loads



Differences in AMI and load-research based profiles are relatively small. We can estimate fairly accurate residential profiles with load research samples as residential customers use electricity for the same end-uses and across similar hours.

The larger improvements gained from AMI data are in the commercial and industrial (C&I) rate classes. Given business diversity and associated loads, statistical precision under load research is generally lower than residential; this is true even when the sample is relatively large; the load variance in C&I rate classes is just generally larger than residential rate classes. Figure 5 compares the EMW large general service (LGS) AMI loads with the load research profile. The load research profile is based on 160 sample customers representing over 10% of total LGS customers.

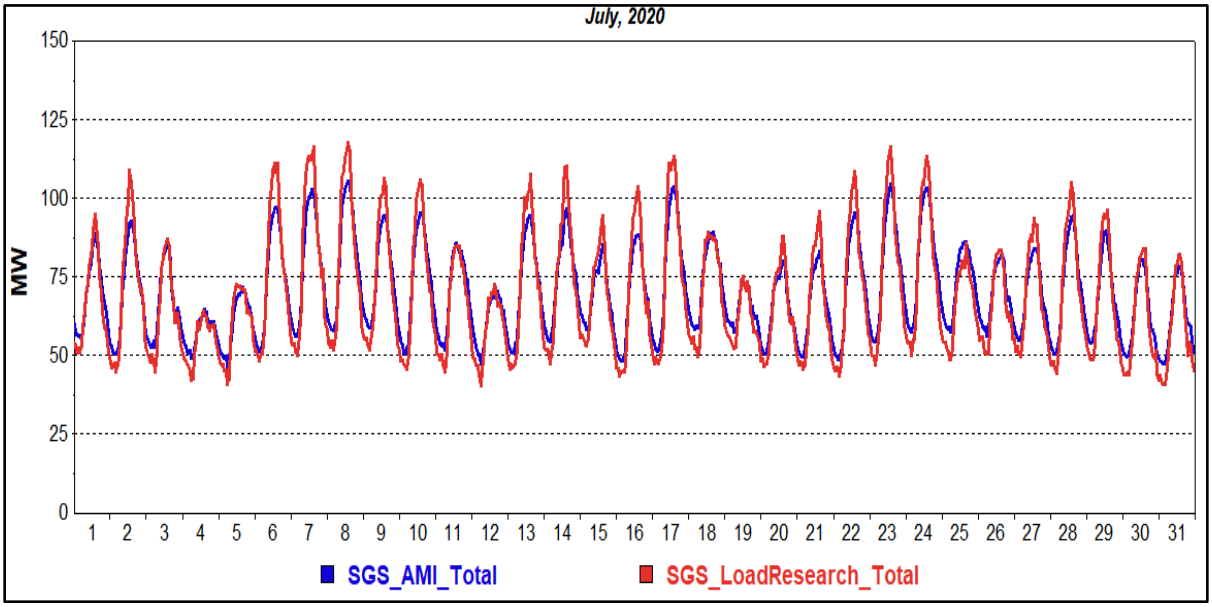
Figure 5: EMW 2020 LGS AMI vs. Load Research (July 2020)



The difference between LGS aggregated loads and load research profile is more visible than that in the residential class. The LGS load research profile tends to underestimate both minimum and peak hour loads when compared with the AMI data.

Improved accuracy from AMI data is more evident in the small general service (SGS) rate class in the Evergy Missouri Metro service area (EMM). Figure 6 compares AMI and load research July hourly loads.

Figure 6: EMM 2020 SGS AMI vs. Load Research (July 2020)



For this class, the load research profiles over-estimate peaks and underestimate minimum load hours when compared with AMI aggregated loads.

7. Summary

There has been a significant shift within the utility industry from load research to towards AMI load aggregation for load analysis. This transition will contribute to improved rate class hourly and daily load measurement supporting utility analysis including forecasting, ratemaking, financial analysis, and resource planning.

Evergy has also been making this transition. First by utilizing AMI data in their load research load estimation process and now by transitioning to 100% AMI load data aggregation. Evergy has built a well thought-out process and application for aggregating customer interval loads to use in weather normalization to support the 2022 rate case. This process compares well to AMI aggregation processes developed by other utilities. Customer information data is merged with customer interval data with multiple checks on the process to guarantee data are mapped to the correct customer and rate schedule. Aggregated rate class loads are verified against the daily registry which is used for billing and also compared with billed sales and system load. Evergy has an assigned project team that meets regularly to review load aggregation results, address any issues, and explores new AMI data applications and methods for aggregating AMI data.

Comparisons of AMI load profiles with load research based load profiles shows improved load measurement in the commercial sector where there is a greater diversity of customer use when compared with the residential class. In the residential rate class, there is insignificant differences in load profiles derived from load research vs. AMI load aggregation. The load comparisons show that Evergy's load research program has generated reasonable load profiles for applications in cost of service, rate design, weather normalization, and estimating unbilled sales.

Across the industry, the transition to AMI for load analysis has not been easy, in the long-run, utilities will see cost savings as the load research function is replaced with load aggregation algorithms. AMI load aggregation is significantly less complex than developing statistical-based load profiles, and results in more accurate rate class hourly loads. AMI is measured data; load research based profiles are statistical estimates.

Improvements in traditional database applications such as Oracle SQL and Microsoft SQL and new distributed database applications such as Hadoop and cloud base aggregation software such as Google BigQuery will allow for faster load aggregation and reduced computing costs. Also, future MDMS upgrades will incorporate roll-up capabilities. Several utilities have taken advantage of software development and are generating near real-time rate class hourly loads. This in turn has opened up new applications to support financial closing, track forecast performance, gain clarity on near-term usage trends, and evaluate direct load control program impacts. However, software, computer processing, and staff with expertise with these new applications will require additional and on-going utility investments since unleashing AMI capability is not something that comes automatically with just the installation of AMI Meters.

Evergy's AMI load aggregation process benchmarks well with methods developed by other utilities with AMI systems. Like nearly all utilities, Evergy has independently developed their application and validation process using available software and had to address similar issues raised by the utilities we interviewed. This includes identifying the right data channels, mapping load data to customers, building validation processes, addressing computer resource constraints, and scaling to capture non-AMI meters. Evergy is well-positioned to utilize aggregated AMI data for cost of service studies and rate case weather estimates and is making progress toward leveraging AMI data for additional use cases in the future.

BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION

In the Matter of the Rate Design Case of Evergy Metro, Inc. d/b/a Evergy Missouri Metro	)))	No. EO-2021-0349
In the Matter of the Rate Design Case of Evergy Missouri West, Inc. d/b/a Evergy Missouri West	)))	No. EO-2021-0350

EVERGY MISSOURI METRO AND EVERGY MISSOURI WEST
TIME OF USE RATE DESIGN REPORT

COMES NOW, Evergy Metro, Inc. d/b/a Evergy Missouri Metro ("Evergy Missouri Metro") and Evergy Missouri West, Inc. d/b/a Evergy Missouri West ("Evergy Missouri West") (collectively, the "Company" or "Evergy") and files this *Time of Use (TOU) Rate Design Report* ("Report") with the Missouri Public Service Commission ("Commission") and, in support of the filing, states as follows:

I. INTRODUCTION

Background

1. On September 25, 2018, Evergy Missouri Metro[1] filed a *Non-Unanimous Partial Stipulation and Agreement Concerning Rate Design Issues* in Case No. ER-2018-0145 ("0145 Stipulation"), which was approved by the Commission's *Order Approving Stipulations and Agreements* on October 31, 2018 ("0145 Order").

2. As part of the 0145 Stipulation, Evergy Missouri Metro agreed to:

> By June 30, 2020, KCP&L will file a rate design case limited to TOU issues. For GMO, signatories further agree the September 20, 2016 Non-Unanimous Stipulation and Agreement in ER-2016-0156

[1] Effective October 7, 2019, Evergy Missouri Metro adopted the service territory and tariffs of Kansas City Power & Light Company ("KCP&L").

will be expanded to include TOU, with the TOU rate design case to commence by June 30, 2020.

3. On June 15, 2020, Evergy Missouri Metro filed a *Motion for Extension of Time* ("Motion") seeking addition time, until June 15, 2021, to file the rate design case detailed above.[2]

4. On June 29, 2020, the Commission issued its *Order Granting Motion for Extension of Time*.

II. RATE DESIGN

5. Attached hereto as **Exhibit A** is the Report of Evergy Missouri Metro's and Evergy Missouri West. The Report confirms the reasonableness of the Company's TOU program that the Company began offering to customers on October 1, 2019. The Report describes in detail how the Company met all Stipulation commitments, as well as, presents a desire to offer an additional 2-period TOU rate to expand the Company's TOU rate options at Evergy in its next general rate case. The Report shares slight modifications to the current 3-period TOU rate offering that the Company will seek approval in its next general rate case. The Report communicates this TOU expansion, refinements, and important elements of the Company's Rate Modernization Plan. The cases are presented in a Report format, providing support for the Company's conclusions.

III. REQUEST FOR COMMISSION GUIDANCE

6. The Company shared a summary of its TOU Rate Design Plan contained in Exhibit A with Staff ("Staff") for the Commission and the Office of the Public Counsel ("OPC") on March 3, 2021 and made adjustments to that plan where possible in response to their feedback. The

[2] "The Company seeks additional time to file a rate design case so that the case is supported by 12 months of Time of Use "(TOU") information inclusive of the summer season. Staff for the Commission ("Staff") has requested, and the Company agrees, that it will include the TOU data in its rate design case and share that information with stakeholders. That data will include hourly Advanced Metering Infrastructure ("AMI") information for the TOU participants and their control group, as well as, any other data used in the evaluation of the rate and used in the Evaluation Measurement & Verification ("EM&V"). See, *Motion*, ¶3, pp. 3-4.

Company hopes that this docket will enable discussion and provide further understanding of stakeholder positions on the latest TOU proposals, as well as, result in Commission guidance concerning how TOU rates could be proposed in the Company's 2022 rate case filings.

IV. PROPOSED PROCEDURAL SCHEDULE

7. In adherence with Fuel Adjustment Clause ("FAC") requirements mandating a general rate case proceeding every four years, it is expected that the Company will make a general rate case filing sometime in 2022. The Company would like to include expected TOU stakeholder feedback and Commission TOU guidance in the general rate cases. The Company proposes the following procedural schedule.

- Report filing (June 15, 2021)
- Workshop meeting (July 15, 2021)
- Response from parties (August 15, 2021)
- Commissioner questions and comments (September 2021)

WHEREFORE, Evergy Missouri Metro and Evergy Missouri West respectfully submit this information for consideration by the Commission.

Respectfully submitted,

/s/ Roger W. Steiner

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Attorneys for Evergy Missouri Metro and Evergy Missouri West

CERTIFICATE OF SERVICE

I do hereby certify that a true and correct copy of the foregoing document has been hand-delivered, emailed or mailed, postage prepaid, to the Staff of the Commission and to the Office of the Public Counsel this 15h day of June 2021.

/s/ Roger W. Steiner

Attorney for Evergy Missouri Metro and Evergy Missouri West

VERIFICATION

COUNTY OF JACKSON)
) SS
STATE OF MISSOURI)

I, Darrin R. Ives, state that I am Vice President of Regulatory Affairs for Evergy Missouri West, that I have reviewed the foregoing pleading, that I am familiar with its contents, that the statements contained therein are true and correct to the best of my knowledge and belief, and that Evergy Missouri West has had no communication with the Office of the Commission within the prior 150 days regarding any substantive issues likely to arise in this case.

Under penalty of perjury, I declare that the foregoing is true and correct to the best of my knowledge and belief.[3]

Evergy, Inc.

Darrin R. Ives, Declarant

[3] *See* Letter from the Commission, dated March 24, 2020: "[A]ny person may file an affidavit in any matter before the Commission without being notarized so long as the affidavit contains the following declaration: [']Under penalty of perjury, I declare that the foregoing is true and correct to the best of my knowledge and belief.[']_____ Signature of Declarant[.] This guidance applies both to pleadings filed in cases before the Commission and to required annual reports and statements of income."

Evergy Missouri Metro & Evergy Missouri West

Time of Use Rate (TOU) Rate Design Case Report

June 15, 2021

Contents

1 EXECUTIVE SUMMARY

The Company's filing and report are organized as follows:

Section 1 – Executive Summary (Witness: Kim Winslow)

Section 2 – History of Regulatory Orders Pertaining to Time of Use (Witness: Brad Lutz)

Section 3 – Overview of Evergy's Rate Modernizaton Plan (Witness: Brad Lutz)

Section 4 – Success of Evergy's TOU Rate (Witness: Brian File)

Section 5 – TOU Rate Design Plan (Witness: Ed Hedges)

Appendix A – Interim EM&V Key Findings

Appendix B – Future Rate Options

Appendix C – TOU Education Tools

Appendix D – Exemplar Rate Tariffs

This "Time of Use Rate Rate Design Case Report" ("Report") defines the Company's plans to further deploy Time of Use ("TOU") rate designs for its residential customers in its Missouri utility jurisdictions, specifically Evergy Missouri Metro and Evergy Missouri West (collectively, the "Company").[1] This Report fullfills commitments made by the Company in the Non-Unanimous Partial Stipulation and Agreement Concerning Rate Design Issues in Case No. ER-2018-0145 and Case No. ER-2018-0146 ("0145 Stipulation") to "file a rate design case limited to TOU issues. For GMO, signatories further agree the September 20, 2016 Non-Unanimous Stipulation and Agreement in ER-2016-0156 will be expanded to include TOU, with the TOU rate design case to commence by June 30, 2020." The 2016 GMO rate design case commitment was filed on June 30, 2020. On June 15, 2020, the Company filed a request for an extension of the Time of Use Rate Design Case referred to in Case No. ER-2018-0145, Section 2.i.. On June 29, 2020, the Commission granted the Company's request for extension and ordered the Company to file a TOU Rate Design Case by June 15, 2021. This Report fulfills that requirement. Further the Company intends that this Report and 0145 Stipulation will enable discussion and provide further understanding of stakeholder positions on the latest TOU proposals, as well as, result in Commission guidance concerning how TOU rates could be proposed in the Company's 2022 rate case filings.

[1] The Company anticipates the TOU plans discussed herein will be applicable to all of the Evergy jurisdictions as rate cases are filed; therefore there are references to Evergy Kansas Metro and Evergy Kansas Central jurisdictions.

Starting immediately after the rate cases in 2018, the Company began executing on its commitments and successfully launched the 3-period, opt-in TOU rate for its residential customers on October 1, 2019 as agreed upon in the 0145 Stipulation. The 0145 Stipulation identified a number of steps to guide the deployment. The guidance covered:

- Details to define the TOU rate design
- Develop a comprehensive customer research, education and marketing plan
- Evaluate leading practices on customer education and engagement on TOU deployment
- Develop a process to solicit feedback from customers
- Metrics to gauge changes in customer behavior
- Various opportunities for stakeholder engagement and update

To achieve this, Evergy formed a cross-functional project team of over 80 subject matter experts from almost every area of the Company and began the year-long initiative to research, develop and implement a cohesive TOU solution. The solution was built on a customer research plan that leveraged qualitative and quantitative customer feedback to inform critical product, marketing and customer education decisions. For implementation, the Company built momentum for the introduction of the new TOU plan by connecting with “Innovators and Early Adopters”, key demographic groups known to seek out new approaches, to ignite early awareness, enrollment and advocacy, moving the effort in a positive direction as greater awareness was built within the larger customer base.

Evergy continued to execute on its plans following the October 1, 2019 roll-out and deems that the deployment has been successful, particularly if measured against the initial goals, but also with respect to customer satisfaction. Within the 0145 Stipulation, each jurisdiction had a goal of reaching 1,750 customers by December 31, 2020. Those goals were surpassed. As of June 11, 2021, Evergy exceeds the enrollment target with a total of 5,538 active enrollments (2,917 enrollments in Missouri West and 2,621 enrollments in Missouri Metro). This equates to about 160% of the stipulated goal.

Additionally, Evergy retained Guidehouse Inc. (“Guidehouse”), to support the efforts to study residential TOU rates and provide independent evaluation services to verify the ex-post (historical) impacts of the TOU rates through an Evaluation, Measurement and Verification (“EM&V”). The results of the interim EM&V presented to stakeholders on December 17, 2020 included:

- Results indicate that the TOU rate and associated program design has had the desired effect of reducing consumption during the on-peak period (4-8 pm M-F) in both the summer and non-summer seasons and driving participant bill savings (on average).
- Peak System Impacts – TOU participants lowered their demand by 4-9% at system coincidence peak.

- Bill Impacts - On average, participants are saving annually. Summer bills see the greatest savings, approximately half of which are driven by behavioral changes while non-summer bills see an increase for those previously on the electric heating rate primarily driven by rate structure changes.
- Annual savings for residential general customer ranges from 5 to 10%.
- Annual savings for residential space heating customer ranges from 3 to 6%.
- Enrollments – the Company had exceeded stipulated enrollment targets within the evaluation year, which at the time was 142% of the overall Missouri enrollment target of 3,750 customers.
- Attrition – Approximately 50% of attrition (700 customers) that occurred during the evaluation year was from customers moving.

The Company will submit a final EM&V of the initial TOU deployment by December 31, 2021.

Moving forward, the Company anticipates a general rate case filing in early 2022. As a step in its preparedness, the Company developed a Rate Modernization Plan ("Rate Plan"). The Rate Plan is intended to guide the Company on several identified rate objectives over a period of time. The Rate Plan provides a framework for Evergy that is both responsive to its historical regulatory obligations in Missouri and Kansas, but also provides a framework for updating the Company's rate plans and to guide future general rate case filings. Continuing to offer opt-in TOU rate(s) is an important element of the Rate Plan. As part of its overall Rate Plan, the Company is considering expanding its residential rate portfolio to include to include a Low Income Community Solar Subscription rate, Subscription Pricing rates, and Prepay options, as well as a 2-period TOU rate option to complement the existing 3-period TOU rate option.

In addition to the Rate Plan, the Company conducted various internal studies and reviews to inform its TOU rate designs, information that will be used to enhance rates proposed in its 2022 Missouri rate cases. As an initial step, the Company reviewed industry best practices and benchmarked several types of residential rate offerings, including TOU, Subscription Pricing, and other Time Variant rates, as well as a Prepay programs. Evergy retained the services of the Brattle Group to assist with this effort. Led by Dr. Ahmad Faruqui and Ryan Hledick, Brattle's benchmarking efforts provided comprehensive information and detail concerning TOU rate design applied across the industry, including a view of international efforts. The analysis identified a few key points to inform Company plans, which include:

- Despite widespread availability across most states, enrollment in TOU rates is still very low nation-wide. Only a few utilities have substantial (i.e., >10%) participation in TOU rates.
- Analysis of dozens of TOU pilot programs worldwide indicate that customers do respond by shifting consumption and reducing peak demand. The design choice that most affects the impacts of TOU rates is the ratio of peak to off-peak prices, with stronger price signals yielding higher peak load reductions.

- Most TOU rates are offered on an opt-in basis, but a few are opt-out (default). Opt-out rates have higher enrollment rates relative to opt-in rates (e.g., 80% enrollment for opt-out versus 20% enrollment for opt-in), though opt-out offerings achieve lower impacts per participant.
- TOU rates can also be combined with other rate structures with stronger price signals during the most critical hours. The effect of these programs is increased by enabling technologies which help to inform customers of prices and automate customer response.

Evergy has a long history of listening to our customers and working to best understand what they want concerning energy and believes that approaches taken for a TOU rate should reflect customer preference in order to maximize results and customer engagement. The Company engaged with customers in numerous ways to understand their opinions. One common theme emerged in the results from these studies and that is the ongoing desire for customers to enjoy a choice of rates.

Customer input, industry perspective, learning from our experiences and data analytics create an important foundational perspective. The Company seeks to build on its success and offer an expanded portfolio of rate designs to engage customers and support our strategic direction. These inputs informed our planning and formation of principals to guide the planning of the next phase of TOU deployment.

Turning to analysis, Evergy examined the seasonal periods, time periods and price differentials to assess the current 3-period, opt-in TOU offer. For seasonal periods, daily peak loads and market day-ahead average daily energy price profiles support that peak loads occur in the four months of June, July, August, and September. For time periods, consideration was given to the actual seasonal and daily fluctuation in system and customer class loads along with the wholesale costs of energy to develop the optimum time periods for a residential TOU rate. Most analysis of historical data supports a 4-hour, Summer On-Peak period from 3–7 pm, which is slightly misaligned with the residential class 4-hour peak load period and Evergy's current TOU On-Peak period from 4-8 pm. Based on a desire to maintain consistency with the current TOU rate design and "future proof" the time period for the future anticipated impact of increased solar penetration and customer behavioral load shifts, Evergy determined to continue with the On-Peak period of 4-8 pm. For pricing, residential class's share of costs (generation, transmission, distribution and energy) from the Company's most recent class cost of service studies were allocated to the TOU time periods analysis to determine the target price differential for each time period by season. This analysis supports a rate design wilth a strong summer peak price and a significantly discounted super-off-peak price, with modest price differences in the other periods.

For its TOU Rate Design Plan, Evergy will seek approval of two primary proposals that will build on the success of its intial TOU rate design. First, we propose to to refine existing 3-period TOU rate design. This refinement will include:

- Align summer seasons to June 1-September 30
- Maintain the On-Peak period from 4 pm-8 pm
- Maintain summer pricing differentials, but reduce the non-summer price differentials to better reflect cost
- Continue to leverage market research to explore broadening customer education and marketing to achieve greater participation

Second, we propose to add a new optional 2-period TOU rate design. This option is designed to be attractive to customers with less ability to shift usage throughout the year and help address bill impact of TOU typically occurring for space heating customers. This new 2-period TOU rate will include:

- Summer On-Peak and Off-Peak periods with the On-Peak pricing aligned with the 3-period rate
- Non-Summer Off-Peak and Super Off-Peak periods with the Super Off-Peak period aligned with the 3-period rate

In addition to these rate design changes, the TOU Rate Design Plan includes ongoing plans for customer education. The benefit of customer education was clearly established in the Company review of the initial TOU rate. Evergy will continue an integrated education and outreach campaign to help increase customer awareness of all rate plan offerings, especially the TOU rate. This integrated strategy will focus on simplification, consistency, customer understanding and outreach. Evergy intends to deliver clear, concise and personalized, data-driven education, leveraging critical technology and infrastructure. Consistency will be reinforced through a centralized message on our website where customers can easily access additional information and education. It is expected these messages will help customers understand the important impacts of the TOU Rate Plan beyond saving money, particularly the community and grid benefits of the rate. Finally, the Company expects to connect with new customer segments under this plan. By using integrated mix of channels, such as social media, email and other digital forms, the Company expects to deploy messages that resonate with new and existing customers.

It is our intention that this Report and this docket will enable discussion and provide further understanding of stakeholder positions on the TOU proposals presented in this Report, as well as result in Commission guidance concerning how TOU rates could be proposed in the Company's 2022 rate case filings.

2 HISTORY OF REGULATORY ORDERS PERTAINING TO TIME OF USE

The following sections describe the history of Missouri Public Service Commission ("MPSC") regulatory orders pertaining to TOU and the Company's efforts to fulfill the agreements.

2.1 BACKGROUND OF S&A AND MPSC ORDERS

On September 25, 2018, parties to Dockets ER-2018-0145 and ER-2018-0146 entered into a non-unanimous partial stipulation and agreement concerning rate design issues ("Rate Design S&A").[2] Section 2 of the Rate Design S&A details agreements among the signatories on issues related to TOU rates. In addition, Section 6 of the Rate Design S&A notes that the Company's two-part TOU tariffs will continue and will not be available to new customers. The details of Section 2[3] are as follows:

"*2. a. The Signatories believe this Rate Design Stipulation defines a meaningful and successful process to establish alternative rate plans in the form of Time of Use ("TOU") rates for residential customers following accepted best practice and ensuring measured impact to customers within the class. The Company believes TOU rates should be part of a broad selection of rates offered to Customers and utilized to help the Company provide an opportunity to Customers to shift demands from peak periods and benefit from that shifting load. Further, TOU rates allow the Company and Customers to extract additional benefit from recent upgrades in metering and billing systems.*

b. Effective October 1, 2019, KCP&L and GMO will offer a residential Time of Use Service, originally proposed as a pilot by the Company in this case, as an opt-in rate that would be available as an alternative to standard residential rates, which shall continue to be available.

i. The TOU opt-in rate will remain in effect until changed by Commission order.

ii. Customers who take service under the TOU opt-in rate and switch back to a standard rate will be required to wait 12 months before they will be eligible to re-enroll in the TOU opt-in rate.

c. The Company will develop a comprehensive customer research, education and marketing plan and identify the Company readiness and outreach capabilities and resources required to introduce the TOU rate plan to residential customers.

i. By the end of Q4 2018, the Company will meet with Staff, OPC, DE and Renew MO (stakeholders) to review the customer research plan.

ii. By the end of Q1 2019, the Company will launch the customer research plan.

[2] Refer to Order Approving Stipulations and Agreements, dated October 31, 2018.
[3] Ibid

iii. The Company will evaluate leading practices on customer education and engagement on TOU deployment. During Q2 2019, the Company will develop a marketing and education plan and will meet with stakeholders to review.

1. The Company will develop a plan that may include various forms of tools, marketing, and customer education such as mailings, outbound calling, text messaging, website information, media outlets and outreach through various company partners including community action agencies, senior housing centers and others.

2. The plan will include marketing to specific end-uses that might benefit from the TOU rate plan, such as Electric Vehicle charging and space conditioning.

3. The Company will address the potential impact to the customer contact center and training that will ensue to properly address customer questions. The Company will provide all call center personnel with effective and sufficient training and education on their TOU offering. Company shall evaluate opportunities to educate new customers requesting service on the availability of a TOU as well as other educational opportunities when existing customers call the contact center for other matters, including TOU education through an Interactive Voice Recognition ("IVR").

4. The plan will address how to approach vulnerable customer segments, such as low-income customers, elderly customers and customers with electricity-dependent medical needs.

5. Education on the merits of the TOU opt-in rate plan, both specific to the customers taking service thereunder as well as to customers at large, will continue throughout the offering of the TOU opt-in rate plan.

6. The Company will work with stakeholders to operationalize the customer journey from first learning about the TOU rates, to enrolling/un-enrolling, receiving the first bill and managing their energy usage going forward

iv. The Company will develop a process to solicit feedback from customers availing themselves of the TOU rate and those who do not avail themselves of such rate to determine program success and opportunities for improvement. This is referred to as "Customer Feedback Mechanism"

1. End of Q4 2018, discuss with stakeholder options for Customer Feedback Mechanism". This process shall be developed with stakeholder input. The Company will keep customer documentation and records on all customer feedback to the degree possible regarding its post-implementation of TOU in a format that can be shared with stakeholders upon request.

2. End of Q2 2019, finalize draft of Customer Feedback Mechanism and share with stakeholders.

3. End of Q4 2019, finalize Customer Feedback Mechanism and plans for implementing the mechanism, and share with stakeholders.

v. The Company will develop, with stakeholder input, metrics to gauge changes in customer behavior. This is referred to as "Customer Behavior Metrics."

1. End of Q4 2018, discuss with stakeholders options for Customer Behavior Metrics.

2. End of Q2 2019, finalize draft of Customer Behavior Metrics and share with stakeholders.

3. End of Q4 2019, finalize Customer Behavior Metrics and share with stakeholders.

vi. Company will develop a business case for implementation of shadow billing feasibility, with the goal of implementing shadow billing for all residential customers.

1. End of Q4 2018, Company will review draft plan of shadow billing with stakeholders.

2. End of Q1 2019, Company will finalize business case for shadow billing and share with stakeholders to define next steps.

vii. Education on the merits of the opt-in rates, both specific to the customers taking service thereunder as well as to customers at large, will continue from the dates addressed herein until the Company's next general rate cases.

d. The Company will provide details of the education, marketing and outreach efforts, and customer TOU subscription numbers to the Commission at an on-the-record presentation in December 2019 and September 2020.

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.

f. Company will meet with stakeholders by the end of Q1 2020 and end of Q1 2021 to discuss number of customers on TOU rate plan; changes in customer behavior including shift demands from peak periods and benefit from that shifting load; education effectiveness; customer feedback and questions; observations from summer vs non-summer rate impacts. Nothing precludes any stakeholder from making a filing with the Commission should it believe the Company is not actively providing reasonable outreach and education to their customers or other concerns regarding TOU deployment. Nothing prevents the Company from opposing any such filing.

g. If by December 31, 2019 KCP&L and GMO do not have at least 750 customers per company signed up for the TOU service, stakeholders will discuss and consider changes to the education and outreach plan or changes to program design necessary to enhance enrollment.

h. If KCP&L and GMO have not gained at least an additional 1000 customers per company by December 31, 2020, stakeholders will review education and outreach plan and program design changes necessary to enhance enrollment.

i. By June 30, 2020, KCP&L will file a rate design case limited to TOU issues. For GMO, signatories further agree the September 20, 2016 Non-Unanimous Stipulation and Agreement in ER-2016-0156 will be expanded to include TOU, with the TOU rate design case to commence by June 30, 2020.

j. KCP&L and GMO will submit a Residential TOU rate design in their next rate cases based on lessons learned from the TOU service.

k. Company will complete an EM&V Report by December 31, 2021.

1. End of Q2 2019, review draft of EM&V plan with parties and solicit feedback on parameters and methodology.

2. End of Q4 2019, finalize EM&V plan with parties.

l. KCP&L and GMO shall be authorized to defer for recovery prudently incurred program costs (representing the prudently incurred work detailed above and including marketing, education, evaluation and administration costs) associated with the TOU service. In the next rate case, KCP&L and GMO shall be authorized to recover prudently incurred program costs at the level represented by the percentage of customers enrolled in the TOU service at the time of filing of the rate cases compared to the above target level, not to exceed 100% recovery of costs. KCP&L and GMO will demonstrate that such percentage is not simply a result of transferring customers to a lower rate, but based on efforts directly related to changing customer behavior through marketing and education."

