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Evergy Services, Inc. Commercial & Industrial Evaluation, Measurement, and Verification Report – FINAL Appendices

MEEIA Cycle 3 – Program Year 3 (2022)

Prepared for:

evergy

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Report Definitions

Note: Definitions provided in this section are limited to terms critical to understanding the values presented in this report.

Reporting Periods

Cycle 2

Refers to programs implemented in program years 2016-2019, which corresponds to April 2016-December 2019.

Cycle 3

Refers to programs implemented in program years 2020-2023, which corresponds to January 2020-December 2023.

Savings Types

Gross Reported Savings

Savings reported in the Evergy Missouri West (Evergy MO West) and Evergy Metro annual reports prior to any evaluation, measurement, and verification (EM&V) ex post gross adjustments and net-to-gross (NTG) adjustments. In previous Guidehouse EM&V reports, gross reported savings were referred to as ex ante gross savings.

Gross Verified Savings

Savings verified through Guidehouse's impact evaluation methods prior to NTG adjustments. In previous EM&V reports, gross verified savings were referred to as ex post gross savings.

Gross Realization Rates

The ratio of gross verified savings to gross reported savings.

Missouri Energy Efficiency Investment Act (MEEIA) Target

Three-year savings target approved by the Missouri Public Service Commission for a given program.

Net Verified Savings

Savings verified through Guidehouse's impact evaluation methods and inclusive of NTG adjustments.

Percentage of MEEIA Target Achieved

The ratio of net verified savings to the MEEIA target; reflects Evergy MO West's and Evergy Metro's overall achievement toward the MEEIA target.

Net-to-Gross Components

Free Ridership (FR)

The program savings attributable to free riders—i.e., program participants who would have implemented a program measure or practice in the absence of the program.

Participant Spillover (PSO)

The additional energy savings achieved when a program participant—as a result of the program's influence—installs energy efficiency measures or practices outside the efficiency program after having participated.

Nonparticipant Spillover (NPSO)

The additional energy savings achieved when a nonparticipant implements energy efficiency measures or practices as a result of the program's influence (e.g., through exposure to the program) but that are not accounted for in program's gross verified savings.

Billing Analysis Approach to NTG

Approaches to estimating NTG that rely on the use of control groups, either through randomized control trials or quasi-experimental designs (e.g., the use of matching techniques to develop relevant nonparticipant comparison groups), and billing analysis to model participant net savings.

Key Report Sources

The following is a list of the most commonly referenced documents the evaluation team used for this year's analysis:

Illinois Technical Reference Manual Version 10.0. (Illinois TRM v10). https://www.ilsag.info/technical-reference-manual/il-statewide-technical-reference-manual-version-10-0/

Illinois Technical Reference Manual Version 9.0. (Illinois TRM v9). https://www.ilsag.info/technical-reference-manual/il-trm-version-9.

Illinois Technical Reference Manual Version 8.0. (Illinois TRM v8). https://www.ilsag.info/technical-reference-manual/il_trm_version_8/.

Illinois Technical Reference Manual Version 7.0. (Illinois TRM v7). http://www.ilsag.info/il_trm_version_7.html.

Evergy MEEIA 3 Technical Resource Manual - 2021-01-01 Update https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=EO-2019-0132&attach_id=2021006918

Missouri Public Service Commission. Missouri Energy Efficiency Investment Act (MEEIA) Rules and the Stipulation and Agreement. December 16, 2019.

Missouri Code of State Regulations 20 CSR 4240-22.070 (8).

California Public Utilities Commission. *California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects.* October 2001. https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpuc_public_website/content/utilities_and_industries/energy_-_electricity_and_natural_gas/cpuc-standard-practice-manual.pdf

Daniel M. Violette and Pamela Rathbun. "Estimating Net Savings: Common Practices," Chapter 23 in *The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures*. 2014. http://energy.gov/sites/prod/files/2015/02/f19/UMPChapter23-estimating-net-savings_0.pdf.

Jane Peters and Ryan Bliss. *Common Approach for Measuring Free Riders for Downstream Programs.* Research Into Action. October 4, 2013.

California Public Utilities Commission. "2007 SPM Clarification Memo." 2007. https://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/73172-10.htm.

Guidehouse, Inc. Evaluation, Measurement, and Verification (EM&V) Plan for MEEIA Cycle 3 for Evergy Services, Inc. December 2020.

Rachel Brailove, John Plunkett, and Jonathan Wallach. *Retrofit Economics 201: Correcting Commons Errors in Demand-Side Management Benefit-cost Analysis.* Resource Insight, Inc. Circa 1990.

Acronyms and Abbreviations

ASHP	Air Source Heat Pump
BMS	Building Management System
Btu	British Thermal Unit
C&I	Commercial and Industrial
CF	Coincidence Factor
CFL	Compact Fluorescent Lamp
CFM	Cubic Feet per Minute
CSM	Customer Solution Manager
dB	Decibel
DR	Demand Response
DLC	DesignLights Consortium
DSM	Demand Side Management
EE	Energy Efficiency
EER	Energy Efficiency Ratio
EFLH	Equivalent Full Load Hour
EM&V	Evaluation, Measurement, and Verification
ESF	Energy Savings Factor
ETO	Energy Trust of Oregon
EUL	Effective Useful Life
FR	Free Rider(ship)
HID	High-intensity discharge
HOU	Hours of Use
HP	Horsepower
HSPF	Heating Seasonal Performance Factor
HVAC	Heating, Ventilation, and Air Conditioning
HVLS	High Volume Low Speed
IC	Implementation Contractor
IECC	International Energy Conservation Code
IEER	Integrated Energy Efficiency Ratio
ISR	In-Service Rate
KCMO	Kansas City, Missouri
KCP&L	Kansas City Power and Light, now Evergy, Inc.
kW	Kilowatt
kWh	Kilowatt-Hour
LED	Light-Emitting Diode
MEEIA	Missouri Energy Efficiency Investment Act
MO	Missouri
NMR	NMR Group, Inc.

NPSO	Nonparticipant Spillover
NTG	Net-to-Gross
O&M	Operations and Maintenance
OBEA	Online Business Energy Audit
PCT	Participant Cost Test
PITA	Program Influence on Trade Ally
PSC	Permanent Split Capacitor
PSO	Participant Spillover
PTAC	Package Terminal Air Conditioner
PY	Program Year
RCx	Retrocommissioning
RIM	Ratepayer Impact Measure
RUL	Remaining Useful Life
SBL	Small Business Lighting
SCT	Societal Cost Test
SEER	Seasonal Energy Efficiency Ratio
SO	Spillover
SP	Single Phase
SPM	Standard Practice Manual
TMY3	Typical Meteorological Year 3
TRC	Total Resource Cost
TRM	Technical Reference Manual
UCT	Utility Cost Test
VFD	Variable Frequency Drive
VRF	Variable Refrigerant Flow
W	Watts
WHF	Waste Heat Factor
WHFd	Waste Heat Factor Demand
WHFe	Waste Heat Factor Energy

Document Structure

As agreed to with stakeholders and discussed during the Evergy DSM Advisory Group quarterly meetings (December 7, 2020 and January 27, 2021), Guidehouse (also referred to as the evaluation team throughout this document) is providing a condensed evaluation, measurement, and verification (EM&V) report that presents key impact evaluation findings and recommendations. This report also summarizes the program year 3 (PY3) process evaluation findings that address the five required questions per the Missouri Code of State 20 CSR 4240-22.070 (8) (Missouri regulations). The document, provided separately from these appendices, is divided into the following sections:

- **Summary of Approaches:** Provides a summary of the evaluation approaches for the impact evaluation, including the process for using secondary sources. It also includes overviews of the approach for net-to-gross (NTG), cost-effectiveness, and process research.
- **Portfolio Findings and Evaluation Results:** This section provides findings and recommendations at the portfolio and sector levels for gross and net savings, cost-effectiveness, and overarching process findings.

In addition to the condensed report, Guidehouse prepared several appendices to accompany the evaluation and provide further insight and documentation:

- **Appendix A. Introduction:** Provides an overview of the evaluation approach, including impact and process evaluation activities and cost-effectiveness.
- **Appendix B. Summary of Program Findings and Recommendations:** Details the findings and recommendations that resulted from each program's evaluation.
- **Appendix C. Cross-Cutting Methodologies:** Covers Guidehouse's overall approach toward cross-cutting methodologies, namely determining cost-effectiveness and NTG savings.
- **Appendix D-G. Program-Specific Methodologies:** Details program-specific impact and process evaluation methodologies, including any differences between the cross-cutting methodologies and those the evaluation team used for each program.
- **Appendix H. Survey Instruments:** Provides detailed survey guides, including participant, trade ally, and supplier interview guides, when applicable.
- **Appendix I. Cost-Effectiveness Data – CONFIDENTIAL:** An Excel databook containing the following:
  - All measure-specific input assumptions.
  - Program-level administrative costs incurred by the program administrator.
  - Detailed benefit and cost breakdowns by cost test and program or portfolio.
- **Appendix J. Excel Databook – CONFIDENTIAL:** Provides additional analytical data and figures for each program and summary results tables for the portfolio.

Appendix A. Introduction

In accordance with the Missouri Energy Efficiency Investment Act (MEEIA) Rules and the Stipulation and Agreement, Evergy Services, Inc. (Evergy), on behalf of its affiliates Evergy Missouri West (Evergy MO West) and Evergy Metro, has contracted with Guidehouse to evaluate, measure, and verify the information tracked by Evergy MO West and Evergy Metro for its portfolio of three commercial and industrial (C&I) demand-side management programs and one educational and behavioral program for the 3-year program cycle from January 1, 2020 through December 31, 2022. The following Evergy programs are covered by this evaluation:

- C&I programs:
  - Business Energy Savings Program – Standard (Business Standard program)
  - Business Energy Savings Program – Custom (Business Custom program)
  - Business Energy Savings Program – Process Efficiency (Process Efficiency program)
- Educational and behavioral program:
  - Online Business Energy Audit (OBEA)

Guidehouse conducted the following tasks as part of its impact evaluation, process evaluation, and cost-effectiveness analysis for program year 3 (PY3):

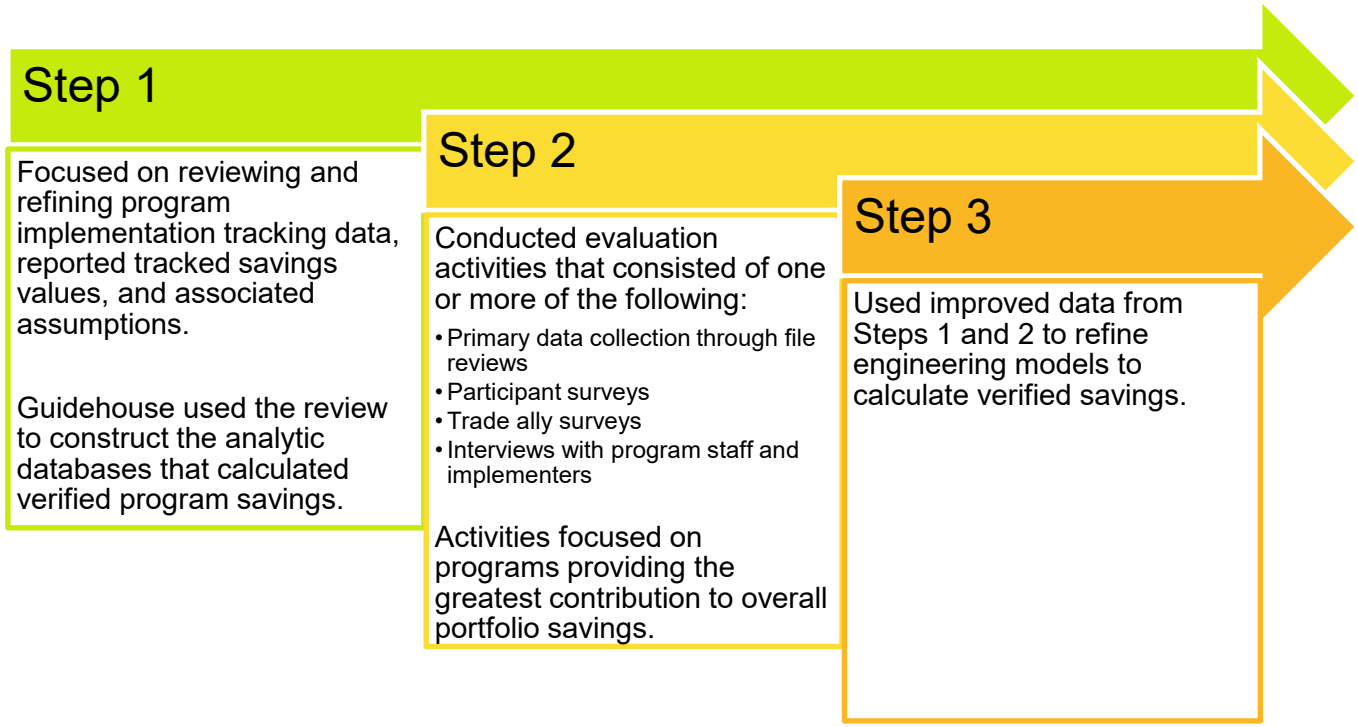
- Evaluate the gross and net energy and peak demand savings from Evergy's energy efficiency C&I programs.
- Evaluate the effectiveness of and develop actionable recommendations to improve the design of Evergy's suite of C&I programs.
- Estimate the cost-effectiveness of Evergy's C&I programs.

The evaluation team consists of Guidehouse and NMR Group, Inc. (NMR). As the primary contractor, Guidehouse is the main point of contact for Evergy and the implementation contractors (ICs). Guidehouse has ultimate responsibility for managing the effort, controlling quality, and confirming deliverables are submitted on time and on budget. NMR led the Process Efficiency and OBEA program evaluations. Throughout this report, this team is referred to as Guidehouse or the evaluation team.

A.1 Impact Evaluation Approach

The evaluation team employed a variety of methods to evaluate, measure, and verify the energy and demand savings achieved by each of the evaluated programs. The team summarizes the approach for gross impact, net savings analysis, and process evaluation in Figure A-1 and describes the key methods in the following sections.

Figure A-1. Gross Impact, Net Savings Analysis, and Process Evaluation Approach



Source: Guidehouse analysis

Per Missouri regulations,[1] Evergy Metro and Evergy MO West are required to complete an impact evaluation for each program using one or both of the methods and one or both of the protocols detailed as follows:

1. **Impact evaluation methods.** At minimum, comparisons of one or both of the following types shall be used to measure program and rate impacts in a manner that is based on sound statistical principles:
    a. Comparisons of pre-adoption and post-adoption loads of program or demand-side rate participants, corrected for the effects of weather and other intertemporal differences.
    b. Comparisons between program and demand-side rate participants' loads and those of an appropriate control group over the same period.
2. **Load impact measurement protocols.** The evaluator shall develop load impact measurement protocols designed to make the most cost-effective use of the following types of measurements, either individually or in combination:
    a. Monthly billing data, hourly load data, load research data, end-use load metered data, building and equipment simulation models, and survey responses.

[1] Missouri Code of State Regulations 20 CSR 4240-22.070 (8).

b. Audit and survey data on appliance and equipment type, size and efficiency levels, household or business characteristics, or energy-related building characteristics

Evaluators are also required to develop protocols to gather information and to provide estimates of program free ridership (FR), spillover (SO), and program NTG ratios.

Table A-1 summarizes the evaluation team's methods and protocols, as they align with Missouri requirements, for the impact evaluation.

Table A-1. Missouri Regulations' Impact Evaluation Methods and Protocols

Program		Impact Evaluation Method	Impact Evaluation Protocol
C&I Energy Efficiency Programs	Business Standard Program	1a	2a and 2b
	Business Custom Program	1a	2b
	Process Efficiency Program	1a	2b
Educational and Behavioral Programs	OBEA*	N/A	N/A

*Guidehouse does not recommend conducting an impact evaluation for this program because Evergy does not report savings. However, this type of program would likely be evaluated using 1b and 2a.
Source: Guidehouse analysis

A.1.1 Process for Using Secondary Sources

Evaluation results in MEEIA Cycle 3 reflect findings from research conducted concurrent with each program year. When all stakeholders and Evergy agree, these research findings are applied to current and following program years. For example, in PY3, Guidehouse conducted NTG research for the Business Standard program. The resulting NTG ratio from this research has been applied to PY3 gross savings for the Business Standard Program.

The evaluation team used primary in-state data when possible and when the team agreed with its applicability to Evergy's territories. Primary out-of-state data was used when primary in-state data was not available. Secondary out-of-state data was used when neither reliable primary in-state data or primary out-of-state data were available.

A.1.2 Net-to-Gross

Guidehouse used two primary methods to develop net verified savings for each program in PY3:

- **NTG ratios,** which involved the derivation of NTG components including FR and SO informed by participant and trade ally surveys
- **Deemed NTG estimates,** which applied predetermined estimates that did not warrant data collection or were informed by PY1 or PY2 research

For programs where Guidehouse developed NTG ratios, the components were based on survey data collected from participants and trade allies in the 2nd half of MEEIA Cycle 2 PY4, and PY1-

PY3 of MEEIA Cycle 3. Guidehouse used the following component definitions, provided by the Uniform Methods Project,[2] to calculate the NTG ratios:

- **FR:** The program savings attributable to free riders—i.e., program participants who would have implemented a program measure or practice in the absence of the program.
- **Participant SO (PSO):** The additional energy savings achieved when a program participant—as a result of the program's influence—installs energy efficient measures or practices outside the efficiency program after having participated.
- **Nonparticipant SO (NPSO):** The additional energy savings achieved when a nonparticipant implements energy efficient measures or practices as a result of the program's influence (for example, through exposure to the program) but that are not accounted for in program savings.

Using these definitions, the evaluation team calculated the NTG ratio as follows in Equation A-1:

Equation A-1. NTG Ratio

$$\text{NTG Ratio} = 1 - \text{FR rate} + \text{PSO rate} + \text{NPSO rate}$$

Where:

FR rate =	Free ridership rate
PSO rate =	Participant spillover rate
NPSO rate =	Nonparticipant spillover rate

Participating end-use customers are in the best position to articulate the likelihood they are able to afford the increased efficiency equipment without rebates. Trade allies are best suited to comment on the influences of a program beyond the rebate (such as a program's influence on their technical knowledge, stocking patterns, and typical product specifications and recommendations). Programs that leverage the NTG component method include Business Standard and Business Custom.

To address the EM&V auditor's comments regarding FR estimates, Guidehouse made the following adjustments to its NTG approach in PY2. Relevant changes were included in the PY3 surveys:[3]

- Formalized the sensitivity analysis conducted on "don't know" responses in the FR and SO analyses
- Eliminated FR questions from the trade ally survey
- Added a question to the trade ally NPSO survey asking the trade allies to describe the direct or indirect influences the program had on the high efficiency projects that did not receive program rebates

Additional detail on the NTG approach is provided in Appendix C.2.

[2] Daniel M. Violette and Pamela Rathbun, *Estimating Net Savings: Common Practices*, Chapter 23 in *The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures*, 2014, http://energy.gov/sites/prod/files/2015/02/f19/UMPChapter23-estimating-net-savings_0.pdf.

[3] Guidehouse sent surveys to PY3 Custom, PY2 and PY3 Process Efficiency participants, and all Process Efficiency Trade Allies. Insufficient responses were received to develop updated NTG ratios for these programs.

A.2 Process Evaluation Approach

The evaluation team's process evaluation focused on addressing the five required questions per the Missouri regulations (shown in Figure A-2) and identifying program process improvements to increase program participation and savings.

Figure A-2. Five Required Questions per Missouri Regulations

Source: Guidehouse analysis of Missouri Code of State Regulations 20 CSR 4240-22.070 (8)

In PY3, Guidehouse performed the activities Figure A-3 shows to inform its process evaluation:

Figure A-3. Process Evaluation Activities

Source: Guidehouse analysis

The evaluation team summarized findings for the Missouri-required process evaluation questions across all programs. PY3 program-specific process findings and recommendations are provided in Appendix B.

A.3 Cost-Effectiveness Approach

Guidehouse calculated benefit-cost ratios and total net benefits at the program and sector levels for the five standard benefit-cost tests: total resource cost (TRC) test, societal cost test (SCT), utility cost test (UCT), participant cost test (PCT), and ratepayer impact measure (RIM) test. Benefit-cost ratios are informative because they show the value of monetary benefits relative to the value of monetary costs as seen from various stakeholder perspectives.

The evaluation team's formulation of the benefit-cost tests followed the 2001 California Standard Practice Manual (SPM)[4] and did not account for the subsequent 2007 SPM Clarification Memo.[5]

Guidehouse's benefit-cost analysis accounted for the following cash flows:

- Avoided energy costs
- Avoided capacity costs
- Avoided operations and maintenance (O&M) costs

[4] California Public Utilities Commission, *California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects*, October 2001, https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpuc_public_website/content/utilities_and_industries/energy_-_electricity_and_natural_gas/cpuc-standard-practice-manual.pdf.

[5] California Public Utilities Commission, "2007 SPM Clarification Memo," 2007, https://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/73172-10.htm.

- Incentives
- Lost revenue/bill reductions
- Administrative costs[6]
- Participant equipment costs

Table A-2 summarizes how program costs and benefits are assigned to each of the cost tests consistent with the California SPM.

Table A-2. Cost and Benefit Assignments by Cost Test

Item	TRC Test	SCT	UCT	PCT	RIM Test
Avoided Costs	Benefit	Benefit	Benefit	N/A	Benefit
O&M Savings	Benefit	Benefit	N/A	Benefit	N/A
Incentives	Transfer	Transfer	Cost	Benefit	Cost
Lost Revenue	Transfer	Transfer	N/A	Benefit	Cost
Administrative Costs	Cost	Cost	Cost	N/A	Cost
Participant Equip. Costs*	Cost	Cost	N/A	Cost	N/A

*Based on the California SPM, participant equipment costs are net costs for the TRC test and the SCT. Participant equipment costs are gross costs for the PCT.
Source: Guidehouse analysis

A.3.1 Source of Benefit and Cost Assumptions

Table A-3 summarizes the sources of data used in the benefit-cost analysis. Many of the input assumptions used in Guidehouse's analysis came directly from Evergy. Critical assumptions that differed in the evaluation team's analysis were energy and peak demand savings (derived from verified data rather than reported estimates), NTG ratios, O&M benefits, effective useful life (EUL) and remaining useful life (RUL) values, and participant equipment costs. Reference Appendix I for detailed inputs and outputs from Guidehouse's benefit-cost model.

Table A-3. Sources of Benefit and Cost Data

Data*	Source
Avoided energy costs	Provided by Evergy
Avoided capacity costs	Provided by Evergy
Retail rates	Provided by Evergy
Load shapes	Developed by Guidehouse
Discount rates	Provided by Evergy and classified by Evergy as highly confidential
O&M savings	Guidehouse analysis

[6] Including portfolio-level costs related to energy efficiency and demand response (DR) programs, software development costs, EM&V costs, and educational program costs.

Data*	Source
Participant equipment costs	Business Standard program: Illinois Technical Reference Manual (TRM) and Evergy-prescribed values Business Custom program: Incremental or total project cost as reported in the tracking database. The IC determines which type of cost is most appropriate given the type of project. Incremental cost used for major renovation grow facility projects Process Efficiency: Total project cost as reported in tracking database
Energy and peak demand savings	Guidehouse engineering analyses
EUL	Illinois TRM, program tracking data, Evergy-prescribed values
RUL	Guidehouse analysis based on lifetime of replaced equipment and related mortality analysis techniques
NTG	Guidehouse NTG analysis
Line loss factors	Provided by Evergy
Incentives	Program tracking database
Participation	Program tracking database
Administrative costs	Provided by Evergy

*Guidehouse does not provide the avoided energy and capacity costs in this report because they are confidential to Evergy.
Source: Guidehouse analysis

Appendix B. Summary of Program Findings and Recommendations

The following sections summarize Guidehouse's impact and process evaluation findings and recommendations by program.

B.1 Business Standard Program

The Business Standard program offers a diverse set of measures that have standardized measure savings and an incentive process that improves accessibility to the customer. These program aspects help increase the number of participants in the program for a broad segment of Evergy's customers, with more complex projects using the Business Custom program to tailor upgrades to a customer's needs. Any Evergy C&I customer is eligible to participate in the program. Program measures include energy efficiency projects such as lighting, lighting controls, motors, and HVAC equipment.

