BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the Application of Evergy Kansas Metro, Inc., Evergy Kansas South, Inc. and Evergy Kansas Central, Inc. for Approvalof its Demand-Side Management Portfolio Pursuant to the Energy Efficiency Investment Act (KEEIA), K.S.A. 66-1283.	))))))	Docket No. 22-EKME-254-TAR

DIRECT TESTIMONY OF
DANIELLE GOLDBERG

ON BEHALF OF
THE CITIZENS' UTILITY RATEPAYER BOARD

June 17, 2022

****Redacted Version****

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1. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name, title, and employer.

A. My name is Danielle Goldberg. I am a Senior Associate at Synapse Energy Economics, Inc. ("Synapse Energy Economics" or "Synapse"), located at 485 Massachusetts Avenue, Suite 3, Cambridge, MA 02139.

Q. Please describe Synapse Energy Economics.

A. Synapse Energy Economics is a research and consulting firm specializing in electricity and gas industry regulation, planning, and analysis. Our work covers a range of issues, including economic and technical assessments of demand-side and supply-side energy resources, energy efficiency policies and programs, integrated resource planning, electricity market modeling and assessment, renewable resource technologies and policies, and climate change strategies. Synapse works for a wide range of clients, including state attorneys generals, offices of consumer advocates, trade associations, public utility commissions, environmental advocates, the U.S. Environmental Protection Agency, U.S. Department of Energy, U.S. Department of Justice, the Federal Trade Commission, and the National Association of Regulatory Utility Commissioners. Synapse has over 30 professional staff with extensive experience in the electricity industry.

Q. Please summarize your professional and educational experience.

A. I have five years of experience in research and consulting at Synapse. While at Synapse, my work has focused on energy efficiency topics, including cost-effectiveness analysis, best practices for energy efficiency program design, electrification strategies, and equitable distribution of benefits. While most of my ongoing energy efficiency work is based in

Massachusetts, I provided expert testimony in New Hampshire regarding the utility-run energy efficiency plan and importance of ratepayer funded energy efficiency programs. I have also reviewed energy efficiency policies across all 50 states; supported energy efficiency modeling in Vermont, New Hampshire, and Connecticut; and critiqued energy efficiency plans or policy in New Jersey, Nova Scotia, Minnesota, Wisconsin, Missouri, Illinois, Iowa, Ohio, Indiana, and Puerto Rico. I hold a Bachelor of Science in Mechanical Engineering from Northeastern University. My resume, attached as Schedule DG-1, presents additional details of my professional and educational experience.

Q. On whose behalf are you testifying in this case?

A. I am testifying on behalf of the Citizens' Utility Ratepayer Board ("CURB").

Q. Have you previously testified before a state or provincial commission?

A. Yes. I have testified before the New Hampshire Public Utilities Commission.

Q. Have you testified before the Kansas Corporation Commission?

A. No.

Q. What is the purpose of your testimony?

A. The primary purpose of my testimony is to provide recommendations for how future Demand-Side Management ("DSM") Portfolios by Evergy Kansas Metro, Inc. ("Evergy Kansas Metro"), and Evergy Kansas Central, Inc. and Evergy Kansas South, Inc. (referred to together as "Evergy Kansas Central") (collectively referred to herein as "Evergy" or the

"Company") can improve upon the 2023-2026 DSM Portfolio Filing[1] to better align with industry best practices.

Q. Are you sponsoring any exhibits with your testimony?

A. Yes. I am sponsoring the following exhibits:

- Resume of Danielle Goldberg: Exhibit DG-1

2. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

2.1. Summary of Conclusions

Q. Please summarize your conclusions.

A. My conclusions are summarized as follows:

- Evergy could improve transparency around its assumptions and methods, specifically regarding its cost-effectiveness calculations, its Technical Resource Manual ("TRM"), and, more generally, within the Excel workbooks used to support the 2023-2026 DSM Portfolio Filing.
- Cost-effectiveness testing at the measure level can diminish the big-picture benefits of energy efficiency programs. Some non-cost-effective measures can provide benefits to a portfolio which the Commission could wish to consider at a policy level.
- Evergy is accurately capturing the costs within its Total Resource Cost ("TRC") test but not the benefits, leading to imbalance.

[1] Evergy Kansas Metro and Evergy Kansas Central. KEEIA 2023–2026 Demand-Side Management Portfolio Filing, December 17, 2021, p. 7. Hereafter called "2023-2026 DSM Portfolio Filing."

- A rate and bill impact assessment ("RBIA") should be conducted alongside a Ratepayer Impact Measure ("RIM") test to allow for more comprehensive decision making and clarity regarding potential bill impacts.

2.2. Summary of Recommendations

Q. Please summarize your recommendations.

A. I recommend that, after the existing program gains some footing, the following modifications be applied to future planning cycles:

- The KCC should revisit elements of the benefit-cost analysis ("BCA") framework including, but not limited to, improving cost-effectiveness testing practices by removing measure-level screening thresholds, calculating all costs and benefits associated with the TRC test, and supplementing the RIM test with a RBIA for decision-making purposes.
- Evergy should improve modeling transparency within cost-effectiveness calculations and the TRM.

3. ASSESSMENT OF FUTURE DSM PLANS

Q. Within your testimony, what have you identified as areas for Evergy to improve when submitting future plans?

A. There are two high-level elements I suggest the Commission review with additional scrutiny in subsequent plans. First, I recommend that Evergy modify several of its cost-effectiveness screening practices. Second, I recommend that Evergy improve its modeling transparency with respect to cost-effectiveness testing and the TRM.

3.1. Cost effectiveness testing

Q. What elements of cost-effectiveness screening should be improved to align with industry best practices?

A. I have three recommendations for Evergy's cost-effectiveness screening practices. Evergy should (1) refrain from screening at the measure-level when determining which measures to include within its portfolio, (2) include all participant-related benefits within the TRC test, and (3) supplement the RIM test with a RBIA for decision-making purposes.

Q. How does Evergy use cost-effectiveness testing to determine which measures belong in its portfolio?

A. Evergy relies on the results of the measure-level TRC test to determine which measures belong within its portfolio.[2] Measures that exceed a TRC test ratio of 1.0 are included within the portfolio. Evergy also considers the RIM test as its other primary test with an objective to have all measures exceed a RIM test ratio of 0.7.[3]

Q. Do you agree with this application of the TRC test?

A. No. Cost-effectiveness testing at the measure level is a problematic approach to developing a comprehensive energy efficiency portfolio. While this approach ensures every measure is cost-effective, it can diminish the big-picture benefits of energy efficiency programs. Some non-cost-effective measures can provide benefits to a portfolio. For instance, a customer may be swayed to participate in a program because of a particular non-cost-effective measure, and then, as a result, install additional measures that are cost-effective,

[2] Evergy response to f21.
[3] Evergy response to CURB-23.

or simply develop a relationship with the program administrator. A positive relationship could be instrumental in encouraging the same customer to consider other measures in the future or to help to spread the word about benefits of the program. Additionally, non-cost-effective measures may work well in tandem with other measures, or even be essential to the safe operation or installation of other measures. For instance, high-quality ventilation could be a necessary compliment to air sealing or HVAC measures, even though ventilation might not be cost-effective on its own.[4]

It is useful to obtain cost-effectiveness test results at the measure level for informational purposes, but I caution against this as a strict threshold.

Q. Is cost-effectiveness testing at the measure-level consistent with the KEEIA statute?

A. Not necessarily. The KCC has the flexibility to consider cost-effectiveness of both the energy efficiency program portfolio and the individual programs—the KCC does not include measure-level cost-effectiveness as screening criteria.[5] The KCC has previously applied this approach, ultimately declining to approve individual programs that failed to pass either the TRC or the RIM tests in its order in Docket No. 16-KCPE-446-TAR.[6]

Q. What do you recommend as an alternative to cost-effectiveness assessment at the measure level?

A. I suggest that Evergy assess cost-effectiveness at the program or, preferably, sector level. By assessing the portfolio more broadly than at the measure level, the company has more

[4] National Energy Screening Project (NESP). 2020. *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources (NSPM for DERs)*. E4TheFuture, Synapse Energy Economics, Energy Futures Group, ICF, Pace Energy and Climate Center, Schiller Consulting, Smart Electric Power Alliance. Pages H-1 through H-3.