On September 27, 2018, parties to Dockets ER-2018-0145 and ER-2018-0146 entered into a non-unanimous partial stipulation and agreement regarding class revenue shifts ("Class Revenue S&A").[4] Paragraph 4 of the Class Revenue S&A addresses customer education regarding rate design:

4(a). The Company agrees to develop and implement a customer education plan regarding the rate design presented in this Stipulation. In the development of the education plan, the Company will examine and evaluate leading educational processes and practices on customer education of rate designs. The Company's rate design education plan may include various forms of tools, marketing and customer education such as mailings, outbound calling, utilization of their Interactive Voice Response Unit ("IVR"), text messaging, website information, media outlets and outreach through various company partners including community action agencies, senior housing centers and others.

4(b). The Company agrees to provide Staff, OPC, and DE with a report detailing its planned rate design education program within the Q2 of 2019. The Company and interested parties may further address the Company's rate design education program within the stakeholder meetings identified in the Time Of Use ("TOU") Non-Unanimous Stipulation and Agreement filed on September 25, 2018 in these cases."

[4] Ibid.

It should also be noted that on June 15, 2020, the Company filed a request for an extension of the Time of Use Rate Design Case referred to in Case No. ER-2018-0145, Section 2.i.. On June 29, 2020, the Commission granted the Company's request for extension and ordered the Company to file a TOU Rate Design Case by June 15, 2021. This Report fulfills that requirement.

2.2 ADHERENCE TO RATE DESIGN AND CLASS REVENUE STIPULATION AND AGREEMENTS

To date, the Company has fulfilled the requirements of the Rate Design and Class Shift S&A's regarding TOU. Table 1 is a summary of the meetings with signatories and presentations to the Commission to fulfill the Company's requirements.

Table 1: Summary of Company Meetings To Fulfill S&A Requirements

DATE	DESCRIPTION
December 20, 2018	TOU Stakeholder Meeting-Shadow Billing Business Case, Customer Research Plan, Customer Feedback Mechanism and Customer Behavior Metrics discussed
February 27, 2019	TOU Stakeholder meeting-Draft of the EM&V Plan was shared
June 28, 2019	TOU Stakeholder meeting Project goals, Marketing Campaign & Rate Education Plan, and Customer Service Approach
October 1, 2019	Company began offering opt in TOU rates
December 11, 2019	MPSC Presentation-Strategy, Marketing & Outreach & Education, Enrollment Success
January 22, 2020	TOU Stakeholder meeting- Strategy, Marketing & Outreach & Education, Enrollment Success
March 26, 2020	TOU Stakeholder meeting -COVID-19 Pandemic, Marketing Campaign Recap, Enrollments, Education Effectiveness and Customer Feedback
September 23, 2020	MPSC Presentation-Enrollments, Education & Marketing Campaign Update, Customer Feedback, and COVID-19 Pandemic Considerations
October 30, 2020	TOU Stakeholder Meeting-Enrollments Update and EM&V Update
December 17, 2020	TOU Stakeholder Meeting -Enrollments Update and EM&V Interim Results
March 29, 2021	TOU Stakeholder Meeting -Enrollment Update, Education Effectiveness, & Customer Feedback

In accordance with the Rate Design and Class Shift S&A's, the Company has strived to gain input from stakeholders on this TOU Rate Design Case submittal. The Company presented its plan to stakeholders on March 3, 2021.

3 EVERGY'S RATE MODERNIZATION PLAN OVERVIEW

In 2020, Evergy developed a Rate Modernization Plan ("Rate Plan") that will guide the Company on several identified rate objectives over a period of time. The Rate Plan provides a framework for Evergy that is both responsive to its historical regulatory obligations in Missouri and Kansas, but also provides a framework for the Company's future general rate case filings. TOU is an important element in the Company's overall rate portfolio and this report and filing have aided in informing the Company on its initial TOU rate offering established in October 2019. It is important to the Company that the Rate Plan addresses how TOU fits into its overall portfolio of choice based rates for our customers.

The drivers of Evergy's Rate Plan are not all encompassing. However, the drivers identified reflect that the utility must balance many forces to increase overall customer satisfaction while recovering revenue requirements. The Company identified the following drivers to inform the Rate Plan:

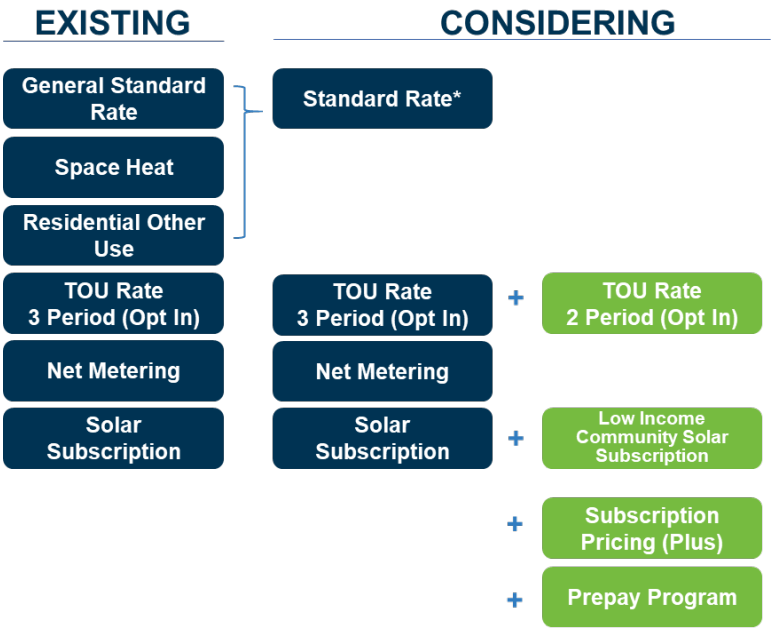
- Rates should include proper price signals that will enable adoption of emerging energy technologies that are most beneficial to the grid
- Rates should implicitly promote beneficial electrification and grid benefits
- Customer surveys indicate that higher customer satisfaction is directly correlated to choice
- As a result of mergers and acquisitions the past two decades, Evergy has multiple service territories in Missouri and Kansas with disparate rates
- Strive for rates that are more equitable across diverging customer classes and subclasses
- Significant MPSC and Kansas Corporation Commission ("KCC") interest exists around time of use and distributed generation rates

Through the Rate Plan, which will be executed over several rate cases and will flex with changes in regulatory outcomes, industry developments and customer desires, the Company will drive towards the following rate objectives:

- Creating rates that are independent of end use requirements
- Bringing rate structures closer together across jurisdictions
- Enabling business growth
- Simplifying rates and increase pricing transparency
- Providing greater customer choice
- Increasing customer satisfaction
- Leveraging Customer Information System ("CIS") and Automated Meter Infrastructure ("AMI") investments
- Developing price signals to increase grid efficiency

Considering these drivers, Evergy developed its Rate Plan. Figure 1 specifically highlights the components of the Rate Plan for Evergy's residential customers in anticipation of the Company's next rate case in Missouri[5]. As shown in Figure 1, the Company has developed a 2-period TOU rate to complement the Company's existing 3-period TOU rate offer. These TOU rates are further described in Section 5. A Low Income Community Solar Subscription rates, Subscription Pricing rates, and a Prepay program are further described in Appendix B.

Figure 1: Missouri Residential Rate Plan



The Rate Plan may take several years/rate cases to fully capture rate designs being considered to meet goals.

[5] Evergy does not address a Rate Plan for business customers in this Report.

4 SUCCESS OF EVERGY'S TOU RATE

While having the option to choose from multiple plans or services is not new in most aspects of a customer's life, the ability for an Evergy residential customer to choose from multiple rates is a new concept to customers given the regulated utility environment. Historically, rates have been focused on revenue recovery and providing only basic pricing signals. As the utility landscape has evolved, Evergy has prioritized choice for its customers. Following the approval of the Rate Design and Class Shift S&A's in October 2018, Evergy utilized the following twelve months to research, develop and implement the S&A's requirements to develop a TOU rate plan and looked to to turn this pricing mechanism into a productized solution for customers. To address these requirements, Evergy formed a cross-functional project team of over 80 subject matter experts from almost every area of the Company and began the year-long initiative to research, develop and implement a cohesive TOU solution.

Evergy deems that the TOU deployment has been successful, particularly if measured against the initial goals but also with respect to customer satisfaction. Within the 0145 Stipulation, each jurisdiction had a goal of reaching 1,750 customers by December 31, 2020. These goals were exceeded. As of June 11, 2021, Evergy exceeds the enrollment target with a total of 5,538 active enrollments (2,917 enrollments in Missouri West and 2,621 enrollments in Missouri Metro). This equates to about 160% of the stipulated goal.

The following sections describe the plan the Company undertook to develop a TOU Rate Plan that would be robust and responsive to customer needs. The primary goals of Evergy's TOU rate include:

(1) expand realm of customer choice by offering new choice based, time varying rates;
(2) reduce system coincident peak demand; and
(3) align pricing structure with cost causation.

Appendix C includes examples of the Company's education tools referred to in this section.

4.1 CUSTOMER RESEARCH PLAN

By the end of 2018, Evergy had collaborated with stakeholders to develop a comprehensive Customer Research Plan that leveraged qualitative and quantitative customer feedback to inform critical product, marketing and education decisions. As part of this plan, a Customer Feedback Mechanism was developed that comprised of five channels for soliciting and measuring customer reactions. These include: Focus Groups, Surveys, Social Media, Contact Center, and Website.

In early 2019, the Company began implementing this Customer Research Plan, kicking it off with six qualitative in-person focus groups:

- Adults with kids
- Adults with no kids

- Electric vehicle ("EV") drivers
- Low-income adults
- Elderly and on a fixed income
- Elderly and not on a fixed income

The Company sought to understand customer reactions to the TOU rate plan, the products and tools that would be needed by customers to understand the plan and support them when taking service on the plan, identify segments most likely to enroll, and test marketing and education messaging and visual creative content.

Following the in-person focus groups, the Company measured quantitative reactions to these same questions and incorporated marketing and education message testing to a larger digital audience. Once the TOU plan was launched in October 2019, the Company implemented post-enrollment, un-enrollment and behavior change surveys, as well as a form submission on the website and tracking mechanisms on social media and through the Customer Contact Center to continue measuring customer satisfaction, solicit feedback and gain insights for innovation and continuous improvement. In the spring of 2020, after customers had been on the plan for at least six months, a series of in-depth interviews were conducted with TOU participants to have a more comprehensive conversation on the offering - what's working, what could be improved, what do you like the most, etc. These measurement mechanisms are ongoing.

4.2 IN-PERSON FOCUS GROUPS[6]

After learning about TOU and seeing the actual visuals on rate plans, almost all except the elderly were very interested in the TOU Rate Plan. The interested customers were motivated by the ability to make changes that would lower their electric bill. The two elderly groups (both fixed and non-fixed income) were very hesitant to adopt the TOU rate plan. Hesitancy rested on change, worry about whether they would end up paying more, and uncertain of Evergy's motivations.

Through the focus groups, the Company learned that customers are aware of their electricity usage and do try to control their usage. Their motivation is to lower their monthly electric bill, but not to reduce their electrical footprint.

- 4-8 pm is peak usage in many households ("HHs"), although not all. This is the time when adults are getting home from work and children are coming home from school and afterschool activities. Thermostats are set to ensure comfort, dinner is being cooked, and members are using electricity for laundry, lights, TV, gaming, and phone charging. Several said that their peak usage time is 6-10 pm.

[6] In-Person Focus Groups (n = 47) Six 90-minute focus groups, Dates: January 29-31, 2019 / Six Groups: 1) No kids under 18 y/o living in HH, 2) With kids under 18 y/o living in HH, 3) Low-Income working, 4) Elderly and NOT on a fixed income, 5) Elderly and on a Fixed Income, and 6) Electric Vehicle Owners

- Activities that could be shifted fairly easily by most HHs were dishwasher usage (turned on later, or programmed later), laundry (shifted to other times or shifted to the weekend), and electric car charging (programmed to charge during the night).
- Changing the thermostat to “savings” during 4-8 pm would cause discomfort for most respondents. Most feel that they don’t have any margin for thermostat change within the “comfort” temperature range and that their HH members would not tolerate less comfortable temperatures.
- Bathing (tended to be children), cooking, and TV were activities that were too timely to shift. These are activities that must happen during the 4-8 pm timeframe. A few did mention that they could shift cooking away from the peak hours by meal planning or cooking earlier in the day.
- Turning out unneeded lights is an activity that most customers saw as a potential savings, yet most said that they are already trying to turn out unneeded lights, to varying success.

The different customer groups had different capabilities to make behavior/usage changes:

- Elderly - Many are home all day and could conceivably shift electrical usage to times 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 have 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 4-8 pm due to school and bedtime schedules: 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 years would have a very hard time making changes to their electrical usage.
- Working Adult HHs - All-adult HHs are smaller so have fewer persons 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 nighttime hours of midnight-6 am. Those with cars that have a small battery were more likely to say that they couldn’t wait to leave their battery on low until midnight. Those with high capacity batteries were already scheduling their charging for the later, non-peak hours.

In addition, customers expressed both 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 household can't change their behavior or change enough"
- Suspicious of Evergy motivations/intentions
- Too complicated to figure out if savings are possible

4.3 ENROLLMENT SURVEYS[7]

Evergy has also been retaining results of TOU customer enrollment surveys. Results of the enrollment surveys include:

- Saving money was the primary incentive for switching to the TOU plan for 93% of enrollees.
- Just under 90% of Missouri Evergy customers were largely satisfied with the enrollment process for the TOU plan.
- Three-quarters of customers rated the TOU communications - that included online tools, emails, and rate comparison reports to educate customers on the available plans - as very to extremely helpful.
- Just under half (48%) of the enrollees were aware of the Rate Comparison Tool. Of those, nearly two-thirds (63%) said the Rate Comparison Tool had a strong influence on their enrollment decision.
- While higher income customers were more likely to be aware of the Rate Comparison Tool (55% versus 44%), they were less likely to be influenced by it (56% versus 68%).
- Cost (96%) and comfort (85%) are the highest considerations on household electricity usage.
- Those that enrolled in TOU expected just under $20 in monthly savings (average: $19.11).
- Customers used a wide range of energy saving behaviors, even before their enrollment in TOU.
- Nearly all customers had at least one person at home during the peak hours.

4.4 UN-ENROLLMENT SURVEYS[8]

Results of TOU customer un-enrollment surveys include:

- Increased electricity costs or failure to save were the two biggest reasons for opting out of the TOU plan. Moving was also cited quite often, indicating that a process for automatic re-enrollment process might be helpful.

[7] Enrollment Surveys (n = 1,114) Every customer who enrolled in TOU received an email inviting them to complete a short survey. These surveys were completed between October 21, 2019 and October 4, 2020. All respondents were sent a $10 e-gift card for completing the survey.

[8] Un-enrollment Surveys (n = 160) Every customer who un-enrolled in TOU received an email inviting them to complete a short survey. These surveys were completed between December 20, 2019 and October 4, 2020. All respondents were sent a $10 e-gift card for completing the survey.

- Most of these customers put a great deal of effort into changing their behaviors. Running appliances during non-peak hours, turning off lights and running air conditioner less during peak hours were the most common changes with some finding them challenging to make.
- Those that chose to opt out of the plan were more likely to have people at home during the 4-6 pm time period.
- Making it cheaper, either through lower peak rates or non-peak rates, was mentioned by nearly a third of unenrolled customers completing the survey. Many customers who opted out also felt that they were not fully informed of how the pricing worked.

4.5 BEHAVIOR SURVEYS[9]

Participating TOU customers were also surveyed six months following enrollment. Results of the behavior surveys include:

- Two-thirds of TOU participants are satisfied and feel that the plan has met expectations. Older people are more highly satisfied (72% vs. 64%) and feel TOU has more fully met expectations (70% vs. 64%)
- Most customers saw their electric bills go down at least somewhat, on average $17 a month. Over 1 in 5 were unsure of the TOU rate plan's impact on their bill. A few customers reported seeing their bills increase.
- TOU customers have been most successful with running appliances during non-peak hours and adjusting the thermostat. Older TOU customers feel they have been more successful in shifting usage (60% vs. 52%)
- Saving money was still the primary incentive for switching to the TOU plan after being on the rate plan for 6 months.
- Over half of TOU participants said the Rate Comparison Tool had a strong influence on their enrollment after being on the rate plan after 6 months. While nearly two-thirds rated the Rate Coach reports as very useful, less than half felt that way about the Energy Analyzer and Welcome Kit.
- Seventy-eight percent of TOU participants have reviewed their hourly usage at least a few times since enrolling. Almost two-thirds who did review their hourly usage found it useful.
- EV owners made a substantial movement to charging their electric cars overnight after enrolling in the TOU plan (24% to 84%).

[9] Behavior Surveys (n = 750) Every TOU customer received an email inviting them to complete a short survey after being on the TOU rate plan for six months. These surveys were completed between July 16, 2020 and November 1, 2020. All respondents were sent a $10 e-gift card for completing the survey.

- COVID-19 Pandemic made shifting to non-peak hours harder for more than one-third of TOU participants. More people were at home during the quarantine period both during peak times and in general.
- Over half felt that it was harder to shift their usage from the peak hours during warmer weather. The use of the air conditioner was the overwhelming reason that made it hard to shift usage.
- TOU participants most appreciate savings and pricing options, as well as awareness of their energy usage.

4.6 EDUCATION TOOLS

Per the Rate Design S&A, by the end of 2018 Evergy completed a business case that evaluated shadow billing. The business case included industry research on traditional shadow billing approaches, goals of shadow billing, best practices and pitfalls. Understanding the advantages of shadow billing allowed Evergy to establish goals and criteria to evaluate solution options. Evergy recommended a shadow billing approach that included three tools - Rate Education Reports, Online Rate Analysis Tool, and Post-Enrollment Rate Coach Reports[10]. These tools are delivered strategically and cohesively to customers to provide personalized information that allow customers the ability to better make decisions on managing their energy. This shadow billing strategy formed the foundation for Evergy's TOU engagement strategy. Marketing and education were then built in collaboration with this engagement strategy.

4.6.1 Pre-Enrollment Education Tools

The Company's pre-enrollment education tools include a Rate Education Report and an Online Rate Analysis Tool.

Rate Education Reports
A personalized paper and/or email report mailed and/or emailed to customers two times per year educating them on their rate plan options. Specific report features include: detail on why they are receiving the report, overview of different rate plans available, personalized cost comparison of rate plans the customer is eligible for, monthly and yearly rate plan comparisons, tips, and frequently asked questions.

Key statistics are as follows:

- 42% average unique open rate
- 68% average overall open rate, indicating many customers open the report more than once
- 60% spent time reading the report vs glancing or skimming it

[10] See Appendix C for examples of the TOU education tools.

Online Rate Analysis Tool
An interactive web tool that includes rate plan comparisons, rate details and a rate simulator. The tool helps customers answer key questions including: How does this rate plan work? Is this the best rate plan for me? How will this rate affect my bill, short and long-term? What behavioral changes can I make that would make an optional rate plan, like TOU, work best for me?

Key statistics are as follows:

- 61% TOU customers interacted with the Online Rate Analysis Tool before enrolling
- 44% clicked the "Change My Plan" call to action within the tool

4.6.2 Post-Enrollment Education Tools

The Company's post-enrollment education tools include Rate Coach Reports and self-service hourly AMI data analytics.

Rate Coach Reports
Personalized, proactive, data-driven weekly report to TOU customers educating and coaching them on how to be successful on TOU. Customers receive an introductory report, week over week coaching, and a monthly peak usage and cost summary. Key report features include: rate details, hourly usage and costs visualization, weekly comparison, peak usage summary, tips, and season transition education when applicable.

Key statistics are as follows:

- 57% average unique open rate and many customers open multiple times. Opower[11] shared that this open rate was the highest in its experience in the utility industry. In addition, for comparison, Evergy company unique open rate average is approximately 40%.

Self-Service Hourly AMI Data Analytics
Interactive web tools that visualize customer hourly usage and costs.

Key statistics are as follows:

- 63k impressions, or views, since October 2019

[11] Evergy has retained Opower and partners with Opower to provide the TOU Rate Education Reports, Online Rate Analysis Tool, and Post-Enrollment Rate Coach Reports.

4.7 MARKETING OUTREACH AND EDUCATION PLAN

Evergy created an awareness, enrollment and success campaign to help customers understand their rate options, to reach and exceed the stipulated enrollment goal of 3,500 customers, and help customers to be successful to manage their energy on the new rate plan once enrolled.

The Company identified the four main objectives:

- Inform all customers on the new TOU rate option and how time of day affects electricity pricing.
    - Measurement:
        - Location: TOU participation location percentages consistent with Evergy residential customer location
            - Result: TOU participation locations consistent[12]
        - Channels: Use J.D. Powers 2019 recommended communication channels for rate education (bill insert, direct mail, email, bill message, bill newsletter)[13]
            - Result: Used Bill inserts, direct mail, email, bill message and more
        - Rate Landing Pages: Increase TOU rate page visits 20% over Evergy's General Use Rate pages
            - Result: 800% more pages views vs Evergy's Standard Rate Page after Spring Campaign based on Google Analytics
- Educate interested customers on where to find information about the TOU option and how the rate plan works.
    - Measurement:
        - TOU Landing Page: Time of page (over 1 minute) and bounce rate (under 60%)
            - Results: 1:49 avarage time on page, 51.5% bounce rate based on Google Analytics after Spring 2020 campaign
        - Rate Comparison Tool Visits: Rate Comparison Tool percentage of enrollment Over 40%
            - Results: 61 percent
        - Rate Video Views: Achieve over 2,500 views
            - Results: 4,400 after one year based on YouTube video plays

[12] *Based on Guidehouse Evaluation from December 2020*
[13] *J.D. Power 2019 Electic Utility Residential Customer Satisfaction Study, SM – (Results includes Waves 1-3)*

- Enroll customers in TOU, exceeding enrollment goals of 3,500, through targeted, data-driven marketing.
    - Measurement:
        - Enrollment numbers as of December 2020
            - Result: 2,261 Mo Metro, 2,744 Mo West[14]
        - Enrollment channel: Goal of over 70% enrollments coming from online
            - Result: 91% as of 12/14/2020
        - Surveys: Post-enrollment surveys to understand enrollment experience and any challenges
            - Results: See section 4.3, 4.4 and 4.5 for results
        - Marketing channel: Channel performance at or above industry benchmark
            - Result: Just under 90% of Missouri Evergy customers were largely satisfied with the enrollment process for the TOU plan.

- Assist customers who have enrolled by creating tools and an ongoing communication campaign.
    - Measurement:
        - TOU Rate Coach Report open rates, stay at or above Evergy marketing email average of 40% open rate
            - Result: Over 57% average weekly open rate
        - Survey Response: Use post-enrollment survey, 1:1 interviews and un-enrollment survey data to understand customers understanding or rate and communication needs
            - Results: See section 4.3, 4.4 and 4.5 for results

Evergy developed a multi-pronged education and outreach campaign to educate customers about the new TOU rate plan, while also specifically focusing on key segments who, based on research, were likely to enroll. Prior customer feedback reflects that rate information feels complicated, so it was imperative to simplify messaging and use strong visuals to help customers understand the complexities of the TOU program relative to the standard rate. Due to the multiple TOU time frames and pricing[15], the offer had the potential of being confusing. Therefore, the team focused on messaging, creative, tools (pre-enrollment and post-enrollment), and outreach tactics to engage the TOU customer.

[14] *Based on GuideHouse Evaluation from December 17, 2020*

[15] The current TOU rate includes 3-period pricing of Off-Peak: 6 am-4 pm and 8 pm-12 am; Super Off-Peak: 12 am-6 am; and On-Peak: 4 pm-8 pm.

4.7.1 Messaging

Because the TOU rate could feel complicated relative to the standard rate and hard for customers to remember and understand the time periods, a simple tagline of “Wait ‘til 8” was developed to help customers understand the plan and what times they needed to shift their usage to save money. While there are other time periods during the day that a customer could save money, Evergy wanted to simplify the concept and make it easy to understand, therefore the “after 8pm” messaging was selected.

4.7.2 Creative

The Company identified the need to develop a creative concept that tapped into everyday behaviors to connect the new plan in a simple, fun and memorable way. It was important to show customers that they could save money on energy with the new plan – not by changing what they do, but when they do it. To do this, a simple everyday clock concept was developed, with a tagline of “Wait ‘til 8” in the middle to help customers remember the after 8 o’clock message. Then, a bold, everyday appliances imagery like a dishwasher and washing machine, was paired with a clock to visually represent the types of changes a customer would need to make to be successful on the new plan.

4.7.3 Pre-Enrollment Tools

During the focus groups, the Company learned that customers were interested in new options, but they wanted to be able to do a lot of their own research and self-educating before selecting a new rate plan. Therefore, it was important to provide new, easy to understand tools to help customers learn about the rates and use personalized energy usage information.

Rate Education Reports

Mass awareness and understanding of the new rate options was an identified goal. As a special direct mail and email item, each customer would receive a personalized Rate Education Report two times per year – one in the spring and one in the fall. This personalized report educates customers about their new rate plan options, leverages customer AMI data to explain how the plan works and provides a detailed rate comparison of what a customer would have paid over the past 12 months on the two different rate plan options.

Online Rate Analysis Tool

To provide a great online experience and to help customers compare their options and costs, an Online Rate Analysis Tool was added. This new tool allows customers to login to their billing account and compare what they would have paid over the last twelve months on TOU compared to their current rate. Evergy data shows that over 60% of customers who signed up for TOU first looked at this comparison tool before deciding to enroll.

4.7.4 Post-Enrollment Tools

Knowing that this was a new concept for customers, and if behavioral changes did not persist, customers may realize a higher energy bill, instead of lowered energy costs. Therefore, data driven tools and continuous education were imperative to help customers be successful on the new TOU plan. To accomplish this, Welcome Kits and Rate Coach Reports were developed to increase a customer's success of participating on the TOU rate.

Welcome Kit

Once a customer enrolls, they receive a welcome letter via US Postal Service. The welcome kit provides a tear-away card with the rate hours to keep on hand and a "Clean/Dirty" dishwasher magnet that reminded customers to "Wait 'til 8" to run their dishwasher.

Rate Coach Reports

A week after a customer signs up for the TOU plan, they begin to receive a weekly email report called the "Rate Coach". This weekly email serves as a proactive success tool, delivering to customers key TOU information. It provides customers an hourly breakdown of usage and costs overlaid with the pricing period time frames to help them understand their hourly, daily and weekly consumption patterns and how that impacts them considering the TOU rate structure. It also provides a week over week comparison to encourage continuous improvement, a time period and pricing reminder to reinforce the TOU pricing differentials and importance of usage shifting out of the peak period, and realistic tips to continue to educate on and motivate behavioral changes. Research has shown that these weekly reports are TOU customer's favorite success tool. These reports realize nearly a 60% unique open rate each week, with most customers opening it more than 3 times.

4.7.5 Outreach Tactics

A campaign goal was to provide a large-scale customer awareness campaign and to meet and exceed enrollment numbers. To do this, the Company used both mass awareness and more targeted enrollment tactics.

Website

The Company made updates to the rate plan webpage, adding more customer-friendly language, new graphics and a new video which explained how the rate plan works. A new special campaign landing page was developed, which includes additional graphics that matched many of the TOU marketing items, new helpful charts, a video and additional information and imagery.

Video

A new TOU video was created to help explain the new program and concept. The three-part video includes: "How the Rate Works", "Why We Have the New TOU Rate Plan", and "Tips on Being Successful on the Plan".

Digital

The digital campaign included mostly short animated ads to grab the viewer's attention, while also allowing for extra time to share more information about the plan. The creative followed the rest of the campaign and directed customers to landing pages to learn more. Targeted display ads were used to hit key enrollment groups, while also using pixels to retarget individuals who visited the site but chose not to enroll.

Social

A mix of Awareness and Enrollment ads were used to help spread mass awareness. For Awareness ads, Facebook video, static and carousel ads were used to help explain the TOU Plan and provide key points. In Enrollment ads, research-backed audiences of "Early Adopters", "Auto Savers", and "Working Adults with No Kids" were used to target with the ads. In addition, social ads were developed for lookalike customers who enrolled during our first phase and retargeting pixel ads.

Radio

To help accomplish a goal of mass awareness of the TOU Plan, the Company partnered with Fradio to accomplish much of the mass awareness needs. Because research shows that area customers spend a lot of time in the car listening to the radio, the Company used a a "sandwich" approach to the radio ad, with a very catchy jingle used at the opening and closing of the ad and a more informational section in the middle.

Email

Using customer email list and segmentation based on research findings, the Company used email to target customers to enroll. Costumed graphics and copy were used for target groups, including "EV drivers", "Auto Savers", "Working Adults with No Kids" and "Technology Adopters".

4.8 IMPLEMENTATION

It was important to build momentum for the introduction of the new TOU Rate Plan. As a traditional product adoption curve illustrates, connecting with Innovators and "Early Adopters" to ignite early awareness, enrollment and advocacy would allow the Company to move in a positive direction to build greater awareness within the larger customer base. A four-phased implementation approach was developed.