B.1.1 Impact Evaluation Findings and Recommendations

Evergy product managers and the IC continued to move the Business Standard program forward in PY3 to meet the Cycle 3 targets. The Business Standard program implemented 711 projects in 2022. In its third year of Cycle 3, the Evergy Metro Business Standard program achieved 31% and 33% of the 3-year MEEIA Cycle 3 target energy and coincident peak demand savings, respectively. To date, including PY1-PY3, the program has achieved 77% and 84% of the 3-year MEEIA Cycle 3 target energy and coincident peak demand savings, respectively. The Evergy MO West Business Standard program achieved 33% and 39% of the 3-year MEEIA Cycle 3 target energy and coincident peak demand savings, respectively. To date, including PY1-PY3, the program has achieved 86% and 93% of the 3-year MEEIA Cycle 3 target energy and coincident peak demand savings, respectively. The program reported higher savings in PY3 when compared with PY2 and PY1. This suggests that the effects of the COVID pandemic are cooling for C&I customers and that the increased incentive offered at the end of PY3 drove additional savings.

Guidehouse performed a deemed measure savings review and tracking database review for the Business Standard program's impact evaluation and applied the results of the onsite lighting study completed in MEEIA Cycle 2 to capture improved primary inputs for the engineering analysis equations described in Appendix D. The evaluation team reviewed the tracking database to verify its validity and that it contains all necessary information to evaluate the program. The team reviewed the deemed measure savings and assessed the reasonability of the algorithms and assumptions used.

B.1.1.1 Findings

This section provides the evaluation team's findings from the PY3 Business Standard program impact evaluation.

In the Evergy Metro territory, the Business Standard program achieved a 91% realization rate for gross energy savings and an 86% realization rate for gross demand savings, as Table B-1 shows. Table B-2 shows the program's savings to date.

Table B-1. Business Standard Program PY3 Energy and Demand Savings Summary – Evergy Metro

	Gross				Net*	
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	19,457,155	17,716,799	91%	53,977,377	16,512,056	31%
Coinc Demand at Customer Meter (kW)	3,460	2,974	86%	8,523	2,772	33%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio. An NTG ratio of 0.932 was applied to the Business Standard program PY3 verified savings based on research conducted by Guidehouse in MEEIA Cycle 3 PY3.
† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

Table B-2. Business Standard Program to Date Energy and Demand Savings Summary – Evergy Metro

	Gross				Net*	
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	46,837,410	45,568,218	97%	53,977,377	41,494,036	77%
Coinc Demand at Customer Meter (kW)	8,843	7,855	89%	8,523	7,152	84%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio applicable for each year.
† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

In the Evergy MO West territory, the Business Standard program achieved an 88% realization rate for gross energy savings and a 48% realization rate for gross demand savings, as Table B-3 shows. Table B-4 shows the program's savings to date.

Table B-3. Business Standard Program PY3 Energy and Demand Savings Summary – Evergy MO West

	Gross			Net*		
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	18,832,545	16,532,559	88%	46,646,197	15,408,345	33%
Coinc Demand at Customer Meter (kW)	6,603	3,140	48%	7,514	2,926	39%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio. An NTG ratio of 0.932 was applied to the Business Standard program PY3 verified savings based on research conducted by Guidehouse in MEEIA Cycle 3 PY3.
† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

Table B-4. Business Standard Program to Date Energy and Demand Savings Summary – Evergy MO West

	Gross			Net*		
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	45,166,494	44,509,947	99%	46,646,197	40,164,326	86%
Coinc Demand at Customer Meter (kW)	11,478	7,720	67%	7,514	7,007	93%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio applicable for each year.
† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

Guidehouse calculated savings using data from the tracking database, onsite metering in Cycle 2, and secondary sources (e.g., the Illinois Technical Reference Manual, or TRM). In PY3 of Cycle 3, lighting measures accounted for close to 86% of the overall program savings which is slightly lower than previous years when lighting measures were contributing more than 90% (91% in PY2 & 96% in PY3). In PY3, HVAC and Cooling measures accounted for 8.6% of overall energy savings and 8.2% of overall demand savings.

The factors with the greatest impact on the overall program realization rate for energy savings correspond with the lighting measure savings calculations as well as HVAC measures savings

calculations. HVAC measures savings calculations had more impact on Evergy MO West territory rather than Evergy Metro.

For demand savings realization rates, HVAC measures had a significant impact in driving the program-level realization rate. Key factors affecting realization rate by end use are described in the following sections.

Lighting

Some key factors had the most influence on the verified savings of lighting measures. These key factors include assumptions around the baseline wattage, the recorded efficient wattage, hours of use (HOU), in-service rate (ISR), and coincidence factor (CF). These same key factors highly influenced the previous year's impact evaluation as well. The evaluation team addressed these key factors with the following steps:

1. First, Guidehouse aligned the baseline wattage for the verified savings using one of the following approaches:
    a. Leveraging baseline wattage from Evergy TRM 2022
    b. Using actual baseline wattages for some of the measure lines where actual efficient case wattage is higher than TRM baseline wattage
    c. Using wattages from secondary sources on baseline fixture wattage, including the Illinois TRM v10 and manufacturer specification sheets for the efficient lighting product that listed equivalent baseline products.
2. Second, the evaluation team leveraged the recorded efficient wattage for the lamp or fixture in the verified lighting savings calculation for each measure incentivized.
3. Finally, the team included the results of the long-term onsite verification lighting study concluded in MEEIA Cycle 2 in the verified lighting savings calculation. The results of the long-term lighting study led to adjustments to the ISR, HOU, and CFs for lighting measures.

One new measure (Measure ID 580) added to the program in PY3 resulted in a much lower realization rate at measure level and affected the overall program-level realization rate for energy and demand savings. This measure includes "an interior LED fixture replacing >850W HID fixture." The measure contributed to 10% program-level reported energy savings. For more than 85% of fixtures installed through this measure, efficient case wattage (actual reported) is higher (300 watts or above) than deemed efficient wattage (240 watts) used for reported savings calculated from the MEEIA TRM. Guidehouse leveraged the actual reported efficient wattages from the tracking data for calculations. This resulted in a lower energy and demand savings realization rate by about 40% for this measure.

HVAC

1. The most important key factor that affected HVAC realization rate is the difference in calculation algorithm between the MEEIA TRM and IL TRM. In the MEEIA TRM, the unit is defined as per ton per efficiency (SEER/IEER/EER) increment. This change to the MEEIA TRM was implemented for PY2 in an effort by the implementer to increase incentives for higher efficiency HVAC measures. However, when the efficiency increment of an installed unit is higher than what is used for deemed savings calculations, the MEEIA TRM algorithm results in overestimation of energy and demand

savings. Guidehouse used IL TRM v10 algorithms, which are industry standard and results in more reasonable savings estimates. Guidehouse worked with the IC during 2022 when this was first identified to update the MEEIA TRM for PY4 to reduce the impact on realization rate.

Consider the following example, which demonstrates the difference between the two algorithms:

Capacity	=	1 ton or 12 kBtu/hr
Deemed SEERbase	=	10
Deemed SEERee	=	12
Deemed EFLH	=	1,000

Deemed Energy Savings as per MEEIA TRM =
[Capacity * (1/SEERbase – 1/SEERee) * EFLH]/[SEERee – SEERbase]
= 12 * (1/10 – 1/12) * 1,000 / (12-10)
= 100 kWh/Ton/SEER Increment

Now, let's consider an actual measure unit with 1 ton capacity was installed under this measure with a SEER rating of 15:

Reported tracking data savings for this unit = 100 * (15-10) = 500 kWh

However, if we apply the algorithm to calculate energy savings as per IL TRM v10:

Verified savings = 12 * (1/10 – 1/15) * 1,000 = 400 kWh and a realization rate of 80%

2. Another key factor in low realization rate for HVAC energy and demand savings is an error in the implementer's application form for calculating reported savings for air cooled chillers. Deemed savings for these measures is calculated on a per ton per efficiency increment where efficiency is rated in kW/ton unit. The error in the application caused the tracking data savings calculations to use EER values instead of kW/Ton values to calculate increment (kW/Ton = 12/EER). This error affected two measure IDs (Measure 511 and Measure 512) and resulted in a very low realization rate for both measures for energy and demand savings.

   These two measure IDs corresponded in total to over 3,389 kW of reported demand savings (34% of program-level demand savings). Final realization rate for demand savings for these measures was 3% for 511 and 2% for 512.

Total reported demand savings (511 and 512) =	3,389 kW
Total verified demand savings (511 and 512) =	70.4 kW

B.1.1.2 Recommendations

Table B-5 summarizes Guidehouse's recommendations based on its impact evaluation findings.

Table B-5. Business Standard Program Impact Recommendations

Summary of Recommendations	
1. Guidehouse recommends updating efficient case wattage for lighting Measure ID 580, i.e., "Interior LED fixture replacing >850W HID fixture."	This is a new measure added to the Standard program in PY3. Current deemed efficient case wattage value for this measure is 240 watts. In PY3, this measure received great participation and more than 1,000 fixtures were retrofitted under Measure 580. However, for more than 85% of fixtures, efficient case wattage was 300 watts or above. Guidehouse recommends revising the deemed efficient case wattage for this measure to reflect the actual installed fixtures.
2. Guidehouse recommends updating HVAC savings calculation unit from "per ton per efficiency increment" to "per ton" basis.	Guidehouse understands that this recommendation has already been implemented for PY4.
3. Guidehouse recommends creating efficiency tiers for HVAC measures to reward more incentives to more efficient units.	Guidehouse understands that HVAC measures were initially characterized on "per ton per efficiency increment" basis to provide more incentive to more efficient units. However, that approach resulted in a very low realization rate for these measures as described in the above section. Thus, Guidehouse recommends the implementer create new measures with different tiers as per efficiency increment buckets and provide higher incentive per ton for units with higher efficiencies. For example: For Measure ID 370.2 (ASHP<65 kBtu), SEERbase = 13, and SEERee = 16.5 is used for deemed savings calculations. However, tracking data shows that ASHP units installed under this measure in 2022 have SEER ratings from 14 to 26.1. Guidehouse recommends creating two tiers (below 20 and above 20) and have different incentives for each tier.

Source: Guidehouse analysis

B.1.1.3 Net-to-Gross

To capture the customer experience, the NTG analysis used primary research methods, including fielding FR and SO surveys. Guidehouse sent the participant FR survey to the Cycle 3 PY3 participants from January through December 2022 that had not previously responded to an NTG survey. The team sent the survey with questions focused on SO to participants from Cycle 3 PY2.

Survey responses indicated a weighted FR of 15.9% and a weighted PSO of 7.6%. The NPSO of 1.5% was quantified through a trade ally survey in PY2, resulting in a program-level NTG of 93.2%. For "not sure" responses, Guidehouse conducted a sensitivity test in which the score was treated as 0% FR, 50% FR, and 100% FR, and in which respondents who answered "not sure" were completely dropped from the FR calculation. No respondents answered "not sure" to all influence questions, so the "not sure" sensitivity analysis focused solely on the intention score. The sensitivity test resulted in program-level FR ranging from 11% to 17%. The midpoint, treating these respondents as a 50% intention score averaged with the influence score they provided, resulted in a program-level FR value of 15.9%. Removing respondents who answered "not sure" to all intention score questions resulted in a program-level FR value of 17.2%; however, most respondents were able to answer some or all of the intention score questions.

Responses to other questions and a review of program communications support the idea that these respondents are partial free riders, so the evaluation team feels that using the midpoint value of 50% in lieu of "don't know" responses is justified by the review of the participants' full set of responses and communications. Appendix C describes the methodologies for calculating

FR, SO, and NTG. Table B-6 shows the components of the NTG ratio for the Business Standard program.

Table B-6. Business Standard Program NTG Components and Ratio

Program Year	Weighted FR	Weighted PSO	NPSO	NTG Ratio
PY3	0.159	0.076	0.015	93.2%

Source: Guidehouse's NTG ratio research in PY3 for FR and PSO and PY2 for NPSO for the Business Standard program

B.1.2 Process Evaluation Findings and Recommendations

For the process evaluation, Guidehouse conducted program staff interviews, reviewed program materials, and administered participant surveys to identify opportunities to improve program processes.

B.1.2.1 Findings

The evaluation team addressed the five Missouri-required questions for process evaluation through program manager and implementation staff interviews and surveys. Participant survey response rates (Table B-7) were generally consistent with the previous survey conducted with PY2021 participants.

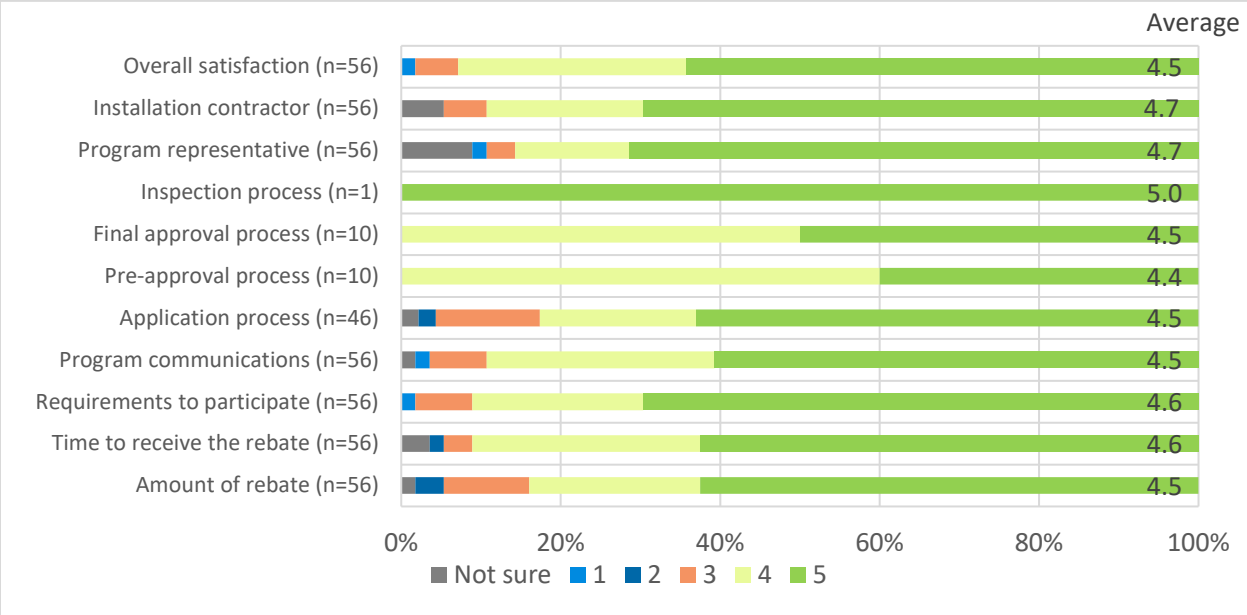
Table B-7. Evergy Metro and Evergy MO West Business Standard Program Survey Sample Size and Responses

Year	Survey Type	Population Size	Completed Surveys	Response Rate
2022	Participant FR	291	52	17%
	Participant SO	204	14	7%
2021	Participant FR	328	52	16%
	Participant SO	610	61	10%
	Trade Ally	158	23	15%
2016	Participant	420	56	13%

Source: Guidehouse survey analysis

Survey respondents ranked their satisfaction with the various aspects of the program highly, with all categories receiving an average ranking of 4.4 to 5.0 (on a 1-5 scale, where 1 is low and 5 is high). The average overall satisfaction with the program is 4.5.

Figure B-1. Participant Satisfaction with Program Aspects (n=56)



Source: Guidehouse survey analysis

Table B-8 summarizes the Missouri-required process questions and associated answers to those questions.

Table B-8. Business Standard Program Missouri Requirement-Based Findings

Missouri Question	Guidehouse Findings
1. What are the primary market imperfections that are common to the target market segment?	The business sector faces a high barrier to participation because of the high upfront installation cost and a lack of understanding of lifetime value for energy efficient products. Evergy addresses these barriers by providing incentives and education, which reduce the incremental cost and improve the understanding of the long-term benefits. For PY3, Evergy offered an end-of-the-year bonus to further incentivize project applications, which contributed toward increased participation in PY3 as compared with PY2.
2. Is the target market segment appropriately defined or should it be further subdivided or merged with other market segments?	Evergy has a well-defined target market of large and small commercial businesses for the Business Standard program. Evergy and the IC track activity by trade ally and have bi-yearly Trade Ally Advisory Board meetings. At these meetings, Evergy provides a program status update and requests feedback from the trade ally representatives on the advisory board about all business programs. Evergy actively solicits feedback on the program by sending surveys to all customers that completed a project in the final email communication. Evergy reviews this feedback and incorporates it into the program design as warranted.
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	The Business Standard program complements the Business Custom program by providing rebates for common energy efficiency upgrades, which continued to be primarily lighting measures in PY3. Evergy is working toward further aligning the Business Standard and Business Custom programs so that multiple end-use energy-saving projects can be easily served across the entire portfolio. While the Business Standard program includes measures that address a variety of energy end uses for a participant, including the HVAC, refrigeration, and cooking energy end uses, 84% of the projects in PY3 were for lighting or lighting control measures. Non-lighting measure participation has increased in PY3 to 16% compared with 10% in PY2 and 6% in PY1. Evergy and the IC are constantly evaluating the measure list to determine whether it is meeting the needs of customers. The other Evergy Business programs primarily address the end uses besides lighting, but they also tend to be dominated by new construction lighting projects.
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	The IC works one-on-one with larger customers and those larger customers' customer solution managers (CSMs). The trade ally network addresses medium and smaller customers. During Cycle 3, the IC has also provided targeted marketing for sectors with historically lower participation. Communication around the PY3 end-of-the-year incentive bonus was clear and effective, leading to record-setting participant levels in Dec 2022.
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	In PY3, Evergy implemented some incentive changes to increase participation. Evergy also offered an end-of-the-year bonus to further incentivize project applications, which contributed to the highest monthly program participation in the program's history for Dec 2022.

Source: Guidehouse analysis

B.1.2.2 Recommendations

The Business Standard program is slightly behind on the 3-year Cycle 3 MEEIA target in both the Evergy Metro and Evergy MO West territories. The program did see some increased

participation in HVAC and cooling measures over previous years. The evaluation team provides the process recommendations listed in Table B-9 based on the PY3 evaluation.

Table B-9. Business Standard Program Missouri Requirement-Based Recommendations

Missouri Question	Guidehouse Recommendations
1. What are the primary market imperfections that are common to the target market segment?	C&I customers appear to be driven by changes in incentives. Evergy provided increased incentives at the end of PY1 and PY3 to drive savings. Both times, these incentive increases appeared to be highly effective in increasing participation. C&I customers and trade allies may start to anticipate such end of year incentive increases and hold off on submitting projects as a result. The implementer has started offering facility assessments and the evaluation team recommend considering additional methods to drive participation outside of end of year incentive increases.
2. Is the target market segment appropriately defined or should it be further subdivided or merged with other market segments?	The program should continue efforts to increase participation among the school strata and small businesses such that certain business types do not dominate the program. These efforts have included targeted webinars explaining the benefits of implementing energy conservation, increased incentives for small businesses, and direct outreach to public sector and municipal customers.
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	The program should continue the marketing and outreach efforts that led to the increased number of HVAC and cooling measures incentivized in PY3 compared to previous program years. The program could continue to research methods to increase participation in the cooking end-use category because that end use is still seeing low participation even though significant potential for energy savings is likely. The program may need to continue to diversify from lighting measures more in upcoming years as new building codes require highly efficient lighting and lighting controls in certain spaces.
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	Guidehouse recommends the following to improve the program's communication channels and delivery mechanisms: • Continue education and training of new and existing trade allies to reduce rebate application errors. • Create accessible targeted marketing materials that can be available on the program's website.
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	The program can continue to develop targeted marketing and targeted incentive increases for measures or business types with lower participation. The program may also benefit by taking a closer look at the types of measures that may be going through the Custom program and consider whether there are ways to move those measures types to the Standard program to reduce the burden of the application process for those measures.

Source: Guidehouse analysis

B.1.3 Cost-Effectiveness Findings

This section presents Guidehouse's cost-effectiveness evaluation for the Business Standard program for each of the five standard benefit-cost tests. Please refer to Appendix A.3 for information on how benefits and program costs are allocated to each of the cost tests as well as the sources for the benefit and cost input assumptions.

The evaluation team applied a midlife adjustment to standard LED A bulbs and reflector LED bulbs (MR-16, B/BR, and PAR) offered through the Business Standard program. This adjustment reflects the natural growth of LED market share, which is anticipated to continue to grow over the life of the LED measures. The Illinois TRM v10 determined a single midlife

adjustment based on estimates of the natural growth of the LED market share that resulted in the equivalent net present value of lifetime savings as the annual estimated decline. This midlife adjustment is applied in 2026 and is a 66% downward adjustment for LED A bulbs and a 39% downward adjustment for reflector LED bulbs. The annual savings claimed were reduced 5 years into the life of the LED bulb measures to account for this downward adjustment and were incorporated into cost-effectiveness calculations.

Table B-10 presents the benefit-cost ratios for the five standard benefit-cost tests for Evergy Metro and Evergy MO West for PY3. Based on the team's benefit-cost analysis, Every Metro achieves a cost test ratio greater than 1.0 in the SCT, UCT, and PCT. The TRC test achieves a ratio of 0.86. Evergy MO West achieves a TRC ratio of 0.81 and a UCT and PCT above 1.0.

Table B-10. Business Standard Program Cost-Effectiveness Results

Territory	TRC	SCT	UCT	PCT	RIM
Evergy Metro	0.86	1.03	1.93	1.39	0.56
Evergy MO West	0.81	0.97	1.99	1.33	0.55

Source: Guidehouse analysis

B.2 Business Custom Program

The Business Custom program provides incentives for energy efficient upgrades for business customers. This program is available to all C&I Evergy customers and is designed to cover a broad range of projects that do not fit in the Business Standard program. The Business Custom program:

- Delivers rebates—available for existing and new facilities—only to those projects that achieve a cost test score from the implementer of 1.0 or higher and have a simple payback period (before applying the rebate) of 1.5 years or greater.
- Calculates rebates in PY3 based on the following:
  - The program allows for a maximum incentive of $1,000,000 per customer (based on tax ID), per year, per jurisdiction capped at $250,000 per project.
  - Participants that exceed the $250,000 per project threshold will be eligible for a reduced rate incentive.
  - Business Custom incentives will be capped at 75% of total measure costs and 100% of incremental costs unless otherwise specified.
  - Business Custom incentives levels are determined based on technology end use but are no lower than $0.04/kWh reduced annually and no higher than $0.45/kWh reduced annually.
- Requires preapproval from the IC before participants purchase and install equipment.

B.2.1 Impact Evaluation Findings and Recommendations

The Business Custom program implemented 156 projects in 2022. In its third year of Cycle 3, the Evergy Metro Business Custom program achieved 28% and 31% of the 3-year MEEIA Cycle 3 target energy and coincident peak demand savings, respectively. To date, including PY1-PY3, the program has achieved 101% and 121% of the 3-year MEEIA Cycle 3 target

energy and coincident peak demand savings, respectively. The Evergy MO West Business Custom program achieved 150% and 193% of the 3-year MEEIA Cycle 3 target energy and coincident peak demand savings, respectively. To date, including PY1-PY3, the program has achieved 322% and 385% of the 3-year MEEIA Cycle 3 target energy and coincident peak demand savings, respectively.

In PY3, the team conducted an impact evaluation, cost-effectiveness analysis, and process evaluation for the Business Custom program. For its impact evaluation, Guidehouse performed a tracking database review, sampling, and an engineering review of sampled projects.

B.2.1.1 Findings

Table B-11 summarizes the energy and peak demand savings and the corresponding realization rates for the Evergy Metro Business Custom program in PY3. Table B-12 shows the program's savings to date.