[5] 2009 Order in Docket 08-442.

[6] Docket No. 16-KCPE-446-TAR, Final Order (June 22, 2017).

room for dynamic programs and innovation. Evergy would have the flexibility to implement smaller programs, such as residential new construction, that may not be independently cost-effective but have positive impacts on long-term savings. This recommendation is not meant to imply the company should relax its due diligence of cost-effectiveness at the program-level or even more granular assessments. Evergy should continue to check for cost-effectiveness at the measure level and scrutinize measures that fall below 1.0, but should not restrict its ability to offer measures or programs that justifiably serve to enhance the portfolio as whole.

Q. What costs and benefits does Evergy include as inputs in its TRC test?

A. Evergy's TRC test inputs include participant incremental costs, utility incentive costs, and program administration costs. For benefits, it includes avoided electric energy costs and avoided electric capacity costs.

Q. Are there any other costs and benefits you would suggest including?

A. Yes. A TRC test is supposed to capture the full costs and benefits of the measure to both the utility and the program participants. Evergy is accurately capturing the costs within its TRC test but not the benefits, leading to imbalance. Evergy did not include the avoided credit and collection costs, which represent real financial benefits to ratepayers as a result of energy efficiency and should be applied as benefits to the applicable customer segments, such as the hard-to-reach residential customers. Evergy's TRC test also excludes benefits associated with non-electric fuel savings.[7] Unlike the utility cost test, which may appropriately focus its analysis on its delivery fuel (in the case of Evergy, electricity), the

[7] 2023-2026 DSM Portfolio Filing. Page 20.

TRC test takes a broader view. If the TRC test accounts for participant costs, it should also account for the participant savings associated with non-electric fuels, such as gas, oil, propane, water, and any other resources that are reduced with programmatic funding and represent real cost savings for customers. In its current form, Evergy's TRC test accounts only for participant costs and ignores all participant benefits.

Q. Do you have any resources for how the Company can value the additional costs and benefits you recommend including in the TRC test?

A. Yes. Evergy can find information on how best to calculate non-electric fuel benefits in the *Methods, Tools and Resources Handbook*, published by the National Energy Screening Project ("NESP") in 2022.[8]

Q. How does Evergy use the RIM test for decision making?

A. Evergy uses the RIM test as a cost-effectiveness test to assess the financial impact of utility investments on customers.

Q. Do you agree with this application of the RIM test?

A. Somewhat. The RIM test serves two purposes: (1) to determine if an investment is likely to increase or decrease rates, and (2) to determine if a RBIA should be conducted. The RIM test is an insufficient tool to look at on its own—rather, it should be paired with a comprehensive RBIA if a value of less than 1.0 is triggered by the RIM test. If a measure fails the RIM test, the test does not indicate how much rates would increase, and who would experience that increase. A separate RBIA is much better suited to answer these questions.

[8] NESP. 2022. *Methods, Tools and Resources: A Handbook for Quantifying Distributed Energy Resource Impacts for Benefit-Cost Analysis.* Available at: https://www.nationalenergyscreeningproject.org/resources/quantifying-impacts/.

RBIAs indicate the direction and magnitude of the impacts, and to whom those impacts occur. In particular, a well-designed RBIA will break out impacts to rates and bills for both participants and non-participants.[9] Smaller bill impacts and consideration of external personal motivations or benefits tied to participation (e.g. bill impacts, conservation efforts, desire to reduce personal carbon footprint) may justify including non-cost-effective measure. In summary, while a RIM test can be a helpful tool for quickly determining whether an investment will impact rates, a RBIA should supplement the RIM test for any major decisions regarding program offerings.

Q. Do you have any resources where the Company can find additional information on RBIA?

A. Yes. Evergy can find more information on best practices for RBIAs in the *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources,* published by NESP in 2020.[10]

3.2. Modeling transparency

Q. Please summarize the ways in which Evergy has introduced transparency into this docket.

A. In an effort to improve transparency regarding its proposed energy efficiency plan, Evergy held four technical conferences spanning the period from January 28, 2022 through

[9] National Energy Screening Project (NESP). 2020. *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources (NSPM for DERs)*. E4TheFuture, Synapse Energy Economics, Energy Futures Group, ICF, Pace Energy and Climate Center, Schiller Consulting, Smart Electric Power Alliance. Appendix A.

[10] National Energy Screening Project (NESP). 2020. *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources (NSPM for DERs)*. E4TheFuture, Synapse Energy Economics, Energy Futures Group, ICF, Pace Energy and Climate Center, Schiller Consulting, Smart Electric Power Alliance. Appendix A.

February 25, 2022. Evergy provided an overview of its plan and allowed stakeholders to ask questions and provide comments. I appreciated the opportunity to attend these sessions and I applaud Evergy for its responsiveness to stakeholders during each technical conference. I strongly support the continuation of this practice in upcoming DSM filings. Further, Evergy held several meetings to review and address issues raised by CURB and Commission Staff ("Issues List Meetings"). Within these meetings, Evergy walked through its proprietary models contained within the 2023-2026 DSM Portfolio filing, including DSMore and the TRM. Evergy and its consultants responded to a multitude of concerns in these sessions and in subsequent discovery requests, allowing CURB to build a thorough understanding of Evergy's Plan and its supporting documents. I value Evergy's willingness to host these meetings and integrate recommendations from intervenors, including a more comprehensive program breakdown.

Q. Please state the areas in which Evergy could improve transparency.

A. Evergy could improve transparency around assumptions and methods, specifically regarding its cost-effectiveness calculations, its TRM, and, more generally, within the Excel workbooks used to support the 2023-2026 DSM Portfolio Filing.

Q. What are the advantages of an accessible and transparent cost-effectiveness tool?

A. It is in the best interest of both Evergy and its ratepayers to have an easily digestible model that clearly defines all sources and assumptions. Models that require unique platforms to operate or extensive background knowledge can limit the number of users that can operate the tool, creating accessibility issues within an organization and for outside parties. Importantly, this can lead to unnoticed errors within the modeling or, just as importantly,

a lack of confidence in the results. Allowing for a thorough, independent review builds trust in the numbers, which is especially important for a new portfolio.

Q. How did Evergy calculate measure-level cost-effectiveness?

A. The model Evergy uses outputs costs and benefits as defined by each of the five primary cost-effectiveness tests: Societal Cost Test (SCT), TRC, RIM, Utility Cost Test (UCT), and Participant Cost Test (PCT). Evergy calculates cost-effectiveness using DSMore, a proprietary tool developed by Integral Analytics. DSMore inputs **[redacted]**[11] **[redacted]**[12] **[redacted]**

Q. In what ways did the DSMore tool impact outside review of the Application?

A. Third-party intervenors do not have full access to DSMore and are unable to review how the proprietary backend code operates. **[redacted]** I

[11] DSMore User Manual. 2020. Page 7. (Confidential).
[12] Evergy's Response to CURB-57. Part c.iii, and QCURB-57_DSMore Monthly End Use Load Shapes.xlsx.

was not able to trace how ** [redacted] ** to result in the final costs and benefits to test the accuracy of the calculations.

Q. Please summarize your recommendations for more transparent cost-effectiveness modeling.

A. Evergy currently uses DSMore to calculate cost-effectiveness. As stated previously, DSMore's calculations for cost-effectiveness are executed with code that is not visible or accessible to intervenors. While I understand that some inputs may be considered confidential, the calculations used to determine the costs and benefits associated with the portfolio should be available for review. Transparent cost-effectiveness models are commonplace for energy efficiency programs. While moving away from DSMore would not be feasible within the current planning period, I strongly recommend Evergy investigates the merits of an Excel-based (or comparable) cost-effectiveness model that contains all calculations required to calculate cost-effectiveness.

Q. Please provide an example of best practice modeling for cost-effectiveness.

A. In Massachusetts, the energy efficiency program administrators file their benefit-cost models with the Department of Public Utilities such that they are available to the general public. While it is uncommon that ratepayer-funded energy efficiency providers make their Excel-based models publicly available, it is commonplace for models to be made available to stakeholders and intervenors in a dissectible format. Massachusetts' model is used as the best practice example due to its availability, but cost-effectiveness models throughout the country also provide open-sourced models to stakeholders and other intervenors, including: Iowa (Alliant), Wisconsin (Focus On Energy), Rhode Island (National Grid), and New Hampshire (all utilities).