4.8.1 Phase 1: Employees

Not only was the TOU Rate Plan new for customers, but it was also something different for most Evergy employees. Providing a strong foundation to employees was important as they are often on the front-line getting questions from their friends and neighbors. The Company started with an internal employee campaign to help all employees, from linemen to accountants, understand how the TOU Rate Plan works and to be confident advocating the new plan to their families and friends. Unique ways were created to get the key message points to stick with team members which included restroom mirror clings, elevator wraps in all buildings, a desk info card and identification badge card with helpful information.

4.8.2 Phase 2: Early Adopters

The second phase, which lasted about three months, included reaching out to customers who are identified as "Early Technology Adopters" and customers who may believe the TOU Rate Plan could be an easy switch for their current lifestyle. This would allow the Company to test the new tools and enrollment process, develop success stories to help advocate for the new rate plan and continue to test messaging and creative. In this phase, email, a low-cost tactic, was used to allow for different messages to be tested. The three main target groups for this phase included:

- "Early Technology Adopters": The Company identified this group through third party data and matched it with customer information. This group tends to be familiar with being the first to try something new and willing to give feedback.
- "EV Drivers": EV drivers are generally already familiar with new technology and options. In addition, they would benefit from the off-peak charging times for their vehicles.
- "Auto Savers": Through an electric usage analyses, we identified customers who would automatically save money on the new TOU rate, without much lifestyle changes.

4.8.3 Phase 3: Mass Awareness

In this phase, mass awareness channels, like radio, were used to create wider reach for the TOU message. Though research using U.S. Census data, the Company learned that Evergy's overall customer group spends a lot of time in the car. On average, the drive commute in Evergy's region is 23 minutes, and 83% of those employed drive to work alone, meaning the Company had a captured audience who often listened to the radio each day. A radio campaign was developed using high-level messaging to drive customers to our website where they could learn more. The Rate Education Report is also mailed to all residential customers.

4.8.4 Phase 4: Enrollment

Our fourth phase was geared toward getting enrollments into the TOU Rate Plan. Through focus groups and online surveys, "Working Adults with No Kids" were identified as a group who was very interested in the program and felt they could make the lifestyle changes necessary to be successful on the new rate. Marketing channels, like social, email and digital, were used to target messaging to this group, in addition to other main audiences like EV Drivers and "Routine Changers".

4.9 EVALUATION, MEASUREMENT AND VERIFICATION (EM&V) PLAN

In accordance with the Rate Design S&A, Evergy agreed to submit an EM&V plan, provide for an interim EM&V report by December 2020, and a final EM&V report to be completed by December 31, 2021. Evergy retained Guidehouse Inc. ("Guidehouse") to support the efforts to study residential TOU rates and provide independent evaluation services to verify the ex-post (historical) impacts of the TOU rates.

Evergy shared the results of the interim EM&V results to stakeholders on December 17, 2020. Below are the key findings from the interim EM&V:

- Results indicate that the TOU rate and associated program design has had the desired effect of reducing consumption during the on-peak period (4-8 pm M-F) in both the summer and non-summer seasons and driving participant bill savings (on average).
- Peak System Impacts – TOU participants lowered their demand by 4-9% at system coincidence peak.
- Bill Impacts - On average, participants are saving annually. Summer bills see the greatest savings, approximately half of which are driven by behavioral changes while non-summer bills see an increase for those previously on the electric heating rate primarily driven by rate structure changes.
- Annual savings for residential general customer ranges from 5 to 10%.
- Annual savings for residential space heating customer ranges from 3 to 6%.
- Enrollments – the Company had exceeded stipulated enrollment targets within the evaluation year, which at the time was 142% of the overall Missouri enrollment target of 3,750 customers[16].
- Attrition – Approximately 50% of attrition (700 customers) that occurred during the evaluation year was from customers moving.

Appendix A includes detailed information regarding the interim EM&V report. Evergy will also submit a final EM&V report per the Rate Design S&A by December 31, 2021.

[16] Evergy had achieved 142% of the stipulated goal (3,500 customers) at December 7, 2020 at the time of the presentation of the interim EM&V. As of June 11, 2021, the Company has achieved 5,538 active enrollments (2,917 enrolled customers in Missouri West and 2,621 enrolled customers in Missouri Metro). This equates to about 160% of stipulated goal.

5 TOU RATE DESIGN PLAN

5.1 INDUSTRY RESEARCH & BEST PRACTICES

Evergy, with the assistance of Brattle, conducted research and benchmarking on TOU deployments across the electric utility industry. Despite the fact that TOU rates are available in most states, enrollment in TOU rates is still very low nationwide, with only a few utilities having substantial (>10%) participation in TOU rates.

5.1.1 Best Practices in TOU Design

The analysis of dozens of TOU pilot programs worldwide indicate that customers do respond by shifting consumption and reducing peak demand. The design choice that most affects the impacts of TOU rates is the ratio of peak to off-peak prices, with stronger price signals yielding higher peak load reductions.

The TOU rate being offered by many utilities today fall into two design categories, legacy and modern. Legacy TOU rates were often introduced decades ago to satisfy Public Utility Regulatory Policies Act requirements and have not been heavily marketed to customers. Many legacy TOU rates have very long (i.e., >6 hour) peak periods, an increased fixed charge (to cover the cost of a TOU meter), and mild peak-to-off-peak price differentials.

Widespread AMI deployment led to a new, more customer-centric generation of modern TOU rates. These rates generally are designed with the simultaneous goals of reflecting costs, encouraging load shifting, and accommodating customer preferences. A survey of TOU pricing pilots over roughly the past two decades provides useful insight into the design best practices of modern TOU rates, which include:

- Most TOU rates are offered on an opt-in basis.
- Many utiliiites offer customers multiple TOU rate option choices.
- On-Peak time periods are significantly shorter, typically 4 hours.
- Modern designs have significantly higher On-Peak to Off-Peak price ratios.
- There is a clear relationship between peak impact and Peak to Off-Peak price ratios.
- Utilities with large solar penetration are shifting their On-Peak period to address the changing system load patterns.

5.1.2 TOU Deployment Strategy, Opt-In vs Opt-Out

As discussed in Section 3, in Dockets ER-2018-0145 and ER-2018-0146, the MPSC approved that KCP&L and GMO would offer a residential **opt-in** Time of Use Service (effective October 1, 2019) as an alternative to the Company's standard residential rate. The TOU opt-in rate would also remain in effect until changed by Commission order.

The subject of opt-in versus opt-out TOU rates has been debated in the electric utility industry for several years. An opt-in structure is such that the default is a flat rate or a blocked/tiered rate and a customer may choose to have a time varying rate. The choice of remaining on the status quo flat or blocked/tiered rate is the choice of the customer. On the other hand, an opt-out structure is such that a commission mandates that all customers are placed on the time varying rate, which forces a customer to take action to revert to the flat or blocked/tiered rate, or select another rate within the utility's portfolio of rates.

States and commissions have adopted different approaches on opt-in versus opt-out. Most utilities in the U.S. still offer TOU rates on an opt-in basis. In a limited number of cases, some utilities have or will deploy TOU on a opt-out or mandatory basis. For example, in California, by 2022, all investor-owned utility ("IOU") companies must automatically move customers to a TOU rate. Customers will be provided the option to "opt out" and stay on their current rate or select another rate. Depending on the utility, some customers, such as low income, will be considered differently and may be offered a different rate.

The California default TOU path began in 2013 and came as a result of legislation to reform residential rates. Specific guidance was offered and key steps were expected to be completed by IOUs to ensure readiness. That transition spanned seven years (2015-2022). It is yet to be determined how successful these rates will be. The success will be contingent on a number of factors.

Another well known default TOU rate was the one offered by Puget Sound Energy in 2001, which had a slight peak to off-peak differential. Following a backlash related to limited customer bill savings because of this low differential, the result was an immediate opt out by 10% of its 300,000 customers and Puget terminated its program in 2002.

In addition to national research, Ameren transitioned to a portfolio of TOU rates in Docket No. ER-2019-0335. Ameren's portfolio includes TOU rates that have different rate differentials and periods. Their portfolio consists of the following: Anytime Users rate, Morning/Evening Savers rate, Overnight Savers rate, Smart Savers rate, and Ultimate Savers rate. With the exception of the Anytime Users rate, the balance of the rates feature time variation in the price of electricity. The Ultimate Savers rate includes a demand charge. Evergy understands that Ameren's AMI deployment will be completed in 2024 at which time all of their customers will fully be able to select service under these rates. Evergy is not familiar with any publicly available results (eg, EM&V, customer satisfaction, off peak load shift) from Ameren's TOU rate offerings to this date.

Brattle performed research for Evergy for purposes of this Report and found that:

- **Opt-out TOU deployment remains an uncommon** deployment method across utilities

  Brattle identified 100+ residential TOU rates offered by IOU across the U.S. Most of these TOU rates are opt-in. Consumers Energy (Michigan), Xcel Energy (Colorado), and the 3 IOUs in California (Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric) have the only opt-out rates among IOUs as far research indicates. The opt-out rates offered by these utilities have all been implemented within the past two years.

- **Average peak demand reduction per participant is higher under opt-in** deployments than opt-out deployments There are few pilots directly comparing opt-in versus opt-out rate designs. One is the Sacramento Municipal Utility District's evaluation of opt-in versus opt-out TOU pilots, which found that the average response per opt-in TOU participant was double that of an opt-out TOU participant.
- **Customer satisfaction** under TOU remains high either opt-in or opt-out. The majority of customers who started and also completed TOU pilots, expressed a high level of satisfaction in their experiences with the new rates and continued taking service under the rate after the study ended, provided such opportunities were available.
- **Opt-out rates have higher enrollment rates relative to opt-in rates** (e.g., 80% enrollment for opt-out versus 20% enrollment for opt-in). "Inertia" causes the majority of customers to stay on their default rate. Time and significant marketing will be required to drive towards a high opt-in rate enrollment. For example, OG&E reached ~20% penetration of its residential class on the Variable Peak Pricing rate tested after a little more than three years of marketing it.[17]
- **Opt-in programs can potentially achieve greater overall impact** due to the fact that opt-in offerings achieve greater impacts per-participant than opt-out program participants. The strong price ratio in Evergy's TOU rate design (6:1)[18] is expected to produce greater system peak demand reductions than an opt-out TOU rate with a mild price differential. Brattle's analysis concluded that an opt-out rate offering with 80% participation would need to have a price ratio of greater than 2:1 in order to produce the same impact as Evergy's opt-in TOU rate with 20% participation.

Evergy has achieved an approximate 1.1% customer enrollment in its opt-in TOU program to date over a 20 month period. While customers continued to enroll during the COVID-19 Pandemic and Evergy did not see a higher than normal un-enrollment in the TOU program, it is likely that customer enrollment was hampered by the COVID-19 Pandemic. Additionally, it will require time for customers to become more aware of the TOU offer, which will occur over time through education and marketing efforts. As described in Section 4.6, Evergy will continue to offer the three core TOU education tools which include the Rate Education Reports, Online Rate Analysis Tool, and Post-Enrollment Rate Coach Reports. These tools have had very good success with customers and have been received positively by customers as indicated by research and data analytics.

[17] "Final Report on Customer Acceptance, Retention, and Response to Time-Based Rates from the Consumer Behavior Studies" by US Department of Energy, November 2016

[18] Throughout this report, ratios are presented to reflect the pricing relationship between the TOU periods. In this example, 6:1 indicates that the on-peak price is six times the off-peak price. The supporting text offered with the respective ratio should help the reader to understand the periods being compared and represented with the ratios.

Section 5.3 offers further detail on the Company's strategic intent with respect to the inclusion of TOU rates in its portfolio of residential rates.

5.2 CUSTOMER RESEARCH

Evergy believes that a TOU rate should reflect customer preference in order to maximize results and objectives. The Company has a long history of listening to our customers and working to best understand what they want in many facets of energy and as their energy provider, exploring electric rates with customers is no exception. Specifically in the last 5-10 years, as part of industry research studies, ongoing research with customer panels and as deliverables of agreements in prior regulatory proceedings, the Company has engaged with customers in numerous ways around their electric rates. One common theme rings true in the results from these studies and that is the ongoing desire for customers to enjoy a choice of rate plans.

When breaking down some of the prior research into "past" or pre-TOU pilot launch and "current" or during the TOU pilot activity, the trends of customers insights stay steady with a strong preference for electric rate choice. These studies and few current findings include:

"Past" – Previous studies incurred to learn from customers on rate preferences and behaviors

1. Industry studies on rates and customer behavior (Electric Power Research Institute 2015)
2. Residential Rate Design Strategy Study (Burns & McDonnell 2017)
3. Demand Side Management ("DSM") Market Potential Studies (2017, 2020)
4. TOU Pre-launch Focus Groups (2019)

   Relevant finding: Most customers said they wouldn't like a mandatory TOU rate plan but also understand that customers don't have a choice.

"Present" – Engagement with current TOU rate participants and non-participants post-enrollment/un-enrollment and behavior change surveys and 1:1 interviews (2019-2021)

1. Current TOU participant 1:1 behavior surveys (2020-2021)

   Relevant finding: Over half of TOU participants would regard Evergy less favorable if they required participation in the TOU plan.

2. Rate Modernization all customer survey (2021)

   Relevant finding: Ninety-three percent of Evergy customers feel it is important to have choice in rate plans. Bill amount and complexity are the two most important considerations when choosing a rate plan. More than half (57%) would be less satisfied with Evergy if TOU were mandatory.

3. JD Power Residential Electric (Annual)

   Relevant finding: Customer satisfaction is higher among customers who have switched from the default rate plan to one they have chosen.

Additionally, Evergy will continue to learn from its customers following approval of new rate options. Activities to obtain feedback and stay in tune with customer attitudes could look similar to the list below.

"Future" – Expected ongoing interaction with TOU participants and Evergy customers at large

1. Repeat current TOU participant and non-participant survey instruments – enrollment, post-enrollment and non-participant attitudes towards their experience and/or preferences.
2. Evergy online customer panel – engage with customers who are interested in giving feedback around energy topics to understand rate choice preferences including experience with existing offerings and preferences around potential offerings.
3. Monitor social media – ongoing observations of Evergy customer reactions to existing rate choice offerings to identify if emerging trends for Evergy to take action.

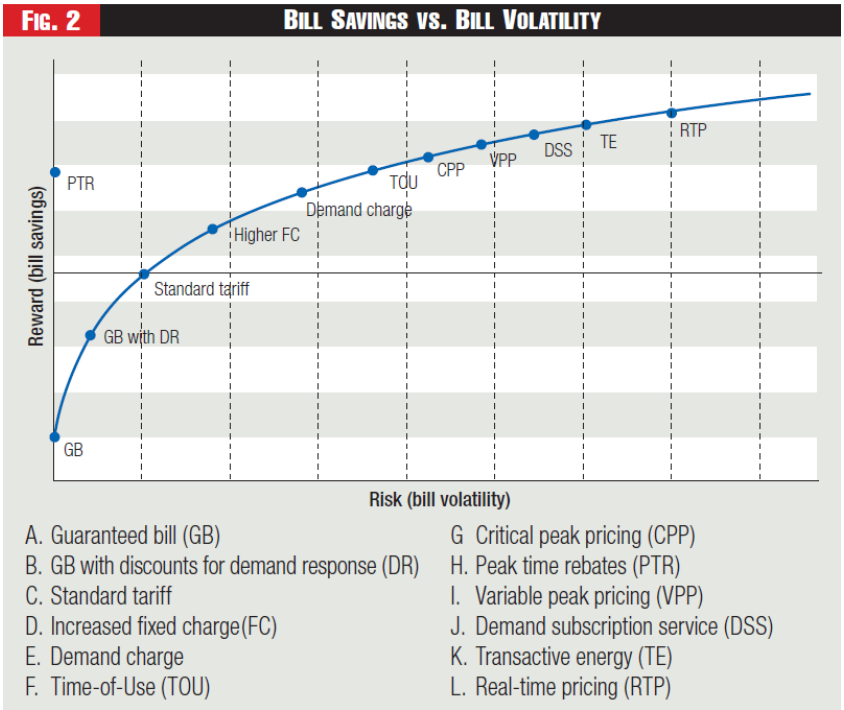
5.3 STRATEGIC INTENT

As the Company continues to move forward with offering its TOU rate, it is important that it delivers on the expectations of the initial Commission approval and appropriately improves upon the rate offering. Earlier in this report the Company detailed the development of its Rate Plan and identified the drivers and goals behind that plan. These broad objectives informed action on a variety of rates with TOU rates being an integral part of the Rate Plan. Strategic expectations for the TOU rate were detailed in the negotiated conclusion of the Company's 2018 Missouri rate cases. As set forth in Section 2.1 of this Report describing the elements of the Rate Design S&A, parties agreed that "TOU rates should be part of a broad selection of rates offered to Customers and utilized to help the Company provide an opportunity to Customers to shift demands from peak periods and benefit from that shifting load. Further, TOU rates allow the Company and Customers to extract additional benefit from recent upgrades in metering and billing systems."[19]

In confirming the TOU rate design's place in a broad selection of rates, the Company examined a range of rate alternatives deployed by electric utilities and noted that most are seeking some balance between risk and reward. This relationship is best visualized in a chart offered by Dr. Ahmad Faruqui of the Brattle Group. Figure 2 shows a number of rate design approaches along a continuum, expressing how these rate offerings balance customer risk and reward.

[19] Non-Unanimous Partial Stipulation and Agreement Concerning Rate Design Issues. Case No. ER-2018-0145 and ER-208-0146, filed September 25, 2018, page 2

Figure 2: Rate Design Spectrum[20]



The baseline reference of Figure 2 is the standard tariff. Other rate design approaches are represented along a curve with higher or lower bill savings and high or lower bill volatility. TOU is shown to the right of the standard bill, suggesting that the TOU rate delivers a higher opportunity for bill savings, but does so with higher bill volatility for the customer. TOU rate designs are distinctly different from standard rate designs and successfully serve as a viable options for customers. Under the Company's Rate Plan, TOU continues to serves a distinct role in the portfolio of rate designs the Company is considering for the future.

Evergy has observed that utilities who offer portfolios of rates experience a distribution of customers across the rate offerings. This is to be expected and in the Company's opinion, a healthy outcome. For example, in 2013 Oklahoma Gas & Electric Company ("OG&E") offered seven distinct rate options to its residential customers. OG&E further reported that participation varied across these rates such that about 44% of the customers sought rates that provide price security, about 36% sought rates that provide price sensitivity and about 20% sought to remain on standard tariff pricing. Georgia Power, for example, offers seven rates for customers to choose from so that customers may "choose the right plan for your budget and lifestyle".[21] Georgia Power's rate plan includes a variety of rates that range from standard residential service to time of use to prepay and a flat bill. Evergy would expect similar distribution of

[20] Ahmad Faruqui, Rate Design 3.0: Future of Rate Design, Public Utilities Fortnightly, May 2018, page 38.
[21] https://www.georgiapower.com/residential/billing-and-rate-plans/pricing-and-rate-plans/plug-in-ev.html

customers across the various rates, similar to OG&E, and the rate plan offered by Georgia Power is similar in concept to the Rate Plan presented in Section 3.

In confirming the expectation of extracting additional benefit from Evergy's recent upgrades in metering and billing systems, one should first consider the nature of these upgrades. At the time of the 2018 Stipulation, the Company, specific to the KCP&L-MO and KCP&L-GMO jurisdictions, endeavored to replace its CIS, or billing system, and deploy an AMI system. The billing systems of both utilities and the Automated Meter Reading ("AMR") system used by KCP&L had reached end of life and replacement was needed. Sufficient benefit to justify the upgrade was expected to be received by bringing the jurisdictions together under a common billing system and AMI system. Important benefit was provided in the area of customer data. In deploying TOU rates, it was expected that these systems could enable further benefit. These expectations have been substantiated through review of customer surveys and the other customer interactions, as it has been demonstrated that TOU has been effective in raising the energy awareness of participating TOU customers. In addition, the Company has communicated comparison of TOU and standard rates in the Rate Education Reports to all customers – participating and non-participating. Among other activities, the Company specifically utilizes the AMI data to support education on the TOU rate plan.

In addition, most significant has been the transition to broader utilization of AMI data. Evergy has every indication that the capabilities of the new billing system and AMI upgrades are providing benefit consistent with the investment and that TOU allows for the extraction of additional benefits.

Turning to the TOU Rate Design Plan and confident these stakeholder and Commission initial expectations are being met, Evergy re-evaluated the state of the Company since the 2018 TOU agreement. Much has occurred since that time and two primary events were relevant in assessing the Company's TOU plans going forward. These events include the merger with Westar and the announcement of Evergy's Sustainability Transformation Plan ("STP"). The merger with Westar brought with it the assets and customers, but also the rate structures and approaches deployed in that jurisdiction. KCP&L and Westar had many similarities but also many differences, all that needed to be brought together as Evergy. At the time of the merger, Westar was planning a billing system replacement, had deployed a limited TOU pilot and was initiating the deployment of an AMI system. Although similar in concept to the work being undertaken by KCP&L side, there were many details that were distinct. As a result, viewing TOU rate design plans from a combined company, or Evergy, perspective required some adjustment.

With the announcement of the STP, Evergy set out its vision to become a sustainable energy company, transitioning generation, modernizing the grid, achieving cost efficiencies and creating an enhanced customer experience. These goals provide an overarching context to guide plans for rate design. The Rate Plan and the TOU Rate Design Plan seeks to complement the goals of the STP.

Under these events and other more tactical perspectives, the Evergy team set out its considerations for the TOU rate design. Efforts began with the consideration of traditional rate design principals, like those exemplified by the Bonbright Principles. The TOU Rate Design Plan represents the continuation of the existing strucutre but yet enhancements. The Company considers the following notable additions:

- ***TOU remains an important part of Evergy's plans for today and in the future.*** Customer Experience is identified as one of the four, key elements of the Evergy STP Plan. Giving customers a choice on their rate plan has been identified as a factor in ensuring the customer experience remains positive. As explored in Section 5.2 of this report, significant weight was given to customer considerations through customer research. In addition, the Company's Rate Plan reinforces the need for not only the existing 3-period TOU plan, but expanding it to also offer a 2-period TOU plan.

- ***It is appropriate to providing a broad selection of rates.*** Building on the prior point, customers have expressed a preference for choice in their rate plan. As shown in Figure 2, a number of commonly deployed rates offer customers a range of options to seek the balance of risk and reward suitable for their situation. TOU rate designs, introducing more bill volatility but offering greater opportunity for savings, move beyond simple cost recovery and seek to influence behavior. The influence is certainly through pricing but is also established by educating customers and helping to align their point of view with the cost drivers observed by the utility. Customer relationships are critical in helping achieve this alignment. A growing portion of customers seek to be more involved in their energy experience. Others are seeking less involvement, instead seeking predictability and control. By providing choice and meeting customers where they are, we expect to receive a more meaningful and lasting effect from the offered rate designs.

- ***The TOU approach implemented by Evergy is working***. When the plan for TOU was defined in the Rate Design S&A, the Company and parties worked together to define "a meaningful and successful process to establish alternative rate plans in the form of Time of Use ("TOU") rates for residential customers following accepted best practice and ensuring measured impact to customers within the class."[22] The process was based on customer education and allowing customers to self-select, or opt-in to, the TOU rate. As Evergy evaluates conditions today, key conditions relevant for TOU deployment such as capacity positions, capacity availability and customer interest are largely the same as they were in 2018. With that, the Company is committed to continuing the TOU deployment largely consistent with the initial deployment. Evergy has been monitoring publicly available information from other utilities that have implemented TOU rates, including recent TOU deployments and the new TOU proposals in rate case filed by Ameren. Evergy has evaluated these developments and again remains committed to the plan, concluding that a selected approach by a utility is dependent on many factors and "one size does not fit all".

[22] Refer to Order Approving Stipulations and Agreements, dated October 31, 2018, Section 2.a. Also referred to in Section 2 of this Report.

- ***Alignment of rate designs across Evergy is an appropriate goal.*** As Evergy brings together the various jurisdictions, having a common rate plan portfolio is a necessary goal. In defining the Rate Plan as well as this TOU Rate Design Plan a focus was kept on aligning rate structures and ensuring a path that will ultimately unify the rate portfolios of the Evergy jurisdictions. While Evergy will certainly look to do what is best for its customers and shareholders within its respective regulatory structures of the Missouri and Kansas jurisdictions, it recognizes that customers simply see Evergy as one company and our customers and shareholders will benefit from increasing consistency with all customer-facing elements of the Company's operations. This is a significant step and one that may take years to fully achieve.

- ***TOU rate designs present challenges and some issues cannot be resolved.*** At face value, TOU rate designs seem to be a good rate design for all customers. However, under closer examination, one might say this is not true. Two situations exemplify the types of issues that may be encountered if expanded or mandatory rates are ordered. First, TOU rate designs are not well suited for customers with loads that cannot be shifted. Customers with continuously running medical equipment or simply those with low levels of usage cannot shift usage to achieve the potential bill savings. Enabling technologies may not be deployed to better respond to the rate's price signals.

  Second, net metering presents a challenge. Issues with net metering and TOU are driven by statutory provisions that have not been updated to reflect dynamic rates. In Missouri, netting and excess provisions are built around the billing period, or month, and do not include provisions that would allow the net metering process to reflect the pricing established by the TOU rate design. Evergy expects that statutory change would be needed to resolve this inconsistency. It is logical to think that the existence of AMI should compel a company to deploy TOU to all customers, however, the truth is some situations are not yet ready for TOU.

  When combined with the customer-facing value of rate plan choice, Evergy remains in support of measured and optional deployment of the TOU rate design.

Evergy has taken a broad view and remains open to new information in considering its TOU Rate Design Plan. The TOU Rate Design Plan builds on its successful initial roll-out of the rate and continues to establish a Rate Plan that respects customer choice and allows for further maturization of the policies and enviroments where the TOU rate will be utilized.

5.4 TOU RATE DESIGN ANALYSIS

This section of the Report provides the results of Evergy's analysis to determine the most appropriate and best time period constructs and price differentials for residential TOU rates for near term offerings to its customers. This analysis is presented in the following sections:

- TOU Season Analysis
- TOU Time Period Analysis
- TOU Price Differential Analysis

The analytical approach was geared toward determining the optimum seasonal TOU pricing periods and price differentials that will reflect the current drivers of system generation and distribution capacity needs and the market energy price variation. To determine the seasonal TOU pricing periods, this study assembled and analyzed system and retail class loads and wholesale cost data for 2019, which represents the last full calendar year of data available.

5.4.1 TOU Season Analysis

Evergy performed a Seasonal Rate Period Alignment Study that explored the possible alignment of seasons across the Evergy jurisdictions. The proposed TOU Rate Design Plan implements a consistent summer season period from June 1 to September 30 for both the Evergy Missouri jurisdictions for TOU rates. There is considerable empirical support for the selection of this four month summer season rate period.

Figures 3–5 show that Evergy and each jurisdiction individually exhibit the highest daily peak load in in the four months of June, July, August, and September. A more detailed analysis for each jurisdiciton, illustrated in Figures 6-8, shows that all hours in which the system load exceeds 90% of the annual system peak hour (pink shading) occur during the months of June through September. This analysis also shows that the majority of hours in which the system load exceeds 75% of the annual system peak hour (yellow shading) also occur during this four month period, with a few hours occurring during the non-summer period.