Table B-11. Business Custom Program PY3 Energy and Demand Savings Summary – Evergy Metro

	Gross				Net*	
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	9,584,681	10,383,458	108%	30,239,803	8,472,901	28%
Coinc Demand at Customer Meter (kW)	2,058	1,836	89%	4,834	1,498	31%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio. An NTG ratio of 0.816 was applied to the Business Custom program based on research conducted by Guidehouse in MEEIA Cycle 3 PY1 and PY2.
† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

Table B-12. Business Custom Program to Date Energy and Demand Savings Summary – Evergy Metro

	Gross				Net*	
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	34,951,435	37,747,524	108%	30,239,803	30,597,177	101%
Coinc Demand at Customer Meter (kW)	6,929	7,195	104%	4,834	5,830	121%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio. An NTG ratio of 0.816 was applied to the Business Custom program based on research conducted by Guidehouse in MEEIA Cycle 3 PY1 and PY2.

† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

Table B-13 summarizes the energy and peak demand savings and the corresponding realization rates for the Evergy MO West Business Custom program in PY3. Table B-14 shows the program's savings to date.

Table B-13. Business Custom Program PY3 Energy and Demand Savings Summary – Evergy MO West

	Gross				Net*	
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	18,366,396	18,441,487	100%	10,016,241	15,048,254	150%
Coinc Demand at Customer Meter (kW)	4,462	3,762	84%	1,587	3,070	193%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio. An NTG ratio of 0.816 was applied to the Business Custom program based on research conducted by Guidehouse in MEEIA Cycle 3 PY1 and PY2.
† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

Table B-14. Business Custom Program to Date Energy and Demand Savings Summary – Evergy MO West

	Gross				Net*	
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	40,270,007	39,617,108	98%	10,016,241	32,246,061	322%
Coinc Demand at Customer Meter (kW)	9,184	7,497	82%	1,587	6,104	385%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio. An NTG ratio of 0.816 was applied to the Business Custom program based on research conducted by Guidehouse in MEEIA Cycle 3 PY1 and PY2.
† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

The evaluation team made the following adjustments to the engineering calculations. These adjustments were the primary drivers of energy and coincident peak demand realization rates in PY3:

1. Updated baseline lighting inputs for Trace 3D modeling projects using the Guidehouse Indoor Horticulture Baseline Memo.
2. Used the engineering algorithm outlined in the Illinois TRM v10 for estimating the peak demand savings while the IC used a kW factor approach.[7]
3. Applied a waste heat factor for demand (WHFd) and CF to calculate peak demand savings to align with lighting spaces and operating schedules verified through phone interviews and desk reviews.
4. Adjusted heat pump measure calculations to include heating savings in addition to the cooling savings already being accounted for by the IC.
5. Consistently applied a savings calculation methodology that differs from the approach implemented by the IC for all non-lighting end-use categories.[8] The Guidehouse approach builds on the IC methodology by applying 8,760 hourly weather data to capture impacts based on time of day and seasonality where applicable.
6. Aligned the calculation of peak demand savings with the utility peak period[9] while the IC used the demand factor approach.
7. Made input and simulation adjustments to energy models provided by the IC to align with as-built conditions and leading practice evaluation methods.

B.2.1.2 Recommendations

Table B-15 summarizes Guidehouse's recommendations based on its impact evaluation findings.

[7] In MEEIA Cycle 2, at the request of Evergy, Guidehouse developed a list of kW factors by end use to calculate peak demand savings based on the historically implemented Business Custom projects in the Evergy Metro service territory. The kW factor is a ratio of the first-year peak demand savings to the first-year energy savings. It was established that the IC would use the kW factor to calculate peak demand savings, which is called the "kW factor approach," and Guidehouse would continue using the engineering approach to estimate peak demand savings. The engineering approach varies depending on the energy efficiency measures, summarized in the Business Custom Program-Specific Methodology Appendix E.

[8] Both Guidehouse and the IC used Typical Meteorological Year 3 (TMY3) weather data to estimate the pre- and post-retrofit power in the calculation of project savings. The TMY3 weather data includes 8,760 outdoor air dry-bulb temperatures and other weather parameters. For the HVAC Controls and Motors and Drives measures, the IC divided the 8,760 hourly temperatures to temperature bins in 2°F, 5°F, or other intervals and calculated the count of hours in each temperature bin. Then the IC predicted the pre- and post-retrofit power for each temperature bin. This approach does not estimate load corresponding to time and day of year. Alternatively, Guidehouse predicted pre- and post-retrofit power for each hour of each day (8,760 hours in total) based on the established regression models and the TMY3 weather data. Using this approach, Guidehouse was able to calculate the peak demand savings following the system peak period.

[9] The system peak period is the period during which demand savings are evaluated. The current Evergy peak period is 4:00 p.m.-6:00 p.m. on weekdays when daily maximum dry-bulb outdoor air temperature is >=95°F from June to August, excluding holidays.

Table B-15. Business Custom Program Impact Recommendations

Summary of Recommendations	
1. Guidehouse recommends the IC provide unlocked analysis workbooks.	Guidehouse recommends that all calculations, independent of measure type, be initially performed in worksheets where the equations are transparent and easily reviewed to facilitate verification and evaluation. Currently, a subset of measure types use locked worksheets, which makes verifying the engineering analysis more difficult and time-intensive.
2. Guidehouse recommends the IC follow the methodology in the Indoor Horticulture Baseline Memo previously provided.	While utilities and implementers may choose whichever method they prefer for claiming savings for indoor agriculture projects, Guidehouse will use the Process Input Equivalent method for evaluating savings of projects to improve savings accuracy. The approach detailed in the Indoor Horticulture Baseline Memo uses a like-for-like baseline to assume an equivalent process input for baseline and efficient cases. This methodology was discussed with and agreed to by Evergy and the IC in March 2021.
3. Guidehouse recommends that all indoor horticulture lighting be DLC-certified.	The DesignLights Consortium (DLC) maintains a Horticultural Qualified Products List for energy efficient horticultural lighting. Growers rely on the Horticultural Qualified Products List to validate performance claims so they can find efficient and effective indoor lighting options for their crops and keep up with cutting-edge technologies. DLC-certified fixtures have been tested and reported against a set of program requirements to allow growers to validate performance claims.
4. Guidehouse recommends the IC use an 8,760 hourly analysis.	Guidehouse recommends that the IC employ an 8,760 hourly analysis evaluation approach when appropriate, particularly for weather-dependent measures such as HVAC equipment. This methodology leverages weather data to analyze energy consumption variances by time of day and seasonality, which better represents the actual operating conditions of the installed equipment.

Source: Guidehouse analysis

B.2.1.3 Net-to-Gross

Guidehouse did not include any additional research from PY3 to update the NTG ratio due to insufficient responses received to the FR and PSO participant surveys. FR and PSO are based on PY1 analysis of the participant FR survey of the Cycle 3 PY1 participants from January through December 2020 and the participant SO survey of participants from the second half of Cycle 2 PY4. Guidehouse conducted a trade ally survey in Cycle 3 PY2 to estimate NPSO.

Participant survey responses indicated a weighted FR of 23.9% and a weighted PSO of 4.0%. Trade ally responses indicated an NPSO of 1.5%, resulting in a program NTG ratio of 81.6%. Appendix C describes the methodologies for calculating FR, SO, and NTG. Table B-16 shows the components of the NTG ratio for the Business Custom program based on the research through PY2.

Table B-16. Business Custom Program NTG Components and Ratio

Program Year	Weighted FR	Weighted PSO	NPSO	NTG Ratio
PY3	0.239	0.040	0.015	81.6%

Source: Guidehouse's NTG ratio research in PY1 and PY2 for the Business Custom program

B.2.2 Process Evaluation Findings and Recommendations

For the process evaluation, Guidehouse conducted interviews with program staff and reviewed program materials to identify opportunities to improve the Business Custom program processes.

B.2.2.1 Findings

The evaluation team addressed the five Missouri-required questions for process evaluation through program manager and implementation staff interviews and surveys with trade allies and participants in prior program years.

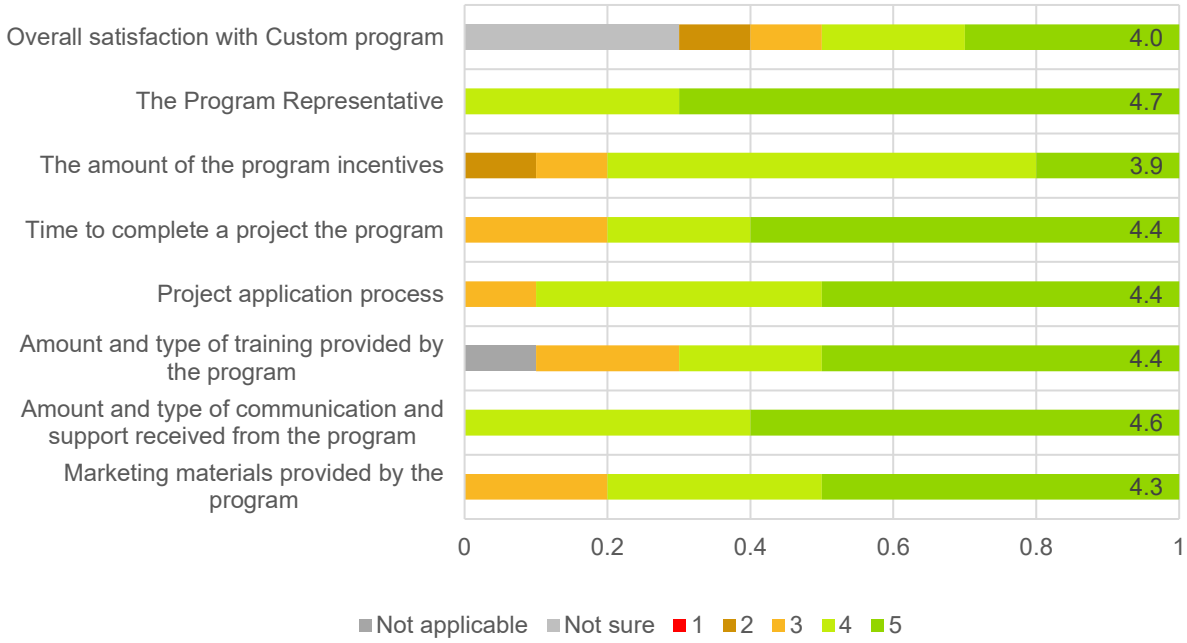
Table B-17. Evergy Metro and Evergy MO West Business Custom Program Survey Sample Size and Responses

Year	Survey Type	Population Size	Completed Surveys	Response Rate
2022*	Participant FR	26	4	15%
	Participant SO	17	3	18%
2021	Trade Ally	50	10	20%
2020	Participant FR	69	13	19%
	Participant SO	135	21	16%
2019	Participant FR†	262	65	25%
	Participant SO	207	37	18%
	Trade Ally	57	18	32%
2018	Participant	270	63	23%
	Trade Ally	152	48	32%
2017	Participant	80	18	23%
	Trade Ally	56	11	20%

* Insufficient responses were received to the FR and PSO participant surveys in 2022 to update the NTG analysis
† Survey sent to MEEIA Cycle 2 PY3 participants (not surveyed in PY3) and MEEIA Cycle 2 PY4 participants.
Source: Guidehouse survey analysis

The following section summarizes previous results of participant and trade ally surveys. PY2 trade allies survey reported high satisfaction with the Business Custom program, with an average satisfaction rating of 4.0 overall (Figure B-2). Trade allies were especially satisfied with the amount of communication and support from the program and the program representative. The lowest satisfaction was with incentive amounts; however, most people still rated their satisfaction as a 4 out of 5. When asked how their satisfaction compared with previous years in the program, most people said their satisfaction had remained the same with most program aspects, and very few indicated their satisfaction had decreased in any way.

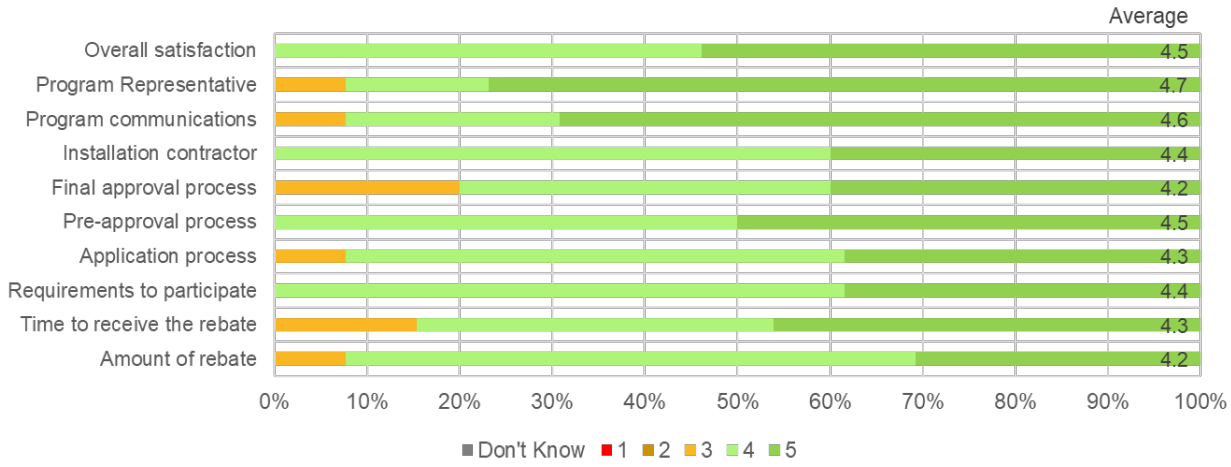
Figure B-2. PY2 Trade Ally Satisfaction with Program Aspects (n=10)



Source: Guidehouse survey analysis

PY1 participant survey respondents[10] ranked their satisfaction with the various aspects of the program high, with all categories receiving an average ranking of 4.2 to 4.7 (on a 1-5 scale, where 1 is low and 5 is high). Satisfaction increased relative to PY4 of MEEIA Cycle 2 ratings in almost all categories, with particularly notable increases in program communications (4.2 to 4.6) and the preapproval process (3.9 to 4.5).

Figure B-3. Participant Satisfaction with Program Aspects (n=13)



Source: Guidehouse survey analysis

[10] PY1 Participant FR survey

Table B-18 summarizes the Missouri-required process questions and associated answers to those questions.

Table B-18. Business Custom Program Missouri Requirement-Based Findings

Missouri Question	Guidehouse Findings
1. What are the primary market imperfections that are common to the target market segment?	Project types included in the Business Custom program can be complex and take many years to complete. Customers may not fully understand the available energy savings from these types of projects, which requires utility education initiatives and incentives.
2. Is the target market segment appropriately defined or should it be further subdivided or merged with other market segments?	Guidehouse found that the target market is appropriately defined. All business customers are eligible to participate in the Business Custom program. Indoor agriculture projects provide the most energy savings to the program. The small and medium business customers are highly targeted by the Business Standard program because the application process and incentives are easier to complete and receive.
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	Evergy has been successful in keeping the share of non-lighting measures well above 20% for the Business Custom program. In PY3, the program consisted of approximately 50% non-lighting measures. The inclusion of some large grow facility projects added to the diversity of the program as they included agriculture lighting and agriculture HVAC measures. Because the overall savings in the Business Custom program can be driven by one or two large projects, Guidehouse thinks program participation appropriately reflects the end-use needs within the target market segment.
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	Marketing and promotion of the Business Custom program is primarily through emails and online webinars available to customers and trade allies. The online communications throughout the year provided information about Evergy's business programs and supplemented the information available on Evergy's website. The Business Custom program communicates closely with the CSMs who represent the larger Tier 1 customers. The implementer has also worked with the CSMs to identify if any direct communication options with Tier 1 customers can be made available to allow for more direct marketing and engagement of these large Tier 1 customers.
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	Customers and trade allies need support to identify and implement large and non-standard energy efficiency projects that fall in the Business Custom program. In previous program years, trade allies reported an interest in learning about potential leads that program staff may have about customers that have shown interest in the program. Trade allies also reported a desire to shift more measures from the Business Custom program to the Business Standard program because incentive processing is easier. They also reported a desire for higher incentives for exterior lighting projects due to the higher labor costs for exterior projects.

Source: Guidehouse analysis

B.2.2.2 Recommendations

The recommendations that correspond to Guidehouse's findings on the process evaluation are provided in Table B-19. These recommendations are based on the findings outlined above and are informed by the program manager interview, IC interview, and participant surveys conducted in PY3.

Table B-19. Business Custom Program Missouri Requirement-Based Recommendations

Missouri Question	Guidehouse Recommendations
1. What are the primary market imperfections that are common to the target market segment?	Some customers do not have the in-house engineering expertise to pursue complex custom projects or to understand the benefits of these projects. The program should continue efforts to offer technical support to: • Help identify non-standard energy efficiency projects that do not fall in the Business Standard program. • Help customers with the application process including the preapproval and post phase. • Develop new industry-specific outreach campaigns that help customers understand how custom projects benefit customers like them.
2. Is the target market segment appropriately defined or should it be further subdivided or merged with other market segments?	Evergy's Business Custom program should continue to work to identify new types of projects with the potential for energy savings. These new project types may be in business types that tend to have low participation in the Business Program. Survey respondents indicated that there are still a few measure types that Evergy did not offer a rebate for that they would like to see included. These may have been due to communication challenges or long payback periods. The IC should continue to work closely with the CSMs to identify opportunities to keep Tier 1 customers actively participating in Evergy's programs and meet the needs of these larger or national accounts.
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	Trade allies and customers should continue to be encouraged to install non-lighting measures. As Evergy begins to conduct facility assessments, efforts could expand in PY4 to leverage these facility assessments to encourage participation in the various non-lighting measures available through the Business Custom program. Efforts should continue to educate customers and trade allies about the availability of peak load shifting because it can lead to significant savings.
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	Evergy should continue efforts to market and communicate about the Business Custom program as part of the broader marketing efforts of Evergy's business programs, including the Business Standard programs. These efforts were shown in previous program years to lead to increased participation among smaller business customers in the Business Custom program.
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	Evergy and the IC should continue to offer technical support and education accessible to all customers. Some survey respondents indicated that they would have preferred more transparency in the final rebate total. However, the overall satisfaction with the program was very high in PY2 and PY3 responses, indicating the communication mechanisms are appropriate for most of the target market. Further efforts to identify trade ally and customer challenges with the application process should continue to be pursued as respondents indicated the lowest satisfaction with the application process. Guidehouse recommends that incentive levels for all end uses be reviewed annually to ensure they are significant enough to maintain strong participation in the program without increasing FR and to consider the time and effort needed to complete the Business Custom application.

Source: Guidehouse analysis

B.2.3 Cost-Effectiveness Findings

This section presents Guidehouse's cost-effectiveness evaluation for the Business Custom program for each of the five standard benefit-cost tests. Please refer to Appendix A.3 for information on how benefits and program costs are allocated to each of the cost tests as well as the sources for the benefit and cost input assumptions.

Table B-20 presents the benefit-cost ratios for the five standard benefit-cost tests for Evergy Metro and Evergy MO West for PY3. Based on Guidehouse's benefit-cost analysis, Evergy MO West achieves a cost test ratio greater than 1.0 in the TRC, SCT, UCT, and PCT. Evergy Metro achieves a TRC ratio of 0.98 and an SCT, UCT, and PCT above 1.0.

Table B-20. Business Custom Program Cost-Effectiveness Results

Territory	TRC	SCT	UCT	PCT	RIM
Evergy Metro	0.98	1.26	1.73	1.82	0.55
Evergy MO West	1.08	1.32	2.19	1.84	0.57

Source: Guidehouse analysis

B.3 Process Efficiency Program

The Process Efficiency program is designed to provide a non-capital-intensive approach to energy efficiency engagement for businesses of all sizes and industries. Through its engagement process, the program seeks to ingrain energy management into its customers' business practices.

The program's activities are focused on providing retrocommissioning (RCx) services. RCx provides incentive offsets for comprehensive system energy optimization studies, allowing participants to identify low- and no-cost, long-term improvement strategies. Incentives are also offered on a $/kWh basis to address recommendations. Through the RCx process, participants receive recommendations for higher cost system improvements. These recommended measures can then be addressed through the Business Standard and Business Custom programs, along with other potential energy efficiency and demand response (DR) programs.

RCx project eligibility includes the following:

- Significantly higher than average energy usage intensity or conditioned area over 100,000 square feet
- Building over 2 years old or 2 years since the last building retrofit
- Existing energy management system

RCx incentives are based on approved energy savings associated with project measures and a study reimbursement based on proven energy savings and study cost with a project simple payback of 18 months or less. An approved RCx service provider must complete an energy study to identify and describe recommended measures and submit a final report describing the implemented measures. The simple payback for the project, based on all measures, must be less than or equal to 18 months to be eligible for an RCx incentive. RCx study and measures are capped at 100% of total implementation cost. Measures creating a simple payback greater than 18 months may still be eligible for Evergy's Business Custom incentives. Projects over 500,000 kWh are required a minimum of 14 days of continuous, typical day equipment-level post-monitoring prior to completing documentation submission.

B.3.1 Impact Evaluation Findings and Recommendations

The Process Efficiency program implemented three projects in 2022. In its third year of Cycle 3, the Evergy Metro Process Efficiency program achieved 0.1% and 1.7% of the 3-year MEEIA

Cycle 3 target energy and coincident peak demand savings, respectively. To date, including PY1-PY3, the program has achieved 0.1% and 1.7% of the 3-year MEEIA Cycle 3 target energy and coincident peak demand savings, respectively. The Evergy MO West Process Efficiency program achieved 1.3% and 15.7% of the 3-year MEEIA Cycle 3 target energy and coincident peak demand savings, respectively. To date, including PY1-PY3, the program has achieved 3.5% and 44.9% of the 3-year MEEIA Cycle 3 target energy and coincident peak demand savings, respectively.

In PY3, the team conducted an impact evaluation, cost-effectiveness analysis, and process evaluation for the Process Efficiency program. For its impact evaluation, Guidehouse performed a tracking database and engineering review of the three projects completed in 2022.

B.3.1.1 Findings

Table B-21 summarizes the energy and peak demand savings and the corresponding realization rates for the single project included in the Evergy Metro Process Efficiency program in PY3. All reported savings were verified leading to a 100% realization rate. Table B-22 shows the program's savings to date.

Table B-21. Process Efficiency Program PY3 Energy and Demand Savings Summary – Evergy Metro

	Gross			Net*		
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	25,058	25,058	100%	19,454,539	19,445	0.1%
Coinc Demand at Customer Meter (kW)	4	4	100%	181.96	3.05	1.7%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio. An NTG ratio of 0.816 was applied to the Business Process Efficiency program based on research conducted by Guidehouse in MEEIA Cycle 3 PY1 and PY2 for the Business Custom Program.Insufficient responses were received from the Process Efficiency participant survey conducted in PY3 to develop an NTG ratio.
† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

Table B-22. Process Efficiency Program to Date Energy and Demand Savings Summary – Evergy Metro

	Gross				Net*	
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	25,058	25,058	100%	19,454,539	19,445	0.1%
Coinc Demand at Customer Meter (kW)	4	4	100%	181.96	3	1.7%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio. An NTG ratio of 0.816 was applied to the Business Process Efficiency program based on research conducted by Guidehouse in MEEIA Cycle 3 PY1 and PY2 for the Business Custom Program. Insufficient responses were received from the Process Efficiency participant survey conducted in PY3 to develop an NTG ratio.
† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

Table B-23. Process Efficiency Program PY3 Energy and Demand Savings Summary – Evergy MO West

	Gross				Net*	
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	337,632	342,927	102%	20,470,674	266,111	1.3%
Coinc Demand at Customer Meter (kW)	53	46	87%	227	35.74	15.7%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio. An NTG ratio of 1 was applied to the Process Efficiency program. Guidehouse will conduct NTG research for the program in MEEIA Cycle 3 PY3.
† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

Table B-24. Process Efficiency Program to Date Energy and Demand Savings Summary – Evergy MO West

	Gross			Net*		
	Reported Savings†	Verified Savings‡	Realization Rate	MEEIA Cycle 3 3-Year Target	Verified Savings	Percentage of MEEIA 3-Year Target Achieved
Energy at Customer Meter (kWh)	805,427	793,290	98%	20,470,674	716,474	3.5%
Coinc Demand at Customer Meter (kW)	126	112	89%	227	102	44.9%

* Guidehouse calculated net verified savings by multiplying gross verified savings by the NTG ratio. An NTG ratio of 1 was applied to the Process Efficiency program. Guidehouse will conduct NTG research for the program in MEEIA Cycle 3 PY3.
† The evaluation team characterized savings as reported and verified. Reported savings represent project savings estimated at the time of measure installation and reported in the program tracking database.
‡ Verified savings represent energy savings verified at the time of the evaluation.
Source: Guidehouse analysis

All the projects involved one measure: repairing compressed air leaks. The evaluation team reviewed the savings algorithm and found the approach to be appropriate and reliable. The kW/cubic feet per minute (CFM) efficiency values used in the verified savings calculations were the key driver for energy and coincident peak demand realization rates.