The Massachusetts model (cited in the footnote) serves as a good example of a transparent benefit-cost calculator.[13] This model is self-contained, such that all the calculations happen within the model. Wherever possible, sources are included for hard-coded values. This model contains all inputs and calculations at the measure-level, with the measure IDs corresponding to the Massachusetts TRM. While this version of the model does not include the benefit-cost ratios aggregated by program, a user could easily produce a report based on the "Master Data" tab, which includes the total costs and the total benefits used within the Total Resource Cost Test.

Q. What are the advantages of an accessible, transparent TRM?

A. Accessible, transparent TRMs are essential for energy efficiency programs. Quantifiable energy savings are the foundation of these programs and, therefore, all assumptions should be available for review by stakeholders. A transparent process allows stakeholders to make suggestions not only regarding the values, but any underlying logic. Energy savings and any accompanying impact factors can be both complex to calculate and constantly evolving due to technology updates, industry baselines, market saturation, and numerous other influences. These assumptions effect cost-effectiveness results, performance incentives, and bill impacts. A transparent TRM reassures stakeholders that the program administrators are confident in their results and sources and welcome external scrutiny, particularly if results vary from neighboring states or other trusted studies.

[13] Eversource Energy. 2022. *2022-2024 Three Year Energy Efficiency Plan*. (DPU. 12-129). ExhibitEversourceEnergy-5(Revised)-BCRModel(12-21 AppendixC(Revised).xlsx. Available at: https://eeaonline.eea.state.ma.us/DPU/Fileroom/dockets/bynumber.

Q. How did Evergy construct its TRM?

A. In Evergy's response to CURB-58, the company describes its process for compiling the TRM as follows:

> *"As the attachments outline, the TRM was created from a robust process that evaluated thousands of energy efficiency and demand response measures for attributes suitable for a Kansas portfolio. The end goal of the process was to create a manageable resource document that would pare down measures to the hundreds, be visible in a single usable spreadsheet for reference and inputs into DSMore and be applicable across all of Evergy's Kansas footprint (including Metro and Central jurisdictions)."*[14]

In attachment "QCURB0058_Evergy_TRM Measure Development Process.docx," Evergy expands upon this description with the following information:

> *"Evergy's process for program design leveraged lessons learned from implementations in Missouri and best practices from other programs across the country to develop a savings model for measures that is as accurate as possible, and takes into consideration evaluation, review, and ease of implementation to maximize program benefits. With this in mind, a large model was created that included a long list of measures that would need to be condensed to create a final Evergy Kansas Technical Resource*

[14] Evergy's response to CURB-58.

Manual (TRM) but would allow initial design to have more specific details to better represent the Kansas Territories."[15]

In Evergy's response to CURB-18, which asks how measures were repurposed from other TRMs, the company answered as follows:

"Evergy utilized the subject matter and industry expertise of a consultant, ICF, to develop the TRM for the KEEIA filing. ICF created the TRM which is comprised of cost-effective program measures. The basis for the measure characteristics and savings were derived from ICF's work on a recent Missouri DSM potential study for Evergy adjusted for Kansas specific data where available. The Kansas specific information was utilized in all cases for climate variables, such as CDD and HDD, but was also done for many appliance and housing stock variables. Where Kansas data was not available, Missouri data was prioritized as the next best resources. The data inputs going into the equations were only used from other TRMs where either there was no better source or the change in the value was unlikely to be significant. Values from TRMs in other states was prioritized based on the similarity of the applicable TRM jurisdiction to Kansas (Illinois being the primary TRM based on proximity and comprehensiveness and also use in MO)."[16]

[15] Evergy's response to CURB-58, Attachment QCURB0058_Evergy_TRM Measure Development Process.docx.
[16] Evergy's response to CURB-18.

Neither Evergy nor its consultant, ICF, provided the model used to compile the list of measures from the potential study, the Missouri TRM, or other neighboring TRMs, citing this information as proprietary. ICF also did not provide a full list of measures input into the model, the sources for those measures, or the algorithms used by the model to determine which value was most relevant to Kansas. I am therefore unable to describe the logic behind the calculations or see the full list of inputs. The flow charts provided by Evergy and ICF, while helpful, did not capture the level of detail I believe should be accessible to stakeholders when evaluating energy efficiency portfolios.

Q. Please elaborate on how Evergy could improve the transparency of the TRM.

A. For each measure within the TRM, a user should be able to find documentation as to how the value is calculated. The process used to calculate that value should be complete, replicable, and include any data sources used within the calculation. Transparency within this process is especially critical given that performance incentives are tied to measure-level savings. The current draft of the TRM (displayed in Appendix C of the 2023-2026 DSM Portfolio Filing) provides incomplete documentation at the measure-level.[17] Many of the measures within the TRM contain values for incremental measure cost and incremental electric energy savings but no source. In other instances, measure sources are listed as "Calculated" or "Calculated Value." It is unclear from these designations whether the values were calculated by Evergy or calculated by a vendor on a per-customer basis. In response to CURB-58, Evergy demonstrates how it calculates the weighted average for a set of Home Energy Education measures, which are a set of measures that are included in

[17] Evergy 2023-2026 DSM Portfolio Filing. Appendix C. Attachments QCURB0058_KEEIA TRM Development.ppt and QCURB0058_Evergy_TRM Measure Development Process.docx..

the TRM but unsourced (Evergy's response to CURB-58, Attachment "QCURB0058_Evergy KS_Aggregation Example.xls" and 2023-2026 DSM Portfolio Filing Appendix C). The energy savings used for the weighted average calculation are uncited within the workbook, although the separate Attachment to CURB-58, named "QCURB0058_Evergy_TRM Measure Development Process.docx," states these savings as coming from historical performance in Evergy Missouri. From this example, it is unclear why the TRM provided in Appendix C of the 2023-2026 DSM Portfolio Filing does not include "Historical performance in Evergy Missouri" as a source. Further, Evergy's response to CURB-58 did not describe how the model determined this particular source out of the numerous sources included within ICF's model.

In instances where the costs or savings value may vary by customer, Evergy should provide an algorithm, model, or other indication of how the value is calculated.

Many of the measures within Evergy's TRM do list a source by name (e.g. "IL TRM v8, 4.4.1."). While this is preferable to an omitted source, it is better practice to list the specific measure, or page number, from the reference and provide a link.[18] If the value has been modified to reflect the differences between the source jurisdiction and Evergy's territory, those changes should be recorded within the entry.

Q. Please summarize your recommendations for a more transparent TRM.

A. I suggest that Evergy develop a more transparent TRM during its first implementation cycle, building upon the existing measure list but expanding the data sources so all references, calculations, and studies are referenced in the correct location. Appendix C in

[18] Evergy 2023-2026 DSM Portfolio Filing. Appendix C. Page 1.

the 2023-2026 DSM Portfolio Filing does not provide sufficient information regarding the origin of values that are foundational to Evergy's programs. Instead, each TRM entry should contain the following:

- Measure name and program
- Value(s) or algorithm(s) (if custom)
- Baseline efficiency equipment
- High efficiency equipment
- Study, TRM, or other reference name(s), page number(s), and link(s) (if available)

The source column value for the TRM entries should not be omitted under any circumstances, and rather should be sourced to the best of Evergy's ability.

Q. Please provide an example of best practice with regard to TRM transparency.

A. The Minnesota (MN) TRM serves as a good example of a clear, publicly available manual.[19] For measures with deemed savings, the MN TRM includes all evaluation studies and sources used to develop the value. Each source is linked at the bottom, and all evaluation studies are available for download. For calculated values, each entry includes the applicable algorithm as well as all definitions and sources required to calculate the value for an eligible participant. For a complete example of best practices within a TRM, see pages 86-91 of the cited MN TRM for a complete measure entry for Residential

[19] Minnesota Department of Commerce. *Minnesota Technical Reference Manual*. Version 3.3. January 31, 2021. Available at: https://mn.gov/commerce-stat/pdfs/mn-trm-3-3.pdf.