Figure 3: 2019 Evergy Daily Peak, Average, and Minimum Loads (MW)

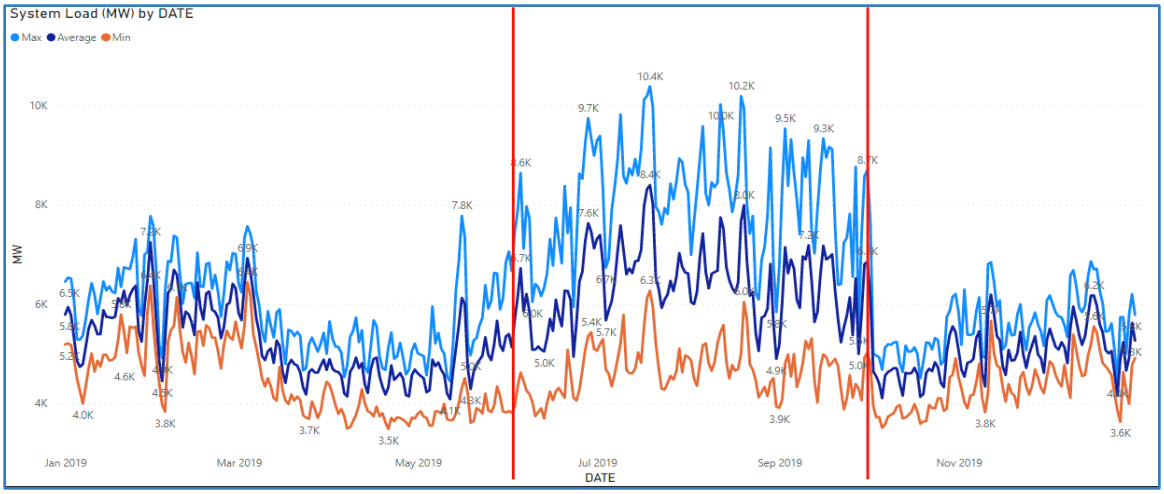


Figure 4: 2019 Missouri Metro Daily Peak, Average and Minimum Loads(MW)

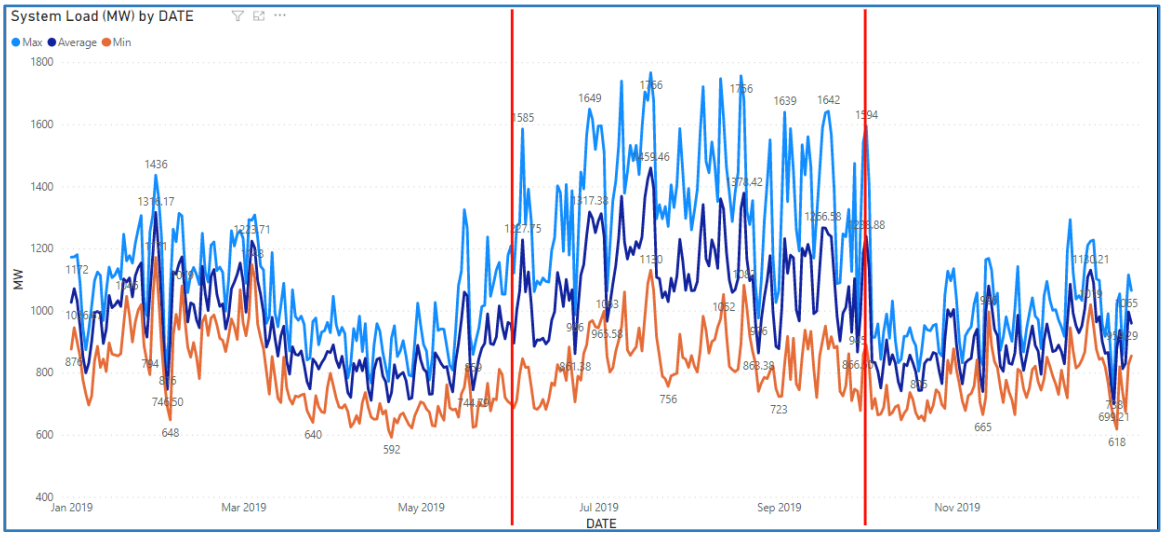


Figure 5: 2019 Missouri West Daily Peak, Average and Minimum Loads(MW)

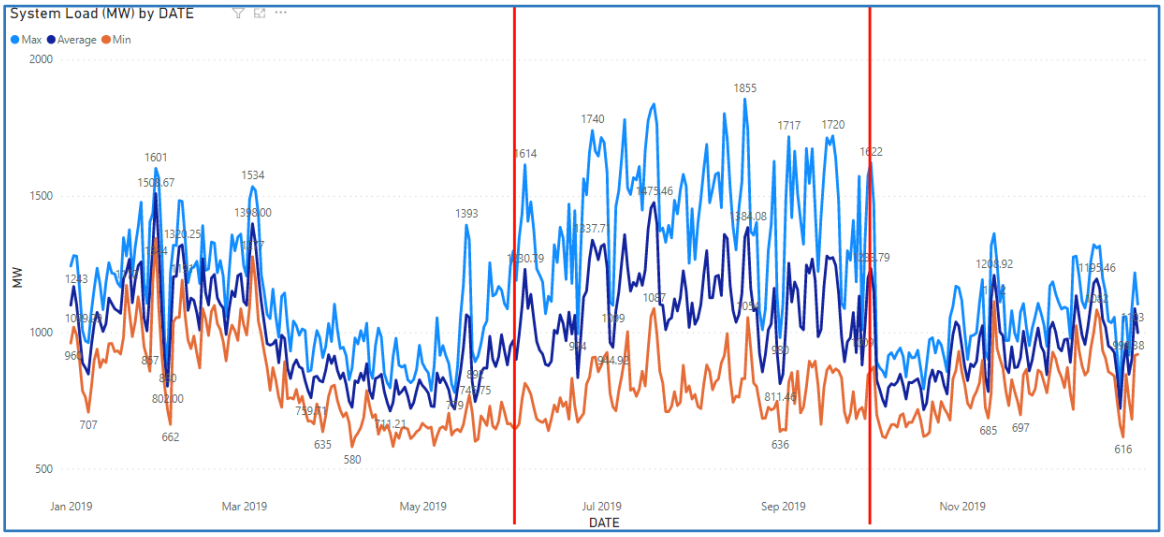


Figure 6: 2019 Evergy High Load Days

DATE	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
6/4/2019	5755	6161	6578	6890	7144	7301	7588	7823	7874	7774	7516	7149	6920	6364	5772
6/5/2019	6517	6986	7451	7839	8227	8506	8617	8638	8611	8456	8076	7638	7292	6614	5872
6/7/2019	6039	6531	6947	7304	7599	7786	7901	7967	7928	7712	7368	6950	6717	6244	5667
6/20/2019	5761	6087	6428	6835	7275	7631	7981	8275	8377	8335	8086	7715	7477	6926	6327
6/22/2019	5556	6129	6653	7046	7376	7643	7813	7942	7920	7532	6994	6624	6191	5645	5129
6/25/2019	5875	6418	6904	7357	7780	8115	8394	8588	8627	8507	8180	7727	7388	6758	6128
6/26/2019	6258	6713	7031	7389	7782	8071	8266	8477	8525	8367	8042	7651	7414	6920	6294
6/27/2019	7078	7622	8127	8547	8882	9071	9195	9252	9079	8907	8575	8185	7928	7358	6716
6/28/2019	7295	7897	8441	8902	9294	9521	9738	9742	9623	9330	8963	8524	8283	7745	7176
6/29/2019	6905	7525	8132	8573	8914	9122	9281	9348	9336	9146	8837	8394	8113	7621	7050
6/30/2019	6597	7165	7675	8083	8385	8624	8806	8945	8991	8851	8560	8104	7785	7218	6543
7/1/2019	7110	7640	8102	8498	8830	9030	9197	9295	9286	9123	8778	8331	8015	7383	6699
7/2/2019	7165	7735	8207	8584	8978	9155	9339	9383	9353	9150	8710	8242	7910	7328	6681
7/3/2019	6731	7187	7551	7902	8182	8304	8336	8276	8148	7875	7452	7019	6790	6368	5906
7/6/2019	5600	6132	6535	6916	7254	7511	7741	7890	7833	7571	7257	6873	6676	6278	5823
7/7/2019	5815	6372	6874	7320	7676	7918	8122	8290	8358	8266	7978	7546	7243	6718	6161
7/8/2019	6956	7553	7988	8336	8546	8685	8839	8903	8873	8656	8356	7971	7708	7106	6483
7/9/2019	6924	7531	8107	8652	9074	9428	9675	9804	9817	9660	9383	8977	8635	8016	7335
7/10/2019	6934	6769	6963	7327	7702	8119	8423	8564	8575	8438	8153	7645	7253	6670	6017
7/11/2019	6345	6796	7175	7531	7882	8119	8309	8430	8425	8263	7952	7460	7119	6547	5924
7/12/2019	6435	6920	7370	7752	8142	8397	8587	8731	8727	8563	8190	7682	7308	6735	6117
7/13/2019	6126	6697	7204	7608	7929	8206	8418	8569	8597	8480	8185	7716	7370	6891	6281
7/14/2019	6278	6937	7490	7904	8242	8509	8716	8872	8919	8793	8545	8087	7851	7177	6526
7/15/2019	6581	7029	7502	7872	8175	8361	8493	8590	8510	8349	8049	7635	7348	6767	6111
7/16/2019	6617	7091	7567	8083	8578	8883	9027	9093	9099	9000	8734	8337	8058	7491	6833
7/17/2019	7639	8171	8654	9087	9419	9708	9962	10099	10116	10027	9710	9285	8934	8318	7671
7/18/2019	7884	8456	8964	9401	9795	9987	10186	10188	10189	10122	9809	9384	9077	8486	7844
7/19/2019	7990	8542	9019	9459	9885	10171	10339	10380	10301	10158	9792	9337	9035	8471	7875
7/20/2019	7420	8001	8461	8874	9220	9551	9760	9920	9953	9796	9477	9054	8761	8232	7625
7/21/2019	5942	6393	6846	7054	7290	7579	7787	7924	7954	7737	7324	6992	6666	6175	5651
7/22/2019	6285	6677	7004	7249	7498	7664	7802	7861	7838	7633	7262	6763	6479	5968	5358
7/24/2019	5834	6215	6545	6883	7208	7454	7695	7884	7930	7784	7445	7003	6665	6100	5499
7/25/2019	6008	6460	6870	7228	7559	7770	7813	7769	7597	7374	7118	6849	6678	6201	5665
7/26/2019	6171	6636	7042	7425	7786	8083	8300	8424	8396	8112	7691	7226	6908	6393	5847
7/27/2019	5749	6250	6719	7106	7461	7719	7920	8092	8109	7961	7613	7174	6920	6453	5937
7/28/2019	5884	6427	6974	7464	7811	8097	8318	8431	8466	8297	8010	7716	7466	6965	6372
7/29/2019	6855	7367	7820	8181	8547	8754	8888	8931	8889	8696	8294	7678	7256	6571	5908
7/30/2019	6299	6812	7264	7701	8079	8393	8658	8822	8852	8696	8295	7804	7470	6844	6222
7/31/2019	6183	6521	6917	7255	7672	8000	8266	8408	8294	8139	7771	7451	7144	6608	6045
8/1/2019	6261	6640	7013	7403	7811	8122	8247	8197	8071	7900	7599	7375	7155	6666	6139
8/4/2019	5528	6124	6653	7118	7503	7791	8040	8195	8279	8154	7828	7487	7164	6567	5943
8/5/2019	6660	7284	7786	8198	8537	8769	8924	8929	8802	8589	8235	7924	7618	6972	6374
8/6/2019	7164	7788	8378	8863	9273	9526	9579	9492	9346	9152	8757	8276	7845	7163	6496
8/7/2019	6282	6444	6653	6955	7229	7612	7971	8170	8227	8131	7833	7505	7191	6566	5962
8/8/2019	5948	6105	6317	6542	6930	7247	7571	7849	7993	7874	7574	7270	6960	6387	5827
8/9/2019	6245	6728	7154	7611	7928	8193	8369	8451	8400	8192	7849	7508	7207	6677	6172
8/10/2019	6071	6663	7152	7500	7746	8006	8189	8298	8353	8310	8022	7758	7490	7016	6533
8/11/2019	5794	6075	6431	6820	7222	7664	8042	8254	8448	8395	8160	7961	7712	7187	6641
8/12/2019	7117	7730	8350	8930	9458	9830	10018	9994	9954	9720	9301	8977	8582	7891	7171
8/13/2019	7293	7868	8388	8785	9140	9379	9476	9452	9326	9056	8586	8109	7637	6953	6266
8/14/2019	6435	6864	7317	7728	8097	8366	8548	8647	8645	8427	7983	7568	7095	6384	5736
8/15/2019	6090	6510	6918	7422	7779	8093	8267	8318	8296	8149	7837	7608	7223	6509	5883
8/16/2019	6118	6444	6705	6930	7145	7178	7375	7708	7854	7754	7439	7182	6909	6428	5964
8/17/2019	5367	5773	6123	6479	6862	7241	7645	7966	8163	8108	7768	7439	7180	6704	6227
8/18/2019	5323	5689	6209	6782	7300	7777	8158	8445	8592	8491	8153	7819	7416	6787	6176
8/19/2019	6924	7585	8250	8853	9383	9771	10031	10174	10186	9992	9608	9307	8836	8091	7441
8/20/2019	7553	8092	8423	8713	9125	9507	9736	9918	9938	9761	9403	9099	8675	7928	7225
8/21/2019	6614	6860	7236	7611	7869	7960	7982	8010	7922	7676	7391	7131	6754	6203	5695
8/29/2019	6335	6926	7477	7873	8442	8768	8997	9146	9138	8941	8544	8247	7528	6700	5986
9/2/2019	5140	5718	6306	6880	7336	7727	8011	8257	8349	8135	7736	7489	7019	6391	5788
9/3/2019	6568	7085	7589	8145	8638	9063	9364	9533	9474	9199	8796	8515	7963	7245	6563
9/4/2019	6228	6580	6961	7355	7710	8017	8238	8379	8351	8070	7640	7354	6887	6205	5590
9/5/2019	6234	6792	7347	7906	8479	8899	9176	9314	9242	8962	8532	8228	7737	7038	6368
9/6/2019	6478	6907	7402	7844	8223	8471	8616	8645	8478	8051	7509	7152	6675	6115	5533
9/7/2019	5327	5801	6295	6779	7210	7620	7902	8091	8098	7860	7460	7199	6767	6291	5815
9/9/2019	6650	7209	7726	8172	8569	8797	8927	8949	8815	8531	8163	7920	7454	6860	6303
9/10/2019	6520	6895	7228	7579	7911	8297	8482	8560	8485	8305	8009	7792	7347	6774	6167
9/11/2019	6878	7373	7822	8280	8724	9071	9243	9294	9196	8837	8377	8061	7594	6943	6360
9/14/2019	5059	5515	5987	6468	6956	7374	7688	7915	7906	7667	7313	7074	6715	6293	5852
9/15/2019	5781	6382	6960	7510	7961	8303	8570	8698	8701	8441	8078	7794	7299	6698	6093
9/16/2019	6707	7304	7885	8430	8876	9142	9303	9331	9142	8884	8569	8229	7706	7007	6334
9/17/2019	6427	6962	7515	8030	8472	8737	8882	8950	8829	8451	8048	7744	7250	6559	5942
9/18/2019	6498	7073	7665	8219	8643	8903	9059	9163	9032	8714	8274	7892	7330	6676	6031
9/19/2019	6598	7280	7955	8438	8811	9064	9116	9012	8827	8478	8195	7864	7347	6694	6062
9/25/2019	5935	6334	6666	7009	7328	7524	7725	7817	7636	7281	7019	6735	6260	5635	5069
9/27/2019	6213	6716	7203	7652	8103	8459	8691	8761	8600	8141	7791	7446	6915	6195	5582
9/30/2019	6587	7035	7513	7921	8250	8461	8577	8563	8381	8030	7845	7582	7171	6580	6057
10/1/2019	6633	7182	7632	8073	8456	8615	8693	8623	8327	7925	7766	7542	7085	6427	5866

Figure 7: 2019 Missouri Metro High Load Days

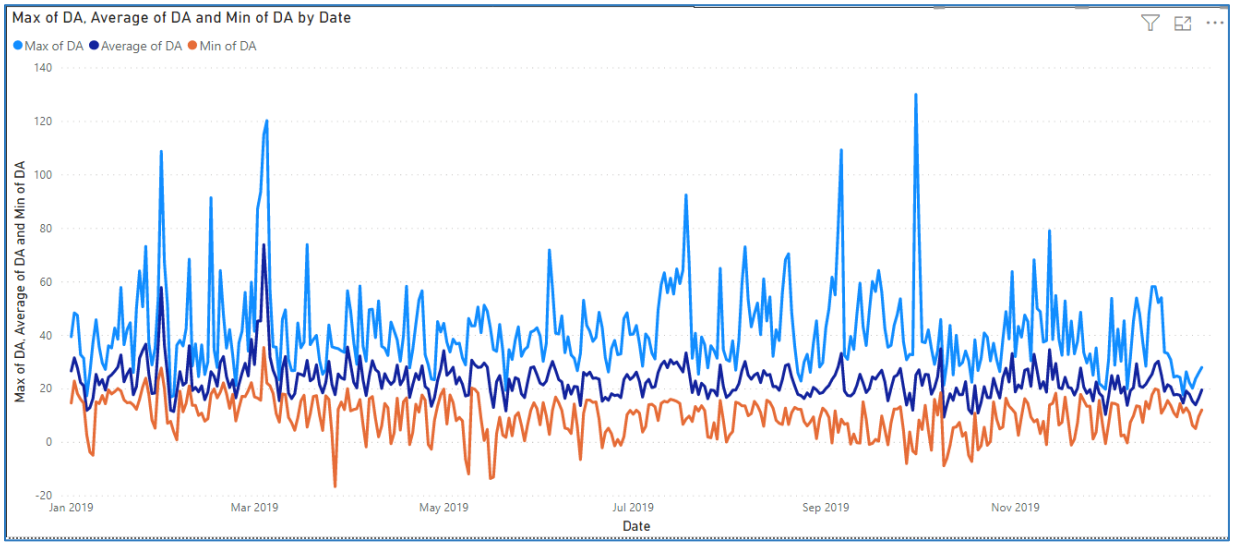
DATE	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1/30/2019	1308	1354	1382	1384	1348	1387	1389	1391	1364	1366	1358	1402	1436	1394	1358	1303	1259	1198
1/31/2019	1328	1361	1364	1323	1293	1239	1185	1142	1107	1083	1103	1154	1206	1195	1172	1127	1079	1039
5/16/2019	856	913	990	1032	1108	1163	1193	1240	1294	1319	1325	1323	1290	1261	1209	1182	1071	981
6/5/2019	950	1028	1128	1228	1305	1382	1447	1498	1563	1585	1559	1523	1515	1464	1406	1347	1215	1084
6/7/2019	876	951	1037	1109	1181	1257	1304	1362	1386	1391	1390	1380	1341	1278	1220	1194	1127	1049
6/17/2019	954	1009	1064	1159	1200	1275	1315	1365	1387	1402	1354	1330	1268	1243	1194	1176	1096	999
6/18/2019	909	973	1004	1063	1147	1232	1293	1343	1355	1380	1350	1275	1205	1148	1097	1092	1012	938
6/20/2019	853	941	1014	1070	1102	1107	1162	1248	1286	1311	1342	1406	1394	1369	1312	1284	1207	1116
6/22/2019	814	836	902	964	1068	1161	1225	1281	1339	1365	1379	1386	1326	1249	1208	1128	1012	945
6/25/2019	866	920	973	1039	1119	1189	1246	1314	1370	1418	1439	1446	1415	1366	1298	1251	1161	1080
6/26/2019	910	996	1052	1135	1188	1231	1270	1334	1357	1376	1388	1392	1361	1309	1257	1224	1143	1063
6/27/2019	974	1059	1132	1231	1327	1398	1460	1512	1547	1565	1560	1517	1482	1426	1357	1307	1239	1148
6/28/2019	1019	1101	1208	1276	1392	1484	1550	1601	1637	1649	1647	1621	1560	1493	1430	1406	1311	1224
6/29/2019	973	1037	1095	1186	1295	1392	1526	1572	1561	1594	1600	1616	1609	1513	1415	1386	1307	1241
6/30/2019	948	995	1088	1174	1270	1331	1384	1428	1479	1503	1519	1519	1499	1458	1378	1336	1257	1156
7/1/2019	1013	1099	1186	1274	1335	1411	1476	1524	1566	1569	1594	1572	1547	1484	1420	1383	1306	1205
7/2/2019	1037	1129	1205	1300	1372	1451	1505	1555	1575	1587	1595	1560	1556	1508	1449	1412	1329	1239
7/3/2019	1049	1113	1177	1208	1271	1325	1392	1445	1499	1510	1495	1487	1415	1339	1256	1213	1140	1067
7/6/2019	817	845	916	1024	1119	1186	1219	1255	1296	1325	1351	1354	1332	1283	1229	1210	1135	1071
7/7/2019	869	904	969	1070	1142	1213	1270	1315	1352	1380	1406	1416	1405	1350	1303	1267	1183	1099
7/8/2019	978	1060	1130	1220	1306	1365	1411	1470	1505	1532	1528	1511	1452	1413	1357	1336	1244	1160
7/9/2019	1059	1119	1172	1263	1364	1448	1530	1597	1677	1722	1739	1736	1695	1679	1612	1571	1500	1361
7/10/2019	1157	1227	1322	1217	1134	1163	1176	1251	1314	1347	1359	1351	1378	1354	1278	1228	1153	1060
7/11/2019	939	1016	1072	1130	1190	1253	1290	1331	1415	1436	1446	1439	1420	1373	1308	1288	1157	1073
7/12/2019	919	987	1077	1152	1226	1297	1391	1496	1524	1495	1530	1532	1520	1468	1320	1265	1177	1096
7/13/2019	874	926	1016	1107	1181	1248	1316	1369	1436	1459	1483	1482	1466	1399	1341	1305	1243	1151
7/14/2019	883	920	1014	1128	1245	1332	1377	1438	1487	1512	1532	1525	1510	1457	1405	1346	1274	1174
7/15/2019	992	1075	1138	1199	1261	1332	1378	1406	1416	1415	1438	1399	1369	1330	1273	1229	1149	1060
7/16/2019	951	1029	1097	1153	1243	1300	1366	1449	1504	1544	1558	1586	1556	1521	1450	1409	1313	1211
7/17/2019	1045	1133	1223	1318	1414	1482	1534	1558	1608	1678	1693	1704	1680	1634	1569	1532	1435	1340
7/18/2019	1146	1213	1289	1360	1454	1548	1613	1671	1671	1665	1652	1665	1677	1645	1590	1557	1474	1364
7/19/2019	1168	1225	1312	1390	1476	1548	1618	1677	1728	1766	1753	1739	1742	1682	1612	1586	1500	1409
7/20/2019	1065	1115	1219	1307	1402	1454	1515	1555	1605	1635	1669	1676	1657	1602	1553	1527	1461	1369
7/22/2019	934	983	1062	1112	1178	1238	1277	1308	1314	1341	1341	1327	1273	1215	1138	1103	1052	963
7/24/2019	856	913	982	1056	1110	1168	1208	1255	1276	1306	1316	1335	1294	1250	1180	1112	1025	932
7/26/2019	859	913	1009	1059	1128	1204	1271	1327	1374	1396	1399	1405	1345	1276	1226	1165	1092	1029
7/27/2019	794	820	912	995	1073	1128	1187	1234	1273	1295	1332	1318	1286	1243	1182	1160	1094	1027
7/28/2019	798	829	896	969	1072	1158	1240	1298	1350	1375	1400	1406	1392	1345	1323	1286	1216	1107
7/29/2019	992	1059	1142	1213	1281	1338	1424	1537	1549	1586	1571	1502	1455	1389	1292	1231	1149	1053
7/30/2019	936	991	1046	1126	1191	1247	1312	1362	1394	1428	1445	1449	1425	1363	1293	1258	1161	1070
8/1/2019	928	970	1014	1056	1137	1195	1262	1333	1382	1393	1382	1353	1318	1285	1244	1223	1147	1077
8/4/2019	802	831	891	976	1083	1170	1225	1295	1333	1372	1381	1390	1356	1307	1284	1233	1151	1058
8/5/2019	963	1034	1094	1183	1296	1400	1461	1502	1528	1568	1575	1571	1480	1401	1360	1312	1220	1136
8/6/2019	1066	1116	1204	1282	1397	1526	1603	1653	1700	1721	1717	1694	1662	1589	1458	1351	1237	1138
8/7/2019	1023	1063	1091	1078	1103	1127	1201	1287	1360	1433	1474	1480	1418	1331	1260	1221	1138	1061
8/8/2019	966	1009	1028	1054	1102	1148	1187	1275	1339	1389	1414	1444	1404	1369	1315	1273	1183	1096
8/9/2019	983	1044	1109	1170	1260	1330	1421	1475	1515	1543	1542	1517	1472	1402	1355	1295	1216	1143
8/10/2019	921	944	1006	1090	1195	1279	1324	1362	1416	1451	1471	1467	1456	1402	1370	1320	1240	1159
8/11/2019	993	1008	1033	1031	1040	1067	1105	1160	1247	1300	1318	1351	1351	1332	1314	1276	1201	1139
8/12/2019	1051	1089	1154	1247	1327	1438	1584	1685	1731	1747	1736	1718	1683	1616	1581	1495	1403	1310
8/13/2019	1114	1162	1244	1311	1400	1461	1521	1584	1604	1621	1598	1573	1516	1441	1390	1304	1196	1103
8/14/2019	1018	1054	1104	1163	1228	1289	1360	1398	1437	1460	1462	1455	1424	1338	1270	1208	1113	1007
8/15/2019	913	965	1021	1075	1135	1202	1252	1301	1346	1380	1338	1328	1303	1260	1257	1180	1029	939
8/17/2019	825	818	851	914	993	1067	1134	1213	1259	1319	1375	1382	1374	1325	1272	1220	1142	1088
8/18/2019	829	838	873	913	969	1049	1157	1249	1319	1366	1421	1444	1413	1376	1330	1281	1189	1093
8/19/2019	1011	1060	1105	1185	1313	1454	1538	1618	1681	1735	1756	1754	1715	1600	1547	1490	1383	1292
8/20/2019	1195	1226	1276	1331	1400	1445	1499	1540	1612	1648	1667	1680	1661	1577	1511	1465	1344	1231
8/23/2019	977	1007	1051	1103	1157	1207	1270	1297	1326	1346	1354	1329	1267	1198	1170	1122	1065	1019
8/28/2019	902	937	980	1057	1135	1189	1237	1287	1343	1382	1413	1413	1395	1306	1278	1199	1065	948
8/29/2019	923	967	1042	1124	1220	1301	1383	1467	1501	1540	1550	1549	1497	1434	1385	1226	1089	984
9/2/2019	742	741	802	870	961	1030	1115	1171	1239	1297	1338	1346	1313	1262	1232	1160	1081	991
9/3/2019	990	1030	1074	1119	1183	1279	1431	1518	1563	1619	1639	1628	1519	1471	1455	1373	1282	1180
9/4/2019	1011	1019	1041	1085	1117	1163	1211	1296	1321	1343	1344	1351	1288	1247	1164	1101	1011	924
9/5/2019	900	941	986	1035	1128	1245	1375	1486	1541	1528	1541	1586	1541	1500	1455	1339	1199	1106
9/6/2019	1017	1054	1091	1140	1207	1336	1392	1430	1409	1450	1431	1412	1385	1300	1210	1121	1041	948
9/9/2019	981	1034	1084	1153	1253	1331	1410	1480	1497	1522	1534	1518	1435	1383	1360	1278	1189	1128
9/10/2019	1011	1030	1084	1120	1183	1232	1291	1336	1406	1437	1430	1397	1368	1336	1306	1208	1135	1043
9/11/2019	995	1034	1095	1153	1241	1314	1387	1468	1534	1553	1560	1545	1458	1402	1357	1283	1171	1089
9/12/2019	1046	1079	1113	1209	1305	1323	1346	1447	1462	1416	1353	1284	1234	1252	1208	1163	1083	996
9/15/2019	854	867	935	1010	1090	1185	1263	1336	1391	1440	1448	1439	1398	1363	1329	1257	1175	1083
9/16/2019	1045	1095	1156	1226	1315	1396	1495	1547	1590	1587	1570	1535	1511	1483	1440	1356	1248	1148
9/17/2019	1039	1077	1123	1175	1251	1360	1504	1578	1619	1637	1636	1572	1482	1418	1373	1286	1167	1091
9/18/2019	1008	1047	1090	1172	1257	1368	1446	1518	1575	1636	1642	1602	1548	1457	1384	1285	1204	1114
9/19/2019	1035	1077	1130	1195	1280	1386	1451	1512	1549	1567	1531	1523	1442	1419	1366	1277	1172	1075
9/20/2019	992	1028	1059	1106	1138	1208	1297	1342	1380	1387	1296	1241	1184	1170	1138	1077	1040	989
9/25/2019	1015	1053	1053	1080	1124	1150	1204	1248	1296	1319	1326	1280	1208	1171	1118	1054	951	870
9/27/2019	861	913	961	1044	1141	1231	1301	1376	1445	1470	1474	1436	1374	1329	1263	1176	1032	940
9/30/2019	999	1036	1090	1135	1214	1288	1397	1445	1525	1542	1525	1493	1362	1329	1299	1236	1147	1072
10/1/2019	1006	1046	1084	1152	1245	1349	1480	1534	1558	1594	1591	1542	1488	1458	1395	1324	1214	1080
10/2/2019	1075	1094	1084	1104	1150	1221	1285	1340	1373	1400	1403	1373	1307	1235	1131	1032	924	824