B.3.1.2 Recommendations

Table B-25 summarizes Guidehouse's recommendations based on its impact evaluation findings.

Table B-25. Process Efficiency Program Impact Recommendations

Summary of Recommendations	
1. Guidehouse recommends the IC provide unlocked analysis workbooks.	Guidehouse recommends that all calculations, independent of measure type, be initially performed in worksheets where the equations are transparent and easily reviewed to facilitate verification and evaluation. Currently, the IC uses locked worksheets, which make verifying the engineering analysis and determining drivers for change in savings difficult.
2. Guidehouse recommends the IC include additional details in the analysis workbooks.	The analysis workbooks for leak repair measures are locked. Although the savings algorithm is available for review in a separate document, the evaluation team was unable to exactly replicate the savings. Displaying additional input parameters such as kW/CFM efficiency and calculated leaked CFM values in the analysis workbook will help identify the drivers for differences in savings values.

Source: Guidehouse analysis

B.3.2 Process Evaluation Findings and Recommendations

B.3.2.1 Findings

Table B-26 summarizes the Missouri-required process questions and associated findings to those questions.

Table B-26. Process Efficiency Program Missouri Requirement-Based Findings

Missouri Question	Guidehouse Findings
1. What are the primary market imperfections that are common to the target market segment?	PY1 was the first year for the Process Efficiency program offering. The program was slow to ramp up in PY1 and PY2 due to challenges posed by the COVID-19 pandemic. Because it is a new program and RCx can be perceived as complex, it takes time for customers and trade allies to better understand the program. However, the program had slightly more engagement in PY3 compared with prior years.
2. Is the target market segment appropriately defined or should it be further subdivided or merged with other market segments?	The program primarily targets industrial customers for implementing RCx projects. For the RCx sector, the target market is appropriately defined.
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	The program is currently focused on providing services for RCx projects for industrial customers.
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	The program is in its third year, and Evergy had challenges throughout promoting it due to the COVID-19 pandemic and the perception of the RCx measures being complex. However, all the communication channels are appropriate for the target market sector. The marketing and promotion activities involved an email campaign, direct mail, webinars, and an RCx-focused campaign for trade allies. The IC team marketing activities evolved over time to build on past efforts.
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	The Process Efficiency program is not being continued in Cycle 3 PY4. If Evergy were to restart the program in future years, Evergy may want to pursue innovative approaches to encourage customer engagement with this program and within the overall C&I suite of programs.

Source: Guidehouse analysis

B.3.2.2 Recommendations

Guidehouse addressed the five required process evaluation questions set forth in the Missouri regulations[11] for the Process Efficiency program; the evaluation team's recommendations are provided in Table B-27.

Table B-27. Process Efficiency Program Requirement-Based Recommendations

Missouri Question	Guidehouse Recommendation
1. What are the primary market imperfections that are common to the target market?	RCx projects can be complex and difficult to understand from a requirements standpoint. If the program were to restart in future years, then it should continue efforts to educate and offer additional technical support to the trade allies, customers, and CSMs to: • Understand the program better. • Help identify energy efficiency projects. • Develop RCx-specific outreach campaigns that help customers understand how these measures benefit customers like them.

[11] 4 CFR- 240-22.070(8)

Missouri Question	Guidehouse Recommendation
2. Is the target market segment appropriately defined or should it be further subdivided or merged with other market segments?	Evergy should work with CSMs to ensure they have the training and expertise needed to help customers identify energy savings in their facilities through an in-depth audit and face-to-face interactions. The CSMs could also work more closely with IC to help identify potential projects and work with IC staff to support the customer through the application process.
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	Evergy could consider targeting and adding more measures similar to the compressed air leaks survey and repairs to facilitate engagement with the customers.
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	Evergy is leveraging multiple avenues to reach customers and trade allies. Evergy could consider RCx-focused events for customers to generate awareness about the measures similar to the C&I Business Energy Solution Forum event in the past. In addition, the IC team should continue with the plan to collect customer testimonials to help build trust and program awareness if the program were to restart.
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	A key challenge to this program is that customers, trade allies, and CSMs may not completely understand it. Evergy could continue educating all the stakeholders and complete outreach efforts to generate awareness for the program. Evergy could also continue to look for innovative approaches to engage customers similar to the leaks survey and repair incentives being offered. As indicated by the IC, the program could allow wider RCx service provider participation with relevant training to get them up to speed on the program requirements.

Source: Guidehouse analysis

B.3.3 Cost-Effectiveness Findings

Process Efficiency savings were reported in PY3 for Evergy Metro and Evergy MO West. Evergy Metro achieved a TRC ratio of 0.01 and Evergy MO West achieved a TRC ratio of 0.12.

Although Process Efficiency administrative costs are low compared with other programs in Evergy's portfolio, they outweigh benefits and are the primary driver in low cost-effectiveness ratios. This program was projected to be cost-effective with greater participation based on the merits of the measures alone.

Table B-28. PY3 Cost-Effectiveness Results – Process Efficiency Program

Territory	TRC	SCT	UCT	PCT	RIM
Evergy Metro	0.01	0.01	0.01	0.31	0.01
Evergy MO West	0.12	0.12	0.12	4.80	0.10

Source: Guidehouse analysis

B.4 Online Business Energy Audit

The OBEA for small and medium businesses is an online tool that enables business customers to track and analyze their energy use. The tool also provides educational materials on energy savings for heating, cooling, lighting, and other electrical equipment. OBEA encourages small

and medium businesses to engage with the broader portfolio of demand-side management programs.

Business customers billed based on energy use (kWh) and not demand (kW) can access the tool through My Account. These customers can track their energy and access tips for saving energy. However, they cannot access the Neighbor Comparison or Energy Analyzer portions of the tool.

B.4.1 Impact Evaluation Findings and Recommendations

B.4.1.1 Findings

Because OBEA does not claim savings for program activities, a savings impact analysis was not part of the scope of the evaluation.

B.4.1.2 Recommendations

There are no savings associated with the OBEA program. The program tracks overall page views and customer-level activity on key program pages such as the Energy Analyzer and Tip Actions. This detailed information is valuable for tracking tool use and should be continued.

B.4.2 Process Evaluation Findings and Recommendations

B.4.2.1 Findings

Guidehouse addressed two program-specific questions and the five Missouri-required questions for process evaluation through staff interviews and a program materials review. The evaluation team interviewed and exchanged emails with the Evergy program manager and reviewed materials on the program website and provided by the program manager to inform the process evaluation.

Table B-29 summarizes the program-specific and Missouri-required process questions and associated answers to those questions.

Table B-29. OBEA Programs Missouri Requirement-Based Findings

Program-Specific Question	Guidehouse Findings
1. How many unique visitors are using OBEA?	The program can see and track unique logins for small and medium business customers. The program continues undergoing changes to include newer features. The overall customer engagement went up as evident from the 28% increase over the prior year.
2. How is it being used relative to other utilities?	Answering this question requires additional research—interviews need to be conducted with program staff of other utilities. The overall widget impressions increased by 36% over prior year indicated either the customers viewing multiple widgets or coming back multiple times to interact with those widgets.

Missouri Question	Guidehouse Findings
1. What are the primary market imperfections that are common to the target market segment?	Some customers do not understand how their actions or their appliances and equipment in their business can affect their energy use. The OBEA tool educates customers on their energy use and provides tips to help them lower it.

Missouri Question	Guidehouse Findings
2. Is the target market segment appropriately defined or should it be further subdivided or merged with other market segments?	In PY3, the program continued targeting small and medium business customers interested in making their businesses more energy efficient or reducing their electricity bill. In the future, OBEA may look to expand the offerings to all C&I and not just restrict to small and medium businesses. There are no specific plans or timeline for this expansion.
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	The tool appropriately reflects the diversity of end-use energy service needs of the target market. The OBEA tool has the following components: • My Energy Usage lets customers view their own usage on a monthly or annual basis. • Detailed interval data is being added to provide deeper insight and help businesses better understand their energy consumption. • Ways to Save is a tip library that provides business-specific suggestions in the areas of lighting, HVAC, and refrigeration for customers to reduce their energy use. The library contains over 30 tips.
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	The program has continued to communicate with customers informing them about the program offerings and making it easy for them to find the relevant information on the website.
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	Evergy is continuing to implement changes to the program such as integrating the web widgets more broadly on the website, making them easier for the customers to find, and encouraging customers to interact with their energy usage patterns.

Source: Guidehouse analysis

B.4.2.2 Recommendations

Guidehouse addressed the five required process evaluation questions set forth in the Missouri regulations[12] for OBEA. Overall, the evaluation team found that the program meets the requirements. Table B-30 summarizes the team's conclusions and recommendations.

[12] 4 CFR- 240-22.070(8)

Table B-30. OBEA Missouri Requirement-Based Recommendations

Missouri Question	Guidehouse Recommendation
1. What are the primary market imperfections that are common to the target market?	Evergy should continue gathering feedback from customers to understand how effectively the tool engages and educates customers on their energy use and how to reduce it.
2. Is the target market segment appropriately defined or should it be further subdivided or merged with other market segments?	The program should continue to monitor the effectiveness of outreach to ensure small business customers learn about the tool. Evergy might want to consider segmentation or propensity modeling to understand who is using the tool and who is not to better target both groups.
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	The IC could consider conducting analysis to assess savings associated with the program by assigning rough savings estimates to tips and applying those estimates to customers who indicated they have taken the tip's action.
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	Evergy has used a variety of communication channels in the past. With the updated tool, using and assessing the efficacy of a variety of channels will continue to be important.
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	Evergy may want to assess the most effective approaches to drive different types of customers to the tool through A/B testing, propensity modeling, or other approaches. In addition, Evergy should consider outbound communication to continue to educate customers without having to come to the web.

Source: Guidehouse analysis

Appendix C. Cross-Cutting Methodologies

This appendix covers Guidehouse's overall approach toward cross-cutting methodologies, namely determining cost-effectiveness and NTG savings.

C.1 Cost-Effectiveness Approach

Guidehouse calculated benefit-cost ratios and total net benefits at the program and sector levels for the five standard benefit-cost tests:

- TRC test
- SCT
- UCT
- PCT
- RIM test

Benefit-cost ratios are informative because they show the value of monetary benefits relative to the value of monetary costs as seen from various stakeholder perspectives.

Cost-effectiveness values were calculated using Guidehouse's ProCESS model and leverage Guidehouse-verified EM&V findings including energy and demand impacts, O&M savings, incremental costs, NTG ratios, participation numbers, program administrative costs, and measure lifetimes. Additionally, energy and demand avoided costs, end-use load shapes, retail rates, discount and inflation rates, and line loss factors were provided by Evergy or characterized by Guidehouse to support cost-effectiveness calculations. The ProCESS model imports measure, program, and utility data where appropriate to determine granular cost-effectiveness results. These results are then summed to various levels of aggregation-to-yield ratios and net-present-value benefits.

Where available, program and avoided cost data and discount rates are consistent with those Evergy used in calculating cost-effectiveness as part of its annual filing. For inputs not accessible through Evergy's planning model, Guidehouse researched inputs consistent with previous Evergy cost-effectiveness evaluations. Guidehouse's ProCESS model formulation of the cost-benefit tests followed the 2001 California SPM[13] and does not account for the subsequent 2007 SPM Clarification Memo.[14]

Table C-1 summarizes how program costs and benefits are assigned to each of the cost tests, consistent with the California SPM. In this analysis, the TRC test and the SCT only differ in the discount rate assumed (i.e., externalities are not included in this SCT analysis). Refer to Table C-2 for sources of assumptions regarding discount rates. For comparison with Evergy Metro

[13] California Public Utilities Commission, *California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects*, October 2001, https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpuc_public_website/content/utilities_and_industries/energy_-_electricity_and_natural_gas/cpuc-standard-practice-manual.pdf.

[14] California Public Utilities Commission, "2007 SPM Clarification Memo," 2007, https://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/73172-10.htm.

and Evergy MO West's reported cost-benefit ratios, this report provides TRC and SCT results without including incentives paid to free riders as required by the 2007 SPM Clarification Memo.

Table C-1. Cost and Benefit Assignments by Cost Test

Item	TRC Test	SCT	UCT	PCT	RIM Test
Avoided Costs	Benefit	Benefit	Benefit	N/A	Benefit
O&M Savings	Benefit	Benefit	N/A	Benefit	N/A
Incentives	Transfer	Transfer	Cost	Benefit	Cost
Lost Revenue	Transfer	Transfer	N/A	Benefit	Cost
Administrative Costs	Cost	Cost	Cost	N/A	Cost
Participant Equip. Costs	Cost	Cost	N/A	Cost	N/A

Source: Guidehouse

C.1.1 Sources of Benefit and Cost Assumptions

Table C-2 summarizes the sources of data used in the cost-benefit analysis. Many of the input assumptions used in Guidehouse's analysis came directly from Evergy. Critical assumptions that differed in Guidehouse's analysis were energy and peak demand savings (derived from verified data rather than reported estimates), NTG ratios, EUL and RUL values, and participant equipment costs. Reference Appendix I for inputs to Guidehouse's cost-benefit model.

Table C-2. Sources of Benefit and Cost Data

Data*	Source
Avoided energy costs	Provided by Evergy
Avoided capacity costs	Provided by Evergy
Retail rates	Provided by Evergy
Load shapes	Developed by Guidehouse
Discount rates	Provided by Evergy and classified by Evergy as highly confidential
O&M savings	Guidehouse analysis
Participant equip. costs	Illinois TRM, Evergy-prescribed values, actual project costs from the tracking database
Energy and peak demand savings	Guidehouse engineering analyses
EUL	Illinois TRM, program tracking data, Evergy-prescribed values
RUL	Guidehouse analysis based on lifetime of replaced equipment and related mortality analysis techniques
NTG	Guidehouse NTG analysis
Line loss factors	Provided by Evergy
Incentives	Program tracking database
Participation	Program tracking database
Administrative costs	Provided by Evergy

*Guidehouse did not provide the avoided energy and capacity costs in this report as these costs are confidential to Evergy.
Source: Guidehouse

C.2 NTG Approach

This section outlines the methods Guidehouse used to estimate FR and SO as part of its evaluation of the Evergy portfolio of energy efficiency and DR programs.

The goal of Guidehouse's approach is to accurately estimate NTG components using multiple methods to approximate not only FR but also SO over the course of the 3-year program cycle. The evaluation team used the following definitions, provided by the Uniform Methods Project,[15] to calculate net savings:

- **FR:** The program savings attributable to free riders—i.e., program participants who would have implemented a program measure or practice in the absence of the program.
- **PSO:** The additional energy savings achieved when a program participant—because of the program's influence—installs energy efficient measures or practices outside the efficiency program after having participated.
- **NPSO:** The additional energy savings achieved when a nonparticipant implements energy efficiency measures or practices as a result of the program's influence (e.g., through exposure to the program) but that are not accounted for in program savings.

Using these definitions, the team calculated the NTG ratio using Equation C-1.

Equation C-1. NTG Ratio

$$\text{NTG Ratio} = 1 - \text{FR rate} + \text{PSO rate} + \text{NPSO rate}$$

Guidehouse used several types of NTG estimates depending on the program type, data availability, and the level of effort planned for the evaluation. Some programs use the prior year's estimated NTG components in the absence of new research that informed all components (such as NPSO). Some evaluated programs have no claimed savings and do not require NTG estimation. Table C-3 summarizes the NTG method used for each program.

Table C-3. NTG Methods by Program

Program Name*	FR and SO Estimated from PY3	FR and SO Estimated from PY1	Used PY2 Value for NPSO	Not Applicable (No Claimed Savings)
Business Custom Program		X	X	
Business Standard Program	X		X	
Process Efficiency Program*	Low Number of Responses			
Business Online Energy Audit				X

* The Process Efficiency Program did not report savings in PY1 and ramped up in PY2, reporting two completed projects in PY2 and three completed projects in PY3. Guidehouse received one survey response from one of the two PY2 participants and one survey response from one of the three PY3 participants. Due to the low number of responses received, they were not leveraged to develop an NTG ratio. Instead, Guidehouse applied the PY2 Custom

[15] Daniel M. Violette and Pamela Rathbun, *Estimating Net Savings: Common Practices*, Chapter 23 in *The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures,* 2014, http://energy.gov/sites/prod/files/2015/02/f19/UMPChapter23-estimating-net-savings_0.pdf.

Freeridership and Non-participant Spillover values and a Participant Spillover value of 0, based on no evidence of Participant Spillover, to calculate the NTG ratio to apply to the PY3 verified savings..
Source: Guidehouse

C.2.1 Participant FR

This section presents the general FR methodology. FR was assessed using a customer self-report approach following the Research Into Action and Energy Trust of Oregon (ETO) framework.[16] This approach used surveys designed to assess the likelihood that participants would have installed some or all of the energy efficiency measures incented by the program even if the program had not existed. The participant surveys followed the same basic structure as the ETO framework.

Based on the ETO methodology, the FR analysis included the following two elements: 1) intention to carry out the energy efficient project without program funds; and 2) influence of the program in the decision to carry out the energy efficient project.

The total FR score was the sum of the intention and program influence scores, resulting in a score ranging from 0 to 100. This score was divided by 100 to convert it into a proportion for application to gross savings values (see Equation C-2).

Equation C-2. Total FR

$$\text{Free Ridership (FR)} = \frac{\text{Intention Score + Program Influence Score}}{100}$$

C.2.1.1 Participant FR Intention Score

The evaluation team assessed intention through several brief questions used to determine how the upgrade or equipment replacement likely would have differed if the respondent had not received program assistance. The initial series of question asked the respondent to identify, out of a limited set of options, what most likely would have occurred without program assistance. Specific wording of the questions varied based on the types of measures installed through the program, but the offered response options captured the following five general outcomes:

1. Would have canceled the project, upgrade, purchase, etc., or installed the lowest efficiency option
2. Would have postponed the project by at least 1 year
3. Would have done something that would have produced savings but not as much as those achieved through the project as implemented (smaller quantity and/or lower efficiency)
4. Would have done the project exactly as implemented through the program
5. Don’t know

Respondents who said they would have canceled or postponed the entire project for at least a year or installed the lowest efficiency available were not considered free riders in terms of intention (a score of 0 for the intention score). The respondents that indicated they would have

[16] Jane Peters and Ryan Bliss, *Common Approach for Measuring Free Riders for Downstream Programs,* Research Into Action, October 4, 2013.

undertaken the project as implemented or purchased/installed the same energy efficient equipment without the program were considered total free riders in terms of intention (a score of 50 for the intention component). Respondents who indicated they would have done something that would have resulted in less savings were considered partial free riders with an intention score between 5 and 45 depending on the combination of responses about the quantity and efficiency level of the equipment that would have been installed in the absence of the program. Table C-4 demonstrates the assignment of efficiency scores and timing adjustments, which combine to form the intention score (Intention = Efficiency * Timing Adjustment).

Table C-4. Efficiency Score and Timing Adjustment Determination

Efficiency Installed in Absence of Program	Efficiency Score
Same efficiency or higher	50
Almost as efficient	33.3
Somewhat less efficient	16.6
Lowest efficiency/lowest cost available	0
Don't know	25

Quantity Installed within 1 Year in Absence of Program	Timing Adjustment
All	1.0 (no change to Efficiency Score)
Most	0.66
Some (or Don't Know)	0.5
Few	0.33
None	0 (Intention Score becomes 0)

Source: Guidehouse

C.2.1.2 Participant FR Influence Score

Guidehouse assessed the program influence on the participant's decision to implement energy efficiency improvements by asking the respondent how much influence—on a scale of 1 (no influence) to 5 (great influence)—various program elements such as incentives and program information had on the decision to implement the measure. Respondents were asked to rate the program's influence on the efficiency and timing of their project separately, to make the influence questions easier for respondents to answer in situations where the program greatly influenced one element of the project but not the other.

A participant's program influence score was then set to the participant's maximum influence rating for any program element. The rationale was that if any given program element had a great influence on the respondent's decision then the program itself had that level of influence, even if other elements had less influence.

Respondents were asked to rate each of the following program elements on the 1-5 influence scale:

- Influence of the **program incentive** on the decision to complete a high efficiency project
- Influence of **educational or marketing materials from an Evergy program** on the decision to complete a high efficiency project
- Influence of **information from Evergy Business Energy Savings program staff** on the decision to complete a high efficiency project

If the respondent indicated that they would have installed the project at a later date in the absence of the program, they also were asked to rate the:

- Influence of the **program incentive** on the decision to complete the project at the time that they did rather than a later date
- Influence of **educational or marketing materials from an Evergy program** on the decision to complete the project at the time that they did rather than a later date
- Influence of the **information from Evergy Business Energy Savings program staff** on the decision to complete the project at the time that they did rather than a later date

The influence score is based on the highest rated program element. Table C-5 shows the influence score for each possible influence rating response. An influence rating response of 5 (Very influential) resulted in an influence score of 0, contributing no value to the total FR score. Program influence and FR have an inverse relationship: the greater the program influence, the lower the FR, and vice versa.

Table C-5. FR Program Influence Scores

Maximum Program Influence Rating Response	Influence Score
1 (Not at all influential)	50
2	37.5
3	25
4	12.5
5 (Very influential)	0
Don't know	25

Source: Research Into Action and ETO Standard FR Protocol

C.2.1.3 Determination of the Weighted FR

Guidehouse estimated FR individually for each survey respondent according to the algorithm described above and observed large variation in FR by end-use type. For this reason, the evaluation determined savings by weighting the individual respondent's share of total energy savings by end-use to estimate end-use level FR for the program. Guidehouse calculated a FR value for lighting and non-lighting participants based on the survey responses, and then weighted these FR values based on the share of verified PY3 lighting and non-lighting savings from the program to develop the weighted FR.

C.2.2 Sensitivity Analysis on Don't Know Responses

Guidehouse has formalized an approach for treatment of "don't know" responses in response to feedback from the EM&V auditor. The standard treatment is described above, in which a don't know response is assigned a midpoint value for either the Intention Score or the Influence Score (e.g., equivalent to 50% attribution for that score). However, to explore the impact of this assumption of 50% attribution for don't know responses on the program-level NTG, Guidehouse will also calculate program-level FR with alternate assumptions of 0% attribution or 100% attribution as well as simply dropping the score from the analysis. Guidehouse will review the results of the sensitivity analysis with the EM&V auditor, and review open-ended responses that may inform the interpretation of the data. Guidehouse will then make a final decision about what assumption to use for the don't know responses. In prior years' analyses, varying the assumption used for don't know has an insignificant impact on the program-level FR estimate. If

a respondent answers don't know to each question required to calculate FR, the respondent is dropped from the analysis altogether.

C.2.3 Participant SO

Guidehouse also assesses SO through the customer surveys. SO is the energy savings influenced by the program but that did not receive program incentives and are not included in the program records. Survey questions aimed to identify whether participants purchased or installed additional energy efficient products without an incentive. The following are examples of survey SO questions:

- Since your participation in the program, did you install or purchase any ADDITIONAL energy efficient products in your home that did NOT receive incentives through Evergy?
- Could you describe the energy efficient product installed or purchased?
- How did you know the product was energy efficient?
- How many energy efficient products did you purchase without an incentive?

Additionally, the evaluation team included a question about the level of influence the program had on the respondent's decision to install the additional measures. An example of the question follows.

- On a 1-5 scale where 1 is not at all influential and 5 is very influential, how influential was your experience in the Evergy program in your choice to install or purchase the energy efficient product?

The 1-5 influence ratings form an SO influence score as follows:

- 1 (low program influence) = 0%
- 2 = 25%
- 3 = 50%
- 4 = 75%
- 5 (high program influence) = 100% (full attribution)

For each participant, Guidehouse calculated SO for measures reported as the product of the measure savings, number of units, and influence score, as Equation C-3 illustrates.

Equation C-3. SO Savings from Installed Measures

$$\text{Measure SO} = \text{Measure Savings} * \text{Quantity} * \text{SO Influence Score}$$

For each participant, the evaluators then totaled the measure-level SO savings to give the participant-level SO savings reflected in Equation C-4. To be conservative, Guidehouse assumed that no participant would have an SO project with higher savings than the program-incented project, effectively capping each participant's spillover at their program kilowatt-hour savings.