HVAC–Furnaces and Boilers. This example provides an algorithm with every variable defined as well as links to all sources and evaluation studies.

Q. What steps can Evergy take to begin the development of a more transparent TRM?

A. I suggest Evergy form a working group to help facilitate the development of a transparent TRM. This group should consist of a range of stakeholders that develop a plan to improve the TRM and other related tasks. In the beginning, this group should establish a charter to describe the roles and responsibilities of the group and of individual members, and procedures for voting, requesting meetings, or suggesting issues for discussion. This group can review additional materials for best practices for TRMs to ensure Evergy's new approach will be a success.

Q. More generally, how Evergy could improve the accessibility of its Excel workbooks and workpapers for outside review?

A. Evergy could increase the overall transparency of its Excel workbooks and workpapers by thoroughly integrating citations and references across the board. Citations within workbooks are useful both for intervenors to review workbooks for accuracy and for the company's internal record keeping and update processes. In Question CURB-57, I provide a list of undocumented assumptions in six different Excel workbooks. I appreciate that Evergy responded to each request for citations, including references to where I could access the data if applicable. Going forward, I strongly suggest integrating these citations into the respective workbooks. Ideally, all values that are hard-coded into the model would be accompanied by a citation, either directly next to the value or in a glossary-style tab within the workbook.

Q. Does this conclude your recommendations for future DSM plans?

A. Yes.

Q. Please reiterate why your recommendations within this testimony apply to future DSM plans rather than the current 2023-2026 DSM Portfolio Filing?

A. Evergy Kansas is putting forth its first large scale DSM plan for the 2023–2026 term. Unlike the DSM plans I reference as examples of best practice, Evergy has not had years of historical plans to build upon and to perfect. I recognize that a brand-new portfolio faces a unique set of hurdles which require significant time and effort, such as building new relationships with customers and vendors, managing supply chains, and tracking considerable amount of new data. In short, new programs should be allowed some leeway as they become established within a territory. However, it is in the best interest of the Company to adopt best practices soon so that future plans can maintain historical consistency.

Q. Does this conclude your direct testimony?

A. Yes, it does.

VERIFICATION

COMMONWEALTH OF MASSACHUSETTS)
)
COUNTY OF MIDDLESEX) ss:

Danielle Goldberg, being duly sworn upon her oath, deposes and states that she is a consultant for the Citizens' Utility Ratepayer Board, that she has read and is familiar with the foregoing *Direct Testimony*, and that the statements made herein are true and correct to the best of her knowledge, information, and belief.

Danielle Goldberg

SUBSCRIBED AND SWORN to before me this 16 day of June, 2022.

Notary Public

My Commission expires: 09/04/25

OFFICIAL STAMP
ALLYSON MICHELLE PHILLIPS
NOTARY PUBLIC - OREGON
COMMISSION NO. 1014725
MY COMMISSION EXPIRES September 6, 2025

Danielle Goldberg, Senior Associate

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dgoldberg@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Senior Associate*, April 2022 – Present, *Associate*, April 2019 – April 2022, *Research Associate*, February 2017 – March 2019

- Conducts research and provides consulting on energy sector issues, with a focus on data, programs, policies, and technologies related to energy efficiency, electrification, and electricity generation.
- Analyzes ratepayer-funded energy efficiency and other distribute energy resource programs across North America for best practices in cost-effectiveness testing and program design.
- Develops and evaluates cost-benefit analyses and other Excel-based models for energy efficiency programs and technologies.
- Prepares and assists with expert testimony related to various energy-sector topics

Helping Overcome Obstacles Peru, Arequipa, Peru. *School Coordinator, English Teacher*, May 2016 – July 2016

- Managed daily operation of the school and organized school functions, including assemblies and field trips.
- Acted as liaison between office staff, volunteers, and parents, communicating in both Spanish and English.
- Developed and led custom lesson plans to teach English to children ages 3-6.

Allen Medical Systems, Acton, MA. *New Product Development Co-op*, January – June 2015

- Designed lifecycle tests for arm traction device adhering to medical standards.
- Worked with pneumatic and electromechanical equipment.
- Developed extensive test documentation detailing calculations and procedures for load profiles and estimated lifetime usage.
- Created parts, drawings, and assemblies for design prototypes.

Bose Corporation, Framingham, MA. *Design Compliance Engineering Mechanical Test Co-op*, January – June 2014

- Performed design validation testing on audio and visual products.
- Conducted environmental and dynamic testing, such as thermal testing, transportation testing, drop testing, and surface damage testing.

Amphenol Alden Products, Brockton, MA, *Mechanical Engineering Co-op*, January – June 2013

- Completed extensive formal training in the fundamentals of SolidWorks for 2D and 3D modeling followed by application of software.
- Performed tolerance analyses and proposed changes based on the results.
- Assessed severity of micro-cracks in electrical connectors using advanced lab equipment.

EDUCATION

Northeastern University, Boston, MA
Bachelor of Science in Mechanical Engineering, 2016. *Cum Laude*.

PUBLICATIONS

Takahashi, K., T. Woolf, B. Havumaki, D. White, D. Goldberg, S. Kwok, A. Takasugi. 2021. *Missed Opportunities: The Impacts of Recent Policies on Energy Efficiency Programs in Midwestern States*. Synapse Energy Economics for the Midwest Energy Efficiency Alliance.

Takahashi, K., E. Sinclair, A. Napoleon, A.S. Hopkins, D. Goldberg. 2021. *Evaluation of EnergyWise Low-Income Energy Efficiency Program in Mississippi – Program Performance, Design, and Implications for Low-Income Efficiency Programs.* Synapse Energy Economics for Sierra Club and Gulf Coast Community Foundation.

Eash-Gates, P., K. Takahashi, D. Goldberg, A.S. Hopkins, S. Kwok. 2021. *Boston Building Emissions Performance Standard: Technical Methods Overview.* Synapse Energy Economics for the City of Boston.

Goldberg, D., J. Frost, D. Hurley, K. Takahashi. 2020. *New England Electrification Load Forecast.* Synapse Energy Economics for E4TheFuture.

Takahashi, K., J. Frost, D. Goldberg, A. S. Hopkins, K. Nishio, K. Nakano. 2020. *Survey of U.S. State and Local Building Decarbonization Policies and Programs*. Presented at the 2020 ACEEE Summer Study of Energy Efficiency in Buildings.

Malone, E., T. Woolf, D. Goldberg. 2019. "Assessing Resource Cost Effectiveness." *A.E.S.P. Magazine,* 2019 Edition, 8-10.

Napoleon, A., D. Goldberg, K. Takahashi, T. Woolf. 2019. *An Assessment of Prince Edward Island Energy Corporations' 2018 - 2021 Energy Efficiency and Conservation Plan.* Synapse Energy Economics for Carr, Stevenson and MacKay as Counsel to the Island Regulatory and Appeals Commission.

Malone, E., D. Goldberg, J. Frost. 2018. *Database of State Efficiency Screening Practices (DSESP): A Resource of the NESP*. Synapse Energy Economics for E4TheFuture.

Knight, P., D. Goldberg, E. Malone, A. S. Hopkins, D. Hurley. 2018. *Getting SMART: Making sense of the Solar Massachusetts Renewable Target (SMART) program*. Prepared for Cape Light Compact.

Malone, E., T. Woolf, D. Goldberg. 2018. *Updating the Energy Efficiency Cost-Effectiveness Framework in Minnesota: Application of the National Standard Practice Manual to Minnesota.* Conservation Applied Research and Development (CARD) Report. Synapse Energy Economics for Minnesota Department of Commerce, Division of Energy Resources.

Fisher, J., M. Whited, T. Woolf, D. Goldberg. 2018. *Utility Investments for Market Transformation: How Utilities Can Help Achieve Energy Policy Goals.* Synapse Energy Economics for Energy Foundation.

A. Hopkins, PhD, K. Takahashi, D. Goldberg.2018. *Strategic Electrification Webinar*. Synapse Energy Economics.

D. Goldberg, E. Malone, J. Kallay, K. Takahashi. 2018. *Blog post: Switch on the Savings: A Heat Pump Cost-Effectiveness Study.* Synapse Energy Economics.

D. Goldberg, J. Kallay. 2017. *Blog post: Energy Efficiency Programs Plan for Post LED Success.* Synapse Energy Economics.