Figure 8: 2019 Missouri West High Load Days

DATE	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1/25/2019	1279	1313	1376	1466	1477	1443	1373	1314	1272	1244	1211	1202	1176	1176	1214	1227	1205	1188	1165	1106
1/28/2019	865	892	965	1091	1180	1194	1180	1185	1179	1181	1182	1183	1196	1256	1340	1404	1390	1376	1344	1268
1/29/2019	1205	1230	1286	1377	1404	1360	1338	1292	1262	1251	1244	1269	1294	1348	1403	1437	1428	1412	1389	1352
1/30/2019	1401	1439	1500	1554	1601	1600	1601	1586	1558	1545	1530	1521	1507	1539	1591	1600	1587	1546	1497	1425
1/31/2019	1375	1388	1452	1531	1567	1539	1496	1419	1346	1275	1227	1173	1153	1164	1242	1274	1271	1245	1198	1141
2/7/2019	1072	1108	1161	1236	1300	1361	1393	1420	1401	1391	1383	1376	1367	1380	1434	1483	1480	1453	1432	1366
2/8/2019	1308	1334	1386	1451	1480	1459	1415	1379	1336	1292	1254	1221	1191	1203	1256	1325	1334	1330	1313	1274
3/3/2019	1106	1144	1189	1241	1274	1325	1328	1305	1279	1272	1256	1231	1229	1266	1327	1442	1481	1487	1465	1412
3/4/2019	1369	1406	1455	1532	1534	1504	1462	1423	1377	1338	1309	1283	1277	1300	1341	1440	1474	1476	1434	1383
3/5/2019	1350	1362	1434	1520	1499	1442	1375	1331	1289	1261	1228	1205	1191	1206	1250	1333	1357	1352	1327	1285
3/6/2019	1254	1290	1353	1433	1429	1338	1262	1214	1156	1131	1099	1084	1098	1113	1154	1203	1205	1177	1152	1063
5/16/2019	718	722	769	836	905	949	1014	1082	1136	1199	1244	1290	1335	1368	1393	1365	1317	1280	1221	1098
6/4/2019	754	762	806	862	915	953	1006	1088	1172	1243	1284	1293	1352	1401	1435	1418	1369	1311	1261	1134
6/5/2019	814	813	847	903	1011	1093	1186	1276	1366	1442	1517	1568	1593	1600	1614	1596	1529	1456	1379	1208
6/6/2019	796	797	820	878	906	953	988	1050	1107	1175	1240	1298	1340	1400	1407	1386	1321	1261	1216	1098
6/7/2019	782	772	794	857	920	1007	1084	1191	1278	1345	1393	1435	1461	1478	1472	1429	1368	1295	1249	1155
6/20/2019	681	688	720	763	830	901	972	1037	1075	1158	1240	1309	1376	1444	1462	1470	1426	1366	1318	1195
6/22/2019	736	729	741	755	794	844	926	1037	1162	1253	1326	1382	1431	1446	1437	1376	1300	1249	1192	1074
6/25/2019	711	702	748	790	855	921	1007	1105	1209	1294	1378	1442	1508	1555	1563	1543	1484	1388	1316	1187
6/26/2019	821	810	835	870	930	1012	1092	1187	1232	1277	1327	1391	1425	1478	1504	1460	1392	1322	1269	1178
6/27/2019	839	835	855	916	1012	1114	1215	1333	1430	1506	1575	1617	1637	1660	1640	1600	1534	1467	1423	1306
6/28/2019	924	907	928	974	1068	1172	1288	1393	1498	1603	1671	1712	1740	1724	1711	1639	1574	1503	1458	1345
6/29/2019	948	918	914	909	977	1095	1225	1340	1449	1521	1581	1615	1648	1662	1664	1642	1585	1497	1434	1340
6/30/2019	927	890	863	855	934	1049	1170	1281	1376	1460	1511	1557	1592	1629	1646	1614	1558	1481	1408	1297
7/1/2019	894	877	896	927	1032	1148	1252	1367	1460	1534	1594	1639	1683	1695	1714	1688	1622	1535	1473	1341
7/2/2019	923	910	922	965	1049	1156	1269	1370	1462	1534	1596	1629	1671	1676	1696	1658	1610	1527	1462	1340
7/3/2019	933	926	937	963	1036	1099	1184	1268	1354	1423	1509	1559	1580	1587	1559	1488	1408	1321	1260	1158
7/6/2019	726	712	716	724	766	859	966	1083	1166	1248	1305	1359	1418	1450	1461	1437	1383	1292	1239	1152
7/7/2019	827	802	789	785	826	910	1015	1127	1221	1318	1384	1421	1462	1504	1519	1501	1452	1363	1293	1197
7/8/2019	839	844	886	922	1002	1087	1196	1321	1400	1457	1519	1589	1614	1640	1638	1583	1519	1450	1403	1277
7/9/2019	906	918	950	1011	1078	1147	1243	1359	1461	1552	1625	1699	1748	1780	1778	1758	1692	1625	1562	1438
7/10/2019	1010	1002	1022	1061	1152	1239	1274	1182	1184	1253	1304	1377	1451	1497	1529	1507	1455	1358	1282	1166
7/11/2019	798	787	814	853	927	1009	1083	1174	1237	1306	1377	1429	1473	1492	1505	1484	1425	1342	1272	1154
7/12/2019	795	794	808	855	929	1018	1128	1212	1308	1374	1447	1489	1537	1551	1567	1541	1473	1382	1298	1186
7/13/2019	794	765	772	780	836	948	1070	1190	1289	1370	1419	1473	1520	1544	1559	1535	1484	1395	1331	1211
7/14/2019	836	808	797	792	856	979	1114	1237	1348	1428	1478	1519	1566	1589	1608	1579	1528	1449	1388	1279
7/15/2019	861	857	881	919	989	1065	1127	1214	1289	1349	1390	1415	1435	1448	1443	1419	1360	1296	1253	1140
7/16/2019	803	809	847	889	960	1025	1099	1176	1262	1352	1445	1518	1579	1642	1665	1660	1601	1520	1450	1324
7/17/2019	936	936	963	1002	1089	1188	1332	1443	1533	1581	1619	1642	1705	1761	1776	1767	1721	1630	1573	1445
7/18/2019	1071	1059	1081	1106	1183	1264	1380	1486	1580	1650	1720	1744	1791	1775	1805	1818	1757	1678	1608	1505
7/19/2019	1108	1087	1100	1126	1196	1296	1396	1497	1583	1660	1729	1785	1837	1831	1827	1817	1747	1669	1603	1496
7/20/2019	1069	1023	1016	994	1063	1164	1290	1404	1491	1566	1617	1687	1720	1745	1762	1736	1690	1614	1552	1452
7/24/2019	710	709	739	790	837	903	975	1056	1117	1190	1244	1298	1338	1385	1392	1377	1320	1241	1176	1046
7/26/2019	782	786	809	838	903	981	1058	1162	1239	1312	1364	1420	1456	1484	1467	1421	1340	1261	1211	1107
7/27/2019	751	732	734	731	783	878	979	1080	1180	1252	1321	1366	1394	1434	1434	1398	1329	1254	1199	1105
7/28/2019	773	750	752	743	798	889	989	1086	1196	1297	1383	1428	1476	1512	1521	1476	1423	1354	1290	1197
7/29/2019	887	879	919	947	1004	1088	1174	1264	1343	1406	1480	1531	1555	1579	1570	1550	1492	1375	1296	1150
7/30/2019	781	781	809	854	914	982	1065	1155	1250	1330	1392	1448	1491	1524	1535	1504	1442	1344	1277	1140
8/1/2019	755	758	800	854	901	968	1015	1104	1191	1260	1334	1395	1438	1453	1442	1410	1358	1303	1241	1147
8/3/2019	753	728	745	747	778	856	952	1061	1153	1230	1275	1329	1357	1383	1401	1368	1311	1220	1146	1060
8/4/2019	738	721	722	720	760	862	973	1099	1198	1295	1353	1409	1448	1480	1491	1478	1427	1342	1274	1164
8/5/2019	810	814	843	882	949	1024	1133	1261	1371	1434	1487	1528	1556	1598	1575	1540	1482	1422	1353	1226
8/6/2019	897	880	930	967	1034	1133	1234	1352	1458	1546	1611	1653	1679	1678	1689	1672	1586	1492	1399	1252
8/7/2019	860	857	900	948	985	1017	1026	1047	1080	1148	1202	1272	1357	1427	1475	1456	1398	1339	1256	1123
8/8/2019	790	789	825	878	923	966	997	1049	1106	1167	1264	1353	1433	1494	1525	1518	1449	1379	1301	1182
8/9/2019	828	818	848	895	945	1031	1105	1208	1300	1398	1472	1532	1561	1579	1567	1543	1469	1397	1339	1233
8/10/2019	867	829	832	831	872	966	1069	1209	1311	1381	1437	1503	1555	1585	1581	1563	1505	1434	1369	1255
8/11/2019	905	888	889	913	947	980	1015	1043	1076	1106	1175	1262	1349	1402	1457	1450	1403	1369	1313	1212
8/12/2019	914	929	962	1011	1057	1103	1205	1325	1439	1560	1648	1735	1791	1784	1802	1780	1699	1641	1560	1440
8/13/2019	1011	995	1008	1054	1103	1181	1287	1395	1500	1564	1630	1670	1693	1708	1696	1653	1566	1463	1368	1230
8/14/2019	834	828	863	921	961	1029	1106	1189	1270	1339	1402	1456	1497	1524	1529	1494	1418	1342	1236	1098
8/17/2019	796	772	762	783	791	826	888	950	1021	1106	1213	1293	1368	1396	1457	1448	1388	1320	1253	1154
8/18/2019	872	845	835	830	839	900	961	1006	1085	1188	1294	1385	1463	1520	1552	1549	1479	1413	1315	1199
8/19/2019	840	830	879	955	1014	1084	1181	1313	1439	1558	1663	1741	1808	1839	1855	1818	1748	1700	1601	1463
8/20/2019	1066	1054	1083	1160	1178	1238	1321	1409	1455	1459	1524	1585	1660	1709	1743	1726	1660	1610	1522	1372
8/23/2019	803	801	835	905	944	983	1022	1096	1160	1220	1284	1337	1378	1403	1391	1340	1258	1203	1161	1069
8/28/2019	719	715	764	829	873	902	942	1002	1072	1128	1205	1269	1327	1383	1396	1359	1285	1221	1137	1010
8/29/2019	721	731	773	863	911	975	1050	1159	1273	1372	1462	1533	1579	1620	1627	1614	1540	1439	1269	1077
9/2/2019	650	641	650	650	667	738	833	937	1051	1166	1254	1326	1377	1439	1491	1457	1394	1339	1239	1113
9/3/2019	817	835	870	944	1003	1055	1126	1217	1308	1420	1511	1586	1665	1717	1715	1658	1595	1539	1433	1285
9/4/2019	869	852	857	932	955	980	1013	1084	1139	1209	1265	1331	1370	1420	1418	1381	1296	1249	1154	1031
9/5/2019	738	738	779	871	907	956	1030	1115	1226	1337	1445	1549	1620	1664	1662	1616	1531	1496	1387	1257
9/6/2019	863	857	887	957	989	1043	1113	1185	1274	1350	1418	1471	1491	1509	1482	1398	1295	1230	1140	1025
9/7/2019	708	704	708	727	755	803	887	962	1057	1134	1211	1303	1358	1401	1412	1358	1281	1220	1150	1055
9/9/2019	799	812	865	943	995	1059	1144	1255	1368	1487	1574	1643	1659	1674	1652	1617	1542	1478	1370	1276
9/10/2019	917	894	935	997	1040	1080	1128	1186	1257	1339	1412	1490	1523	1546	1533	1495	1440	1398	1320	1204
9/11/2019	881	872	914	999	1040	1103	1200	1291	1379	1466	1545	1609	1652	1673	1661	1604	1518	1466	1375	1236
9/12/2019	910	894	932	1034	1071	1142	1225	1329	1378	1417	1438	1450	1409	1385	1364	1330	1313	1277	1219	1109
9/14/2019	666	662	672	704	732	793	856	930	1018	1103	1210	1303	1373	1425	1417	1386	1302	1258	1176	1101
9/15/2019	821	798	798	804	827	914	1028	1149	1238	1343	1432	1500	1553	1577	1582	1538	1482	1418	1310	1197
9/16/2019	861	864	897	979	1014	1081	1179	1293	1400	1502	1594	1636	1698	1713	1680	1624	1585	1515	1403	1254
9/17/2019	880	877	915	996	1034	1091	1131	1241	1375	1486	1582	1637	1662	1688	1674	1602	1532	1478	1370	1230
9/18/2019	860	852	891	979	1013	1067	1146	1272	1394	1513	1604	1656	1689	1720	1697	1630	1547	1485	1375	1247
9/19/2019	873	866	906	988	1016	1082	1150	1270	1391	1488	1554	1614	1638	1613	1573	1528	1475	1413	1322	1183
9/20/2019	863	858	890	958	1008	1041	1101	1162	1248	1355	1435	1476	1480	1412	1369	1295	1248	1212	1149	1064
9/25/2019	782	793	838	925	966	987	1024	1092	1160	1217	1291	1339	1386	1410	1382	1307	1251	1197	1098	974
9/27/2019	715	729	776	860	906	957	1030	1142	1249	1345	1433	1506	1557	1572	1550	1464	1414	1352	1262	1122
9/30/2019	843	853	903	988	1034	1070	1142	1193	1299	1390	1468	1509	1539	1574	1537	1470	1427	1368	1279	1159
10/1/2019	866	860	888	980	1018	1073	1146	1254	1350	1440	1548	1601	1622	1617	1576	1508	1461	1410	1319	1197
10/2/2019	873	877	901	982	1028	1040	1088	1145	1232	1304	1365	1429	1453	1461	1468	1413	1329	1241	1150	1008

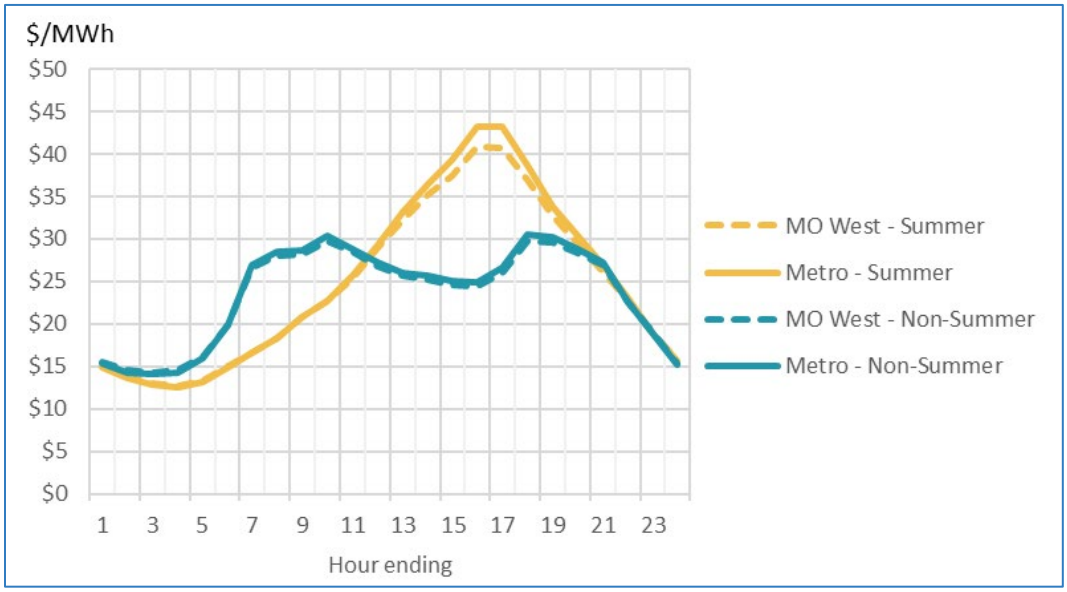
A review of Southwest Power Pool's ("SPP's") Integrated Marketplace day-ahead ("DA") locational marginal prices ("LMP") for 2019 do not indicate a significant seasonal pattern in average daily prices and show that 'price spikes' can occur throught the year. Figure 9 shows that SPP's maximum daily DA prices exhibit quite a bit of fluctuation on a daily basis but the daily average DA prices are fairly consistent throughout the year.

Figure 9: 2019 SPP Daily Peak Prices-KCP&L LMP($/MW)



Further analysis of the SPP DA energy prices shows that the SPP DA average daily energy price profile is substantially different between the summer and non-summer period, as shown in Figure 10. This further supports the summer season definition of June through September.

Figure 10: 2019 SPP Average Daily Day Ahead Energy Prices by Season



A review of cooling degree days for the past 10 years also indicate that the summer period should be aligned with the calendar period June 1 through September 30. Table 2 below shows that June, July, and August are clearly the three dominant summer season months. September historically has 60% higher cooling degree days than May, further supporting the June-September summer period.

Table 2: Historical Monthly Cooling Degree Days

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2010	0	0	6	38	109	383	488	512	158	11	0	0
2011	0	0	3	20	111	336	568	414	97	48	1	0
2012	0	0	49	40	180	385	634	376	131	39	5	0
2013	0	0	0	13	92	276	367	346	223	28	0	0
2014	0	0	0	9	152	277	289	395	130	14	0	0
2015	0	0	2	7	59	301	398	304	262	33	0	0
2016	0	0	2	12	57	417	428	381	221	55	13	0
2017	0	0	6	27	78	299	446	222	205	42	0	0
2018	0	0	0	11	269	390	439	391	217	40	0	0
2019	0	0	0	17	81	272	404	349	304	22	0	0
Total	**0**	**0**	**68**	**194**	**1188**	**3336**	**4461**	**3690**	**1948**	**332**	**19**	**0**

5.4.2 TOU Time Period Analysis

In defining the daily time periods for TOU pricing programs, consideration must be given to the actual seasonal and daily fluctuation in system and customer class loads along with the wholesale costs of energy. This section of the Report provides an overview of the analysis Evergy performed in developing the time periods for residential TOU tariffs. This analysis is presented in the following sections:

- System Load Analysis
- SPP Energy Market Pricing Analysis
- Residential Class Load Analysis
- System Cost Analysis

This analysis shows there is considerable empirical support for the following general daily TOU time periods:

- Summer On-Peak – 6-hour period from 2 pm to 8 pm
- Super Off-Peak – 6-hour period from Midnight to 6 am

There is less empirical support for a general daily Non-Summer On-Peak period, but the system and residential load profiles are elevated in the late afternoon and early evening hours, potentially indicating there may not be a need for a Non-Summer On-Peak period, or that the Non-Summer On-Off-Peak price differential should be modest in comparison to the Summer season differentials.

It should be noted that Evergy used the seasonal and general daily TOU pricing periods presented here in the Business Electric Vehicle Charging Service ("BEVCS") tariff proposed in the Company's current Transportation Electrification filing[23].

The identification of an optimum, most desirable 4-hour On-Peak period for residential customers is less straight forward. Most of the empirical evidence based on analysis of historical data indicates for a 4-hour Summer On-Peak period from 3–7 pm, which is slightly misaligned with the residential class 4-hour peak load period and Evergy's current TOU On-Peak period from 4-8 pm. Based on a desire to maintain consistency with the current TOU rate design and "future proof" the time period for the future anticipated impact of increased solar penetration and customer behavioral load shifts, Evergy determined to continue with the On-Peak period of 4-8 pm.

5.4.2.1 System Load Analysis

The first step in the TOU time period analysis was to establish and compare the system peak day/hour for each jurisdiction. Table 3 lists the system peak day and hour for the consolidated Evergy system and individual jurisdiction for each of the past five years. The Evergy summer system peak usage periods are very weather temperature dependent and the Peak Day varies throughout the months of July and August based on when the hottest days occur. However, the system annual Peak Hour consistently occurs from 4-5 pm as the late afternoon increases in residential usage adds to the system load and before the commercial and industrial loads begin to diminish.

Table 3: Evergy System Peaks by Jurisdiction

	Evergy			KS Metro			MO Metro			MO West			KS Central		
Year	Date	Hour	MW	Date	Hour	MW	Date	Hour	MW	Date	Hour	MW	Date	Hour	MW
2019	7/19	4-5	10.380	7/18	5-6*3	1,700	7/19	3-4	1766	8/19	5-6	1,855	7/19	4-5	5,108
	GPE			KCP&L-KS			KCP&L-MO			KCP&L-GMO			Westar		
2018	7/12	4-5	5,439	6/28	4-5	1,737	7/11	3-4*2	1,819	7/12	5-6*3	1,929	6/28	4-5	5,204
2017	7/20	5-6*3	5,384	7/21	4-5	1,648	7/20	5-6*3	1,847	7/20	4-5	1,910	7/20	4-5	5,242
2019	8/04	4-5	5,408	8/11	5-6*2	1,700	8/04	4-5	1,842	8/11	4-5	1,904	7/21	4-5	5,184
2015	7/13	4-5	5,266	7/13	4-5	1,623	7/13	4-5	1,802	7/13	4-5	1,841	7/24	4-5	5,167
2014	8/25	4-5	5,258	8/25	5-6*3	1,605	7/22	4-5	1,833	8/25	5-6*2	1,849	8/25	4-5	5.223
2013	8/30	4-5	5,242	7/09	5-6*3	1,556	7/22	4-5	1,878	8/30	4-5	1,860	7/09	4-5	5,184
2012	7/25	4-5	5,653	7/25	4-5	1,698	7/25	3-4*1	1,945	7/25	4-5	2,011	7/25	3-4	5,393

*1 Load was 1 MW greater than 4-5 hour
*2 Load was <5 MW greater than 4-5 hour
*3 Load was <10 MW greater than 4-5 hour

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To identify general system peak loading periods for all Evergy jurisdictions, the combined Evergy load profile for 2019 was reviewed. Table 4 shows the 72 peak load hours (red shading) where total system load exceeded 90% of the 2019 annual system peak. All of the peak load hours occurred between noon and 9 pm, with nearly 90% (64) of the peak hours occurring during a 6-hour period from 2 pm to 8 pm.

Table 4: Evergy 2019 Peak Load Hours

DATE	12	13	14	15	16	17	18	19	20	21	22
6/28/2019	8441	8902	9294	9521	9738	9742	9623	9330	8963	8524	8283
6/29/2019	8132	8573	8914	9122	9281	9348	9336	9146	8837	8394	8113
7/2/2019	8207	8584	8978	9155	9339	9383	9353	9150	8710	8242	7910
7/9/2019	8107	8652	9074	9428	9675	9804	9817	9660	9383	8977	8635
7/17/2019	8654	9087	9419	9708	9962	10099	10116	10027	9710	9285	8934
7/18/2019	8964	9401	9795	9987	10186	10188	10189	10122	9809	9384	9077
7/19/2019	9019	9459	9885	10171	10339	10380	10301	10158	9792	9337	9035
7/20/2019	8461	8874	9220	9551	9760	9920	9953	9796	9477	9054	8761
8/6/2019	8378	8863	9273	9526	9579	9492	9346	9152	8757	8276	7845
8/12/2019	8350	8930	9458	9830	10018	9994	9954	9720	9301	8977	8582
8/13/2019	8388	8785	9140	9379	9476	9452	9326	9056	8586	8109	7637
8/19/2019	8250	8853	9383	9771	10031	10174	10186	9992	9608	9307	8836
8/20/2019	8423	8713	9125	9507	9736	9918	9938	9761	9403	9099	8675
9/3/2019	7589	8145	8638	9063	9364	9533	9474	9199	8796	8515	7963

Table 5 shows that while each of the jurisdiction load profiles varies somewhat, they all generally align with the Evergy load pattern with 100% of peak load hours occurring between noon and 9 pm with over 80% of the peak load hours occurring between 2 pm and 8 pm.

Table 5: 2019 Peak Load Hours by Jurisdiction

MO-West HOURLY LOAD

DATE	12	13	14	15	16	17	18	19	20	21	22
6/28/2019	1498	1603	167	1712	1740	1724	1711	1639	157	1503	1458
7/1/2019	1460	1534	159	1639	1683	1695	1714	1688	162	1535	1473
7/2/2019	1462	1534	159	1629	1671	1676	1696	1658	161	1527	1462
7/9/2019	1461	1552	162	1699	1748	1780	1778	1758	169	1625	1562
7/17/2019	1533	1581	161	1642	1705	1761	1776	1767	172	1630	1573
7/18/2019	1580	1650	172	1744	1791	1775	1805	1818	175	1678	1608
7/19/2019	1583	1660	172	1785	1837	1831	1827	1817	174	1669	1603
7/20/2019	1491	1566	161	1687	1720	1745	1762	1736	169	1614	1552
8/6/2019	1458	1546	161	1653	1679	1678	1689	1672	158	1492	1399
8/12/2019	1439	1560	164	1735	1791	1784	1802	1780	169	1641	1560
8/13/2019	1500	1564	163	1670	1693	1708	1696	1653	156	1463	1368
8/19/2019	1439	1558	166	1741	1808	1839	1856	1818	174	1700	1601
8/20/2019	1455	1459	152	1585	1660	1709	1743	1726	166	1610	1522
9/3/2019	1308	1420	151	1586	1665	1717	1715	1658	159	1539	1433
9/9/2019	1368	1487	157	1643	1659	1674	1652	1617	154	1478	1370
9/11/2019	1379	1466	154	1609	1652	1673	1661	1604	151	1466	1375
9/16/2019	1400	1502	159	1636	1698	1713	1680	1624	158	1515	1403
9/17/2019	1375	1486	158	1637	1662	1688	1674	1602	153	1478	1370
9/18/2019	1394	1513	160	1656	1689	1720	1697	1630	154	1485	1375

MO-Metro HOURLY LOAD

DATE	12	13	14	15	16	17	18	19	20	21	22
6/28/2019	1484	1550	16	1637	1649	1647	1621	1560	149	1430	1406
6/29/2019	1392	1526	15	1561	1594	1600	1616	1609	151	1415	1386
7/1/2019	1411	1476	15	1566	1569	1594	1572	1547	148	1420	1383
7/2/2019	1451	1505	15	1575	1587	1595	1560	1556	150	1449	1412
7/9/2019	1448	1530	15	1677	1722	1739	1736	1695	167	1612	1571
7/17/2019	1482	1534	15	1608	1678	1693	1704	1680	163	1569	1532
7/18/2019	1548	1613	16	1671	1665	1652	1665	1677	164	1590	1557
7/19/2019	1548	1618	16	1728	1766	1753	1739	1742	168	1612	1586
7/20/2019	1454	1515	15	1605	1635	1669	1676	1657	160	1553	1527
8/6/2019	1526	1603	16	1700	1721	1717	1694	1662	158	1458	1351
8/12/2019	1438	1584	16	1731	1747	1736	1718	1683	161	1581	1495
8/13/2019	1461	1521	15	1604	1621	1598	1573	1516	144	1390	1304
8/19/2019	1454	1538	16	1681	1735	1756	1754	1715	160	1547	1490
8/20/2019	1445	1499	15	1612	1648	1667	1680	1661	157	1511	1465
9/3/2019	1279	1431	15	1563	1619	1639	1628	1519	147	1455	1373
9/16/2019	1396	1495	15	1590	1587	1570	1535	1511	148	1440	1356
9/17/2019	1360	1504	15	1619	1637	1636	1572	1482	141	1373	1286
9/18/2019	1368	1446	15	1575	1636	1642	1602	1548	145	1384	1285
10/1/2019	1349	1480	15	1558	1594	1591	1542	1488	145	1395	1324

Since the peak load periods correlate so well, the Company established the 2 pm to 8 pm as a common 6-hour summer system peak load period that load modification rates and programs should be designed to address. The establishment of this common 6-hour system peak load period is not intended to set the peak period for any specific rates or programs as lower-level customer or device load profiles have been reviewed. It is only established as a time period that load modification measures should focus on for system capacity benefits. Individual measures

may need to incorporate only a subset of these hours or include hours outside of these to capture other grid level benefits, to encourage customer participation, or to minimize customer impact.

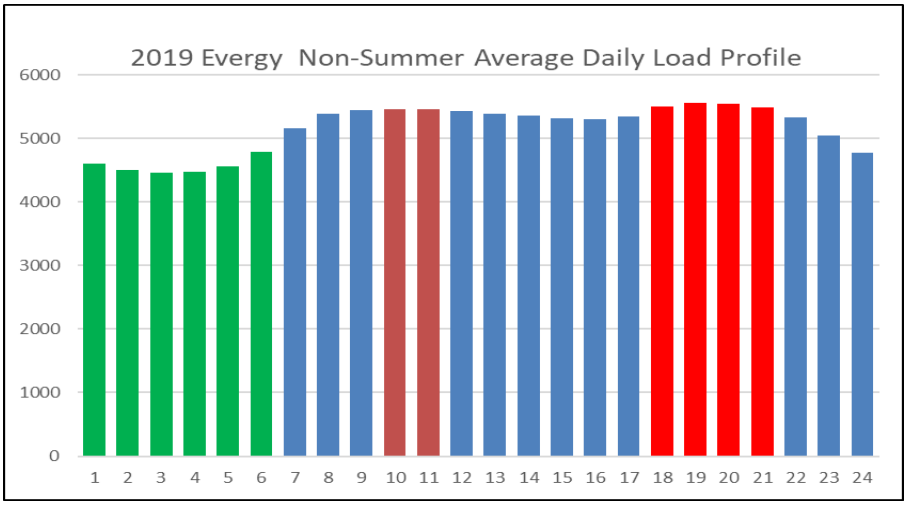
The monthly system peak loads were also analyzed to determine if the 6-hour system peak load period (2-8 pm) represents the time period in which monthly peaks can also be expected to occur. Table 6 presents the hour in which the system monthly peak has occurred during the past three years. A majority of the monthly system peak loads occur between 3 pm and 7 pm, but a few non-summer months experience a monthly system peak during the 7-8 am hour.

Table 6: Evergy/GPE[24] Monthly System Peak Load Hour (hour-ending)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Evergy 2019	1900	1900	800	1700	1800	1700	1700	1800	1700	1600	800	1900
GPE-2019	1900	1900	800	800	1800	1600	1700	1800	1700	1600	800	1800
GPE-2018	800	800	1900	800	1700	1800	1700	1600	1700	1700	800	800
GPE-2017	800	800	800	1700	1800	1700	1800	1700	1700	1700	800	1900

Figure 11 shows that in 2019, the Evergy non-summer month average day, the four peak load hours, while much less pronounced in the non-summer months, occur between 5 pm and 9 pm with the next two highest load hours occur between 9 am and 11 am. Figure 15 shows similar patterns for each Missouri jurisdiction during non-summer months. A residential On-Peak TOU period for the non-summer months should consider both the monthly system peak period and the early evening residential load influence on the average load.

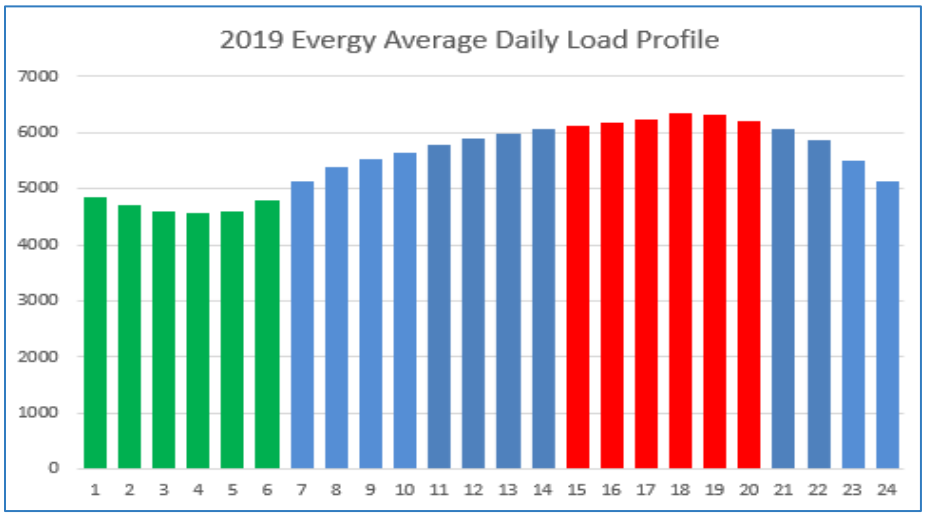
Figure 11: 2019 Evergy Non-Summer Average Day Hourly Loads



[24] *In this table GPE (Great Plains Energy) represents the combined loads of the legacy KCP&L and KCP&L GMO jurisdictions and Evergy represents the combined loads of all current Evergy jurisdictions.*

In defining the system minimum loading period for a 'Late-Night' or 'Super Off-Peak' TOU pricing programs across all Evergy jurisdictions, the Company first examined the combined Evergy load profile for 2019. Figure 12 illustrates that the 6-hour 'low-load' period with the lowest average system load occurs between midnight and 6 am.