Equation C-4. Overall Participant SO

$$\text{Participant SO} = \text{Minimum } (\Sigma\text{Measure SO, Project Savings})$$

Finally, the team summed the SO across participants and divided the program total SO savings by the program total savings in the sample to yield a participant SO percentage, as Equation C-5 shows.

Equation C-5. Participant SO Percentage

$$\%\ \text{Participant SO} = \frac{\sum \text{Participant SO (population)}}{\text{Program Savings in Sample}}$$

C.2.4 Trade Ally NPSO

The following sections present details on the trade ally NPSO method. Guidehouse's NTG analysis employs an incremental scoring approach (i.e., 1=0%, 2=25%, 3=50%, 4=75%, 5=100%) for all scoring.

C.2.4.1 Program Influence on Trade Ally Methodology

The analysis used the responses to the program influence on trade ally (PITA) questions in two ways:

- To qualitatively provide insight and context for the NTG analysis
- To form part of an attribution factor to determine what share of non-incented high efficiency project savings should be attributed to the program as SO

Guidehouse's analysis resulted in a marketing influence score based on questions that focus on how trade allies are marketing energy efficient products due to program influence. Table C-6 presents the question and resulting program volume influence scores.

Table C-6. Calculation of Marketing Influence Score

Response to Question: How much influence has that marketing assistance had on your ability to successfully market energy efficiency to your customers? (Scale of 1-5)	Marketing Influence Score
1 (Not at all influential)	0%
2	25%
3	50%
4	75%
5 (Very influential)	100%

Source: Guidehouse

Guidehouse also asked trade allies about the likelihood that they would have recommended the same high efficiency measures in the absence of the program. That response was converted into a recommendation program influence score as Table C-7 shows. A high likelihood score converts into a low program influence score and vice versa.

Table C-7. Calculation of Recommendations Influence Score

Response to Question: Since participating in the Evergy program, have you changed your energy efficiency offerings to customers? For instance, have you added more high efficiency products to your offerings, stopped offering lower efficiency models, or started recommending higher efficiency models as the "default" option? If the program had never been available, what is the likelihood that you would have made those same changes? (Scale of 1-5)	Recommendations Influence Score
1 (Not at all likely)	100%
2	75%
3	50%
4	25%
5 (Very likely)	0%

Source: Guidehouse

Finally, the team calculated an overall PITA score. The score is the maximum of the previously calculated influence scores. The maximum of the scores is used rather than an average because using an average would unduly underestimate the program's impact in instances where the program has had a strong influence on the high efficiency sales of a trade ally who has always recommended high efficiency measures, for example.

C.2.4.2 NPSO Methodology

Trade allies answered a series of questions to establish the possible existence of SO for their top three highest saving measures as well as any other measures that had a significant amount of non-incented high efficiency sales in the prior year.

Estimating the Number of Non-Incented High Efficiency Projects. For each measure, the survey asked the trade ally to estimate how many (if any) additional projects it completed without rebates. Then the survey asks trade allies to describe why they did not seek incentives for the program-qualifying measures and how the program influenced those measures; Guidehouse reviewed these open-ended responses to identify instances in which potential spillover projects should not be considered spillover (e.g., the project did not occur in Evergy territory). Trade allies often reported that spillover occurred because customers did not want to take the time to complete the program-related paperwork, whereas the participants have demonstrated that they are willing to take the time to complete program paperwork to receive rebates when working with a participating trade ally who is aware of the program rebates. This suggests that the participating trade allies' reported spillover is occurring with nonparticipating customers who don't value rebates enough to take the time to apply for them.

Attributing Non-Incented Projects to the Program. For each SO measure, Guidehouse calculated the number of SO projects by multiplying each trade ally's total number of non-incented projects by an attribution factor based on the trade ally's responses to program influence questions. If the trade ally said that the program did not have any influence on the non-incented measures, the attribution factor was automatically 0% (meaning that no SO was assigned to the program for those measures for that trade ally). Otherwise, the attribution factor was based on the PITA score (discussed above) and the trade ally's response to the following question on program influence:

How influential do you think the program was on these additional units sold without rebates? (Scale of 1-5)

The 1-5 influence ratings form an SO influence score as follows:

- 1 (low program influence) = 0%
- 2 = 25%
- 3 = 50%
- 4 = 75%
- 5 (high program influence) = 100%

Equation C-6. Attribution Factor

$$\text{Attribution} = \text{PITA Score}^* \text{ SO Influence Score}$$

Next, Guidehouse calculated the number of SO projects per trade ally for each measure by multiplying the total number of non-incented projects by the attribution factor.

Equation C-7. Number of SO Projects by Trade Ally and Measure

$$\#\text{ of SO Projects}_{Measure} = \#\text{ of Non-Incented Projects}_{Measure} * \text{Attribution}$$

Estimating SO Project Savings. SO was calculated for each trade ally/measure combination separately. Guidehouse then calculated the total number of SO projects per measure category and multiplied the total number of SO projects across all trade allies by the measure's savings adjustment factor.

Equation C-8. Savings-Adjusted SO at the Measure Level

$$SO_{Measure} = \frac{\sum \#\text{ of SO Projects}_{Measure}}{\#\text{ of Program Projects}_{Measure}}$$

Finally, Guidehouse calculated a program-level SO estimate by weighting each measure's SO estimate by the measure's share of total program energy savings, as Equation C-9 shows.

Equation C-9. SO at the Program Level

$$SO = \sum SO_{Measure} * \frac{\text{Program Savings}_{Measure}}{\text{Program Savings}_{Total}}$$

C.3 Application of Baseline Energy Codes

The Business Standard program uses an assumed code that represents an approximate weighted average of the energy codes adopted in the territories. As the majority of the participants in the Business Standard program are customers located in Kansas City, Missouri (KCMO), Guidehouse believes it is appropriate to use KCMO's energy code for the Business Standard measures. Once KCMO updates its energy code, which it is currently considering to be International Energy Conservation Code (IECC) 2021, then Guidehouse will reevaluate which baseline code is most appropriate for the Business Standard program.

For the sampled projects for the Business Custom program, Guidehouse reviews the county or city code and applies the most relevant code as applicable for new construction and replace-on-

burnout HVAC projects. For early replacement HVAC projects, which are uncommon, Guidehouse uses a dual baseline approach to calculate savings. The existing equipment baseline is used until the assumed end of useful life of the existing equipment and then the code baseline is used for the RUL of the new equipment. Table C-8 outlines what Guidehouse assumed for PY3 based on the current energy codes for the Business Custom program.

Table C-8. Business Custom Program Energy Code Analysis

Location	Assumed Energy Code for PY3	Energy Code Source
No Code	IECC 2012	More conservative to estimate savings
City of Kansas City, MO	IECC 2012	https://www.kcmo.gov/city-hall/departments/city-planning-development/building-and-rehabilitation-code
Jackson County, MO	IECC 2009	https://www.jacksongov.org/DocumentCenter/View/267/54-Building-Code-PDF
Sedalia, MO	IECC 2015	https://library.municode.com/mo/sedalia/codes/code_of_ordinances?nodeId=CD_ORD_CH10BUBURE_ARTIVBUCO
Raytown, MO	IECC 2018	https://www.raytown.mo.us/index.asp?SEC=3B107F85-E8A5-482D-BF3E-F6BE008B599C
Riverside, MO	IECC 2018	https://www.riversidemo.com/buildingcodes/page/building-inspections
Buckner, MO	IECC 2003	https://ecode360.com/29975606#33347316
Belton, MO	IECC 2012	https://library.municode.com/mo/belton/codes/unified_development_code?nodeId=UNDECO_CH10BUST
Smithville, MO	IECC 2012	https://www.smithvillemo.org/pview.aspx?id=1943
Warrensburg, MO	IECC 2018	https://www.warrensburg-mo.com/197/Building-Inspections-Permits
Platte County, MO	IECC 2018	https://drive.google.com/drive/folders/0B3XJaCcHmN_qNkNoM3JuWElyZ0U
Gladstone, MO	IECC 2018	https://www.gladstone.mo.us/CommunityDev/adoptedcodes.php
Grandview, MO	IECC 2018	https://www.grandview.org/work/city-government/community-development/ordinances-codes
North Kansas City, MO	IECC 2018	http://www.nkc.org/departments/community_development/permits_and_applications

Source: Guidehouse analysis

Appendix D. Business Standard Program-Specific Methodologies

Evergy designed the Business Standard program to help C&I customers save energy through a broad range of energy efficiency options that address all major end uses and processes. The program offers standard rebates as well as midstream incentives. The measures incentivized—including lighting, HVAC equipment, and motors—are proven technologies that are readily available with known performance characteristics.

Based on Missouri regulations, the evaluation team used method 1a and protocol 2a and 2b to evaluate the Business Standard program. This evaluation of the Business Standard program consisted of the following activities:

- Gross impact evaluation (detailed in Appendix D.1)
- Process evaluation (detailed in Appendix D.2)
- NTG analysis based on work conducted in Cycle 3 PY3 (detailed in Appendix B.1.3)

D.1 Impact Evaluation

The impact evaluation assessed gross energy and demand savings by conducting the following activities:

- Tracking database review
- Deemed measure savings review

D.1.1 Tracking Database Review

The evaluation team conducted a thorough review of the program tracking database in March 2023 that included 12 months of data (January 2022-December 2022) for the program year. Guidehouse reviewed the program tracking database to assess the availability of data fields that help the impact evaluation, including the following:

- Participant contact details and installation address
- Building type
- Installed measure information (quantity, measure type, size, capacity, efficiency levels)
- Reported energy and demand savings at the measure and project[17] levels
- Project costs (implementation cost and incremental equipment cost)
- Trade ally contact information

D.1.2 Deemed Measure Savings Review

The Evergy MEEIA TRM documents assumptions for deemed measure savings for the Business Standard program. The evaluation team reviewed the deemed measure savings used

[17] A project is a unique application that includes single or multiple Standard and Custom measures.

to calculate the reported savings for the Business Standard program. This review identified and verified the accuracy and completeness of the engineering algorithms and assumptions used in the deemed savings calculations to ensure they reflect equipment performance in Evergy's service territory. Guidehouse reviewed the baseline and efficient case wattages, HOUs, waste heat factors (WHFs), and CFs used for lighting measures. For non-lighting measures, Guidehouse reviewed the baseline and efficient case ratings and calculation variables such as HOU and CF used to calculate the deemed savings. The deemed measure savings do not differentiate by building type whereas many of the values used for calculating savings such as HOUs, WHFs, and CFs do vary by building type.

Table D-1 summarizes the assumed baseline wattages for all the lighting measures included in the Business Standard program savings. The majority of these are from the Illinois TRM v10, but some updates were made to more closely match the baseline wattage range, baseline wattage lamp type listed in the measure name, or the baseline lamp or fixture types listed in the tracking data.

Table D-1. Baseline Wattage Assumptions

Primary Key	Library Measure Name	Baseline Wattage Assumption
102.4	LED Exit Sign	10.5
102.5	LED Exit Sign	25.4
109.3	Remove 4ft Lamp from T8 or T12 system	30.8
110.3	Remove 8ft Lamp from T8 or T12 System	56
150.3	Exterior LED replacing 251W-400W Fixture or Mogul Screw-Base Lamp	325
152.3	Exterior LED replacing < 175W Fixture or Mogul Screw-Base Lamp	151
166.3	Interior LED Linear Lamp replacing 4ft T8, T12, or T5 Lamp	32.7
166.4	Interior LED Linear Lamp replacing 4ft T8, T12, or T5 Lamp	33
167.2	Interior LED Linear Lamp replacing 2ft T8, T12, or T5 Lamp	17
167.3	Interior LED Linear Lamp replacing 2ft T8, T12, or T5 Lamp	17
168.3	Interior LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO fixture	77.3
169.3	Interior LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO fixture	98
170.3	Interior LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO fixture	77.3
171.3	Interior LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO fixture	77.3
172.3	Interior LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO fixture	98.0
173.3	Interior LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO fixture	77.3
174.5	LED Refrigerator Case Lights w/Doors 4ft 5ft or 6ft replacing Fluorescent Refrigerator Case Lights w/Doors 4ft 5ft or 6ft	84.7
221.4	LED Low/High Bay Fixture replacing 301W-450W fixture	375
313.2	Interior 8' LED Linear Lamp replacing 8ft T8 or T12 Lamp	59.5
313.3	Interior 8' LED Linear Lamp replacing 8ft T8 or T12 Lamp	59.5

Primary Key	Library Measure Name	Baseline Wattage Assumption
352.1	LED <=11 Watt Lamp replacing Interior Halogen A 28-52 Watt Lamp	36
354	LED <=14 Watt Lamp replacing Interior Halogen BR/R 45-65 Watt Lamp	55
355	LED <=13 Watt Lamp replacing Interior Halogen MR-16 35-50 Watt Lamp	50
356	LED <=20 Watt Lamp replacing Interior Halogen PAR 48-90 Watt Lamp	70
504	Remove 4ft Lamp from T5 or T5HO system	48.2
505	LED <= 9 Watt Pin-Based Lamp replacing CFL Pin-Based Lamp	13
506	LED 10 - 15 Watt Pin-Based Lamp replacing CFL Pin-Based Lamp	21
507	LED >= 16 Watt Pin-Based Lamp replacing CFL Pin-Based Lamp	41.7
509	Parking Garage LED Linear Lamp replacing 4ft T8, T12, or T5/T5HO Lamp	41.8
565	Interior T12/T8 4' 1-2 Lamp Fixture Replaced by LED Fixture	69.9
566	Interior T12/T8 4' 3-6 Lamp Fixture Replaced by LED Fixture	128.9
567	Interior T12/T8 8' 1-2 Lamp Fixture Replaced by LED Fixture	156.4
568	Interior T12/T8/T5/T5HO 2' 1-4 Lamp OR Ubend 1-2 Lamp Fixture Replaced by LED Fixture	57.7
570	Interior T5/T5HO 4' 3-6 Lamp Fixture Replaced by LED Fixture	344
571	Interior T12/T8 4' 1-2 Lamp Fixture Replaced by LED Retrofit Kit	67
572	Interior T12/T8 4' 3-6 Lamp Fixture Replaced by LED Retrofit Kit	124.6
573	Interior T12/T8 8' 1-2 Lamp Fixture Replaced by LED Retrofit Kit	145.7
574	Interior T12/T8/T5/T5HO 2' 1-4 Lamp OR Ubend 1-2 Lamp Fixture Replaced by LED Retrofit Kit	57.1
576	Interior T5/T5HO 4' 3-6 Lamp Fixture Replaced by LED Retrofit Kit	266.8
577	Interior LED Fixture Replacing 150-300W HID Fixture	237.9
578	Interior LED Fixture Replacing 301-500W HID Fixture	449.9
579	Interior LED Fixture Replacing 501-850W HID Fixture	750
580	Interior LED Fixture Replacing >850W HID Fixture	1,062.9
581	Interior LED Retrofit Kit/Lamp Replacing 150-300W HID Fixture	213.9
582	Interior LED Retrofit Kit/Lamp Replacing 301-500W HID Fixture	429.7
585	Exterior LED Replacing HID or Fluorescent Fixture <210W	146.3
586	Exterior LED Replacing HID or Fluorescent Fixture 211-300W	286.8
587	Exterior LED Replacing HID or Fluorescent Fixture 301-500W	440.6
588	Exterior LED Replacing HID or Fluorescent Fixture >500W	951.6
589	Parking Garage LED Fixture or Screw-Base LED Lamp Replacing HID or Fluorescent Fixture <=130W	126.0

Primary Key	Library Measure Name	Baseline Wattage Assumption
590	Parking Garage LED Fixture or Screw-Base LED Lamp Replacing HID or Fluorescent Fixture 131-210W	154.0
591	Parking Garage LED Fixture or Screw-Base LED Lamp Replacing HID or Fluorescent Fixture >210W	284.1

Source: Guidehouse analysis

D.1.3 Verified Savings Analysis

This section describes Guidehouse's methodology for the completion of the onsite metering and associated analysis of the sites selected for metering from the Cycle 2 PY1 Business Standard project sample. Guidehouse used results of the sampling of the Cycle 2 PY1 project population for all subsequent program years based on a review of the mix of building types showed that the project populations are similar.

D.1.3.1 Sampling

For the MEEIA Cycle 2 evaluation, Guidehouse selected a sample of projects completed in 2016 for onsite EM&V in 2017. The data collected from this sample of projects has been used since the onsite EM&V was completed based on the assumption that the population of projects are still representative of the entire current year populations of the Business Standard program within a stratum. Guidehouse evaluated both service territories in a combined sample based on discussions with the implementer at the time and Evergy product managers. Guidehouse feels that this is still a reasonable approach due to similarities in program execution. Additional detail on the sampling is available in the Cycle 2 PY1 Report and Appendix. Guidehouse completed both short-term and long-term metering at the sampled sites. Table D-2 lists the meter count by building type for the short-term metering.

Table D-2. MEEIA Cycle 2 Onsite EM&V – Business Standard Program Meter Count by Building Type

Stratum	MEEIA Cycle 2 Business Standard		MEEIA Cycle 2 Small Business Lighting		MEEIA Cycle 1 Loggers		Total
	Evergy MO West	Evergy Metro	Evergy MO West	Evergy Metro	Evergy MO West	Evergy Metro	
Industrial	14	6			13		33
Office	3	20	0	6			29
Other	7	7	7	4	36		61
Retail	17	17	8	3	51	7	103
School	15	29			1		45
Warehouse	12	17	5		26		60
Exterior	7	7	2	2			18
Total	**75**	**103**	**22**	**15**	**127**	**7**	**349**

Source: Guidehouse analysis

Table D-3 lists the meter count by building type for the long-term metering. A total of 18 sites were included in the long-term metering and a total of 97 lighting loggers were installed.

Table D-3. Cycle 2 Onsite EM&V – Business Standard Program Meter Count by Building Type for Long-Term Metering

Stratum	Long-Term Sampling Business Standard		Total
	Evergy MO West	Evergy Metro	
Office	3	20	23
School	15	29	44
Warehouse	12	18	30
Total	**30**	**67**	**97**

Source: Guidehouse analysis

Table D-4 presents a comparison of the program participation by strata between Cycle 2 PY1-PY4 (i.e., 2016-2019) and MEEIA Cycle 3 PY1-PY3 (i.e., 2020-2022) for the Business Standard program. The percentage of total reported savings by strata is similar among all program years. However, some strata such as Warehouse have seen a decrease in the percentage of reported energy and demand savings because high bay measures with overestimated savings accounted for a large fraction of the Warehouse strata savings. With the correction made to this measure for Cycle 2 PY2, the percentage of the total savings in the Warehouse strata decreased in Cycle 2 PY2 and has remained relatively similar since that time. MEEIA Cycle 3 PY3 saw an increase in participation in the Office strata and a decrease in the Retail strata compared with Cycle 3 PY2. The increased savings in the Office strata is probably due to office spaces opening back after COVID pandemic.

Table D-4. Comparison of Reported Savings by Strata from 2016 through 2021

Strata	% of Total Reported kWh							% of Total Reported kW						
	2016	2017	2018	2019	2020	2021	2022	2016	2017	2018	2019	2020	2021	2022
Industrial	21%	22%	8%	5%	7%	4%	14%	22%	23%	7%	5%	6%	4%	15%
Office	2%	7%	17%	24%	17%	16%	31%	2%	8%	19%	24%	19%	25%	33%
Other	16%	21%	28%	33%	13%	11%	11%	15%	16%	27%	31%	11%	7%	8%
Retail	8%	11%	35%	14%	16%	33%	12%	7%	11%	35%	14%	15%	21%	10%
School	6%	2%	2%	18%	31%	18%	19%	6%	3%	2%	19%	33%	28%	21%
Warehouse	47%	37%	10%	6%	16%	17%	13%	48%	39%	10%	7%	16%	16%	13%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Guidehouse analysis

Table D-5 provides the number of buildings metered and the number of meters for each stratum for the 2016-2017 lighting study, as well as relative precision values for energy and demand impacts for each building type. Guidehouse used a confidence and relative precision target analysis to confirm that enough individual buildings were metered to provide reasonable values for HOU and CF. For the combined Evergy MO West and Evergy Metro sample, the relative precision and confidence for each building type fell within the target range of 90/20 confidence and precision at the program level.

Table D-5. Business Standard Program Metering by Strata

Program	Stratum	Buildings		Meters	Energy	Demand
		Year-End Building Population	Building Sample Size	Meters Sample Size	Relative Precision at 90% Confidence (one-tailed)	Relative Precision at 90% Confidence (one-tailed)
Business Standard and Small Business Lighting	Industrial	163	7	33	7.3%	5.9%
	Office	144	5	29	34.6%	29.9%
	Other	262	9	61	27.8%	22.2%
	Retail	251	12	103	34.6%	17.4%
	School	94	8	45	9.5%	14.5%
	Warehouse	206	9	60	13.9%	10.9%
	Total	**1,120**	**50**	**331**	**13.5%**	**10.4%**

Source: Guidehouse analysis

Guidehouse also calculated the relative precision for the CF and HOU for each stratum at the end of the long-term metering. Table D-6 presents these results at the 90% confidence interval. The overall relative precision for the mix of building types falls within the 90/20 target range.

Table D-6. Business Standard Program Relative Precision by Strata

Stratum	CF Relative Precision at 90% Confidence	HOU Relative Precision at 90% Confidence
Industrial	29%	44%
Office	15%	19%
Other	9%	20%
Retail	6%	7%
School	9%	19%
Warehouse	14%	24%
Exterior	N/A	7%
Total Program	**9%**	**14%**

Source: Guidehouse analysis

D.1.3.2 Onsite Verification and Metering

In MEEIA Cycle 2, Guidehouse completed the onsite verification and metering of sampled projects for the Business Standard program. For the sample selected in 2016, Guidehouse stratified the Business Standard program population by building type, including Industrial, Office, Retail, School, Warehouse, and Other. Guidehouse developed the sample by building type to

capture the HOUs and CFs by building type for the lighting measures installed in the Business Standard program.

Guidehouse metered most of the sampled projects for the short-term duration (8 weeks, February 2017-April 2017) and completed long-term metering of a smaller sample for three strata. The three strata were selected based on feedback from the Evergy team on which building types were of most interest to them. Guidehouse selected three strata—School, Warehouse, and Office—for the long-term (12 months) metering.

The evaluation team retrieved short-term data for the three long-term metering strata in April 2017, along with the other short-term sites. The evaluation team also collected metering data in October 2017 and for a final time in March 2018. Guidehouse used onsite verification to verify project implementation information and to collect the operating parameters for installed lighting projects. Guidehouse used the metered data (lighting loggers, current data loggers, etc.) to develop building type level inputs for HOUs and CFs used in the verified savings calculations for all verifications since 2017.

D.1.3.3 HOU and CF Analysis Methodology

The following discussion is for reference, as Cycle 3 PY3's analysis used the results from the MEEIA Cycle 2 lighting logger activities. The evaluation team stratified each of the building type strata (Industrial, Office, Retail, etc.) into large and small building types, because the HOU for large and small customers is measurably different. The evaluation team stratified the sites by size based on whether the reported energy savings for a site were greater than 100,000 kWh or the reported demand savings by site were greater than 10 kW. Guidehouse did not use building size (e.g., square footage) as a method to stratify the population because this data was not available for all sites. However, for the sites with square footage data, Guidehouse compared the stratification using the kilowatt-hour and kilowatt savings criteria with the building size and found good correlation. Guidehouse used the substrata to determine the weighted strata HOU and CF as outlined in Figure D-1.