TESTIMONY

New Hampshire Public Utilities Commission (Docket No. DE 20-092): Direct Testimony of Courtney Lane and Danielle Goldberg regarding the NHSaves 2021-2023 Triennial Energy Efficiency Plan and the importance of ratepayer funded energy efficiency programs. On behalf of the Office of the Consumer Advocate. April 19, 2022.

TESTIMONY ASSISTANCE

Illinois Commerce Commission (Docket No. 18-0211): Direct Testimony of Max Chang regarding Ameren Illinois Company's voltage optimization plan and the importance of prioritizing low-income communities. On behalf of the People of the State of Illinois, represented by the Office of the Illinois Attorney General. March 7, 2018.

Commonwealth of Massachusetts Appellate Tax Board (Docket No. C331142): Expert report by Max Chang on the process of steam generation and distribution under the Commonwealth of Massachusetts' definition for manufacturing. On behalf of the City of Boston. January 11, 2018.

Resume updated May 2022

REFERENCED DATA REQUESTS

CURB DR – 18
CURB DR – 21
CURB DR – 23
CURB DR – 57 (Confidential not provided)
CURB DR – 58

Evergy KS Central and KS Metro
Case Name: 2022 EKME_EKCE KEEIA
Case Number: 22-EKME-254-TAR

Requestor Astrab Joseph -
Response Provided February 21, 2022

Question:CURB-18

Please refer to Appendix C.

a. Please explain the process used by Evergy to assign incremental values, impact factors, or other measure characteristics to measures within the TRM.

i. For instances where values were repurposed from existing TRMs, please include which TRMs were reviewed and why the TRMs referenced within Appendix C were selected as proxies for Kansas programs. Please clarify if location-specific conditions such as weather, housing stock, or cost-of-living metrics were accounted for during this process and if any values were modified as a result of these considerations.

RESPONSE: (do not edit or delete this line or anything above this)

Response:

Evergy utilized the subject matter and industry expertise of a consultant, ICF, to develop the TRM for the KEEIA filing. ICF created the TRM which is comprised of cost-effective program measures. The basis for the measure characteristics and savings were derived from ICF's work on a recent Missouri DSM potential study for Evergy adjusted for Kansas specific data where available. The Kansas specific information was utilized in all cases for climate variables, such as CDD and HDD, but was also done for many appliance and housing stock variables. Where Kansas data was not available, Missouri data was prioritized as the next best resources. The data inputs going into the equations were only used from other TRMs where either there was no better source or the change in the value was unlikely to be significant. Values from TRMs in other states was prioritized based on the similarity of the applicable TRM jurisdiction to Kansas (Illinois being the primary TRM based on proximity and comprehensiveness and also use in MO).

Information provided by:
Mark Leonard

Verification:
I have read the Information Request and answer thereto and find answer to be true, accurate, full and complete, and contain no material misrepresentations or omissions to the best of my knowledge and belief; and I will disclose to the Commission Staff any matter subsequently discovered which affects the accuracy or completeness of the answer(s) to this Information Request(s).

Signature /s/ *Brad Lutz*
Director Regulatory Affairs

Evergy KS Central and KS Metro
Case Name: 2022 EKME_EKCE KEEIA
Case Number: 22-EKME-254-TAR

Requestor Astrab Joseph -
Response Provided March 03, 2022

Question:CURB-21

Please refer to the 2023-2026 Demand-Side Management Portfolio Filing, p. 7-8 and 18. What specific criteria and criteria thresholds did Evergy use to determine which measures belong in the portfolio? In light of overall portfolio cost effectiveness (e.g., as indicated by the UCT), why doesn't Evergy propose to tap more DSM resources?

RESPONSE: (do not edit or delete this line or anything above this)

Response:
Measure-level TRC was used as the primary criteria with a 1.0 threshold for inclusion in the programs. Since the lowest TRC for any measure included is 1.0, this would result in an average TRC above 1.0 but would still constitute the inclusion of all cost-effective opportunities.
The objective of the Company's KEEIA portfolio filing was to balance cost effectiveness from multiple tests perspective (TRC and RIM primary per the KCC guidance) along with understanding customer financial impact (rate impact and bill savings). With those in mind, the portfolio proposed is different than what a portfolio would like with optimizing to UCT to 1.0 only.

Information provided by:
Mark Leonard & Brian File

Verification:

I have read the Information Request and answer thereto and find answer to be true, accurate, full and complete, and contain no material misrepresentations or omissions to the best of my knowledge and belief; and I will disclose to the Commission Staff any matter subsequently discovered which affects the accuracy or completeness of the answer(s) to this Information Request(s).

Signature /s/ *Brad Lutz*
Director Regulatory Affairs

Evergy KS Central and KS Metro
Case Name: 2022 EKME_EKCE KEEIA
Case Number: 22-EKME-254-TAR

Requestor Astrab Joseph -
Response Provided March 03, 2022

Question:CURB-23

Please explain how each of the following cost-effectiveness tests contribute to decision making including for DSM planning, program design, and incentive setting.

a. Total Resource Cost Test

b. Utility Cost Test

c. Ratepayer Impact Test

d. Participant Cost Test

e. Societal Cost Test

RESPONSE: (do not edit or delete this line or anything above this)

Response:
The KEEIA statute allows for the KCC to decide which cost effectiveness test it deems appropriate to approve demand side management (DSM) programs. Per previous KCC guidance in DSM dockets, the primary test used to evaluate program cost effectiveness was the Total Resource Cost test (TRC). Evergy's primary design consideration was that the TRC test result should be greater than 1 for all programs with the exception of programs targeted at low income or general education (public benefit). Secondarily, within the design considerations, there was also an objective to achieve a Ratepayer Impact Measure (RIM) testing result of 0.7 or greater per KCC Staff approach in a prior KEEIA case from 2016 (16-KCPE-466-TAR). All other tests were calculated as part of the design process for information about benefits being created from various perspectives but were not used in the program screening process.

Information provided by:
Mark Leonard

Verification:

I have read the Information Request and answer thereto and find answer to be true, accurate, full and complete, and contain no material misrepresentations or omissions to the best of my knowledge and belief; and I will disclose to the Commission Staff any matter subsequently discovered which affects the accuracy or completeness of the answer(s) to this Information Request(s).

Signature /s/ *Brad Lutz*
Director Regulatory Affairs

Evergy KS Central and KS Metro
Case Name: 2022 EKME_EKCE KEEIA
Case Number: 22-EKME-254-TAR

Requestor Astrab Joseph -
Response Provided April 25, 2022

Question:CURB-57

For each of the undocumented assumptions in the listed tabs of the following workbooks, please provide the source, related reports, documentation and workpapers, in native spreadsheet format with formulas intact and assumptions and inputs documented, preferably in a single workbook, with all tabs unlocked. If the data is from a model, please indicate the model.

a. QCURB-3_CONF_KEEIA EE DR Riders Calculator V11_(v23 programs) (for both EKC and EKM)

i. Main Inputs (locked)

ii. Territory Margin Rates

iii. Sales and Revenue

iv. Margin Rates

v. Retail Rates

vi. Monthly Load Shape

vii. Annual Riders Calc (locked)

viii. General Inputs (locked)

ix. Riders Calc (locked)

b. QCURB-3_CONF_Central Avoided Capacity Cost Framework vF.xlsx (for both EKC and EKM)

i. Assumptions

ii. Scenario Probabilities

iii. Preferred Plan Low Load woDSM

iv. Preferred Plan Mid Load woDSM

v. Preferred Plan Elect Load woDSM

vi. ENPFZ Low Load woDSM

vii. ENPFZ Mid Load woDSM

viii. ENPFZ Retire Elect Load woDSM

ix. IRP Peak Forecasts

c. QCURB-3_CONF_KEEIA 1 DSMore Batch Tool (for both EKC and EKM)

EKM)

i. Measures

ii. Budget

iii. Loadshapes

d. QCURB-3_CONF_KEEIA SPP transmission fee impact (v20 program results)

i. KS Central NSI-Sch 1A & LRS

ii. KS Central NSI-Sch 12

iii. KS NSI-Sch 1A & LRS

iv. KS NSI-Sch 12

v. Reg Zonal Avg Loads

vi. Total Reg ATRR Aug 2021

vii. Pre-IS ATRR

viii. Post-IS ATRR

e. For all assumptions input into QCURB-3_CONF_KEEIA 1 DSMore Blank Batch Template (for both EKC and EKM).