Figure 12: 2019 Evergy Average Day Hourly Loads



To determine if this 6-hour low-load period is consistent for all jurisdictions, the Company performed a similar examination for each jurisdiction. Figure 13 show the similar low-load period for each jurisdiction. The 6-hour period with the lowest load is consistently midnight to 6 am in each jurisdiction.

While each jurisdiction generally follows the Evergy load patterns, there are subtle differences in the jurisdictional system loading patterns due the customer classes that make up each jurisdictional customer base. Figure 14 and Figure 15 present the six highest and lowest average annual hourly load hours by jurisdiction and season (summer and non-summer).

Based on the system load analysis the following system level characteristics were identified and are used in defining the daily time periods for Residential TOU rates:

- Summer On-Peak period must incorporate the historical annual system peak hours (4 pm-6 pm).
- Summer On-Peak period should fall within the 6-hour (2 pm-8 pm) system peak loading period.
- Non-Summer peak load periods are less well defined but there is generally a 4-hour higher load period from 5 pm-9 pm.
- There is a 6-hour system low-load period from midnight to 6 am.

Figure 13: 2019 Evergy Average Day Hourly Loads by Jurisdiction

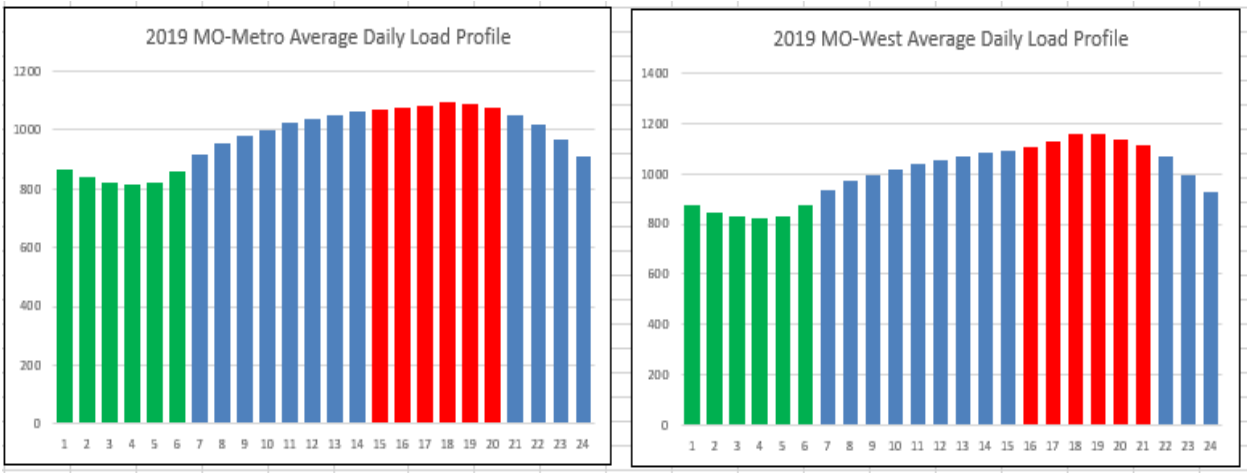


Figure 14: 2019 Evergy Average Summer Day Hourly Loads by Jurisdiction

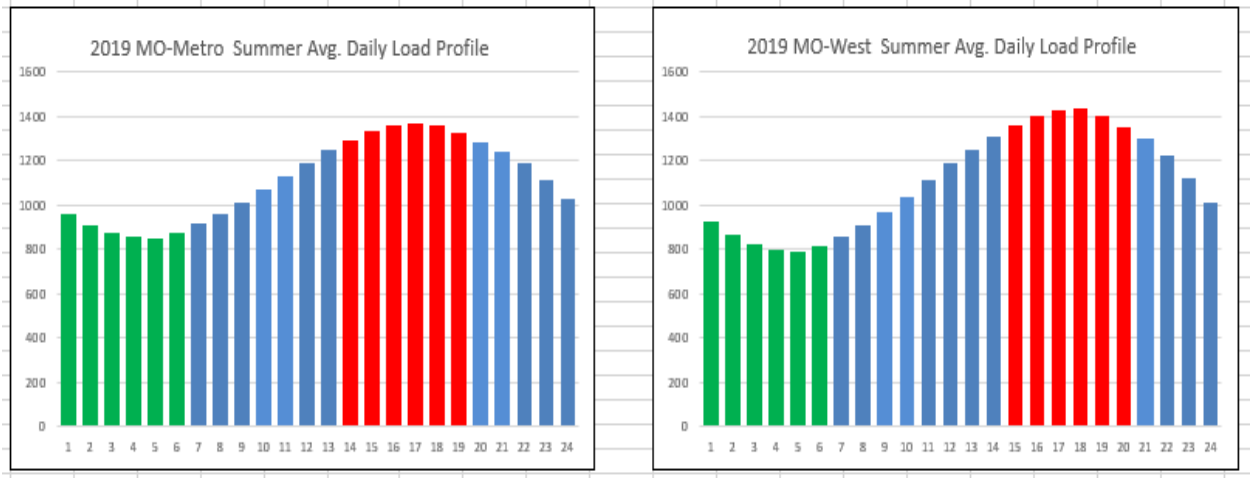
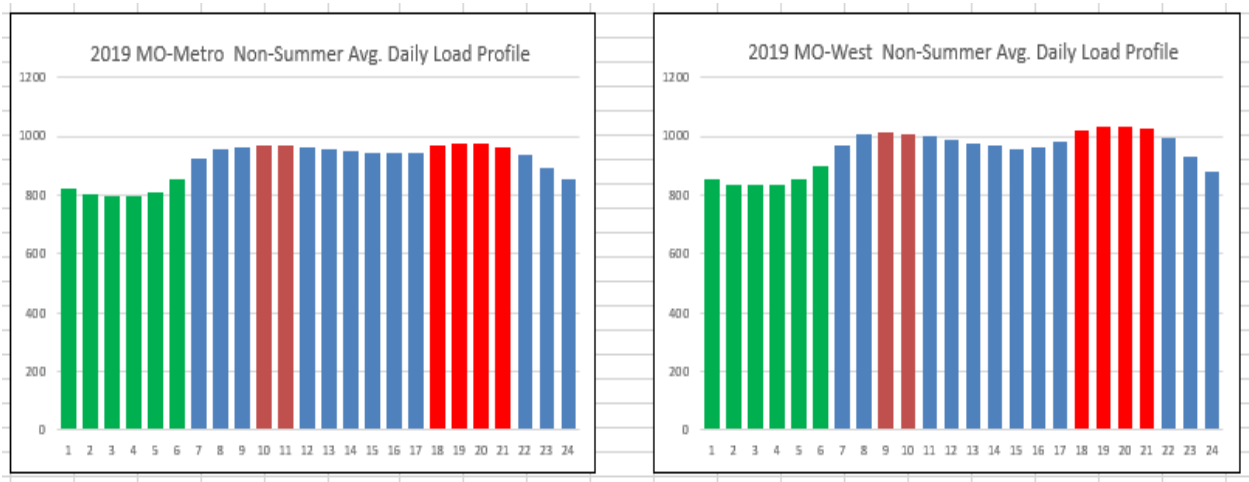


Figure 15: 2019 Evergy Average Non-Summer Day Hourly Loads by Jurisdiction



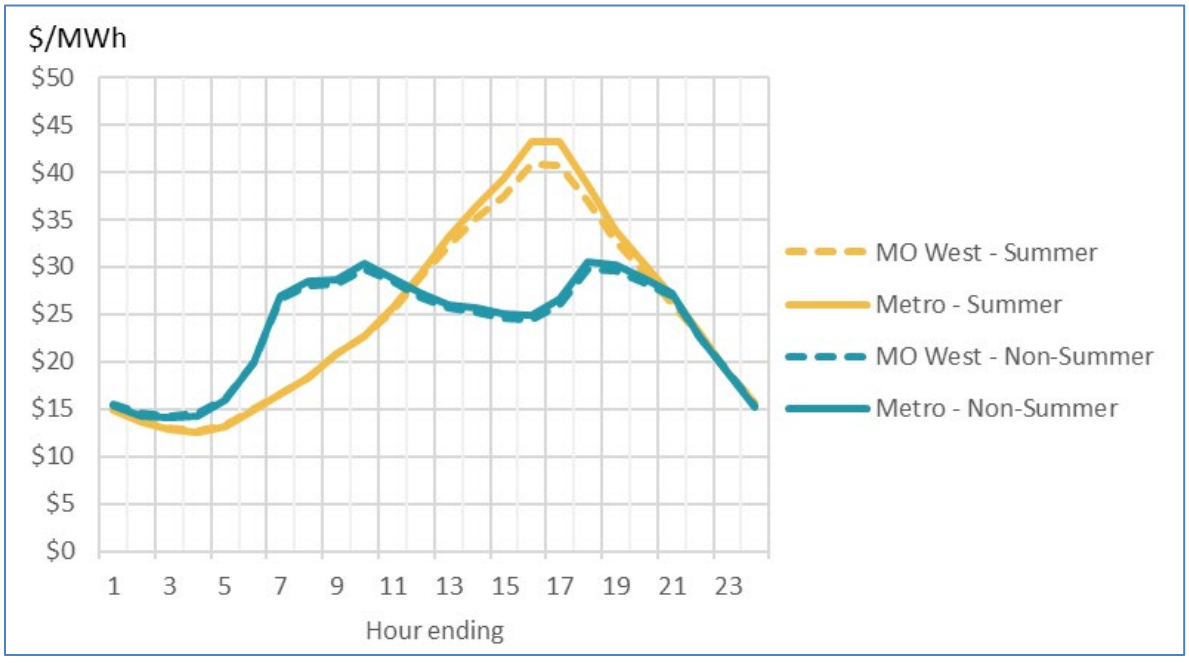
5.4.2.2 SPP Energy Market Pricing Analysis

In defining the system peak loading periods for time varying rate ("TVR") pricing programs, consideration must also be given to the actual daily fluctuation in the cost of energy during each season season. Each TVR requires different considerations and analysis of hourly energy prices. For Critical Peak Pricing and Peak Time Rebate rate options the focus would be on determining the price impact of the few extreme or outlier pricing periods. In contrast, for TOU rates, which sets a fixed rate by time period and season, the focus of the analysis is to identify the consistent daily high- and or low-cost periods. For this TOU peak pricing period analysis, Evergy analyzed the 2017-2019 SPP day-ahead hourly prices.

The Evergy Metro and West systems each have individual SPP LMP load nodes that follow the same hourly price patterns, but often differ in magnitude due to transmission congestion that can occur between the load nodes. For report simplicity, we have only presented illustrations of the SPP DA LMPs for Evergy Metro.

As discussed earlier in this Report, a review of SPP's DA LMP for 2019 do not indicate a significant seasonal pattern in the average daily energy prices and show that 'price spikes' can occur throught the year. The previous seasonal analysis identified significant differences in the daily price profiles between the summer and non-summer seasons as illustrated in Figure 16.

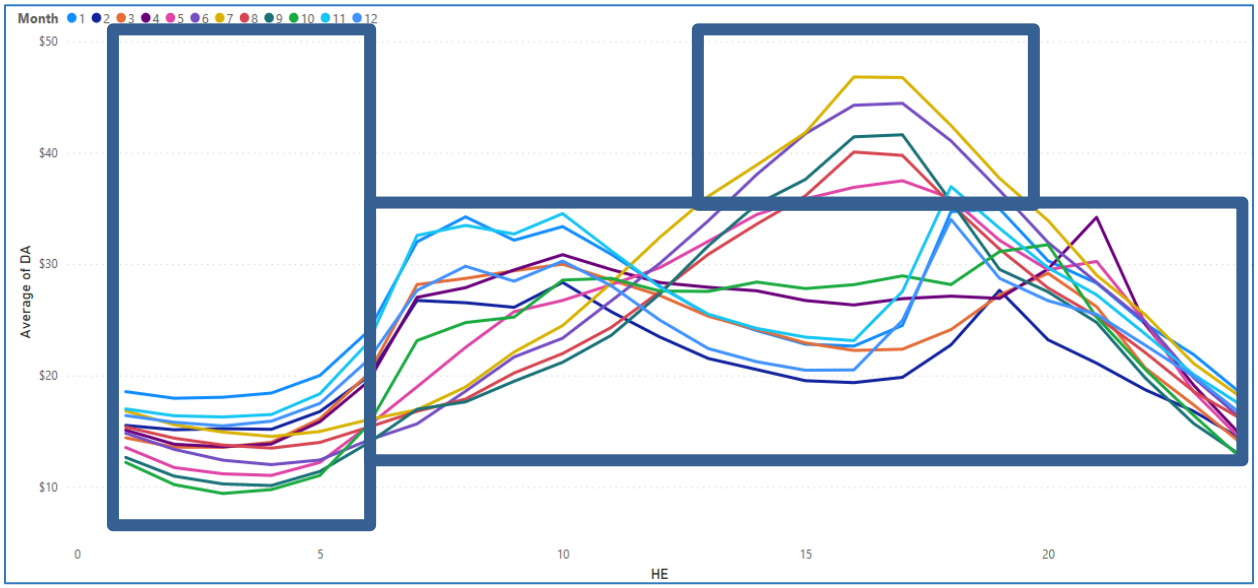
Figure 16 - 2019 SPP Average Daily Day Ahead Energy Prices by Season



In defining TOU pricing periods, consideration must be given to the actual daily fluctuation in the cost of energy. To identify any daily pricing patterns we further analyzed the three year monthly average hourly day-ahead energy prices which are illustrated in Figure 17. Inspection of the average hourly day-ahead energy prices shows three clear time-based pricing patterns.

1. A year-round low pricing period between midnight and 6 am.
2. A summer season (June-Sept) high price period generally between 1 pm and 8 pm with the highest price hours occurring between 3 pm and 6 pm.
3. Consistent market prices across other time periods and seasons.
4. Non-summer months prices are generally elevated in the morning and evening hours and are softer between noon and 5 pm.

Figure 17: SPP Three Year Monthly Average Hourly Day-Ahead Energy Prices
KCP&L-LMP 2017-2019



5.4.2.3 Residential Class Load Analysis

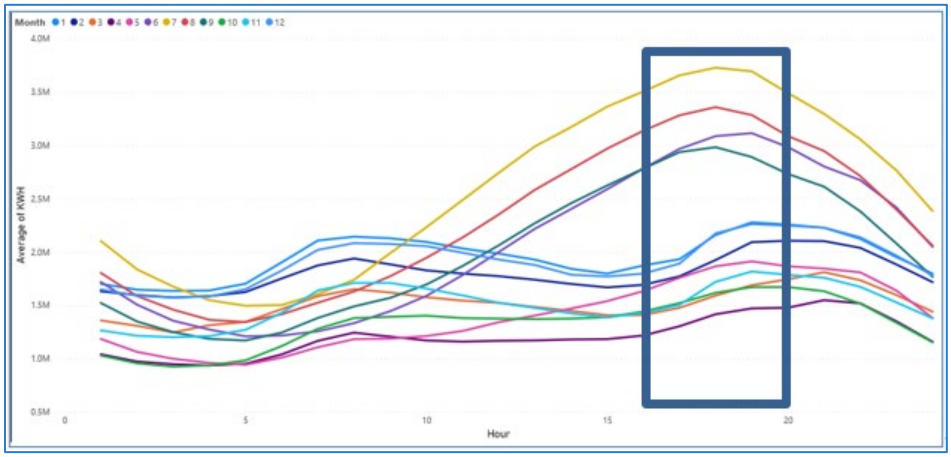
To establish the basis for the TOU rate pricing periods for residential customer classes across all jurisdictions, Evergy performed an analysis of the residential class loading profiles to establish any common characteristics for both the Summer and Non-Summer seasons.

In defining a residential summer peak loading period for all Evergy jurisdictions, the Company first looked at the Evergy residential class load research data for 2019[25]. Figure 18 shows that the combined Evergy residential load is substantially higher during the four month summer season period (June-September) than during the non-summer period. The monthly residential peak hours occurred during the 5-6 pm (hour ending ("HE") 18) or the 6-7 pm (HE19) hours.

[25] The most recent load research data available for Evergy Central was the 2016-2017 test year data used in the last general rates case.

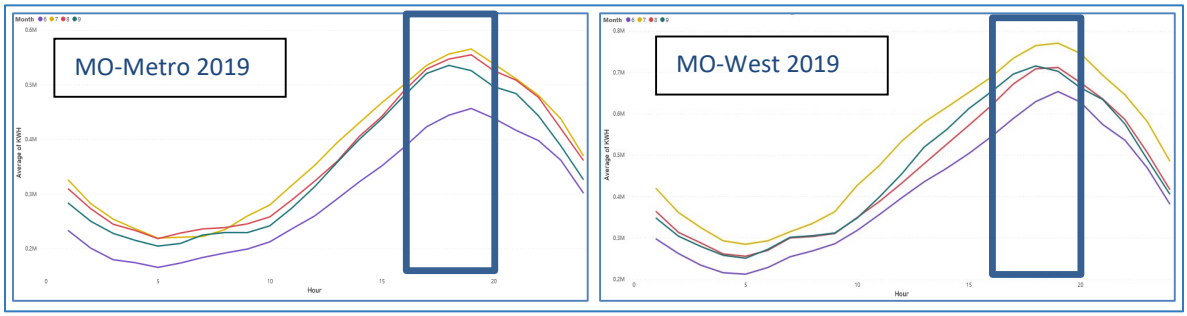
Figure 18 also illustrates that the residential class has a fairly symmetrical load profile around a 4-hour summer peak load period between the hours of 4 pm and 8 pm.

Figure 18: 2019 Evergy Residential Load Profile by Month



While there are slight variations in the residential summer load profiles by jurisdiction, as Figure 19 illustrates, they all follow the Evergy combined profile with the summer average monthly peak hours occurring between 5 pm and 7 pm and the highest residential class load hours generally occurring between 4 pm and 8 pm.

Figure 19: 2019 Evergy Residential Summer Load Profile by Jurisdiction



In defining a residential non-summer peak loading period for all Evergy jurisdictions, the Company further analyzed the Evergy residential class load research data for 2019. Figure 19 shows that the combined Evergy residential class load is substantially lower and less pronounced during the non-summer months than during the four month summer season. Figure 20 shows that the residential non-summer peak load period, while exaggerated by the plot scale, occurs between 5 pm and 10 pm.

Figure 20: Evergy Residential Non-Summer Load Profile by Month

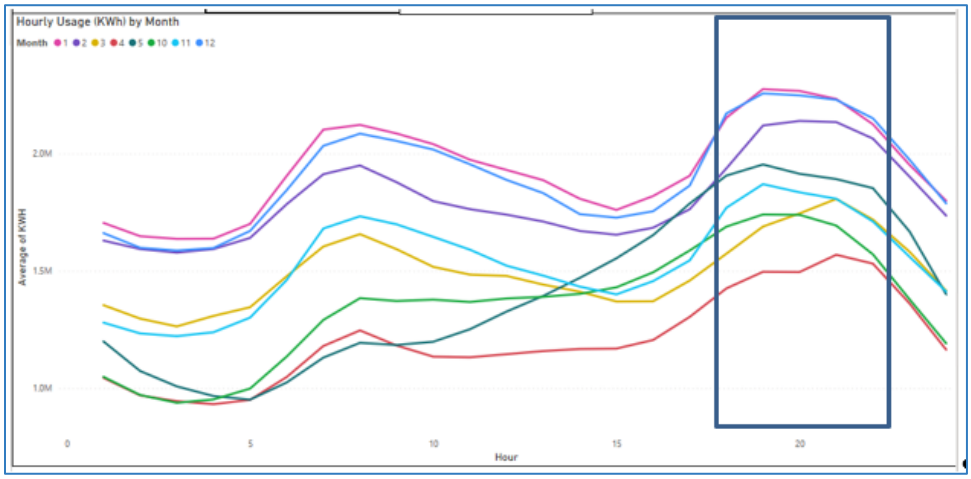
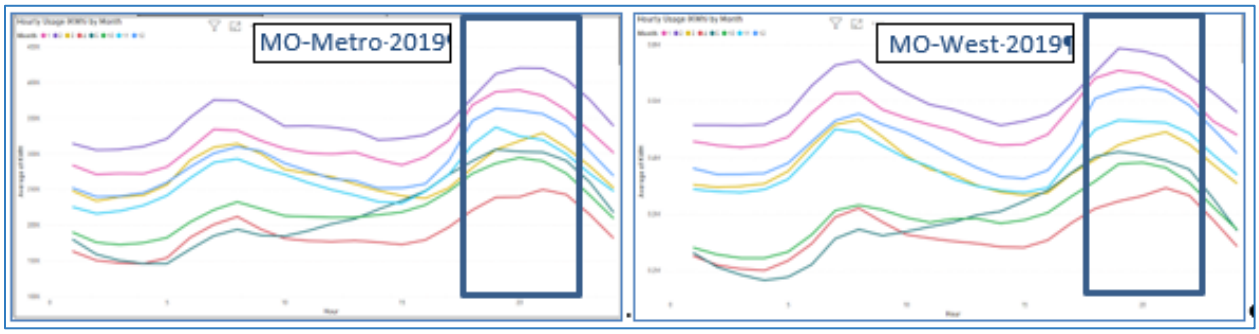


Figure 21 illustrates the Evergy residential non-summer monthly load profiles by jurisdiction. While there are slight variations in the non-summer load profiles by jurisdiction, the early evening high load period aligns with the Evergy combined profile with the highest residential class non-summer load hours generally occurring between 5 pm and 10 pm.

Figure 21: Evergy Res Non-Summer Monthly Load Profile by Jurisdiction



In defining the residential class minimum loading period for all Evergy jurisdictions, the Company first examined the Evergy residential class load profile for 2019. Figure 21 illustrates that the residential 'low-load' generally occurs in the early morning hours, but that there are variations that requires us to look more closely at the Summer and non-summer periods.

Figure 22 shows that the Evergy combined residential classes has a consistent five hour low usage period in the non-summer months between midnight and 5 am. The sixth hour may be the hour before or after depending on the month and weather.

Figure 23 shows that the Evergy combined residential class five hour low usage period occurs later between 2 am and 7 am. The sixth hour may be before or after depending on weather.

Inspection of the residential class load profiles by jurisdiction (Figure 18 and Figure 20) show consistent low load periods for each Missouri jurisdiction.

Figure 22: Evergy Residential Non-Summer Low Load Period

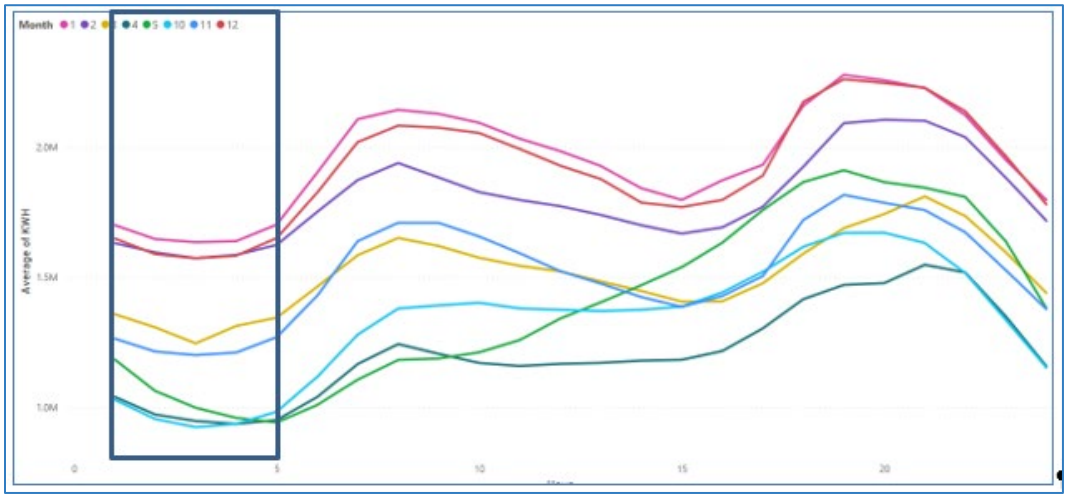
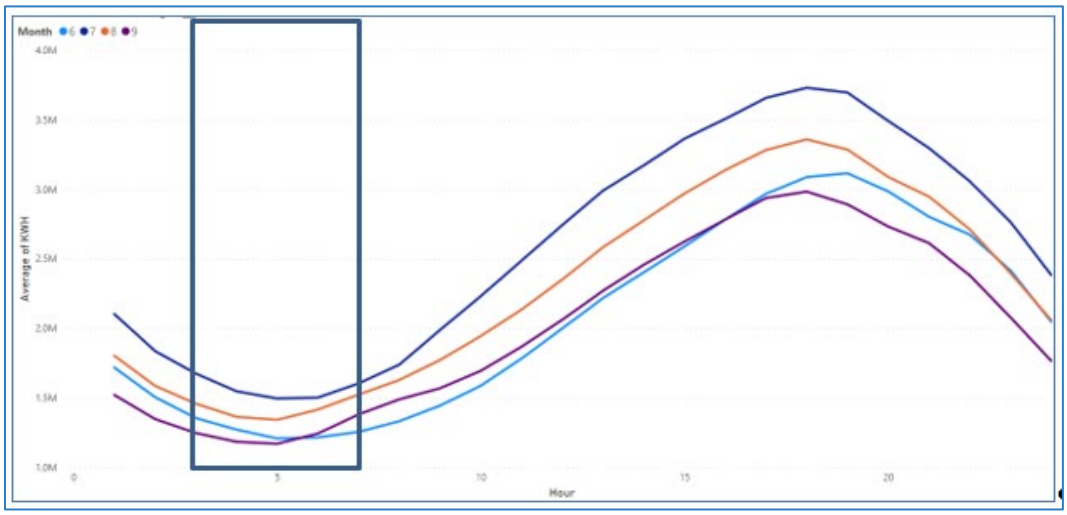


Figure 23: Evergy Residential Summer Low Load Period



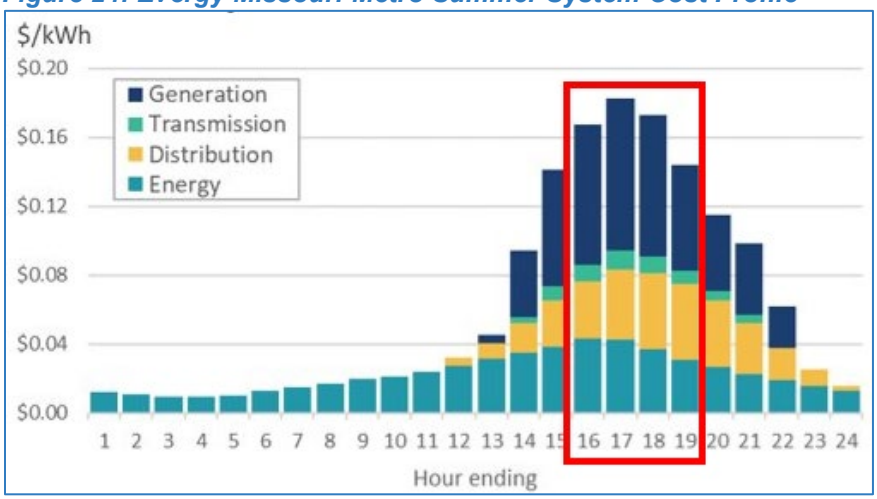
5.4.2.4 System Cost Analysis

Evergy further analyzed the potential residential TOU pricing periods from a total system cost perspective that included marginal generation costs, embedded transmission and distribution infrastructure costs, and SPP DA energy costs. In developing the hourly system cost profiles the Company allocated the respective system cost components as follows:

- Generation capacity costs: The avoided cost of capacity approved in the Company's most recent Missouri Energy Efficient Investment Act ("MEEIA") filing[26] was used. This generation capacity cost was allocated to the top 100 system net load hours, assuming 1,000 MW of solar deployed. This level of solar adoption reflects the near-term customer Evergy grid scale solar and customer additions identified in the most recent Integrated Resource Plan ("IRP").
- Transmission costs: Embedded transmission costs[27] were allocated to the system top 25 high-load hours of each month of the year, approximating the driver of SPP transmission charges.
- Distribution costs: Assumed 25% of total embedded residential distribution cost[28] is driven by peak demand growth, and were allocated to top 500 residential load hours. This broad allocation reflects the diversity in timing of local distribution peaks.
- Energy costs: are based on the SPP Day-Ahead hourly energy costs.