Figure D-1. Methodology for Determining Strata HOU and CF from Logger Data

Step 1: Stratify Cycle 2 PY1 population by size	• Use information on reported kilowatt-hour and kilowatt savings by site to stratify into large and small sites
Step 2: Determine a substrata weight	• Determine what percentage each strata's kilowatt-hour savings is represented by small or large sites in the Cycle 2 PY1 population
Step 3: Assign a substrata to each HOU and CF determined from the logger data by space type	• Roll up the lighting logger data to be by space type within the site • Link the results of Step 1 to the logger data so that each logger data point by space type is assigned to a substrata
Step 4: Assign a substrata for Cycle 1 and small business lighting logger sites	• Use reported kilowatt-hours or kilowatts to assign a substrata for Cycle 1 sites • All small business lighting sites from the short-term sampling are assigned to the small strata
Step 5: Determine a substrata HOU and CF	• Equally weight all logger calculated HOUs and CFs within a substrata • Result will be 13 HOUs and CFs
Step 6: Determine a weighted strata HOU and CF	• Weight substrata results by substrata population weight determined in Step 2 • End result will be a seven-strata HOU and CF

Source: Guidehouse analysis

Table D-7 presents the results of this analysis using the long-term metering data compared with the HOU and CF calculated for Cycle 2 PY1 from just the short-term logger data. Overall, the HOU decreased between 7%-19% for all interior space types. The HOU increased for exterior space types 15% due to some of the long-term metering sites having exterior loggers that recorded higher HOU. The CF increased for the Industrial, Other, and School strata and decreased for the Office, Retail, and Warehouse strata. The change for the three strata with long-term metering, School, Office, and Warehouse, is based on seasonal variations in operating hours captured in the long-term metering.

Table D-7. Comparison Between Cycle 2 PY1 and Cycle 2 PY2 for CF and HOU for the Business Standard Program

Stratum	Results of Short-Term Logger Analysis		Results of Long-Term Logger Analysis and Updated Weighting		% Change	
	CF	HOU	CF	HOU	CF	HOU
Industrial	0.62	5,144	0.64	4,584	3%	-11%
Office	0.75	4,484	0.69	3,636	-8%	-19%
Other	0.67	5,280	0.73	4,925	9%	-7%
Retail	0.83	5,662	0.74	4,921	-10%	-13%
School	0.59	4,074	0.63	3,642	6%	-11%
Warehouse	0.64	4,110	0.55	3,611	-15%	-12%
Exterior	0.0	4,702	0.0	5,392	0%	15%

Source: Guidehouse analysis

D.1.3.4 Analysis

The following section describes the evaluation team's analysis methodology to calculate the verified energy savings and coincident peak demand savings for the Business Standard program measures. Guidehouse applied the following calculation algorithms using guidance from the Evergy MEEIA TRM and the Illinois TRM v10, which includes industry standard algorithms for engineering review of the following measures implemented:

- Lighting
- Lighting Controls
- Air Cooled Chillers
- Variable Speed Drive Compressors
- Single-Package Unitary Air Conditioners
- Air Source Heat Pumps
- ECM Motors Walk-In Coolers & Freezers
- High Volume Low Speed Fans
- Package Terminal Heat Pumps (PTHP)
- VRF - Air Cooled
- VFD for HVAC Supply and Return Fans
- ECM Compressor and Condenser/Condensing Unit Fan Motors

Lighting Measures

The team referenced the Evergy MEEIA TRM to obtain the calculation inputs. The WHFs for energy and demand savings are based on Section 4.5 from the Illinois TRM v10 (Table D-8).

Table D-8. WHFs for Lighting Measures

Stratum	WHFe*	WHFd*
Industrial	1.02	1.04
Office[18]	1.10	1.36
Other	1.08	1.30
Retail	1.12	1.29
School[19]	1.15	1.40
Warehouse	1.02	1.17
Exterior	1.00	1.00
Refrigerators[20]	1.29	1.29

* WHFe and WHFd are the waste heat factors for energy and demand, respectively.
Source: Illinois TRM v10, Section 4.5, Pages 531-533

Energy Savings

Equation D-1. Energy Savings for C&I Lighting Measures

$$\Delta kWh = \frac{(Watts_{base}\text{-}Watts_{ee}) * ISR * Hours * WHF_e}{1{,}000}$$

Where:

$Watts_{base}$ Wattage of baseline lighting fixture/lamp; the evaluation team used the following data sources (listed by priority):
1. Baseline wattage from Evergy TRM 2022
2. Actual baseline wattages for some of the measure lines where actual EE case wattage is higher than TRM baseline wattage
3. Wattages from secondary sources on baseline fixture wattage, including the Illinois TRM v10 and manufacturer specification sheets for the efficient lighting product that listed equivalent baseline products

$Watts_{ee}$ Actual wattage of installed efficient lighting; the evaluation team used the following data sources (listed by priority):
1. Actual wattage from the tracking database
2. Wattage listed by the manufacturer for the efficient technology reported in the tracking database

ISR In-service rate (99% assumed for interior lighting, 97% assumed for exterior lighting based on the onsite findings)

Hours Average HOU per year; the evaluation team used the following data sources to get the HOU (listed by priority):
1. HOU according to space type based on results of the long-term metering
2. HOU from Section 4.5 of the Illinois TRM v10 for parking garage and refrigerated cases measures

[18] Building/Space Type: Office - Mid Rise, Illinois Statewide Technical Reference Manual Version 10.0 (Illinois TRM v10), page 533, https://www.ilsag.info/technical-reference-manual/il-statewide-technical-reference-manual-version-10-0/

[19] Building/Space Type: High School, Illinois TRM v10, page 532, https://www.ilsag.info/technical-reference-manual/il-statewide-technical-reference-manual-version-10-0/.

[20] Building/Space Type: Refrigerated Cases, Illinois TRM v10, page 533, https://www.ilsag.info/technical-reference-manual/il-statewide-technical-reference-manual-version-10-0/.

WHF_e Waste heat factor for energy to account for cooling energy savings from efficient lighting; the waste heat factor varies according to space type and is based on Section 4.5 from the Illinois TRM v10

Coincident Peak Demand Savings

Equation D-2. Coincident Peak Demand Savings for C&I Lighting Measures

$$\Delta kW = \frac{(Watts_{base}\text{-}Watts_{ee})*ISR*CF*WHF_d}{1000}$$

Where:

$Watts_{base}$ Same as above
$Watts_{ee}$ Same as above
ISR Same as above
CF Summer peak coincidence demand factor; the evaluation team used the following data sources to get the CF (listed by priority):
1. CF according to space type based on results of the long-term metering
2. CF according to space type from Section 4.5 of the Illinois TRM v10 for parking garages and refrigerated cases measures

WHF_d Waste heat factor for demand to account for cooling energy savings from efficient lighting; the waste heat factor varies according to space type and is based on Section 4.5 from the Illinois TRM v10

Lighting Controls

The team referenced the Evergy MEEIA TRM to obtain the calculation inputs. The WHFs for energy and demand savings are based on Section 4.5 from the Illinois TRM v10 (see Table D-9).

Table D-9. WHFs for Lighting Control Measures

Stratum	WHFe	WHFd
Industrial	1.02	1.04
Office	1.10	1.36
Other	1.08	1.30
Retail	1.12	1.29
School	1.15	1.40
Warehouse	1.02	1.17
Exterior	1.00	1.00
Refrigerators	1.29	1.29

Source: Illinois TRM v10, Section 4.5, Pages 531-533

Energy Savings

Equation D-3. Energy Savings for C&I Lighting Control Measures

$$\Delta kWh = kW_{Controlled} * Hours * ESF * WHF_e * ISR$$

Where:

$kW_{Controlled}$	Total lighting load connected to the control in kilowatts; savings is per control; the evaluation team used the following data sources (listed by priority): 1. Actual wattage from the tracking database for Networked Lighting Controls 2. Based on minimum wattage per control installed required in the application to achieve measure approval in the Business Standard program: 425 W per control for Occupancy and Vacancy Sensors and 570 W per control for Daylighting controls; lighting control projects completed with lower wattage controlled per control are recommended to submit through the Business Custom program and are excluded from the Business Standard program; lighting control projects for fixture-level controls are submitted through the Business Custom program
Hours	Average HOU per year; the evaluation team used the HOU according to space type based on results of the long-term metering
ESF	Energy savings factor (represents the percentage reduction to the operating hours from the non-controlled baseline lighting system) 0.24 for Occupancy and Vacancy Sensors, 0.28 for Daylighting controls, and 0.49 for Networked Lighting Controls based on Illinois TRM v10
WHF_e	Waste heat factor for energy to account for cooling energy savings from efficient lighting; the waste heat factor varies according to space type and is based on Section 4.5 from the Illinois TRM v10
ISR	In-service rate (99% assumed for interior lighting, 97% assumed for exterior lighting based on the onsite findings)

Coincident Peak Demand Savings

Equation D-4. Coincident Peak Demand Savings for C&I Lighting Control Measures

$$\Delta kW = kW_{Controlled} * WHF_d * (CF_{base} - CF_{LC}) * ISR$$

Where:

$kW_{Controlled}$	Same as above
ISR	Same as above
CFbase	Summer peak coincidence demand factor; the evaluation team used the following data sources to get the CF (listed by priority): 1. CF according to space type based on results of the long-term metering 2. CF according to space type from Section 4.5 of the Illinois TRM v10 for parking garages
CFLC	Retrofit summer peak coincidence factor for the lighting system with Lighting Controls installed is assumed to be 0.15 regardless of building type
WHF_d	Waste heat factor for demand to account for cooling energy savings from efficient lighting; the waste heat factor varies according to space type and is based on Section 4.5 from the Illinois TRM v10

Air Cooled Chillers

Energy Savings

Equation D-5. Energy Savings for Air Cooled Chillers

$$\Delta kWh = TONS * ((IPLVbase) – (IPLVee)) * EFLH$$

Where:

TONS	Actual installed chiller nominal cooling capacity in tons (note: 1 ton = 12,000 Btu/hr)
IPLVbase	Efficiency of baseline equipment expressed as Integrated Part Load Value (kW/ton) provided in Section 4.4 from the Illinois TRM v10
IPLVee	Efficiency of high efficiency equipment expressed as Integrated Part Load Value (kW/ton) = Actual Installed
EFLH	Equivalent full load hours for cooling in Existing Buildings or New Construction provided in Section 4.4 from the Illinois TRM v10

Coincident Peak Demand Savings

Equation D-6. Coincident Peak Demand Savings for Air Cooled Chillers

$$\Delta kW = TONS * ((PEbase) – (PEee)) * CF$$

Where:

TONS	Same as above
PEbase	Peak efficiency of baseline equipment expressed as Full Load (kW/ton)
PEee	Peak efficiency of high efficiency equipment expressed as Full Load (kW/ton) = Actual Installed
CF	Summer peak coincidence factor for commercial cooling (during system peak hour) = 91.3%

Variable Speed Drive Compressor

Energy Savings

Equation D-7. Energy Savings for Variable Speed Drive Compressor

$$\Delta kWh = 0.9 \times hp_{compressor} \times HOURS \times (CF_b – CF_e)$$

Where:

ΔkWh	Gross customer annual kilowatt-hour savings for the measure
$hp_{compressor}$	Compressor motor nominal horsepower
0.9	Compressor motor nominal horsepower to full load kilowatt conversion factor
HOURS	Compressor total hours of operation below depending on shift 1,976 for single shift weekdays 3,952 for 2 shift weekdays 5,928 for 3 shift weekdays 8,320 for 3 shift weekdays plus weekends
CF_b	Baseline compressor factor = 0.890 (<= 40 HP), 0.863 (50-200 HP)
CF_e	Efficient compressor = 0.705 (<= 40 HP), 0.658 (50-200 HP)

Coincident Peak Demand Savings

Equation D-8. Coincident Peak Demand Savings for Variable Speed Drive Compressor

$$\Delta kW = \Delta kWh / HOURS * CF$$

Where:

CF	Coincidence factor = 0.59 for single shift 0.95 for 2-shift 0.95 for 3-shift 0.95 for 4-shift

Single-Package or Split System Air Conditioners

Guidehouse applied IECC 2012 as the rating for the baseline IEER, SEER, and EER. For the installed energy efficiency equipment, Guidehouse confirmed energy efficiency ratings by checking the model numbers and manufacturers of products provided from the tracking database.

Energy Savings

Equation D-9. Energy Savings for Single-Package or Split System Air Conditioners

For units with cooling capacities less than 65 kBtu/hr:

$$\Delta kWh = (kBtu/hr) * [(1/SEERbase) - (1/SEERee)] * EFLH$$

For units with cooling capacities equal to or greater than 65 kBtu/hr:

$$\Delta kWh = (kBtu/hr) * [(1/IEERbase) - (1/IEERee)] * EFLH$$

Where:

kBtu/hr	Capacity of the cooling equipment installed in kBtu per hour (1 ton of cooling capacity equals 12 kBtu/hr)
$SEER_{base}$	Baseline SEER from IECC 2012
$SEER_{ee}$	Efficient case SEER value; the evaluation team used the following data sources (listed by priority): 1. Captures tracking data 2. Model numbers and manufacturers of installed energy efficiency equipment, or, 3. Evergy TRM 2022
$IEER_{base}$	Baseline IEER from IECC 2012
$IEER_{ee}$	Efficient case IEER value; the evaluation team used the following data sources (listed by priority): 1. Captures tracking data 2. Model numbers and manufacturers of installed energy efficiency equipment 3. Evergy TRM 2022
EFLH	Equivalent full load hours for cooling are provided in Section 4.4 HVAC End Use of the Illinois TRM v10 and vary by space type

Coincident Peak Demand Savings

Equation D-10. Coincident Peak Demand Savings for Single-Package or Split System Air Conditioners

$$\Delta kW = (kBtu/hr) * [(1/EERbase) - (1/EERee)] * CF$$

Where:

kBtu/hr	Same as above

EER_{base} Baseline EER from IECC 2012 or for air cooled units < 65 kBtu/hr, the following conversion was used based on the baseline SEER assumed: EER = (-0.02 ∗ $SEER^2$) +(1.12 ∗ SEER))

EER_{ee} Efficient case EER value; the evaluation team used the following data sources (listed by priority):
1. Captures tracking data
2. Model numbers and manufacturers of installed energy efficiency equipment
3. Evergy TRM 2022

CF Summer peak coincidence factor from the Evergy MEEIA TRM = 91.3% (based on the value in the Illinois TRM v10)

Air Source Heat Pump

Guidehouse applied IECC 2012 as the baseline rating for the baseline IEER, SEER, and EER. For the installed energy efficiency equipment, Guidehouse confirmed energy efficiency ratings by checking the model numbers and manufacturers of products provided from the tracking database.

The evaluation team used the following data sources (listed by priority) for the efficient case values for SEER, EER, and Heating Seasonal Performance Factor (HSPF):

1. Captures tracking data
2. Model numbers and manufacturers of installed energy efficiency equipment
3. Evergy TRM 2022

Energy Savings

Equation D-11. Energy Savings for Measure of Air Source Heat Pumps

For units with cooling capacities less than 65 kBtu/hr:

$$\Delta kWh = \text{Annual kWh Savings}_{cool} + \text{Annual kWh Savings}_{heat}$$
$$\text{Annual kWh Savings}_{cool} = (kBtu/hr_{cool}) * [(1/SEERbase) – (1/SEERee)] * EFLH_{cool}$$
$$\text{Annual kWh Savings}_{heat} = (kBtu/hr_{heat}) * [(1/HSPFbase) – (1/HSPFee)] * EFLH_{heat}$$

For units with cooling capacities equal to or greater than 65 kBtu/hr:

$$\Delta kWh = \text{Annual kWh Savings}_{cool} + \text{Annual kWh Savings}_{heat}$$
$$\text{Annual kWh Savings}_{cool} = (kBtu/hr_{cool}) * [(1/EERbase) – (1/EERee)] * EFLH_{cool}$$
$$\text{Annual kWh Savings}_{heat} = (kBtu/hr_{heat})/3.412 * [(1/COPbase) – (1/COPee)] * EFLH_{heat}$$

Where:

$kBtu/hr_{cool}$ Capacity of the cooling equipment actually installed in kBtu per hour

SEERbase Seasonal energy efficiency ratio of the baseline equipment based on IECC 2012

SEERee Seasonal energy efficiency ratio of the installed energy efficient equipment

$EFLH_{cool}$ Equivalent full load hours for cooling are provided in Section 4.4 HVAC End Use of the Illinois TRM v10

HSPFbase Heating seasonal performance factor of the baseline equipment based on IECC 2012

HSPFee Heating seasonal performance factor of the installed energy efficient equipment; if rating is COP, HSPF = COP * 3.413

$EFLH_{heat}$	Equivalent full load hours for heating are provided in Section 4.4 HVAC End Use of the Illinois TRM v10
EERbase	Energy efficiency ratio of the baseline equipment based on IECC 2012 For units < 65 kBtu/hr, assume the following conversion from SEER to EER for calculation of peak savings:[21] $EER = (-0.02 * SEER^2) + (1.12 * SEER)$
EERee	Energy efficiency ratio of the installed energy efficient equipment
$kBtu/hr_{heat}$	Capacity of the installed heating equipment in kBtu per hour
3.412	Btu per watt-hour
COPbase	Coefficient of performance of the baseline equipment based on IECC 2012. If rating is HSPF, COP = HSPF / 3.413
COPee	Coefficient of performance of the installed energy efficient equipment

Coincident Peak Demand Savings

Equation D-12. Coincident Peak Demand Savings for Measure of Air Source Heat Pump

$$\Delta kW_{SSP} = (kBtu/hr * (1/EERbase - 1/EERee)) * CF_{SSP}$$

Where:

kBtu/hr	Same as above
EERbase	Same as above
EERee	Same as above
CF	Summer peak coincidence factor from the Illinois TRM v10 = 91.3%

ECM Motors Walk-In Coolers & Freezers

Guidehouse applied existing shaded-pole motor(s) with no fan control operating 8,760 hours continuously in a refrigerated display case or fan coil unit of a walk-in cooling as the baseline. For the installed energy efficiency equipment, Guidehouse confirmed energy efficiency ratings by checking the model numbers and manufacturers of products provided from the tracking database.

The evaluation team used the following data sources (listed by priority) for the efficient case

1. Captures tracking data
2. Model numbers and manufacturers of installed energy efficiency equipment
3. Evergy TRM 2022

Energy Savings

Equation D-13. Energy Savings for Measure of ECM Motors Walk-In Coolers & Freezers

$$\Delta kWh = \text{Savings per motor} * \text{motors}$$

Where:

Savings per motor	Based on the motor rating of the ECM motor

[21] Based on Wassmer, M, *A Component-Based Model for Residential Air Conditioner and Heat Pump Energy Calculations,* Masters' Thesis, University of Colorado at Boulder, note this is appropriate for single speed units only, 2003.

Table D-10. Deemed energy savings for ECM Motors by Size

Evaporator Fan Motor Rating	Annual kWh Savings/motor
16 W	652
1/15 – 1/20 HP	1,586
1/5 HP	2,320
1/3 HP	3,380
1/2 HP	4,481
3/4 HP	5,293

Source: Illinois TRM v10, Section 4.6, Pages 640-643.
If unknown, assume 1/15 HP, therefore 1,586 kWh saved / motor

Motors Number of fan motors replaced

Coincident Peak Demand Savings

Equation D-14. Coincident Peak Demand Savings for Measure of ECM Motors Walk-In Coolers & Freezers

$$\Delta kW = \Delta kWh / Hours * CF$$

Where:

ΔkWh Gross customer annual kWh savings for the measure, as listed above
Hours Hours per year, from the Illinois TRM v10 = 8,760
CF Summer peak coincidence factor from the Illinois TRM v10 = 100%

High Volume Low Speed Fans

Guidehouse applied the baseline condition to be multiple non-high volume low speed (HVLS) existing fans that have reached the end of useful life. Guidehouse confirmed energy efficiency ratings by checking the model numbers and manufacturers of products provided from the tracking database.

The evaluation team used the following data sources (listed by priority) for the efficient case:

1. Captures tracking data
2. Model numbers and manufacturers of installed energy efficiency equipment
3. Evergy TRM 2022

Energy Savings

Equation D-15. Energy Savings for Measure of HVLS Fans

The annual electric savings from this measure are deemed values[22] depending on fan size and apply to all building types:

$$\Delta kWh = Savings\ per\ fans * fans$$

Where:

Savings per fan Deemed savings depending on fan size given in Table D-11

[22] Act on Energy Commercial Technical Reference Manual No. 2010-4.

Fans Number of fans replaced

Table D-11. Annual Deemed Electric Energy Savings of HVLS Fans

Fan Diameter Size (feet)	kWh Savings
20	6,577
22	8,543
24	10,018

Source: Illinois TRM v10, Page 12

Coincident Peak Demand Savings

Equation D-16. Coincident Peak Demand Savings for Measure of HVLS Fans

The annual kilowatt savings from this measure are deemed values depending on fan size and apply to all building types:

$$\Delta kW = \text{Savings per fans} * \text{fans}$$

Where:

Savings per fan Deemed demand savings depending on fan size given in Table D-12
Fans Number of fans replaced

Table D-12. Annual Deemed Electric Demand Savings of HVLS fans

Fan Diameter Size (feet)	kW Savings
20	2.4
22	3.1
24	3.7

Source: Illinois TRM v10, Page 12

Package Terminal Heat Pump

Guidehouse applied the IECC 2012 as the baseline for SEER, EER, and other baseline energy efficiency ratings. For the installed energy efficiency equipment, Guidehouse confirmed energy efficiency ratings by checking the model numbers and manufacturers of products provided from the tracking database.

Energy Savings

Equation D-17. Energy Savings for Package Terminal Heat Pump

$$\text{PTHP } \Delta kWh = \text{Annual kWh Savings}_{cool} + \text{Annual kWh Savings}_{heat}$$
$$\text{Annual kWh Savings}_{cool} = (kBtu/hr_{cool}) * [(1/EER_{exist}) – (1/EER_{ee})] * EFLH_{cool}$$
$$\text{Annual kWh Savings}_{heat} = (kBtu/hr_{heat})/3.412 * [(1/COP_{exist}) – (1/COP_{ee})] * EFLH_{heat}$$

Where:

$kBtu/_{hrcool}$ Capacity of cooling equipment (1 ton = 12 kBtu/hr); the evaluation team used the following data sources (listed by priority):
1. Model numbers and manufacturers of installed energy efficiency equipment

2. Tracking data

EER_{exist} Energy efficiency ratio of the existing equipment based on the IECC 2012 EER = 10.8 – (0.213 x Cap/1000), which is set to 8.244 based on assuming a capacity of 1.0 ton

EER_{ee} Energy efficiency ratio of efficient equipment; the evaluation team used the following data sources (listed by priority):
1. Captures tracking data
2. Model numbers and manufacturers of installed energy efficiency equipment
3. Evergy TRM 2022

$EFLH_{cool}$ Equivalent full load hours for cooling are provided in Section 4.4 HVAC End Use of the Illinois TRM v10 and vary by space type

3.412 Btu per Wh

COP_{exist} Coefficient of performance of the existing equipment based on the IECC 2012 = COP = 2.9 – (0.026 x Cap/1000), which is 2.6 [23]

COP_{ee} Energy efficiency ratio of efficient equipment; the evaluation team used the following data sources (listed by priority):
1. Captures tracking data
2. Model numbers and manufacturers of installed energy efficiency equipment
3. Evergy TRM 2022

Coincident Peak Demand Savings

Equation D-18. Coincident Peak Demand Savings for PTHP

$$\Delta kW = (kBtu/hr_{cool}) * [(1/EER_{exist}) – (1/EER_{ee})] *CF$$

Where:

CF Summer peak coincidence factor from the Evergy MEEIA TRM = 91.3% (based on the value in the Illinois TRM v10).

Variable Refrigerant Flow Air Cooled

Guidehouse applied baseline is ASHRAE 90.1 2013, which is minimally compliant variable refrigerant flow (VRF) system. For the installed energy efficiency equipment, Guidehouse confirmed energy efficiency ratings by checking the model numbers and manufacturers of products provided from the tracking database.