f. QCURB-3_CONF_TD Avoided Cost Calc vF

i. Metro Avoided Capacity

ii. East LoadBook

iii. KS-Central

RESPONSE: (do not edit or delete this line or anything above this)

Confidentiality: CONFIDENTIAL
Statement: (4) Reports, work papers or other documentation related to work produced by internal or external auditors or consultants

Response:

[redacted]

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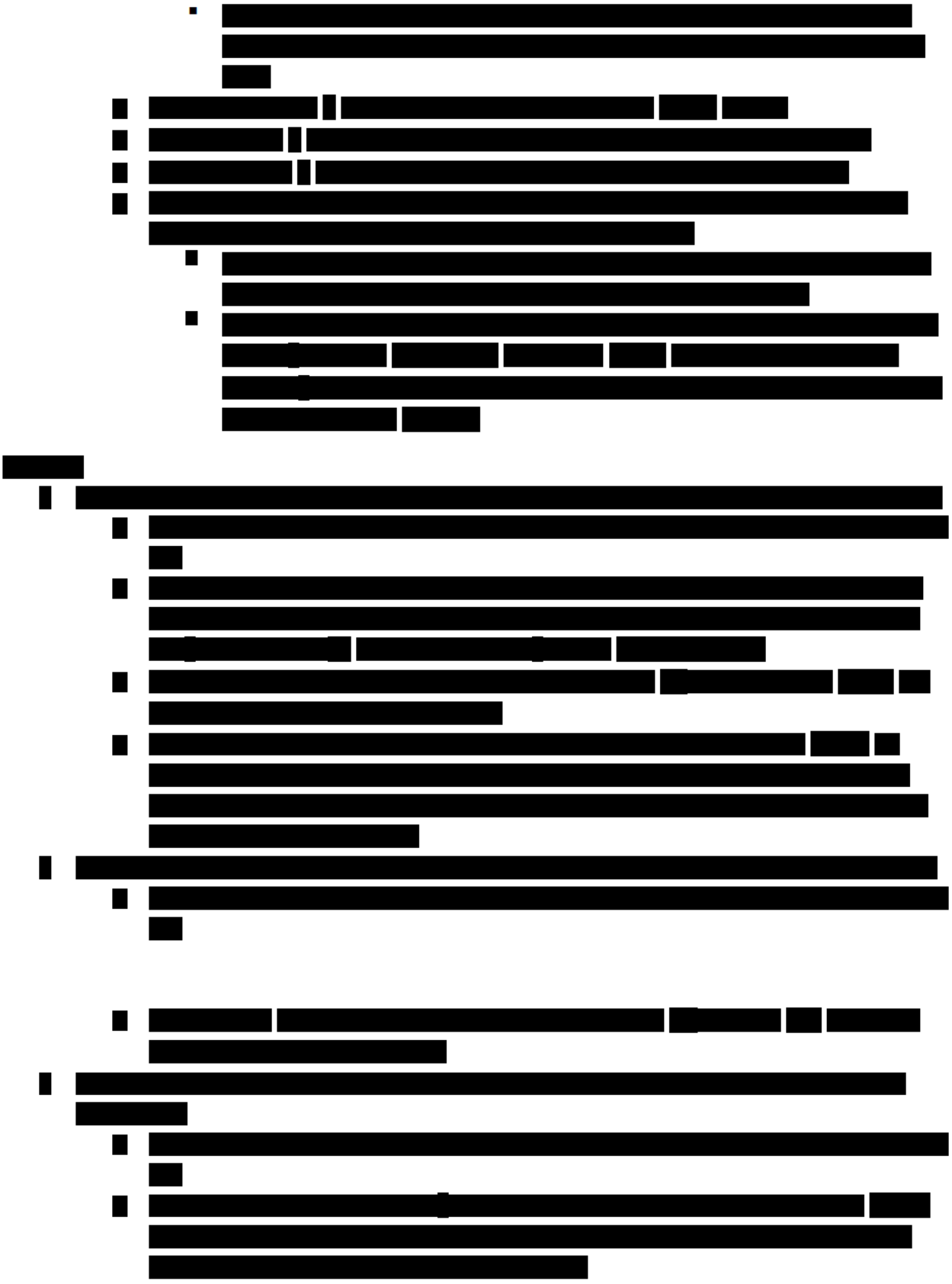

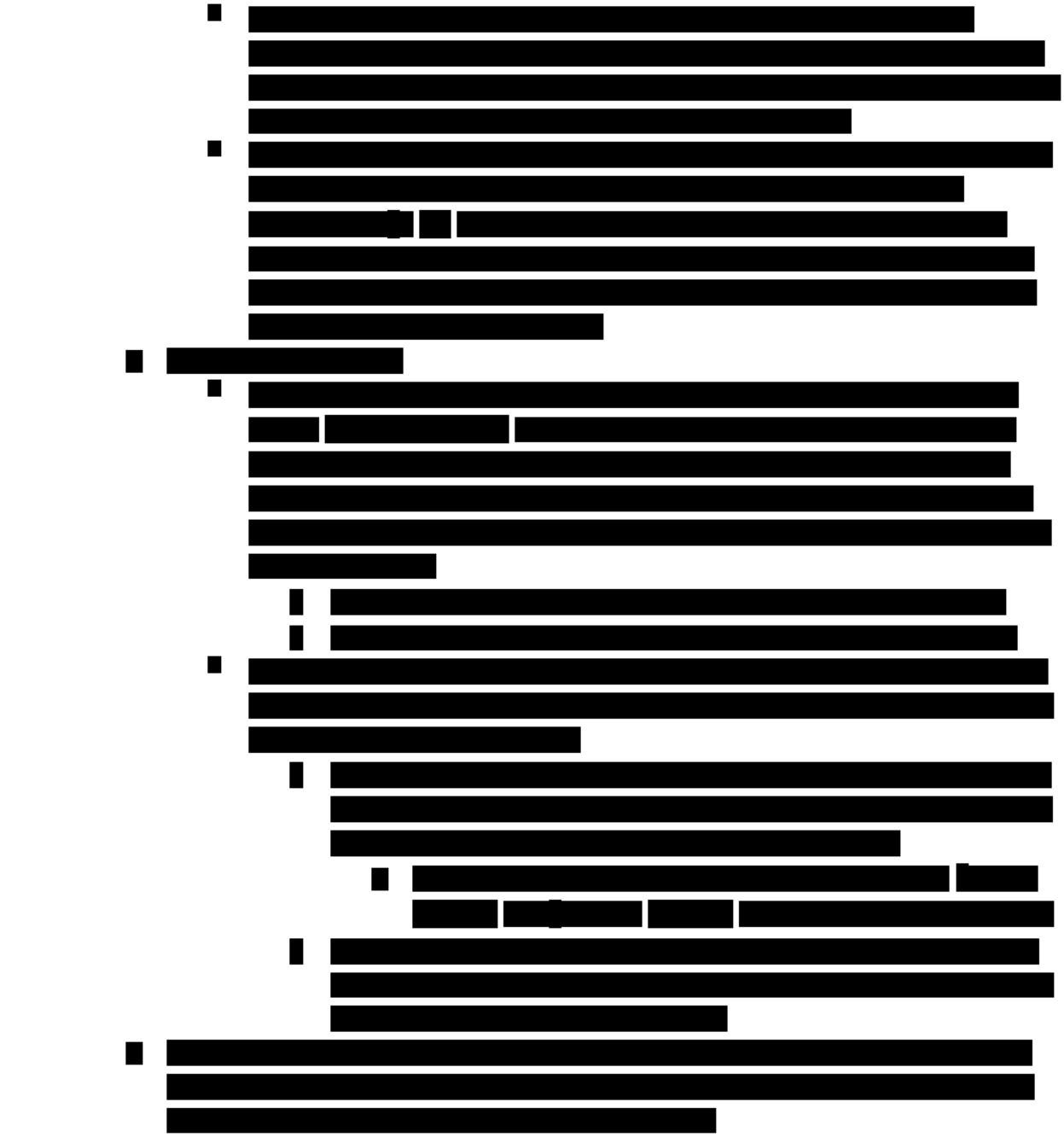

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Information provided by:
Mark Leonard
Tim Nelson
Mark Foltz
Kayla Messamore

Attachment(s):
[redacted]

[redacted]

Verification:

I have read the Information Request and answer thereto and find answer to be true, accurate, full and complete, and contain no material misrepresentations or omissions to the best of my knowledge and belief; and I will disclose to the Commission Staff any matter subsequently discovered which affects the accuracy or completeness of the answer(s) to this Information Request(s).