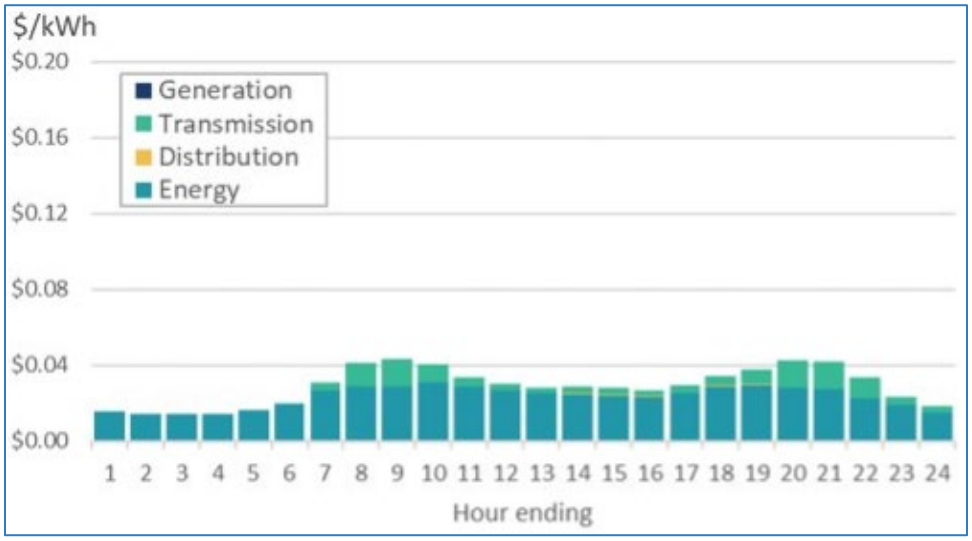
Figure 24 and Figure 25 show the results of this analysis for the Missouri-Metro jurisdiction for the summer and non-summer seasons, respectively. Since the jurisdictional load profiles are very similar, the results for Missouri-West will be very similar. This analysis show that the 4-hour period with the highest average cost for the summer season occurs between 3 pm and 7 pm. For the non-summer season, the analysis does not indicate any significantly higher cost period, but costs are slightly higher in the early morning and evening hours.

Figure 24: Evergy Missouri-Metro Summer System Cost Profile



[26] Docket No. EO-2019-0132
[27] Embedded costs were derived from the most recent rate case cost of service study
[28] Embedded costs were derived from the most recent rate case cost of service study

Figure 25: Evergy Missouri-Metro Non-Summer System Cost Profile



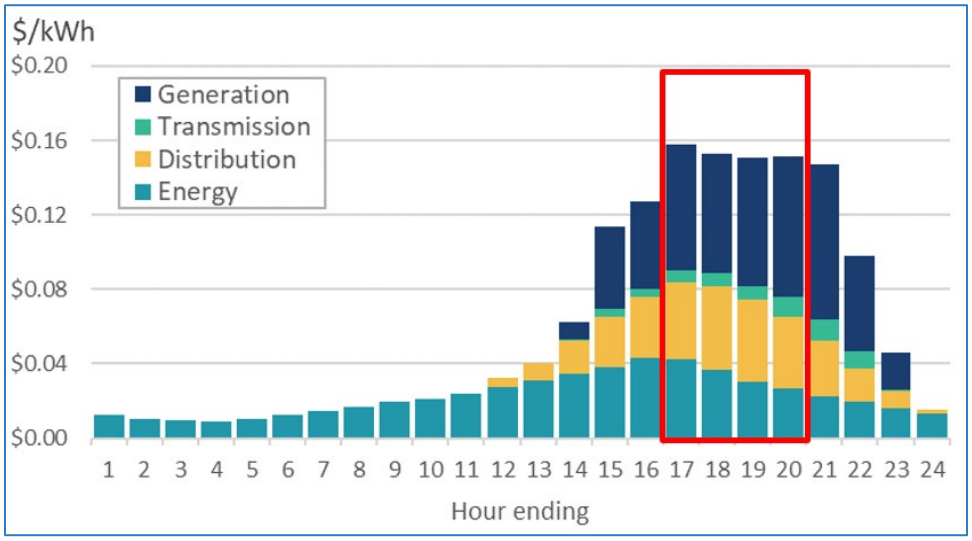
Since the system cost analysis included a significant number of assumption in cost allocations, we performed additional sensitivity analysis see if changes to the key assumptions changed the 4-hour high cost period. Table 7 shows the results of the sensitivity analysis. The only assumption change that moved the 4-hour high cost period to the 4-8 pm hours was an increase in solar penetration. The 2,500 MW of future solar reflects both the customer and Evergy grid scale solar additions identified in the Company's most recent IRP that are expected to occur over the next 10 years.

Table 7: Summer System Cost Profile Sensitivity Tests

Base Assumption	Alternative Assumption	4-hr High Cost Period
MEEIA Avoided Generation Cost	$0/kW-yr generation capacity cost	3 – 7 pm
25% of distribution costs assumed to be capacity driven	50% of distribution costs assumed to be capacity driven	3 – 7 pm
Distribution costs allocated to top 500 hours per year	Distribution costs allocated to top 1,000 hours per year	3 – 7 pm
Assumed 1,000 MW of future solar	Assumed 2,500 MW of future solar	4 – 8 pm

Figure 26 shows the modeled impact on the system cost analysis of the higher solar penetration with the summer 4-hour high cost period shifted to 4-8 pm with the 8-9 pm period of almost the same magnitude.

Figure 26: Evergy Missouri-Metro Modeled Summer System Cost Profile with 2,500 MW Solar

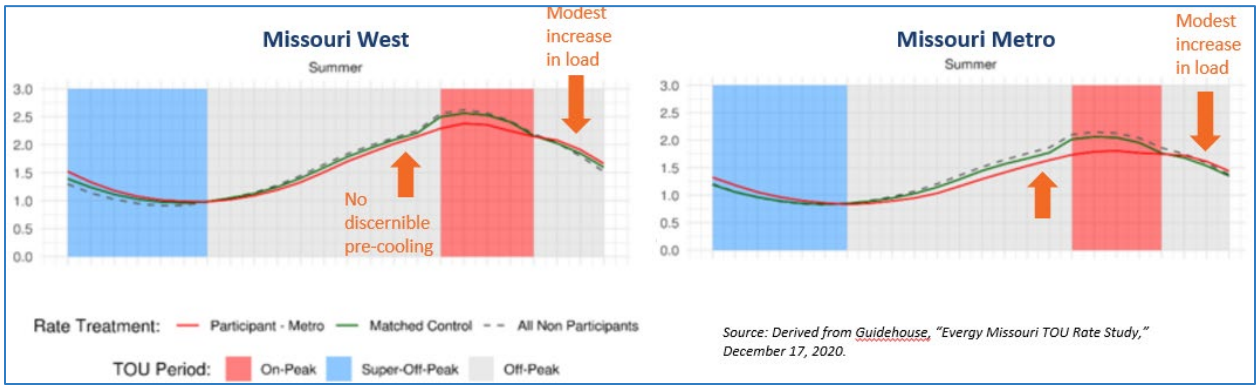


5.4.2.5 TOU Time Period Future Proofing Considerations

Most of the empirical evidence based on analysis of historical data presented in the previous sections indicates a 4-hour Summer On-Peak period from 3–7 pm is reasonable. Evergy's current TOU rate offering has a Summer On-Peak period of 4-8 pm which aligns with the residential class 4-hour peak load period. This misalignment begged the question of which period should be used going forward. Evergy considered several additional factors and decided to retain the 4-8 pm period as the summer On-Peak period to future-proof the rate structure to minimize future time period changes. The following factors were part of that consideration:

- Increased solar penetration – changes to the net system load profile due to the anticipated increase in current IRP will likely shift the summer system cost profile later in the day as illustrated in Figure 26.
- 'Snap-Back' of TOU load – The interim TOU EM&V analysis shows that there is a post TOU On-Peak load 'snap-back' due to the shifting of some load to the post On-Peak hours (Figure 27).

Figure 27: Load 'Snap-Back' after TOU On-Peak Period



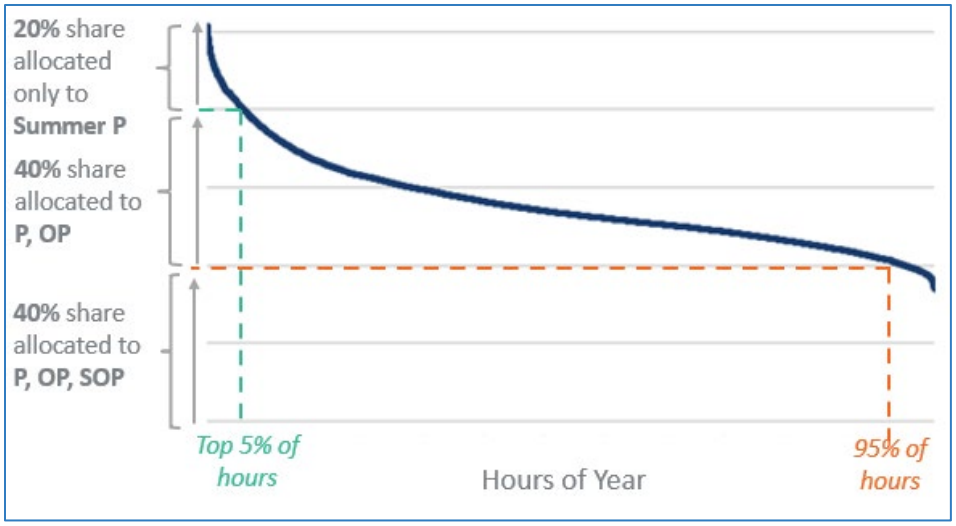
5.4.3 TOU Price Differential Analysis

After establishing the daily TOU On-Peak and Super Off-Peak time periods, the Company performed an analysis to determine the target price differential for each time period by season. In this analysis, the residential classes share of costs from the most recent class cost of service study were allocated to the TOU time periods.

Generation costs - The residential class's share of generation capacity costs were allocated based on analysis of the system load duration curve as illustrated in Figure 28, with the goal of allocating incremental costs of capacity only to the periods which "cause" those costs:

- Summer peak period costs are assumed to include peaking generation which runs during a limited number of hours of the year (i.e., 5%)
- All periods are assumed to include costs of generators that run most (i.e., 95%) of the hours of the year
- The remaining share of costs is allocated to the Off-Peak and Non-Summer peak periods

Figure 28: 2019 Evergy Load Duration Curve (MW)



Energy Costs - The residential class's share of energy costs were allocated proportional to Evergy's average SPP energy prices in each period.

Transmission costs - The residential class's share of transmission costs were allocated to the peak period in each month of the year.

Distribution costs - The residential class's share of distribution costs were allocated to reflect that the peak period drives a proportionally higher share of costs

- 25% of total distribution cost is allocated to the summer and non-summer peak periods
- 75% of total distribution cost is allocated to all periods

5.4.3.1 3-Period Price Differential

Using these cost allocations for calculating the prices for a year round 3-period TOU, results in a rate that has a strong summer peak price and a significantly discounted Super Off-Peak price, with modest price differences in the other periods. Table 8 shows the result of the price differential analysis based on the class cost of service costs from the most recent Missouri-Metro and Missouri-West rate cases.

- Current TOU Rate column presents the current Evergy TOU tariff prices which was established to be revenue neutral with the residential general service billing determinants.
- The Current RN ("revenue neutral") Rate column presents the TOU tariff prices that would be revenue neutral based on the existing tariff price differentials and the settlement billing determinants for both the residential general service and single meter space heating customers.
- The Proposed TOU Rate column presents the prices based on revised pricing differentials that would be revenue neutral with billing determinans for both the residential general service and single meter space heating customers.

  Note: The pricing is for illustrative purposes only and used determinants from the previous rate case. The actual pricing will likely when the Company makes their general rate case filing.

While there are slight variations in the rate differentials calculated for each jurisdiction they are fairly consistent. Based on this analysis we established the following price differential targets (On-Peak/Off-Peak/Super Off-Peak) targets for the 3-period TOU rates:

- Summer: 6.0 / 2.0 / 1.0
- Non-Summer: 3.0 / 1.5 / 1.0

Table 8: 3-Period TOU Price Differential Analysis

		Missouri Metro			Missouri-West		
		Current TOU Rate	**Current RN Rate**	**Proposed TOU Rate**	**Current TOU Rate**	**Current RN Rate**	**Proposed TOU Rate**
Customer Charge	$/mo	$11.47	$11.47	$11.47	$11.47	$11.47	$11.47
TOU Charges							
Summer							
On-Peak	$/kWh	$0.325	$0.304	$0.358	$0.266	$0.251	$0.297
Off-Peak	$/kWh	$0.108	$0.101	$0.099	$0.089	$0.084	$0.078
Super Off-Peak	$/kWh	$0.054	$0.051	$0.059	$0.044	$0.042	$0.048
Non-Summer							
On-Peak	$/kWh	$0.266	$0.249	$0.174	$0.216	$0.205	$0.183
Off-Peak	$/kWh	$0.104	$0.098	$0.098	$0.087	$0.083	$0.077
Super Off-Peak	$/kWh	$0.045	$0.042	$0.060	$0.037	$0.035	$0.050
Price Ratios							
Summer		6.0:2.0:1	6.0:2.0:1	6.1:1.7:1	6.0:2.0:1	6.0:2.0:1	6.1:1.6:1
Non-Summer		5.9:2.3:1	5.9:2.3:1	2.9:1.6:1	5.9:2.4:1	5.9:2.3:1	3.6:1.5:1
Heating Customer Impact							
Average annual bill	$		$1,472	$1,465		$1,588	$1,585
% Increase	%		6.6%	6.1%		3.6%	3.3%

The interim TOU EM&V analysis identified the condition where electric space heating customers on the TOU rate experienced higher bills during the heating season than on their traditional rate. Table 8 shows that the proposed TOU with reduced price differentials in the non-summer season will reduce slightly the impact of TOU for electric space heating customers.

5.4.3.2 2-Period Price Differential

In an effort to provide additional choice for customers beyond the 3-period rate, the Company also evaluated a 2-period TOU rate design that would be a Summer-only TOU option. This option should be attractive to customers with less ability to shift usage throughout the year and address bill impact of the existing TOU rate typically occurring for space heating customers. Table 9 shows the result of the price differential analysis for the Company's proposed 2-period price differential TOU rate to complement the existing 3-period TOU rate. The results of the 3-period price differential analysis were used for calculating the price differentials for the proposed 2-period TOU rate with the following price period definitions:

- Summer: On-Peak 4-8 pm; Off-Peak all other hours
- Non-Summer: Super Off-Peak midnight-6 am; Off-Peak all other hours

For the Summer season, the 2-period On-Peak price was set equal to the 3-period On-Peak price and the Off-Peak price was solved for for the revenue neutrality. For the Non-Summer the 2-period Super Off-peak price was set equal to the 3-period Super Off-peak price and the Off-Peak price was solved for revenue neutrality.

> *Note: The pricing is for illustrative purposes only and used determinants from the previous rate case. The actual pricing will likely when the Company makes their general rate case filing.*

While there are slight variations in the rate differentials calculated for each jurisdiction they are fairly consistent. Based on this analysis the Company established the following price differential targets (Summer On-Peak/Off-Peak and Non-Summer Off-Peak/Super Off-Peak) targets for the 2-period TOU rates:

- Summer: 4.0 / 1.0
- Non-Summer: 2.0 / 1.0

Table 9: 2-Period TOU Price Differential Analysis

		MO-Metro	MO-West
		Proposed TOU Rate	**Proposed TOU Rate**
Customer Charge	$/mo	$11.47	$11.47
TOU Charges			
Summer			
On-Peak	$/kWh	$0.358	$0.297
Off-Peak	$/kWh	$0.091	$0.073
Non-Summer			
Off-Peak	$/kWh	$0.111	$0.095
Super Off-Peak	$/kWh	$0.060	$0.050
Price Ratios			
Summer		3.9 : 1	4.1 : 1
Non-Summer		1.8 : 1	1.9 : 1
Heating Customer Impact			
Average annual bill	$	$1,466	$1,590
% Increase	%	6.2%	3.7%

5.5 PROPOSED RESIDENTIAL TOU RATES

Based on the TOU rate design analysis presented in the previous sections and feedback from our customers, Evergy proposes to incorporate these refinements to the existing 3-period TOU rate and introduce an optional 2-period TOU rate to provide customers an additional TOU rate option.

5.5.1 3-Period TOU Rate

Although the majority of customers on the existing TOU rate are satisfied with the rate and on average have seen an overall decrease in their electric bills, the Company's TOU analysis indicates that some refinement in the rate design is warranted. Evergy proposes to implement several refinements to the existing 3-period TOU rate in its next general rate case.

Table 10 presents the existing Missouri-Metro and Missouri-West 3-period TOU rate constructs along with the proposed refinements in red text. These refinements for further described in the following sections.

Table 10: Proposed 3-Period TOU Rate Refinements

TOU Period	Missouri Metro Price		Missouri West Price		New Price	Time Period
	(¢/kWh)	Delta	(¢/kWh)	Delta	Delta	
Summer	May 16-Sept. 15		June 1-Sept. 30			June 1-Sept. 30
On-Peak	32.498 ¢	6.0 X	26.577 ¢	6.0 X	6.0 X	4 - 8 pm, M-F excl. holidays
Off-Peak	10.833 ¢	2.0 X	8.859 ¢	2.0 X	2.0 X	All other hours
Super Off-Peak	5.416 ¢	1.0 X	4.429 ¢	1.0 X	1.0 X	Midnight - 6 am every day
Non-Summer	Sept 16 – May 15		Oct. 1-May 31			Oct. 1-May 31
On-Peak	26.575 ¢	5.9 X	21.629 ¢	5.9 X	3.0 X	4 - 8 pm, M-F excl. holidays
Off-Peak	10.422¢	2.3 X	8.727 ¢	2.4 X	1.5 X	All other hours
Super Off-Peak	4.449 ¢	1.0 X	3.667 ¢	1.0 X	1.0 X	Midnight - 6 am every day
Super Off Peak	% Summer	0.82 X		0.83 X	1.0 X	
Note: Proposed refinements are shown in red text						

5.5.1.1 Season Definition

As discussed in Section 5.4.1, there is considerable empirical support for the selection of this four month summer season rate period. Therefore, Evergy proposes to maintain two seasons, Summer and Non-Summer and revise the current TOU tariffs to reflect a consistent summer season period from June 1 to September 30 for both Evergy Missouri jurisdictions.

5.5.1.2 TOU Time Periods

Evergy does not propose any changes to the TOU time period defined in the current TOU tariff.

Evergy's current TOU rate offerings have a year round On-Peak period of 4-8 pm which aligns with the residential class 4-hour summer peak load period. The residential class's non-summer high-load period, while not as pronounced, generally occurs between 5 pm and 10 pm. Most of the empirical evidence from the analysis of historical system level data supports a 4-hour Summer On-Peak period from 3–7 pm. However, as discussed in Section 5.4.2.5, Evergy has elected to retain the 4-8 pm period as the On-Peak period for the 3-period TOU rate to future-proof the rate structure and minimize future time period changes.

Evergy's current TOU rate offerings have a year round Super Off-Peak period of midnight-6 am. All of the empirical evidence presented in the prior sections clearly support a year-round Super Off-Peak period from midnight- 6 am.

5.5.1.3 TOU Price Differentials

Evergy's current TOU rate offerings have have summer season price differentals (On-Peak/Off-Peak/ Super Off-Peak) of 6.0 / 2.0 / 1.0. Based on the price differential analysis presented earlier, Evergy proposes to maintain these summer proce differential targets.

Evergy's current TOU rate offerings have have non-summer season price differentals (On-Peak/Off-Peak/ Super Off-Peak) of 5.9 / 2.3 / 1.0 with the Super Off-Peak price being approximately 85% of the summer season Super Off-Peak price. Based on the price differential analysis presented earlier, Evergy proposes to revise the TOU tariffs to lower the price differentals and implement differential targets of 3.0 / 1.5 / 1.0 with no, or minimal, difference in the summer and non-summer Super Off-Peak prices.

5.5.1.4 Extreme Weather Considerations

In discussion with stakeholders on March 3, 2021, concern was expressed that the TOU price differentials may be too great and could generate extremely high bills during extreme summer hot spells. Based on this concern, Evergy performed an analysis to evaluate potential bill impact of the TOU rate during extremely hot weather. The analysis shows that a customer on the TOU rate will likely see less of a bill impact during extreme hot weather, especially if they use a programmable thermostat to raise their temperature during the On-Peak time period (see Table 11).

For the most extreme case, Evergy compared the bill impact of a 3-ton (3 kWh/hr) air conditioner running continuously for 24 hours. Under this scenario, a Missouri-Metro customer on the General Service rate would pay ($10.74/day) 14% more than what they would pay on the TOU rate ($9.42/day). In a less extreme case where the air conditioner runs 100% during the On-Peak period, 75% during the Off-Peak period, and 50% during the Super Off-Peak period the bill impact on either rate is the same at $7.80/day.

Table 11: Extreme Weather Comparison for Missouri-Metro

		3 Period TOU				Std Rate	
		On-Peak Hrs	Off-Peak Hrs	S.Off-Peak Hrs	Total Rate	All Hrs	Premium
AC kWh/hr	3						
Hrs/day		4	14	6		24	
Rate		$ 0.32498	$ 0.10833	$ 0.05416		$ 0.14916	
% Run Time		100%	100%	100%		100%	
kwh/day		12	42	18	72	72	
Cost/day		$ 3.90	$ 4.55	$ 0.97	$ 9.42	$ 10.74	114%
% Run Time		100%	75%	50%		72.92%	
kwh/day		12	31.5	9	52.5	52.5	
Cost/day		$ 3.90	$ 3.41	$ 0.49	$ 7.80	$ 7.83	100%

5.5.2 2-Period TOU Rate

Evergy proposes to add a 2-period TOU rate to provide our customers an additional TOU rate option that could be attractive to customers with less ability to shift usage throughout the year and address the bill impact of the current TOU rate typically occurring for space heating customers. The proposed rate constructs for the 2-period TOU rate are summarized in Table 12 and further described in the following sections.

Table 12: Proposed 2-Period TOU Rate

TOU Period	Price		Time Period
	(¢/kWh)	Delta	
Summer			June 1-Sept. 30
On-Peak	= TOU On-Peak	4.0 X	4 - 8 pm, M-F excl. holidays
Off-Peak		1.0 X	All other hours
Non-Summer			Oct. 1-May 31
Off-Peak		2.0 X	All other hours
Super Off-Peak	= TOU S Off-Peak	1.0 X	12 - 6 am, every day

5.5.2.1 TOU-2 Season Definition

As discussed in Section 5.4.1, the 2-period TOU rate will have two seasons, Summer and Non-Summer, and with the summer season period from June 1 to September 30 for both of the Evergy Missouri jurisdictions.

5.5.2.2 TOU-2 Time Periods

For the Summer season, the 2-period TOU rate will have an On-Peak period from 4-8 pm consistent with the 3-period TOU rate. All other hours will be Off-Peak. The alignment of Summer On-Peak periods between the TOU rates is to encourage peak load reduction.

For the Non-Summer season, the 2-period TOU rate will have a Super Off-Peak period from midnight-6 am consistent with the 3-period TOU rate. All other hours will be Off-Peak. The alignment of Super Off-Peak periods during the non-summer season encourages shifting load into this low-load, low-cost period to improve system utilization.

5.5.2.3 TOU-2 Price Differentials

Based on the price differential analysis presented earlier, Evergy proposes to set the Summer On-Peak price for the 2-period TOU rate equal to the TOU summer On-Peak price and have an On-Peak to Off-Peak price differential target 4.0 / 1.0. The non-summer Super Off-Peak price for the 2-period TOU rate will be set to the TOU Super Off-Peak price and have an Off-Peak to Super Off-Peak differential target of 2.0 / 1.0.

5.6 EDUCATION PLANS

Educating customers about rate plan options is an ongoing effort and one that can present a unique set of challenges. Rate information is highly detailed, complex, and requires customer effort and time to read and fully understand various rate structures and how changes to those structures impact their bills. Evergy will continue an integrated education and outreach campaign to help increase customer awareness of its rate plan offerings, especially the TOU plan.

Based upon the research and key takeaways from past campaigns, Evergy's strategy will center around the following focus areas:

- **Simplify:** Deliver education in a clear, concise manner using streamlined visualizations of key information when possible. To develop this message and personalized, data-driven education, the Company will continue to leverage critical technology and infrastructure such as our Customer Care and Billing System, AMI meter network, Meter Data Management system, Rate Education Reports, Online Rate Analysis Tool, Post-Enrollment Rate Coach Reports, and more.
- **Connect with new customer segments:** Deliver education across an integrated mix of channels proven – through research and historical practices – to be successful in reaching and resonating with new and additional customer segments. The Company will work with customers to help them to understand behavioral changes that may be required to save money on TOU.

- **Champion Consistency:** Implement a consistent, centralized message on Evergy's website. This is a destination to which all other tactics, including direct/in-person communication, will drive so customers can easily access additional information and education.
- **Explaing the Why:** Continue to help customers understand the important impacts of TOU and the community and grid benefits the rate structure delivers. Education materials will help customers understand how TOU relates to energy pricing and how they could save money by shifting their usage to Off-Peak times.

In addition, Evergy will continue to execute on our four mains goals from its 2021 TOU campaign, which are:

- **Inform** all customers on the TOU rate option and how time of day affects electricity pricing, through personalize Rate Education Reports, Online Rate Analysis Tools, and usage and cost visualization tools.
- **Educate** customers on where to find information about the TOU plan option and how the rate plan works.
- **Enroll** customers in TOU through targeted, data-driven marketing.
- **Assist** customers who have enrolled in TOU by developing and implementing tools and an ongoing communication campaign, through weekly post-enrollment coaching emails, to ensure customer success and satisfaction and avert attrition due to plan dissatisfaction.

In additional to individual marketing channel performance, measurement compared to Evergy benchmarks and continued customer post-enrollment and opt-out surveys will be monitored and a TOU awareness question will be added to the Company's Customer Quarterly Tracker survey. This survey will provide a baseline of awareness by end of June 2021 and allow the Company to track awareness over time. The Company's goal for 2021 is to improve overall customer TOU awareness by 5%.

6 APPENDIX A – INTERIM EM&V RESULTS

Below is an excerpt from the Executive Summary, Results and Key Finding of ***Guidehouse's Evergy Missouri Residential Time of Use Rate Evaluation***. This interim evaluation has been submitted to the MPSC and presented to stakeholders.

TOU Rate Impacts[29]

Figure 4 and Figure 5 present the TOU rate impacts for the Missouri Metro and West jurisdictions respectively. The impacts in both the summer and winter seasons are similar across the two jurisdictions with almost all of the impacts being statistically significant at the ninety percent confidence level, which indicates that participants in both jurisdictions did respond to the TOU prices by changing their consumption patterns.

The most notable savings in either season and jurisdiction occur during the on-peak periods as the price differential is the highest during these hours both in comparison to the other TOU periods as well as to the tiered rates (see section 1.2 for additional detail, Table 5 and Table 6). Furthermore, the on-peak period is four hours a day during weekdays, 4 to 8 pm, making it easier to shift consumption than if the on-peak period was longer.

The overall magnitude of the summer impacts, i.e. the kWh impacts, are greater than the winter impacts. However, the difference in the percent impact is closer which is mainly due to summer consumption being higher than the winter. Another potential contributing factor is that winter space heating loads may be less flexible as compared to summer space cooling loads.

It remains to be seen how the impacts change as more participants are available for analysis, but the confidence bands around the interim impact estimates are reasonable, meaning that they are not too wide. (For example, you do not see confidence bands stretch from -0.2 to -1.2 as then it would be difficult to draw reasonable conclusions).