Energy Savings

Equation D-19. Energy Savings for VRF Air Cooled

For units with cooling capacities less than 65 kBtu/hr:

$$\Delta kWh = (kBtu/hr) * [(1/SEER_{base}) - (1/SEER_{ee})] * EFLH$$

For units with cooling capacities equal to or greater than 65 kBtu/hr:

$$\Delta kWh = (kBtu/hr) * [(1/IEER_{base}) - (1/IEER_{ee})] * EFLH$$

Where:

[23] Efficiency of existing unit is estimated based on the 2012 IECC building energy code, and assuming a 1 ton unit; COP = 2.9 – (0.026 * 12,000/1,000) = 2.6

kBtu/hr	Capacity of the cooling equipment installed in kBtu per hour (1 ton of cooling capacity equals 12 kBtu/hr)
$SEER_{base}$	Baseline SEER from ASHRAE 90.1 2013
$SEER_{ee}$	Efficient case SEER value; the evaluation team used the following data sources (listed by priority): 1. Captures tracking data 2. Model numbers and manufacturers of installed energy efficiency equipment 3. Evergy TRM 2022
$IEER_{base}$	Baseline IEER from ASHRAE 90.1 2013
$IEER_{ee}$	Efficient case IEER value; the evaluation team used the following data sources (listed by priority): 1. Captures tracking data 2. Model numbers and manufacturers of installed energy efficiency equipment 3. Evergy TRM 2022
EFLH	Equivalent full load hours for cooling are provided in Section 4.4 HVAC End Use of the Illinois TRM v10 and vary by space type

Coincident Peak Demand Savings

Equation D-20. Coincident Peak Demand Savings for VRF Air Cooled

$$\Delta kW = (kBtu/hr) * [(1/EER_{base}) - (1/EER_{ee})] * CF$$

Where:

kBtu/hr	Same as above
EER_{base}	Baseline EER from ASHRAE 90.1 2013
EER_{ee}	Efficient case EER value; the evaluation team used the following data sources (listed by priority): 1. Captures tracking data 2. Model numbers and manufacturers of installed energy efficiency equipment 3. Evergy TRM 2022
CF	Summer peak coincidence factor from the Evergy MEEIA TRM = 91.3% (based on the value in the Illinois TRM v10)

.

VFD for HVAC Supply and Return Fans

Guidehouse applied baseline as motor installed without a VFD or other methods of control rating. For the installed energy efficiency equipment, Guidehouse confirmed energy efficiency ratings by checking the model numbers and manufacturers of products provided from the tracking database.

The evaluation team used the following data sources (listed by priority) for the efficient case:

1. Captures tracking data
2. Model numbers and manufacturers of installed energy efficiency equipment
3. Evergy TRM 2022

Energy Savings

Equation D-21. Energy Savings for Measure of VFD for HVAC Supply and Return Fans

$$\Delta kWh = 0.746 \times HP \times \frac{LF}{\eta_{motor}} \times RHRS_{Base} \times \left(\sum_{0}^{100} (\%FF \times PLR_{Base}) - \sum_{0}^{100} (\%FF \times PLR_{Retrofit}) \right) \times (1 + IE_{energy})$$

Where:

0.746	Conversion factor for HP to kWh
HP	Nominal horsepower of controlled motor
LF	Load factor; Motor Load at Fan Design CFM from Illinois TRM v10 = 65%
η_{motor}	Installed nominal/nameplate motor efficiency, default motor is a NEMA Premium Efficiency, ODP, 4-pole/1800 RPM fan motor
$RHRS_{Base}$	Annual operating hours for fan motor based on building type, default value is 6,241 and was used for all sites verified in PY3
%FF	Percentage of runtime spent within a given flow fraction range Based on 2012 ASHRAE Handbook
PLR_{Base}	Part load ratio for a given flow fraction range based on the baseline flow control type; from Illinois TRM v10 = $\sum_0^{100}(\%FF \times PLR_{Base})=1$
$PLR_{Retrofit}$	Part load ratio for a given flow fraction range based on the retrofit flow control type; from Illinois TRM v10 = $\sum_0^{100}(\%FF \times PLR_{Retrofit})=0.3$
IE_{Energy}	HVAC interactive effects factor for energy from Illinois TRM v10 = 15.7%

Coincident Peak Demand Savings

Equation D-22. Coincident Peak Demand Savings for VFD for HVAC Supply and Return Fans

$$\Delta kW = (\Delta kWh * PLR_{FF\ peak})/ (RHRS_{Base})$$

Where:

$PLR_{FF\ peak}$	Average flow fraction between the peak daytime hours during the weekday peak time period, from the Evergy MEEIA TRM = 90% (based on the value in the Illinois TRM v10)

ECM Compressor and Condenser/Condensing Unit Fan Motor

Guidehouse applied baseline condition is a Single Phase (SP) or Permanent Split Capacitor (PSC) compressor or condenser unit fan motor. The input wattages of the motors were determined based on the efficiencies for fractional refrigeration application motors in the U.S. Department of Energy study. For the installed energy efficiency equipment, Guidehouse confirmed energy efficiency ratings by checking the model numbers and manufacturers of products provided from the tracking database.

The evaluation team used the following data sources (listed by priority) for the efficient case:

1. Captures tracking database
2. Model numbers and manufacturers of installed energy efficiency equipment
3. Evergy TRM 2022

Energy Savings

Equation D-23. Energy Savings for Measure of ECM Compressor and Condenser / Condensing Unit Fan Motor

$$\Delta kWh = (Watts_{Base} – Watts_{ee}) / 1{,}000 * HOU$$

Where:

$Watts_{Base}$	Input of SP or PSC motor from the Evergy MEEIA TRM = 221.0 watts, weighted average[24]
$Watts_{ee}$	Input of ECM motor from the Evergy MEEIA TRM = 137.7 watts[25]
1,000	Conversion factor watts to kilowatts
HOU	Average annual run hours, 6,220

Coincident Peak Demand Savings

Equation D-24. Coincident Peak Demand Savings for ECM Compressor and Condenser / Condensing Unit Fan Motor

$$\Delta kW = (Watts_{Base} - Watts_{ee}) / 1{,}000$$

D.2 Process Evaluation

In MEEIA Cycle 3 PY3, Guidehouse addressed the five Missouri-required questions for process evaluation through interviews with program staff, one round of participant FR surveys, and one round of participant SO surveys. Table D-13 displays the evaluation team's key process research questions and the evaluation activities conducted to address these questions.

Table D-13. Process Evaluation Research Questions and Approaches

Process Evaluation Research Question	Evaluation Activities
Missouri-Required Questions for Process Evaluation	
1. What are the primary market imperfections that are common to the target market segment?	• Program staff interviews • Participant surveys
2. Is the target market segment appropriately defined, or should it be further subdivided or merged with other market segments?	• Program staff interviews • Participant surveys
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	• Program staff interviews • Participant surveys
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	• Program staff interviews • Participant surveys
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	• Program staff interviews • Participant surveys

Source: Guidehouse

D.2.1 Program Staff Interviews

Guidehouse conducted a program manager interview and an IC interview. Specific process evaluation topics addressed included the following:

- Program operation, challenges, successes, and goals
- Evolution of program design
- Effectiveness of program processes

[24] Wisconsin Focus on Energy 2020 Technical Reference Manual, page 792.
[25] Wisconsin Focus on Energy 2020 Technical Reference Manual, page 792.

- Opportunities for program improvement

D.2.2 Materials Review

Guidehouse conducted a review of the program description and documents available from Evergy to understand the Business Standard program application process and requirements and to research the key considerations of the five Missouri questions. Guidehouse reviewed the following program documents:

- Evergy program documents
- Program website
- Program tracking database
- Program incentives list

D.2.3 Participant Surveys

Guidehouse conducted FR and SO participant surveys to inform the evaluation of the five Missouri process evaluation questions as well as the NTG analysis. The survey was conducted in February and March 2023 and included all PY3 participants for the FR and process questions, as well as all PY2 participants for SO questions. If a participant had projects in both PY2 and PY3, they were sampled on the basis of their most recent project to prioritize the FR and process questions. Participants that had previously responded to a survey were excluded from the FR sample.

Appendix E. Business Custom Program-Specific Methodologies

The Business Custom program is designed to help C&I customers save energy and peak demand through a broad range of energy efficiency options that align with customers' needs.

Based on Missouri regulations, the evaluation team used method 1a and protocol 2b to evaluate the Business Custom program. This evaluation of the Business Custom program consisted of the following activities:

- Gross impact evaluation (detailed in Appendix E.1)
- Process evaluation (detailed in Appendix E.2)

E.1 Impact Evaluation

Guidehouse performed the following impact evaluation activities:

- Tracking database review
- Engineering review consisting of:
  - Engineering desk review
  - Measure and project verification

E.1.1 Tracking Database Review

The evaluation team conducted a thorough review of the program tracking database as described in Section D.1.1.

E.1.2 Engineering Desk Review

Based on the program tracking database review, Guidehouse drew a sample of the program population for an engineering review. Assessing savings for a sample of the program population is a uniform method for the evaluation of large energy efficiency programs.[26] This section describes Guidehouse's methodology for the sampling and engineering review of the Business Custom program in PY3 of MEEIA Cycle 3.

E.1.2.1 Sampling

Guidehouse used a stratified ratio estimation sampling design to develop an efficient sample achieving 90/10 confidence/precision on the program-level realization rate. The following steps were taken:

- Review the program tracking database and define the confidence and precision at the overall program level.
- Define the statistical stratum based on program characteristics.

[26] National Renewable Energy Laboratory, *Chapter 11: Sample Design Cross-Cutting Protocol,* https://www.nrel.gov/docs/fy17osti/68567.pdf.

- Estimate an appropriate variance for each stratum.
- Select a random sample within each stratum.

The evaluation team then divided the population of premises with energy efficiency projects by reported energy savings into the following strata:

- Certainty
- Large
- Small

Stratification aligns with the premise size variability and allows the sample to have a good representation of the population. Guidehouse randomly selected premises proportionately within each stratum to ensure both of the following:

- The evaluation of the largest premises and contributors to the program performance
- The fair representation of smaller premises in the evaluation

The Certainty stratum included the largest premises with energy efficiency projects implemented in the program year, each of which reported 1.0 GWh or greater of energy savings. The evaluation team removed very small premises for sampling. The total savings of those very small premises made up no more than 2% of the total program savings. Guidehouse then divided the remaining premises into Large and Small strata, with large premises constituting the top 50% of the remaining program savings and small premises the bottom 50%. The evaluation team then randomly selected premises within each stratum across both territories to determine the final sample. A census was evaluated for the Certainty stratum. The sample was later separated by territory to determine the territory level realization rates as in previous evaluation years.

E.1.2.2 Engineering Review Methodology

The evaluation team requested project files for the sampled projects from Evergy and the implementation team. Guidehouse reviewed the project files and all the assumptions made by the implementer in developing reported savings. The team also conducted telephone interviews as necessary to ensure full understanding of the project. Guidehouse then verified the energy and coincident peak demand savings for each sampled project using industry standard evaluation methodologies based on the Uniform Methods Protocols,[27] all of which are detailed further below in this section. Finally, Guidehouse calculated realization rates for the program using the following process.

Equation E-1. Realization Rates Per Stratum

$$RR_{stratum} = \frac{\sum_{sampled} E_{ex\ post}}{\sum_{sampled} E_{ex\ ante}}$$

Where:

E Electric energy savings or peak demand reduction for each project in the stratum

[27] Office of Energy Efficiency & Renewable Energy, *Uniform Methods Project: Determining Energy Efficiency Savings for Specific Measures,* https://www.energy.gov/eere/about-us/ump-protocols.

Realization rates in each stratum were applied to the project population of that stratum using Equation E-2:

Equation E-2. Realization Rates Per Stratum and Project Population

$$E_{i,\ ex\ post} = RR_{stratum} * E_{i,\ ex\ ante}$$

The program-level realization rate for the program was calculated using Equation E-3:

Equation E-3. Realization Rates for the Entire Program

$$RR_{program} = \frac{\sum_{i=1}^{5} E_{i,ex\ post}}{\sum_{i=1}^{5} E_{i,ex\ ante}}$$

The evaluation team's engineering review methodology to calculate the verified energy savings and coincident peak demand savings for the Business Custom program measures is described below. Guidehouse applied industry standard methodologies for engineering review of the following measures or similar measures implemented in PY3:

- Lighting Measures
- Building Management System (BMS) Upgrades
- Variable Speed Drive for Pump or Fan
- HVAC
- Refrigeration Upgrade
- New Construction

Energy savings for various measures from the list above are occasionally calculated by the IC using various energy modeling software applications in lieu of engineering calculation algorithms. In these instances, the evaluation team adheres to the following high level verification framework:

1. Verify that a portion of the savings of a given project are generated from an energy modeling platform by means of documentation references or identifying modeling output files.
2. Request all relevant modeling files, if not already provided with the received project documentation. This includes, but is not limited to, model executable files, weather files, model output files, hourly simulation results, and various model reports.
3. Perform energy simulations of the reported model(s) with no changes to ensure the savings from the modeling files received match the claimed savings.
4. Verify all aspects of the model inputs, which vary based on the type of measures included in the model. This includes, but is not limited to, weather files, equipment capacities and quantities, lighting power densities, baseline equipment, equipment efficiencies, building and space areas, and system configurations.
5. Perform energy simulations to include any verified evaluation changes to the energy model(s).

6. Export hourly consumption trends from the model(s) for the purpose of calculating utility peak demand savings.

Lighting Measures

Energy Savings

Equation E-4. Energy Savings for C&I Lighting Measures

$$\Delta kWh = (kW_{base}\text{-}kW_{ee}) * ISR * Hours * WHF_e$$

Where:

kW_{base}	Kilowatts of the baseline lighting, based on kilowatts of existing lighting fixtures for retrofit projects or based on the building-area method or space-by-space method defined in the energy code for new construction projects
kW_{ee}	Kilowatts of the post-retrofit or energy efficient lighting system, based on lighting plans and specifications
HOURS	Average HOU per year, based on project information
WHF_e	Waste heat factor for energy, based on the researched factors through the long-term metering study for each building type
ISR	In-service rate, based on project information

Equation E-5. Energy Savings for C&I Lighting Controls

$$\Delta kWh = kW_{controlled} * ISR * Hours * ESF * WHF_e$$

Where:

$kW_{controlled}$	Total lighting load connected to the installed lighting controls, based on lighting plans and specifications
ESF	Energy savings factor for installed lighting controls, based on the Illinois TRM v10 for each building type

Coincident Peak Demand Savings

Equation E-6. Coincident Peak Demand Savings for C&I Lighting Measures

$$\Delta kWh = (kW_{base} - kW_{ee}) * ISR * CF * WHF_d$$

Where:

CF	Summer peak demand coincidence factor, based on Guidehouse's long-term metering study results
WHF_d	Waste heat factor for demand, based on the researched factors through long-term metering study for each building type

Equation E-7. Coincident Peak Demand Savings for C&I Lighting Controls

$$\Delta kW = kW_{controlled} * ISR * (CF_{baseline} - 0.15) * WHF_d$$

Where:

$CF_{baseline}$	Summer peak demand coincidence factor, based on Guidehouse's long-term metering study results for each building type

BMS Upgrades

No BMS upgrade projects were included in the PY3 Business Custom program. In the past when these measures have been included in the sample, Guidehouse applied consumption data analysis, also called billing data analysis, for the BMS upgrade measures.

Variable Speed Drive for Pump or Fan

Guidehouse applied the end-use regression model approach for the estimation of energy and peak demand savings for variable speed drive projects. Guidehouse performed an end-use regression analysis using the following steps:

1. Review the metering data and other variables (such as outdoor air temperature, production data—this depends on the project type).
2. Create a regression relationship between the metering data and other variables for both pre- and post-retrofit periods.
3. Predict the pre- and post-retrofit hourly power using the created regression models and other variables.
    a. Other variables depend on the project type. For example, if the regression analysis is run for metering data and weather data, the TMY3 data is used for the prediction.
4. Calculate the project savings by subtracting the post-retrofit consumption from the pre-retrofit consumption.

HVAC and HVAC Controls

Guidehouse applied an 8,760 hourly data analysis approach for the determination of energy and peak demand savings for the weather-dependent HVAC measures. Code baseline is assumed for replace-on-burnout projects for HVAC projects. For early replacement projects, Guidehouse uses a dual baseline (existing baseline and code baseline). For HVAC controls implemented on existing HVAC systems, Guidehouse uses the existing system as the baseline. The steps for Guidehouse's 8,760 hourly data analysis approach are as follows:

1. Create a regression model comparing the demand against dry bulb temperatures or other relevant variables.
    a. For example, the regression model could be performed for a performance curve for a cooling system, pump, or fan.
2. Calculate the hourly power for each hour using the regression model.
3. Calculate the pre- and post-retrofit energy consumptions by summing up the annual hours of power.
4. Calculate the pre- and post-retrofit peak demand by extracting average savings that fall within the peak period.

In cases where IL TRM v10 algorithms were used in calculating savings associated with heat pumps, the following equation was used:

Equation E-8. Energy Savings for Heat Pump Measures

$$\Delta kWh = \text{Annual kWh Savings}_{cool} - \text{Annual kWh Savings}_{heat}$$

$$\text{Annual kWh Savings}_{cool} = \text{Capacity}_{cool} * \text{EFLH}_{cool} * \left(\frac{\left(\frac{1}{\text{SEER}_{base}} - \frac{1}{(\text{SEER}_{ee} * \text{SEER}_{adj})} \right)}{1000} \right)$$

$$\text{Annual kWh Savings}_{heat} = \text{HeatLoad} * \left(\frac{\left(\frac{1}{\text{HSPF}_{base}} - \frac{1}{(\text{HSPF}_{ee} * \text{HSPF}_{adj})} \right)}{1000} \right)$$

Equation E-9. Coincident Peak Demand Savings for Heat Pump Measures

$$\Delta kW = \left(\text{kBtu/hr}_{cool} * \left(\frac{1}{\text{EER}_{base}} - \frac{1}{\text{EER}_{ee}} \right) \right) * CF$$

Where:

Capacity_{cool}	Input capacity of the cooling equipment in Btu per hour (1 ton of cooling capacity equals 12,000 Btu/hr)
SEER_{base}	Seasonal energy efficiency ratio of the baseline equipment
SEER_{ee}	Seasonal energy efficiency ratio of energy efficient equipment
SEER_{adj}	Adjustment percentage to account for in-situ performance of the unit
EFLH_{cool}	Equivalent full load hours for cooling
HSPF_{base}	Seasonal energy efficiency ratio of the baseline equipment
HSPF_{ee}	Seasonal energy efficiency ratio of energy efficient equipment
HSPF_{adj}	Adjustment percentage to account for in-situ performance of the unit
EER_{base}	Energy efficiency ratio of the baseline equipment
EER_{ee}	Energy efficiency ratio of energy efficient equipment
HeatLoad	Calculated heat load for the building $(EFLH_{heat} * Capacity_{heat})$
EFLH_{heat}	Equivalent full load hours for heating
Capacity_{heat}	Input capacity of the heat pump equipment in Btu per hour
CF	Summer peak coincidence factor

Refrigeration Upgrade

Guidehouse applied the end-use regression model approach for the estimate of energy and peak demand savings for the refrigeration upgrade project. The detailed methodology is summarized in the section Variable Speed Drive for Pump or Fan.

New Construction

Guidehouse used the annual hourly data analysis approach summarized in the preceding HVAC section for the estimate of energy and peak demand savings for non-lighting new construction projects, specifically weather-dependent HVAC measures. Guidehouse applied the relevant codes and standards for evaluation of new construction projects as described below. HVAC

controls in new construction projects leverage the code baseline as well. All of the projects included in the sample for the Business Custom program in PY3 had a local energy code:

- **Baseline standard or code for Business Custom new construction projects:** Guidehouse adhered to the established energy code by local jurisdiction. If no local energy code existed, the team used IECC 2012.
- **Calculation approach for Business Custom new construction lighting projects:** The evaluation team used the building-area or space-by-space method defined by the energy code to calculate savings for the Business Custom program's new construction lighting projects.
- **Calculation approach for Business Custom new construction indoor agriculture lighting projects:** The evaluation team used the Indoor Horticulture Baseline Memo produced by Guidehouse and agreed upon by the utility and IC.

E.2 Process Evaluation

Guidehouse addressed the five Missouri-required questions for process evaluation through program staff interviews, a program materials review, one round of participant FR surveys, and one round of participant SO surveys, for the Business Custom program. Table E-1 displays the evaluation team's key process research questions and the evaluation activities conducted to address these questions.

Table E-1. Process Evaluation Research Questions and Approaches

Process Evaluation Research Question	Evaluation Activity
Missouri-Required Questions for Process Evaluation	
1. What are the primary market imperfections that are common to the target market segment?	• Program staff interviews • Participant surveys
2. Is the target market segment appropriately defined, or should it be further subdivided or merged with other market segments?	• Program staff interviews • Participant surveys
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	• Program staff interviews • Participant surveys
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	• Program staff interviews • Participant surveys
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	• Program staff interviews • Participant surveys

Source: Guidehouse

E.2.1 Program Staff Interviews

Guidehouse conducted a program manager interview and an IC interview as described in Section D.2.1.

E.2.2 Materials Review

Guidehouse conducted a review of the program description and documents available from Evergy to understand the Business Custom program application process and requirements and

to research the key considerations of the five Missouri questions. Guidehouse reviewed the following program documents:

- Evergy program documents
- Program website
- Program tracking database
- Program incentives list

E.2.3 Participant Surveys

Guidehouse conducted FR and SO participant surveys to inform the evaluation of the five Missouri process evaluation questions. Insufficient responses were received to update the NTG ratio. The survey was conducted in February and March 2023 and included all PY3 participants for the FR and process questions, as well as all PY2 participants for SO questions. If a participant had projects in both PY2 and PY3, they were sampled on the basis of their most recent project to prioritize the FR and process questions. Participants that had previously responded to a survey were excluded from the FR sample.

Appendix F. Process Efficiency Program-Specific Methodologies

The Process Efficiency program is designed to provide C&I customers a non-capital-intensive approach to energy efficiency engagement for businesses of all sizes and industries. The program, through its engagement process, seeks to ingrain energy management into customers' business practices. Currently, the program activities are focused on providing RCx services.

Based on Missouri regulations, the evaluation team used method 1a and protocol 2b to evaluate the Process Efficiency program. This evaluation of the Process Efficiency program consisted of the following activities:

- Gross impact evaluation (detailed in Appendix F.1)
- Process evaluation (detailed in Appendix F.2)

F.1 Impact Evaluation

Guidehouse performed the following impact evaluation activities:

- Tracking database review
- Engineering review consisting of:
    - Engineering desk review

F.1.1 Tracking Database Review

The evaluation team conducted a thorough review of the program tracking database as described in Section D.1.1.

F.1.2 Engineering Desk Review

Based on the program tracking database review, only three projects were completed in PY3. The evaluation team conducted engineering review for all three of the projects. This section describes the evaluation team's methodology for sampling and engineering review of the Process Efficiency program in PY3 of MEEIA Cycle 3.

F.1.2.1 Sampling

The evaluation team selected the census of projects for review in PY3.

F.1.2.2 Engineering Review Methodology

The evaluation team requested project files for the census of projects from Evergy and the implementation team. The evaluation team reviewed the project files and all the assumptions made by the implementer in developing reported savings. The evaluation team then verified the energy and coincident peak demand savings for each sampled project using industry standard

evaluation methodologies based on the Uniform Methods Protocols,[28] all of which are detailed further below in this section. Finally, the evaluation team calculated the realization rates for the program using the following equation.

Equation F-1. Realization Rates for the Entire Program

$$RR_{program} = \frac{\sum_{i=1}^{5} E_{i,ex\ post}}{\sum_{i=1}^{5} E_{i,ex\ ante}}$$

Where:

E Electric energy savings or peak demand reduction for each project in the census

All the projects completed in PY3 consisted of compressed air leak repairs. The evaluation team's engineering review methodology to calculate the verified energy savings and coincident peak demand savings for the compressed air leak measures is described below. The evaluation team applied industry standard methodologies.

Compressed Air Leak Repair

The evaluation team used the following steps in verifying the compressed air leak repair savings:

1. Review the inventory of leaks and associated decibel (dB) readings from the ultrasonic leak detection device.
2. Calculate the volumetric flowrate of the compressed air leak in CFM using the dB versus CFM chart for the ultrasonic leak detection device used by the program and the pressure.
3. Calculate the savings using the input values available in the project files, secondary sources described above, and algorithm presented in the Uniform Methods Protocols Chapter 22: Compressed Air Evaluation Protocol.[29]

The current IC analysis uses supply pressure at the air compressor in calculating the CFM values. Compressed air pressure varies throughout the facility and often regulated to a lower value as per the equipment requirements (typically between 40 psi and 60 psi). If a compressed air leak is identified after a regulator, the pressure will likely be lower than the supply pressure, which will affect the CFM leaked. The evaluation team recommends recording actual pressure at the leak location whenever available to develop more accurate estimates of leaked CFM values.