Signature /s/ *Brad Lutz*
Director Regulatory Affairs

Evergy KS Central and KS Metro
Case Name: 2022 EKME_EKCE KEEIA
Case Number: 22-EKME-254-TAR

Requestor Astrab Joseph -
Response Provided May 13, 2022

Question:CURB-58

Please refer to the Evergy KEEIA Technical Resource Manual (TRM) provided in response to KCC Q8.

a. In all instances where a source is listed as "Calculated" or "Calculated Value", please provide the formula. If the formula draws on inputs that are not currently in the TRM, please add these inputs to the TRM and provide the source, page number and link.

b. Please provide the source, page number and link or formula for calculating values shown in Column H: Net to Gross Factors and Col. O: Nameplate Demand Savings.

c. Please provide the source, page number and link or formula for calculating realization rates.

d. Please provide the formula for calculating net to gross factors.

e. Please add a tab that defines the data in each column of the KEEIA TRM tab.

f. Please provide links to source documents.

g. In all instances where a source is not listed in the corresponding column, please provide the source, page number, and link, or calculation for the following:

iv. Column I: Incremental Measure Cost ($/Unit)

v. Column L: Electric Energy Savings (Annual kWh/unit)

vi. Column O: Nameplate Demand Savings (kW/unit)

vii. Column S: Coincident Peak Demand Savings (kW/unit)

viii. Column Y: Measure Life (Years)

If Evergy is unable at this time to populate all of the requested TRM data for all of Evergy's proposed DSM measures, please provide data for as many measures as feasible along with an explanation for how Evergy selected the subset of measures to cover in this sample.

RESPONSE: (do not edit or delete this line or anything above this)

Confidentiality: PUBLIC
Statement: This response is Public. No Confidential Statement is needed.

Response:

It is not feasible to provide the level of detail requested in the data request. As an alternative, Evergy can provide a summary of the approach used by ICF to create the measure specific values that are incorporated into the filed KEEIA Technical Resource Manual (see attachments).

As the attachments outline, the TRM was created from a robust process that evaluated thousands of energy efficiency and demand response measures for attributes suitable for a Kansas portfolio. The end goal of the process was to create a manageable resource document that would pare down measures to the hundreds, be visible in a single usable spreadsheet for reference and inputs into DSMore and be applicable across all of Evergy's Kansas footprint (including Metro and Central jurisdictions).

To part a of the question, the term "calculated value" outlined in the TRM refers to the approach used by ICF to work through the aggregation process to combine measures. A specific measure example of the aggregation calculation is also attached for reference.

Information provided by: Brian File, Director – DSM Products

Attachment(s):
QCURB0058_KEEIA TRM Development.ppt
QCURB0058_Evergy_TRM Measure Development Process.docx
QCURB0058_Evergy KS_Aggregation Example.xls

Verification:

I have read the Information Request and answer thereto and find answer to be true, accurate, full and complete, and contain no material misrepresentations or omissions to the best of my knowledge and belief; and I will disclose to the Commission Staff any matter subsequently discovered which affects the accuracy or completeness of the answer(s) to this Information Request(s).

Signature /s/ *Brad Lutz*
Director Regulatory Affairs

Modeled

Program Name	Sub-Sector	Territory	Efficient Measure Definition	kWh
Home Energy Education	HTR MF	Central	Income-Eligible Home Energy Report Custom Measure	76
Home Energy Education	HTR SF	Central	Income-Eligible Home Energy Report Custom Measure	97
Home Energy Education	MF	Central	Home Energy Report Custom Measure	135
Home Energy Education	SF	Central	Home Energy Report Custom Measure	165
Home Energy Education	HTR MF	Metro	Income-Eligible Home Energy Report Custom Measure	76
Home Energy Education	HTR SF	Metro	Income-Eligible Home Energy Report Custom Measure	97
Home Energy Education	MF	Metro	Home Energy Report Custom Measure	135
Home Energy Education	SF	Metro	Home Energy Report Custom Measure	165

Aggregators

	Central	Metro
HTR MF	6%	9%
HTR SF	3%	2%
MF	26%	62%
SF	65%	27%
TOTAL	*100%*	*100%*

These percentages come from dividing the total particiation for the individual iteration of the measure (based on sub-sector) by the the total participation for all iterations of the measure (for all sub-sectors) across all years of the modeling.

Program Name	Territory	Efficient Measure Definition	kWh
Home Energy Education	Central	Home Energy Report	149.9
Home Energy Education	Metro	Home Energy Report	137.1

Customers

Central	75%
Metro	25%

These percentages come from dividing the the total participation from a single territory by the total participation for all territories.

Program Name	Efficient Measure Definition	kWh
Home Energy Education	Home Energy Report	146.7

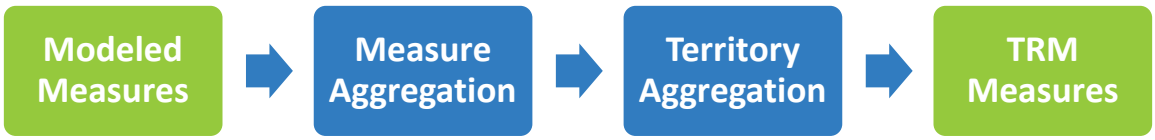
TRM

Program	Measure Name	kWh
Home Energy Education	Behavioral Measures Tier 1	146.7

Evergy's process for program design leveraged lessons learned from implementations in Missouri and best practices from other programs across the country to develop a savings model for measures that is as accurate as possible, and takes into consideration evaluation, review, and ease of implementation to maximize program benefits.

With this in mind, a large model was created that included a long list of measures that would need to be condensed to create a final Evergy Kansas Technical Resource Manual (TRM) but would allow initial design to have more specific details to better represent the Kansas Territories. There were originally two of these models, one for each jurisdiction of the Evergy Kansas Service Territory, so that each measures' likely performance could be modeled against predictive factors such as known building stock, demographics, and rate type.

Once likely performance was modeled at this detailed level it became necessary to combine this information in a logical way that would be implementable and logical according to evaluation best practices. To compile the measures for the TRM, these had to be combined through two aggregation steps, shown in the figure below.



Modeled Measures

The original database has thousands of measures that take an original recommended calculation process from established TRMs (like the Illinois TRM) and applies the calculation to detailed segment types, i.e. building types, and equipment types against their baselines. This allows the list to be comprehensive and compared to population and utility data to determine likely participation. This step is crucial in designing a program in a "green field" territory, where existing programs do not provide a participation baseline for the model. The Missouri participation in DSM programs provided the opportunity to QC the data by allowing the team to compare percent of likely participation across a similar territory, but the detailed measure study allows the Kansas program to be specifically designed to the building types and population data that exist in the real world.

For the example calculations in this whitepaper, the *Behavioral Measure Tier 1* measure is used. This is a residential measure that is included as a part of the Home Energy Education program. The savings for each version of the measure are calculated based on the historic performance of the measure in the Evergy MO territory, adjusted for the Evergy KS territory. The actual calculated values are listed in the table below:

Segment	Measure Savings
Single Family	165
Multi Family	135
Hard-to-Reach Single Family	97
Hard-to-Reach Multi Family	76

The source of the difference in each segments savings value for the same measure is the average home energy use per year. Hard to reach homes have lower average usage due to smaller average home size and less electrical equipment.

Measure Aggregation

Modeled measures and likely participation allowed the team to establish savings goals and budgets required for incentives. To streamline data collection and application processing, measures had to be aggregated to develop a list that is manageable by implementation teams, separated into distinct program types and with estimated savings weighted by business type. In other words, segments of the different sectors were combined to create an aggregate deemed measure.