[29] Guidehouse's Evergy Missouri Residential Time of Use Rate Evaluation, December 10, 2020; Executive Summary, Results and Key Findings

Figure 4. TOU Rate Impacts – Missouri Metro

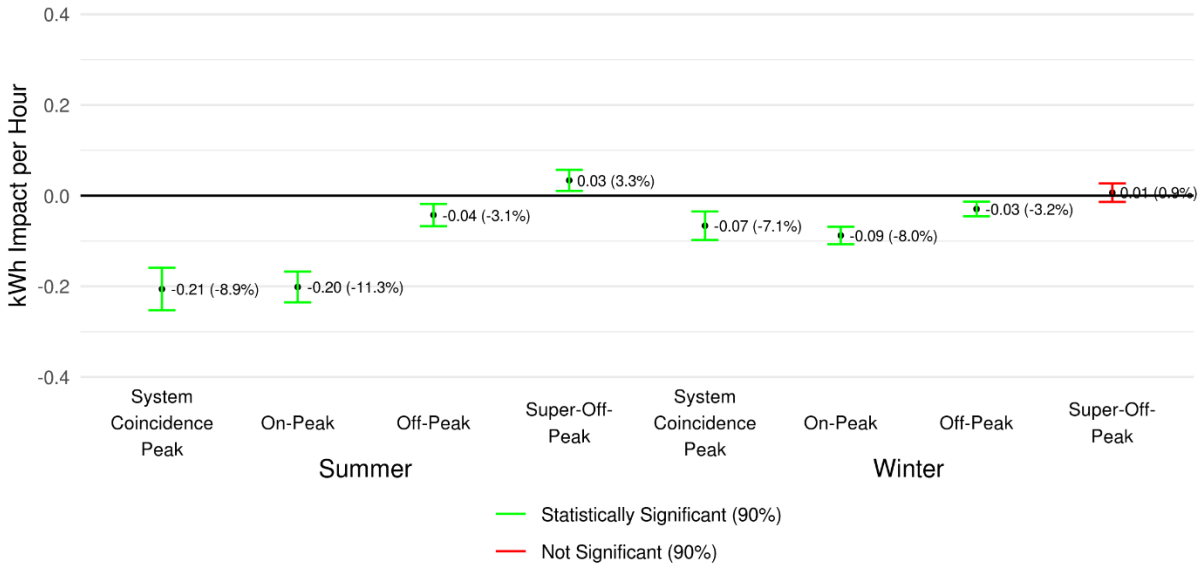
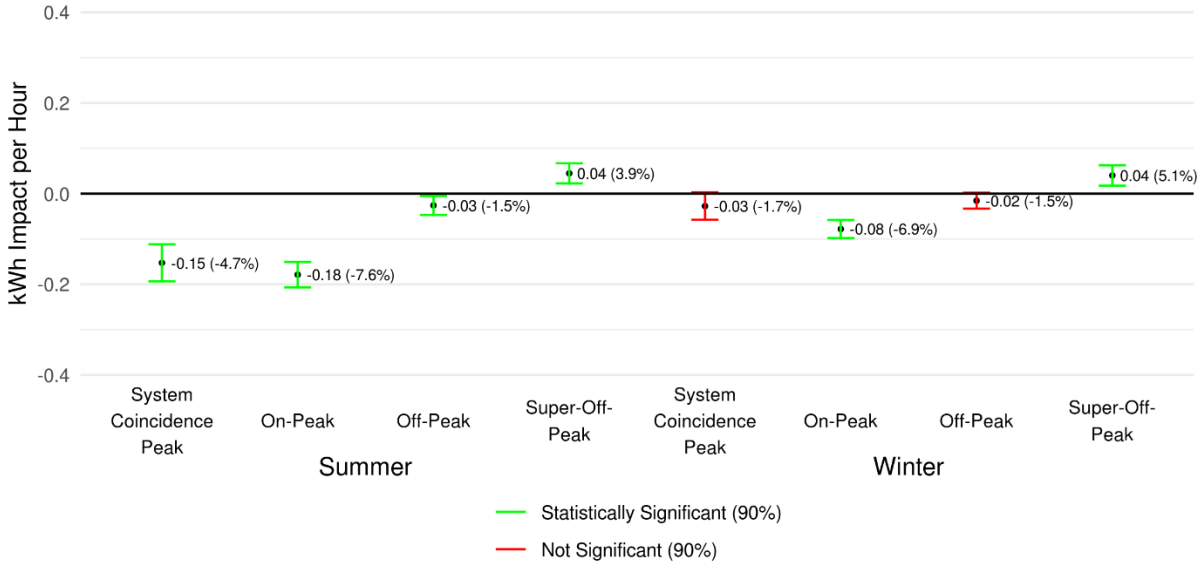


Figure 5. TOU Rate Impacts – Missouri West



During the off-peak period, we do see some impacts though the magnitude is much smaller than the on-peak period which is to be expected given that the off-peak price is much lower than the on-peak price. Given the low price offered during the super off-peak period, we see an increase in consumption as participants shift a portion of their consumption from the higher priced on-peak and off-peak periods to the super off-peak period.

During the summer season, the monthly system coincident peak demand impacts are very similar to those of the on-peak period impacts, but the winter system coincident peak demand impacts are lower than those of the on-peak period impacts.

In the summer, the system coincident peak hours always coincide with the on-peak hours during which we see the highest impacts and hence one would expect similar impacts in the summer system coincident peak. However, during some winter months the system coincident peak can occur in the early morning during the off-peak period, and hence one would expect lower system coincident peak impacts in the winter.

Bill Impacts

This compares the average participant's actual bill under the TOU rate compared to what it would have been under the tiered rate structure accounting for both the rate structure changes (i.e. tiered vs. TOU rates) as well as the associated behavioral changes. The impact estimates of the TOU rates for each jurisdiction, presented above, were used to determine what the average participant's consumption would have been in the absence of TOU rates, effectively adjusting for the change in behavior.

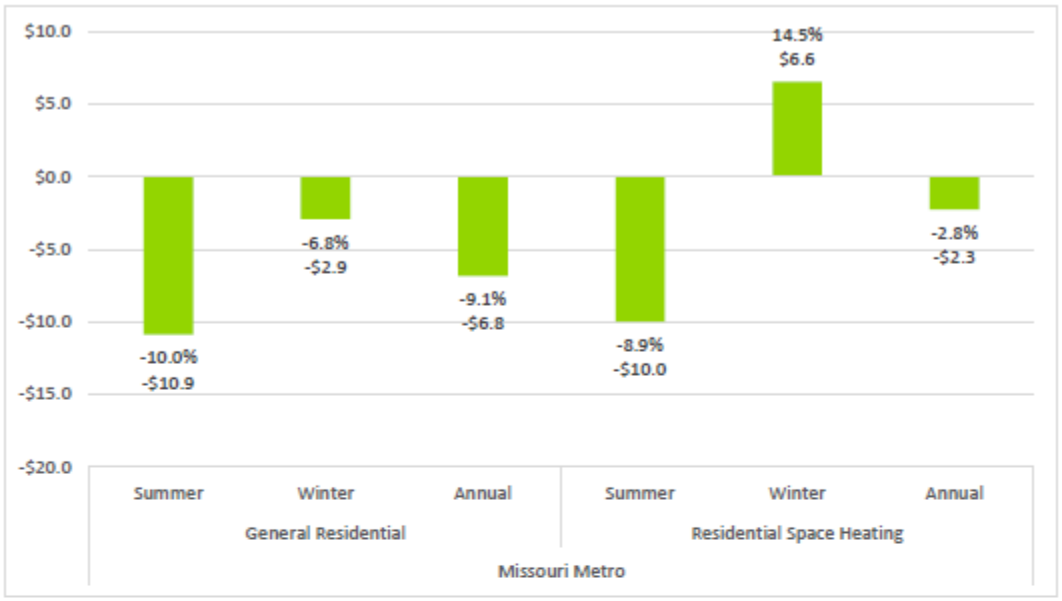
Figure 6 and Figure 7 present the total monthly bill impacts for each season as well as on an annual basis for the Metro and West jurisdictions respectively. Given that participants can be on one of two tiered rates prior to enrolling, we separate the bill impacts based on the tiered rates for each jurisdiction. The composition of these bill savings is discussed in section 3.2.2.

The average participant saves approximately six to ten percent on their bills during the summer season. During the winter months, the average general residential participant sees a slight decrease on their bills while the average residential space heating participant sees an increase. On an annual basis, we can see reductions ranging from three to ten percent depending on the tiered rate that an average participant was on prior to enrolling. This is primarily driven by the savings from the summer season. This pattern is consistent across both jurisdictions.

The aggregate level of consumption in the summer season is higher than the winter in both jurisdictions, and hence the associated kWh impacts are much higher as seen above. This means that more energy is shifted out of the on-peak periods in the summer than in the winter. Furthermore, space cooling loads are more flexible compared to space heating loads. Hence, we see a notable reduction ranging from six to ten percent in monthly summer bills.

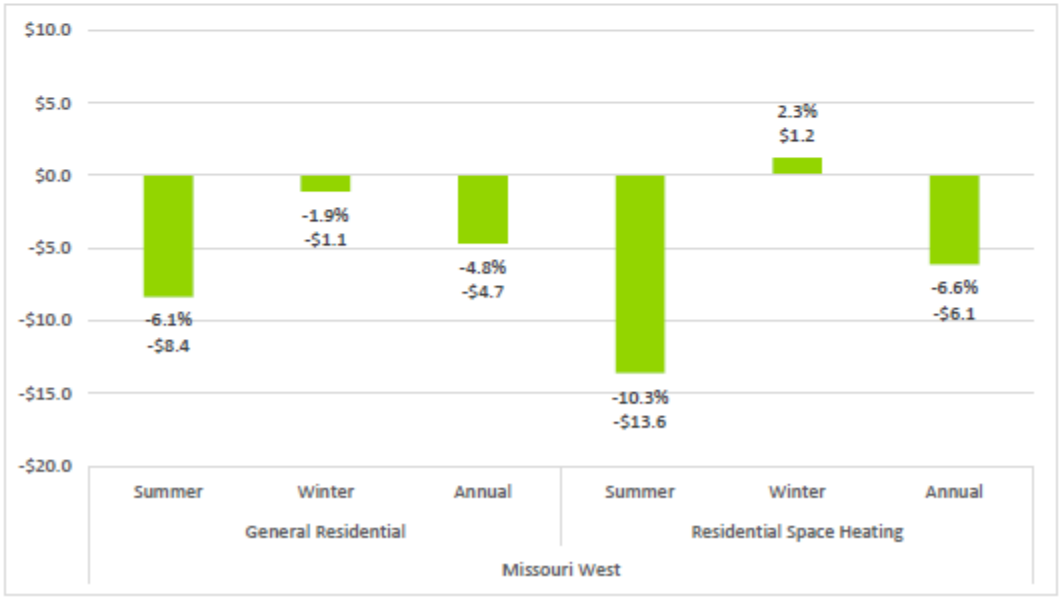
Given that the aggregate level of consumption in the winter is lower than the summer, the magnitude of the kWh impact is lower meaning less energy is shifted out of the on-peak period. For the average participant who was on the space heating rate prior to enrollment, the behavioral changes are not enough to offset the higher-priced TOU rates and hence we see a bill increase during the winter months.

Figure 6. Total Monthly Bill Impacts of TOU Rates – Missouri Metro



Source: Guidehouse Analysis

Figure 7. Total Monthly Bill Impacts of TOU Rates – Missouri West



Source: Guidehouse Analysis

Key Findings

TOU rates were studied in two jurisdictions within Evergy's service territory in the state of Missouri, Metro and West, using an opt-in quasi-experimental design with matched controls. Each jurisdiction has its own TOU rates. Residential customers who were on the general residential or the residential space heating rate were eligible to opt-into the TOU rate.

The key findings can be summarized as follows:

- *The interim results indicate that participants in both jurisdictions did respond to the TOU prices by changing their consumption patterns in both seasons and the patterns are similar across the two jurisdictions.*
- *The summer kWh impacts are greater than the winter, but the percent impacts are closer due the summer consumption being much higher and winter space heating loads being less flexible as compared to space cooling loads.*
- *The system coincident peaks in the summer months occur during the on-peak period while in some winter months it can occur in the morning during the off-peak period and hence the summer / winter system coincident peaks are very similar / slightly lower to the on-peak impacts.*
- *Consistent with the energy and demand impacts, we see higher bill savings in the summer as compared to the winter and the summer savings are the primary drivers of the annual bill savings. Participants who were on the space heating tiered rate prior to enrolling in the TOU rate see a slight increase in their winter bills as compared to those participants who were on the general residential tiered rate.*
- *Approximately half of the summer bill savings for both rates and the winter bill increases for the space heating rate are driven by the rate structure change, i.e. moving from tiered to TOU rates.*

7 APPENDIX B - FUTURE RATE OPTIONS

Below is a summary of future rate options that Evergy has included within its Rate Plan as described in Section 3 of this Report. The following descriptions were presented to stakeholders on March 1, 2021 in its TOU Rate Design Plan Update.

Standard Rate Consolidation

Continued differentiation within the Company's residential rates does not provide significant value and future alignment under more modern rate designs is made more difficult with these variations. The Company has identified the following items to undertake a standard rate consolidation:

- Perform rate clean up and streamlining including review of grandfathered or "frozen" rates to determine which rates can be eliminated. Will potentially require customer impact analysis and feasibility of movement to other rates.
- Look across Evergy jurisdictions and align rate structures where possible to simplify to one standard residential rate. The exact timing of this consolidation is still evolving and will be influenced by customer impact. Consolidation may need to happen over several rate cases and may include tariff revision.
- As rate structures are more aligned, align pricing if/when possible.
- Review tariff differences and align where possible, including potential alignment of operational differences.
- For "new" rates, ensure alignment across Evergy jurisdictions (e.g. structure, pricing, or terms and definitions).

Subscription Pricing

Subscription Pricing offer customers a familiar pricing option so they may choose a level of service and pay according to that level. Subscription Pricing can offer the following attributes:

- Customers pay a fixed monthly bill for energy use
- Price is custom to each customer, based on historic usage and selected perks
- Price is fixed monthly bill for specified term
- In addition to the price, each customer may:
    - Be outfitted with DSM technology giving some level of control of their energy use to the utility
    - Be given increased discounts the more control they give, the more they save
    - Be offered incentives, such as bill credits, to reduce peak demand
- Program can be designed to give middle- and lower-income ratepayers access to newer, more efficient technologies and appliances

Prepay Program

A Prepay Program is a billing option that allows customers to pay in advance for their electric service. A Prepay Program can offer the following attributes:

- Prepay gives a customer the freedom of choice and ability to manage their energy costs
- No deposits, no late charges, or connection fees
- Customers choose when, where, and how often to pay
- Participant consumption is reduced, often up to 10%
- Prepay provides potential benefits to the utility
    - Eliminates customer write-offs
    - Improves cash-flow
    - Reduces call center costs
- Increases customer satisfaction

More than 200 electric utilities across the US, mostly cooperatives and municipals, offer or are planning to offer an AMI-enabled prepay option

Low-Income Solar Subscription Program

The Company will be offering a low-income solar subscription program in its next rate case to meet the 2018 S&A's.

- KCP&L and GMO will propose a low-income component to the solar investment required under section 393.1665 RSMo. no later than their next rate case(s) (Non-Unanimous Stipulation and Agreement filed in these cases on September 19, 2018)

- The Company will consider building SB564-required solar at the same time/place with the understanding that that solar may be used for separate (low-income) projects (Non-Unanimous Stipulation and Agreement filed in these cases on September 25, 2018)

The Company's current work includes:

- Benchmarking other national utility program designs

- Understanding how to overcome any premium of community solar and cross subsidization of a program

8 APPENDIX C - TOU EDUCATION TOOLS

The graphics below include the Welcome Experience and Rate Coach reports, Online Rate Analysis Comparison Tool, and the Rate Education Reports. These are not comprehensive examples of the tools, but are representative examples. These tools have been presented in meetings and presentations identified in Section 2.

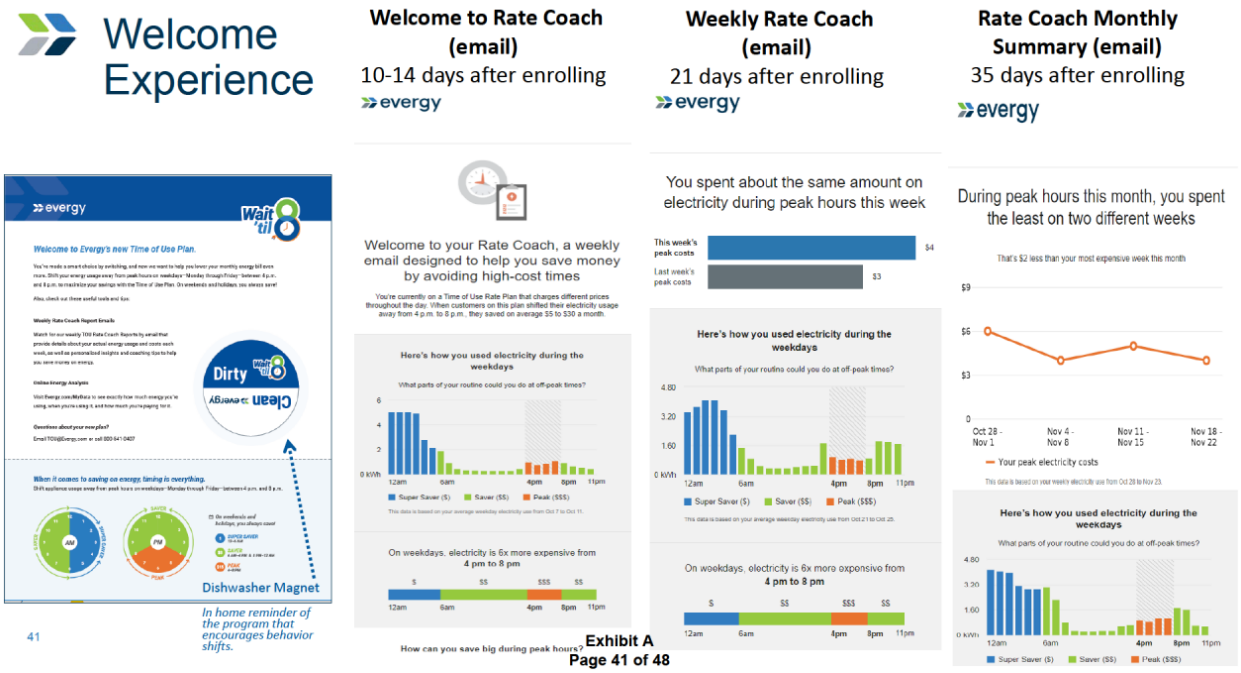


Exhibit A
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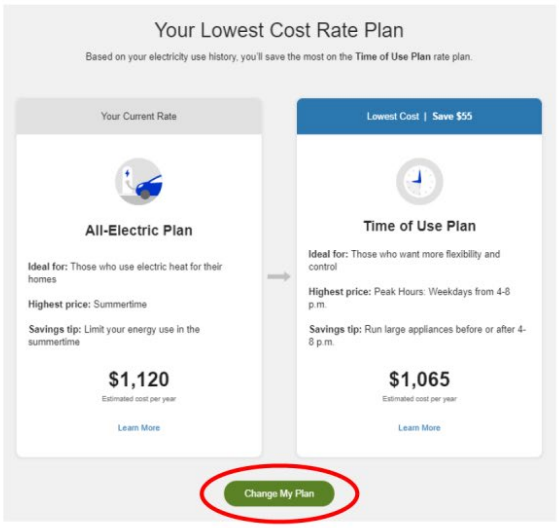
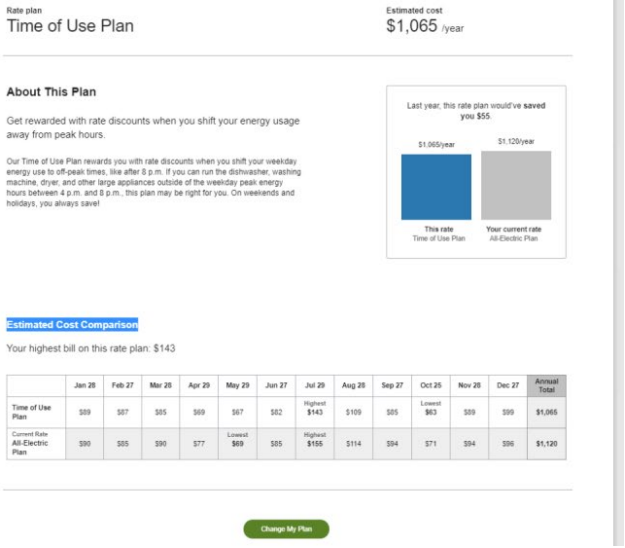
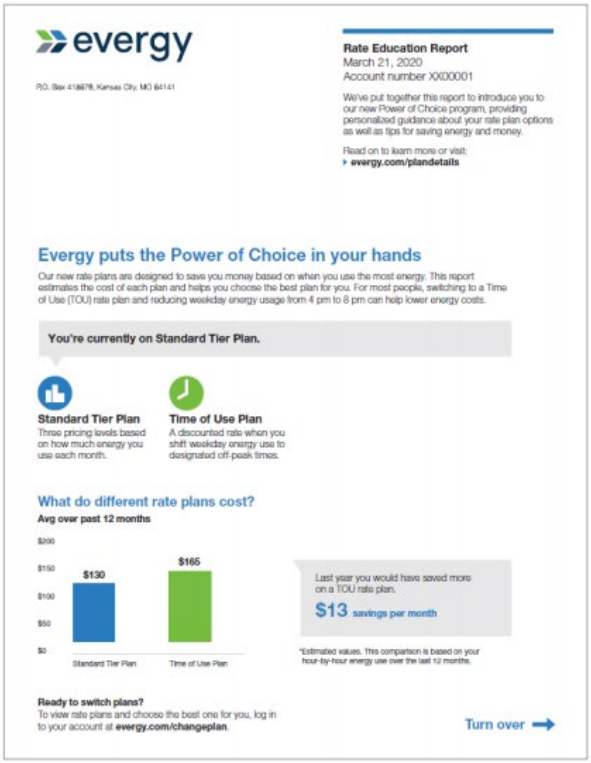
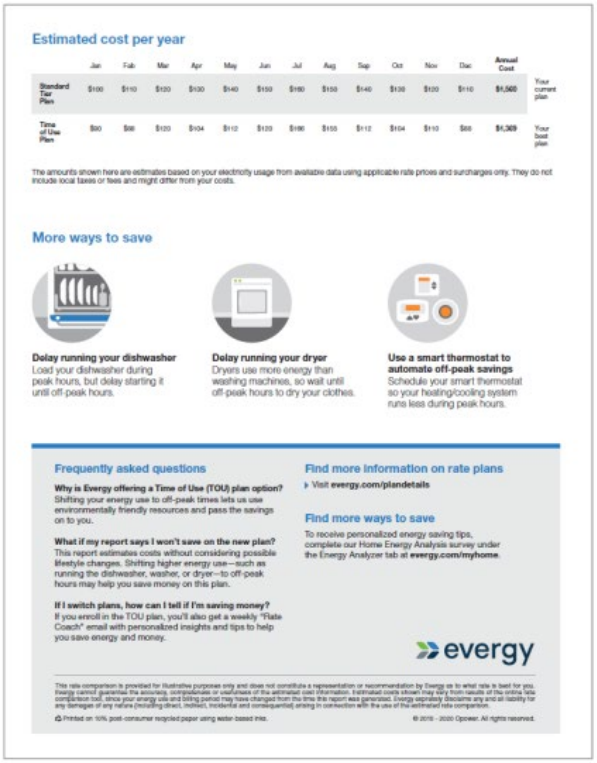
Online Rate Analysis Tool – Rate Comparison & Details





Rate Coach Report





9 APPENDIX D– EXEMPLAR TARIFFS

RESIDENTIAL SERVICE – TIME OF USE ELECTRIC (THREE PART TIME OF USE RATE)

AVAILABILITY

Available to single metered Residential customers receiving AMI-metered secondary electric service to a single occupancy private residence or individually metered living units in multiple occupancy residential buildings, on or after October 1, 2019.

Not available to Customers that own and operate generation connected in parallel with the Company's electric system or that receive service under Net Metering tariff (Schedule NM). Not available for Temporary, Seasonal, Three phase Standby, Supplemental, Resale or single metered multi-occupancy Residential Service.

APPLICABILITY

This rate shall be available as an opt-in option to customers otherwise served under the Company's Residential Service (Schedule R) to encourage customers to shift consumption from higher cost time periods to lower-cost time periods.

A Customer exiting the program, disconnected for non-payment, or on a pay agreement may not be allowed to participate in this rate, at the Company's discretion.

Service shall be provided for a fixed term of not less than one (1) year and for such time thereafter until terminated by either party via (30) day written notice. A Customer exiting the program will be required to wait 12 months before they will be eligible to take service under this rate.

RATE, 1RTOU

A. Customer Charge (Per month)	***MATCH RESIDENTIAL GENERAL***	
B. Energy Charge per Pricing Period (Per kWh)*	Summer Season	Winter Season
Peak	***Maintain Current Pricing Differential For Summer or 6.0 : 2.0 : 1.***	***Decrease Price Differential for Winter To 3.0 : 1.5: 1.***
Off-Peak		
Super Off-Peak		

****The actual pricing may vary slightly as it will be intended to maintain revenue neutrality.***

PRICING PERIODS
Pricing periods are established in Central Time year-round. The hours for each pricing period are as follows:

On-Peak: 4pm-8pm, Monday through Friday, excluding holidays
Super Off-Peak: 12am-6am every day
Off-Peak: All other hours

Holidays are New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.

MINIMUM
Minimum Monthly Bill:

1) Customer Charge; plus
2) Any additional charges for line extensions, if applicable.

SUMMER AND WINTER SEASONS
The Summer Season is four consecutive months, beginning and effective June 1and ending September 30, inclusive. The Winter Season is eight consecutive months, beginning and effective October 1 and ending May 30.

DEMAND SIDE INVESTMENT MECHANISM RIDER
Subject to Schedule DSIM filed with the State Regulatory Commission.

FUEL ADJUSTMENT
Fuel Adjustment Clause, Schedule FAC, shall be applicable to all customer billings under this schedule.

TAX ADJUSTMENT
Tax Adjustment Schedule TA shall be applicable to all customer billings under this schedule.

REGULATIONS
Subject to Rules and Regulations filed with the State Regulatory Commission

RESIDENTIAL SERVICE – TIME OF USE ELECTRIC (TWO PART TIME OF USE RATE)

AVAILABILITY

Available to single metered Residential customers receiving AMI-metered secondary electric service to a single occupancy private residence or individually metered living units in multiple occupancy residential buildings, on or after October 1, 2019.

Not available to Customers that own and operate generation connected in parallel with the Company's electric system or that receive service under Net Metering tariff (Schedule NM). Not available for Temporary, Seasonal, Three phase Standby, Supplemental, Resale or single metered multi-occupancy Residential Service.

APPLICABILITY

This rate shall be available as an opt-in option to customers otherwise served under the Company's Residential Service (Schedule R) to encourage customers to shift consumption from higher cost time periods to lower-cost time periods.

A Customer exiting the program, disconnected for non-payment, or on a pay agreement may not be allowed to participate in this rate, at the Company's discretion.

Service shall be provided for a fixed term of not less than one (1) year and for such time thereafter until terminated by either party via (30) day written notice. A Customer exiting the program will be required to wait 12 months before they will be eligible to take service under this rate.

RATE, 1RTOU 2 Part

A. Customer Charge (Per month)	***MATCH RESIDENTIAL GENERAL***
B. Energy Charge per Pricing Period (Per kWh)*	Summer Season
Peak	***Maintain Current Pricing Differential For Summer or 4.0 : 1.***
Off-Peak	
	Winter Season
Off-Peak	***Decrease Price Differential For Winter to 2.0 : 1.***
Super Off-Peak	

The actual pricing may vary slightly as it will be intended to maintain revenue neutrality.

PRICING PERIODS
Pricing periods are established in Central Time seasonally. The hours for each pricing period are as follows:

Summer-
On-Peak: 4pm-8pm, Monday through Friday, excluding holidays
Super Off-Peak: 12am-6am every day
Off-Peak: All other hours

Winter-

Super Off Peak: 12am-6am every day
Off Peak: All other hours

Holidays are New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.

MINIMUM
Minimum Monthly Bill:

1) Customer Charge; plus
2) Any additional charges for line extensions, if applicable.

SUMMER AND WINTER SEASONS
The Summer Season is four consecutive months, beginning and effective June 1and ending September 30, inclusive. The Winter Season is eight consecutive months, beginning and effective October 1 and ending May 30.

DEMAND SIDE INVESTMENT MECHANISM RIDER
Subject to Schedule DSIM filed with the State Regulatory Commission.

FUEL ADJUSTMENT
Fuel Adjustment Clause, Schedule FAC, shall be applicable to all customer billings under this schedule.

TAX ADJUSTMENT
Tax Adjustment Schedule TA shall be applicable to all customer billings under this schedule.

REGULATIONS
Subject to Rules and Regulations filed with the State Regulatory Commission

VERIFICATION

STATE OF MISSOURI)
) ss.
COUNTY OF JACKSON)

Kimberly Winslow, being first duly sworn, on her oath and in her capacity as Senior Director, Energy Solutions, states that she is authorized to execute on behalf of Evergy Missouri Metro and Evergy Missouri West the foregoing document, and has knowledge of the matters stated in this document, as relevant and detailed within, and that said matters are true and correct to the best of her knowledge and belief.

Kimberly Winslow

Subscribed and sworn to before me this 15th day of June 2021.

Notary Public

My Commission Expires: 4/26/2025

ANTHONY R. WESTENKIRCHNER
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 26, 2025
PLATTE COUNTY
COMMISSION #17279952

VERIFICATION

STATE OF MISSOURI)
) ss.
COUNTY OF JACKSON)

Bradley D. Lutz, being first duly sworn, on his oath and in his capacity as Director, Regulatory Affairs, states that he is authorized to execute on behalf of Evergy Missouri Metro and Evergy Missouri West the foregoing document, and has knowledge of the matters stated in this document, as relevant and detailed within, and that said matters are true and correct to the best of his knowledge and belief.

Bradley D. Lutz

Subscribed and sworn to before me this 15th day of June 2021.

Notary Public

My Commission Expires: 4/26/2025

ANTHONY R. WESTENKIRCHNER
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 26, 2025
PLATTE COUNTY
COMMISSION #17279952

VERIFICATION

STATE OF MISSOURI)
) ss.
COUNTY OF JACKSON)

Brian A. File, being first duly sworn, on his oath and in his capacity as Director Demand-Side Management and Energy Efficiency, states that he is authorized to execute on behalf of Evergy Missouri Metro and Evergy Missouri West the foregoing document, and has knowledge of the matters stated in this document, as relevant and detailed within, and that said matters are true and correct to the best of his knowledge and belief.

Brian A. File

Subscribed and sworn to before me this 15th day of June 2021.

Notary Public

My Commission Expires: 4/26/2025

ANTHONY R. WESTENKIRCHNER
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 26, 2025
PLATTE COUNTY
COMMISSION #17279952

VERIFICATION

STATE OF MISSOURI)
) ss.
COUNTY OF JACKSON)

Ed Hedges, being first duly sworn, on his oath and in his capacity as Consulting Engineer, Energy Solutions Administration, states that he is authorized to execute on behalf of Evergy Missouri Metro and Evergy Missouri West the foregoing document, and has knowledge of the matters stated in this document, as relevant and detailed within, and that said matters are true and correct to the best of his knowledge and belief.

Ed Hedges

Subscribed and sworn to before me this 15th day of June 2021.

Notary Public

My Commission Expires: 4/26/2025

ANTHONY R. WESTENKIRCHNER
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 26, 2025
PLATTE COUNTY
COMMISSION #17279952