In the case of residential offerings, single-family and multi-family measures were grouped where they logically could be but kept separate when the savings could differ significantly or there were specific planned offerings that differed based on home type. For commercial offerings, general and small business were combined in similar cases but kept distinct where logic dictated. The greatest amount of aggregation at this step was on the business side due to the wider variety of different segments in the original modeling.

In the larger model process this one measure has dozens of variations, not only in the type of the equipment but in the modeled savings that each segment type is likely create. For our example measure, the *Behavioral Measure Tier 1*, it applies to all residential customers.

The actual aggregation is a weighted average based on the forecasted participation by segment. In the case of the *Behavioral Measure Tier 1* measure, the segments, the measure-level savings, and their weighting by participation for each are shown in the following table for both territories.

Segment	**Measure Savings**	**Metro Weighting**	**Central Weighting**
Single Family	165	65%	27%
Multi Family	135	26%	62%
Hard-to-Reach Single Family	97	3%	2%
Hard-to-Reach Multi Family	76	6%	9%
Metro Aggregation	*137.1*	*100%*	-
Central Aggregation	*149.9*	-	*100%*

Territory Aggregation

Because the two Evergy Kansas territories are unique, the modeling up to this point was duplicated in each territory. However, it isn't practical or cost effective to run a separate TRM in each territory. Thus, the last step was to aggregate the measures across territories to create a single measure that would be representative of the expected savings of both territories. The aggregation was again done as a weighted average based on the forecasted participation but by territory in this case.

The data in the table below is from our example, the *Behavioral Measure Tier 1* measure:

Territory	Measure Savings	Territory Weighting
Metro	137.1	75%
Central	149.9	25%
TRM Measure	*146.7*	*100%*

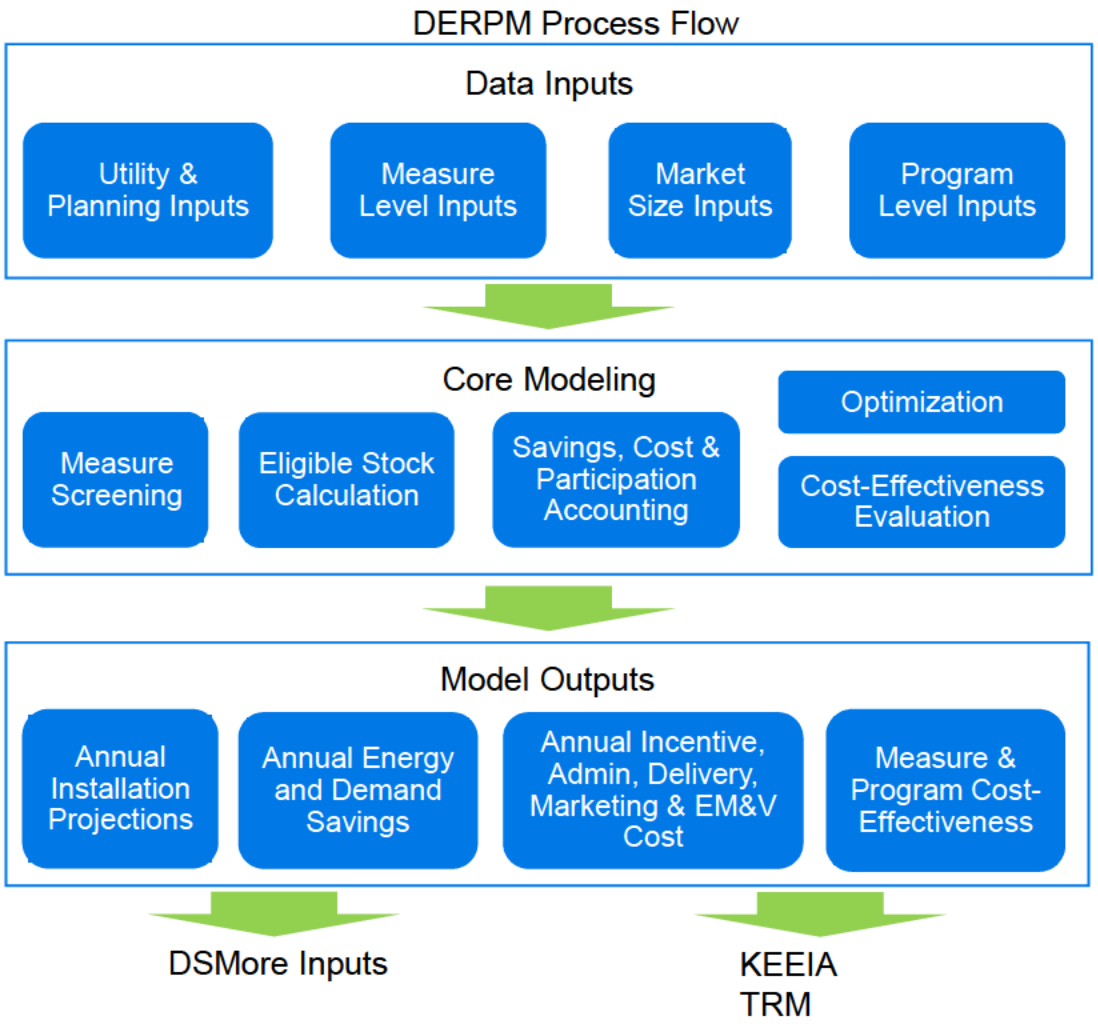
The territory weights are based on the total participation expected for each territory from the specific measure. This value is based both on the total number of customers in the applicable segments in each territory as well as the difference in forecasted participation rates in each territory.

KEEIA TRM development

evergy

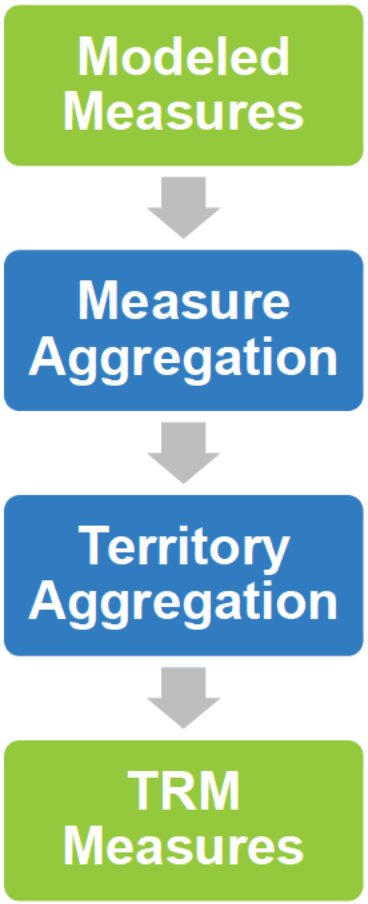
Recap of DSM Planning Process

1. **Program Scoping***
   - Programs and goals
2. **Measure Development**
   - Costs, savings, etc.
3. **Eligible Stock Calculation**
   - Territory details and stock
4. **Measure Selection**
   - Cost-effectiveness & goal achievement
5. **Program Design***
   - Model and program briefs
6. **Design Review***
   - Alternative designs and priorities



New example for Technical Conference

KEEIA TRM Development



- Modeled measures: two jurisdiction-based models with thousands of lines
  - Produces detailed totals for likely measure participation, savings achievement, and budgets
  - Allows unique jurisdictions modeling against predictive factors: building stock, demographics, etc.
- Measure aggregation necessary to create a useable (shorter) measure list for implementation
  - Grouped logically when savings impacts are similar but kept separate when characteristics produce a large modeled difference in savings
  - Largest impact in commercial offerings due to the wider variety of segments in the original models
- Territory aggregation necessary to combine the results from the separate models
  - Final TRM measures were weighted by average forecasted savings in each territory to derive one measure that could be used in either territory
- Ongoing measure evaluation of deemed savings
  - It is an evaluated practice to take a likely measure mix in a territory like Evergy's and use it to create the original deemed measure for program TRMs
  - As Kansas programs proceed through evaluated years, these measures will continue to evolve to more perfectly match program actuals

CERTIFICATE OF SERVICE

22-EKME-254-TAR

I, the undersigned, hereby certify that a true and correct copy of the above and foregoing document was served by electronic service on this 17th day of June, 2022, to the following:

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