F.2 Process Evaluation

In PY3, Guidehouse primarily addressed the five Missouri-required questions for process evaluation through interviews with program staff. Guidehouse also conducted a participant survey of all five participants over PY2 and PY3. Guidehouse received one response from one

[28] Office of Energy Efficiency & Renewable Energy, *Uniform Methods Project: Determining Energy Efficiency Savings for Specific Measures,* https://www.energy.gov/eere/about-us/ump-protocols.

[29] National Renewable Energy Laboratory, *Chapter 22: Compressed Air Evaluation Protocol,* https://www.nrel.gov/docs/fy21osti/77820.pdf.

of the PY2 participants and one response from one of the PY3 participants. Guidehouse also conducted a trade ally survey and received one response of the two participating trade allies. Table F-1 displays the evaluation team's key process research questions and the evaluation activities conducted to address these questions.

Table F-1. Process Evaluation Research Questions and Approaches

Process Evaluation Research Question	Evaluation Activities
Missouri-Required Questions for Process Evaluation	
1. What are the primary market imperfections that are common to the target market segment?	• Program staff interviews • Participant surveys • Materials review
2. Is the target market segment appropriately defined, or should it be further subdivided or merged with other market segments?	• Program staff interviews • Participant surveys • Materials review
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	• Program staff interviews • Participant surveys • Materials review
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	• Program staff interviews • Participant surveys • Materials review
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	• Program staff interviews • Participant surveys • Materials review

Source: Guidehouse

F.2.1 Program Staff Interviews

Guidehouse conducted a program manager interview and an IC interview. Specific process evaluation topics addressed included the following:

- Program operation, challenges, successes, and goals
- Qualification process for trade allies to apply for rebates through the program
- Qualifications for customers to participate in the program

F.2.2 Materials Review

Guidehouse conducted a review of the program description and documents available from Evergy to understand the Process Efficiency program application process and requirements and to research the key considerations of the five Missouri questions. Guidehouse reviewed the following program documents:

- Evergy program documents
- Program website
- Program tracking database
- Program incentives list

F.2.3 Participant Surveys

Guidehouse conducted one participant survey which included both FR and SO questions to inform the evaluation of the five Missouri process evaluation questions as well as the development of a Process Efficiency NTG ratio. The survey was conducted in February and March 2023 and included all five participants from PY2 and PY3 combined for the FR, SO and process questions. Insufficient responses were received to develop an NTG ratio and the program team decided to leverage the Business Custom program NTG ratio finalized in PY2 for all Process Efficiency PY3 participants. Guidehouse reviewed responses for responding to the five-Missiouri required questions.

F.2.4 Trade Ally Surveys

Guidehouse conducted a survey of both trade allies who had participating projects in PY2 and PY3. The survey was fielded in February 2022 and focused on the five Missouri process evaluation questions and nonparticipant spillover. Only one response was received and results were not reported to maintain anonymity of the respondent. The nonparticipant spillover developed for the PY2 Business Custom program was used instead for the PY3 Process Efficiency participants.

Appendix G. Online Business Energy Audit Program-Specific Methodologies

The Online Business Energy Audit (OBEA) program is an opt-in online tool that provides energy-saving tips and helps customers track their energy usage. The tool encourages customers to take energy-saving actions in their businesses through actions they can take on their own and by participating in other Evergy energy efficiency programs.

Evergy does not report energy savings for the OBEA tool. This evaluation program consisted of the following activities for PY3:

- Process evaluation (detailed in Appendix G.1)

G.1 Process Evaluation

Guidehouse addressed the five Missouri-required questions for process evaluation through staff interviews and a program materials review. Table G-1 displays the evaluation team's key process research questions and the evaluation activities conducted to address these questions.

Table G-1. Process Evaluation Research Questions and Approaches

Process Evaluation Research Question	Evaluation Activity
Program-Specific Questions	
1. How many unique visitors are using OBEA?	• Program staff interviews • Materials review
2. How is it being used relative to other utilities?	• Program staff interviews • Materials review
Missouri-Required Questions for Process Evaluation	
1. What are the primary market imperfections that are common to the target market segment?	• Program staff interviews • Materials review
2. Is the target market segment appropriately defined, or should it be further subdivided or merged with other market segments?	• Program staff interviews • Materials review
3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?	• Program staff interviews • Materials review
4. Are the communication channels and delivery mechanisms appropriate for the target market segment?	• Program staff interviews • Materials review
5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?	• Program staff interviews • Materials review

Source: Guidehouse

G.1.1 Program Staff Interviews

Guidehouse conducted in-depth interviews with Evergy's product lead to better understand the OBEA program and the key considerations of the five Missouri questions, namely:

- Program's performance to date
- Any issues or challenges faced
- Potential opportunities for improvement
- Effectiveness of program communication

G.1.2 Materials Review

Guidehouse reviewed the following program planning and marketing materials to research the key considerations of the five Missouri questions, namely:

- Screenshots of the online tools available to customers through OBEA
- Screenshots of bill forecast and bill comparison
- Data on customer logins and tips usage
- Lists of tips used in OBEA
- Evergy program description documents

Appendix H. Survey Instruments

H.1 Business Standard and Custom Participant Online Survey

Sample Variables:

<Measure_Evergy>: Rebated measure, using simplified measure name; pluralized if quantity is more than 1
<MeasureCat_Evergy>: General category of equipment/project, e.g., "Lighting," "Building Optimization," "Compressed Air," "Variable Speed Drive," etc.
<RebateAmount_Evergy>: The dollar value of the rebate the participant received for the measure
<Quantity_Evergy>: The quantity of measures installed
<InspectionFlag_Evergy>: Yes if post-inspection was completed, No if not
<OrganizationName_Evergy >: The name of the customer's company
<StreetAddress_Evergy>: The address where the rebated measures were installed.
<SurveyType_Evergy>: FR (full survey except spillover questions) or SO (spillover and satisfaction questions only)

Introduction

Thank you for participating in the Evergy Business Energy Savings Program participant survey. All data collected is confidential and will only be used to inform our internal evaluation. The surveys will not affect your energy efficiency project, applications, rebates, or service.

If you accidentally close the survey or aren't able to finish today, your progress will be saved - just click the link in your email again.

At the end of the survey we will ask for your preferred email address if you would like to receive the $50 Tango e-gift card in thanks for your time in completing the survey. The gift card will be emailed to you within four weeks of completing the survey.

Screening Questions

S1. Our records show that your organization <OrganizationName_Evergy> received <RebateAmount_Evergy> in Evergy Business Energy Savings Program incentives to complete a <Measure_Evergy> project at <StreetAddress_Evergy>. Is this correct?

1. Yes [CONTINUE TO S2]
2. No [SKIP TO S3]

98. Not sure [SKIP TO S3]

[ASK IF S1=Yes]
S2. Were you directly involved in the decision to purchase and install and complete the <Measure_Evergy> project at <StreetAddress_Evergy>? (Note that you may have completed other energy efficient projects but this survey will focus on <Measure_Evergy>.)

1. Yes [SKIP TO S4]
2. No [CONTINUE TO S3]
98. Not sure [SKIP TO TERMINATE]

[ASK IF S1=2, 98 or S2=2]
S3. Is there someone else at your organization who might be more familiar with the energy efficiency upgrade project? If so, would you please provide us with their email address?

1. Yes, please enter email address [OPEN ENDED] [SKIP TO TERMINATE]
2. No [SKIP TO TERMINATE]

98. Not sure [SKIP TO TERMINATE]

[ASK IF S2=Yes]
S4. Are you an employee of <OrganizationName_Evergy> or the owner/property manager at <StreetAddress_Evergy>, or were you involved in the project in some other capacity (e.g., as an installation contractor or energy services provider)?

1. Employed at <OrganizationName_Evergy> or owner/property manager at <StreetAddress_Evergy> [SKIP TO S6]
2. Employed by another organization [CONTINUE TO S5]

98. Not sure [SKIP TO TERMINATE]

[ASK IF S4=Employed by another organization]
S5. We are looking to survey the decision-maker at <OrganizationName_Evergy> who made the purchase decision to install <Measure_Evergy>. Could you provide us with the name and email address of the project decision-maker at <OrganizationName_Evergy> that you worked with?

[ENTER NAME/EMAIL, THEN TERMINATE]

98. Not sure [SKIP TO TERMINATE]

[ASK IF S4=Employed at <OrganizationName_Evergy> or owner]
S6. Could you please verify your name and email address? (Note: this information is requested for survey management purposes only; your responses will remain anonymous and will not be linked with any of your contact information.)

[ENTER NAME/EMAIL]

[Display if S2=2 or 98 or S4=2 or 98]
Terminate Message: Those are all the questions we have for you. Thank you for your time.

[If <SurveyType>=SO, skip to Participant Spillover section]

Awareness and Participant Journey

A1. How did you first learn about the Business Energy Savings Program?
[ROTATE 1-13]

1. Evergy email
2. Evergy bill insert
3. Other mailing from Evergy
4. Evergy community event
5. Evergy website
6. Evergy field representative
7. Newspaper, magazine, or other print media advertisement
8. Family, friend, or word of mouth
9. Contractor, vendor, or equipment installer
10. Evergy call center
11. Information received after participating in another Evergy program
12. Social media ad
13. Other Evergy program emails
14. Other, Please Describe: [OPEN ENDED]

98. Not sure

A2. What made your company first decide to purchase the new <MeasureCat_Evergy> equipment? [SELECT ALL THAT APPLY; ROTATE 1-10]

1. Recommended by contractor
2. Old equipment stopped working
3. Old equipment needed too many repairs
4. Was paying high utility bills and wanted to save money
5. Wanted to improve our work environment
6. Wanted to make our company more "green"/reduce greenhouse gas emissions
7. Wanted to improve the property value
8. Wanted to reduce operation and maintenance costs
9. Learned about the availability of a rebate from Evergy
10. Received a rebate from Evergy or other utility in the past

97. Other, Please Describe
98. Not sure

A3. What was the status of your old equipment when you decided to buy the new <MeasureCat_Evergy> equipment? [SELECT ONE]

1. It was working and did not need any repairs beyond regular maintenance
2. It was working but needed minor repairs
3. It was working but needed major repairs
4. It was not working but was repairable
5. It was not working and could not be repaired
6. Not applicable, rebated <Measure_Evergy> was new equipment

7. Other, please describe
98. Not sure

Participant Free Ridership

FR1. Had you already decided to purchase the new <Measure_Evergy> equipment before you learned about the program?

1. Yes
2. No
98. Not sure

[Ask if FR1=1, else skip to FR3]

FR2a. Prior to learning about the Business Energy Savings Program, had you received a cost estimate for the full cost of the same <Measure_Evergy> project (i.e., at the same scope and efficiency level as completed through the program)?

1. Yes
2. No
98. Not sure

[Ask if FR2a=1, else skip to FR3]

FR2b. Did you have funding arranged for the full cost of the entire project without any utility incentives prior to learning about the Business Energy Savings Program?

1. Yes, we had full funding arranged
2. No
98. Not sure

FR3. If the program incentive was not available, would you have purchased and installed any <MeasureCat_Evergy> regardless of efficiency level within a year of when you completed this project? [ALLOW ONE RESPONSE]

1. Yes, I would have purchased the same quantity of equipment at the same time or within the next year (regardless of efficiency level)
2. [IF Quantity_Evergy>1] I would have purchased a smaller quantity of equipment at the same time or within the next year (regardless of efficiency level)
3. No, I would not have purchased any equipment of any efficiency level at that time or within a year after that point

98. Not sure

[Ask if FR3 = 2]

FR3a. How many fewer <Measure_Evergy> would you have purchased?

1. Most of them (approximately two-thirds or more of the <Measure_Evergy>)
2. Some of them (approximately one-third or more of the <Measure_Evergy>)
3. Few of them (approximately one-third or fewer of the <Measure_Evergy>)

98. Not sure

FR3b. If the program incentive was not available, what energy efficiency level would you have selected for this project when you did complete it? [ALLOW ONE RESPONSE]

1. Same energy efficiency as installed through the project
2. Almost as efficient (approximately two-thirds as efficient as what was installed)
3. Somewhat less efficient (approximately one-third as efficient as what was installed)
4. Much less efficient (minimal efficiency level available)
5. Lowest cost available (regardless of efficiency)

98. Not sure

[Ask if FR3 = 1 and FR3b=1]

FR3c. You stated that without the program incentive, you would have completed exactly the same project. Does that mean your business would have paid an additional <RebateAmount_Evergy> to cover the entire cost of the <Measure_Evergy> project?

1. Yes
2. No

98. Not sure

FR4a. On a scale of 1 to 5, where 5 is "very influential" and 1 is "not at all influential," how influential were the following elements when you were deciding whether to complete this high efficiency <Measure_Evergy> project rather than a lower efficiency project?

[For FR4 responses 1, 2 and 3 record responses 1 through 5, NA]

1. Program incentive
2. Educational or marketing materials from an Evergy program
3. Information from Evergy program staff
4. Information from the installation contractor/trade ally

FR4b. On a scale of 1 to 5, where 5 is "very influential" and 1 is "not at all influential," how influential were the following elements on your decision to complete the <Measure_Evergy> project at the time that you did rather than at a later date?

[For FR4 responses 1, 2 and 3 record responses 1 through 5, NA]

1. Program incentive
2. Educational or marketing materials from an Evergy program
3. Information from Evergy program staff
4. Information from the installation contractor/trade ally

[Skip to Awareness and Participant Journey Part 2 section]

Participant Spillover

SO1. Since learning about the program, did you install any *additional* energy efficient equipment or make any additional energy efficiency upgrades at the same facility or at any other facility within Evergy's Missouri service territory?

1. Yes
2. No

98. Not sure

[Ask if SO1 = 1, else skip to PS3]

SO2. Did you apply for an incentive from Evergy for the additional energy-efficient equipment or upgrade?

1. Yes, and I received an incentive from Evergy
2. Yes, but I did not receive an incentive from Evergy
3. No

98. Not sure

[Ask if SO2=2]

SO3. Do you know why you did not receive an incentive from Evergy for the additional energy-efficient equipment or upgrade?

[OPEN ENDED]

98. Not sure

[Ask if SO2=3]

SO4. Why didn't you apply for an incentive from Evergy for the additional energy-efficient equipment or upgrade?

[OPEN ENDED]

98. Not sure

[Ask if SO2 = 2 or 3, else skip to PS3]

SO5. How influential was Evergy's Business Energy Savings Program on your decision to install the *additional* energy efficient equipment which did not receive incentives? Please rate on a 5-point scale in which 5 means "very influential" and 1 means "not at all influential."

[1-5, Not sure]

[Ask if SO5=2, 3, 4, or 5, else skip to PS3]

SO6. Please describe the energy efficient equipment that was installed without incentives:

a. Enter description:
b. Enter quantity: [NUMERIC]
c. Enter approximate installation date [DATE]
d. How do you know this equipment is high efficiency? [OPEN ENDED]

SO7. Was this additional energy-efficient equipment installed by the same contractor that installed the equipment that was rebated by Business Energy Savings Program?

1. Same contractor
2. Different contractor
3. Not applicable; we did not use a contractor to install the additional equipment
4. Not sure

[Skip to Participant Satisfaction section if SURVEYTYPE = SO]

Awareness and Participant Journey Part 2

A_6A. On a scale of 1 to 5 where 1 means "strongly disagree" and 5 means "strongly agree," please rate your agreement with the following statements: [MATRIX STYLE QUESTION; COLUMNS ARE 1-5 and Not sure]

1. The program is easy to work with and understand.
2. When I had questions, I knew who to contact.
3. I had enough information about measure eligibility and rebates to make decisions about which equipment to install.

[Ask if A_6A 1-3 is less than 4]

A_6B_1. Please describe what aspects of the program were not easy to work with or understand. [OPEN ENDED]

A_6B_2. Please describe any confusion there may have been regarding who to contact. [OPEN ENDED]

A_6B_3. Please describe the lack of clarity there may have been regarding the measure eligibility or rebates. [OPEN ENDED]

A7. Did you have to submit a pre-approval application for your project?
[Single Response]

1. Yes, I submitted it
2. Yes, but my contractor submitted it
3. No

98. Not sure

[Ask if A7 = 1; else skip to next section]

A8. How easy was it to complete your Business Energy Savings Program project pre-approval application? Please use a scale of 1 to 5, where 1 is "not at all easy" and 5 is "extremely easy."
[Record 1-5, Not sure]

Participant Satisfaction

[Ask if <SurveyType> = FR, else skip to PS3]

PS1. How would you rate your satisfaction with the following aspects of the Evergy Business Energy Savings Program? Please rate on a 5-point scale in which 5 means "very satisfied" and 1 means "not at all satisfied."

[ROTATE a-f, RECORD 1-5, Not sure]

a. Amount of rebate
b. Time it took to receive the rebate
c. Requirements to participate in program
d. Program communications
e. [ASK IF A7 != 1] Application process
f. [ASK IF A7 = 1] Pre-approval application process
g. [ASK IF A7 = 1] Final approval process
h. [ASK IF <InspectionFlag_Evergy> = Yes] Inspection process (virtual or in-person)
i. The program representative
j. Your installation contractor
k. Overall satisfaction with the program

[Ask PS2a if PS1a was < 3]

PS2a. Why did you provide this rating for the amount of the rebate?
[OPEN ENDED]

[Ask PS2b if PS1b was < 3]
PS2b. Why did you provide this rating for the time it took to receive the rebate?
[OPEN ENDED]

[Ask PS2c if PS1d was < 3]
PS2c. Why did you provide this rating for the program communications?
[OPEN ENDED]

[Ask PS2d if PS1c was < 3]
PS2d. Why did you provide this rating for the requirements to participate in the program?
[OPEN ENDED]

[Ask PS2e if PS1e was < 3]
PS2e. Why did you provide this rating for the application process?
[OPEN ENDED]

[Ask PS2f if PS1f was < 3]
PS2f. Why did you provide this rating for the pre-approval application process?
[OPEN ENDED]

[Ask PS2g if PS1g was < 3]
PS2g. Why did you provide this rating for the final approval application process?
[OPEN ENDED]

[Ask PS2h if PS1h was < 3]
PS2h. Why did you provide this rating for the inspection process?
[OPEN ENDED]

[Ask PS2i if PS1i was < 3]
PS2i. Why did you provide this rating for the program representative?
[OPEN ENDED]

Ask PS2jif PS1j was < 3]
PS2j. Why did you provide this rating for your installation contractor?
[OPEN ENDED]

[Ask all]
PS2k. Why did you provide this rating for your overall satisfaction with the program?
[OPEN ENDED]

[ASK ALL]
PS3. How likely you would be to participate in Evergy rebate programs again? Please rate on a 5-point scale in which 5 is "very likely" and 1 is "not at all likely."
[Record responses 1 through 5, Not sure]

PS4. Have you recommended the Evergy Business Energy Savings Program to colleagues or friends?
1. Yes
2. No
98. Not sure

[Ask if <SurveyType> = FR]
PS5. Were there any other types of energy saving equipment or upgrades that you wanted to install but that Evergy did not offer incentives for?
[OPEN ENDED, None]

[ASK ALL]
PS6. Please share any suggestions you may have for improving the Evergy Business Energy Savings Program.
[OPEN ENDED, None]

PS7. Based on your overall experience as a customer of Evergy, how would you rate your satisfaction with the company on a scale of 1 to 5, where 5 is "very satisfied" and 1 is "not at all satisfied"?
[1-5, Not Sure]

[Ask if PS7<3, else skip to Firmographics; F1]
PS8. What were the reasons that you give it that rating?
[OPEN-ENDED]

Firmographics

Just a few questions left.

F1. What type of organization is <OrganizationName_Evergy>?
[ROTATE]
1. Office
2. Retail
3. Convenience Store
4. Grocery
5. Restaurant
6. Industrial
7. Light Manufacturing
8. Warehouse
9. Church
10. K-12 School
11. College/University
12. Government Building
13. Other; please describe: [OPEN ENDED]
14. Not sure

F2. Which of the following descriptions best fits the facility at <StreetAddress_Evergy>?
1. Your organization's only location
2. One of several locations within Evergy service territory
3. One of several locations both within and outside of Evergy service territory
4. Your organization's headquarters, with several locations within Evergy service territory
5. Your organization's headquarters, with several locations both within and outside of Evergy service territory
6. Other, please describe: [OPEN ENDED]

98. Not sure

Close

We would like to offer you a $50 Tango e-gift card in thanks for completing our survey. If you would like to receive this gift card, please enter your preferred email address below. Tango e-gift cards can be used at a variety of retailers and restaurants, such as Amazon, Chipotle, etc. If you would not like the gift card, please check "No thanks."

Your email address will only be used to send the e-gift card. You will receive the gift card within four to six weeks of completing the survey. Be sure to click the forward arrow below to record your response.

a. Please enter your email address: [OPEN ENDED]
b. No thanks, I do not wish to receive a Tango gift card

Survey Completion Message

Thank you for your time in completing this survey. Your responses will help Evergy improve their programs to better serve customers like you!

H.2 Process Efficiency Participant Online Survey

Sample Variables:

<RebateAmount_Evergy>: The dollar value of the rebate the participant received for the measure
<OrganizationName_Evergy >: The name of the customer's company
<StreetAddress_Evergy>: The address where the rebated measures were installed.

Formatting Notes:
Any text enclosed in square brackets (e.g., [SKIP TO S3] is programming instructions and will not be visible to the survey respondents).

Introduction
Thank you for participating in the Evergy Retro-Commissioning Program participant survey. All data collected is confidential and will only be used to inform our internal evaluation. The surveys will not affect your energy efficiency project, applications, rebates, or service.

If you accidentally close the survey or aren't able to finish today, your progress will be saved - just click the link in your email again.

At the end of the survey we will ask for your preferred email address if you would like to receive the $50 Tango e-gift card in thanks for your time in completing the survey. The gift card will be emailed to you within four weeks of completing the survey.

Screening Questions

S1. Our records show that your organization <OrganizationName_Evergy> received <RebateAmount_Evergy> in Evergy Retro-Commissioning Program incentives (rebates or bill credits) to complete a compressed air leaks survey and repair project at <StreetAddress_Evergy>. Is this correct?

3. Yes [CONTINUE TO S2]
4. No [SKIP TO S3]
99. Not sure [SKIP TO S3]

[ASK IF S1=Yes]
S2. Were you directly involved in the decision to complete the compressed air project at <StreetAddress_Evergy>? (Note that you may have completed other energy efficient projects but this survey will focus on the compressed air leaks repair project.)

3. Yes [SKIP TO S4]
4. No [CONTINUE TO S3]
99. Not sure [SKIP TO TERMINATE]

[ASK IF S1=2, 98 or S2=2]
S3. Is there someone else at your organization who might be more familiar with the project? If so, would you please provide us with their email address and/or other contact information?

1. Yes, please provide contact information: [OPEN ENDED] [SKIP TO TERMINATE]
2. No [SKIP TO TERMINATE]

99. Not sure [SKIP TO TERMINATE]

[ASK IF S2=Yes]

S4. Are you an employee of <OrganizationName_Evergy> or the owner/property manager at <StreetAddress_Evergy>, or were you involved in the project in some other capacity (e.g., as an installation contractor or energy services provider)?

3. Employed at <OrganizationName_Evergy> or owner/property manager at <StreetAddress_Evergy> [SKIP TO S6]
4. Employed by another organization [CONTINUE TO S5]

98. Not sure [SKIP TO TERMINATE]

[ASK IF S4=Employed by another organization]

S5. We are looking to survey the decision-maker at <OrganizationName_Evergy> who made the decision to pursue the compressed air leaks survey and repairs. Could you provide us with the name and email address of the project decision-maker at <OrganizationName_Evergy> that you worked with?

[ENTER NAME/EMAIL, THEN TERMINATE]

99. Not sure [SKIP TO TERMINATE]

[ASK IF S4=Employed at <OrganizationName_Evergy> or owner]

S6. Could you please verify your name and email address? (Note: this information is requested for survey management purposes only; your responses will remain anonymous and will not be linked with any of your contact information.)

[ENTER NAME/EMAIL]

[Display if S1=2 or 98 or S2=2 or 98 or S4=2 or 98]

Terminate Message: Those are all the questions we have for you. Thank you for your time.

Awareness and Participant Journey

A1. How did you first learn about the Retro-Commissioning Program? Select all that apply.

15. Contractor or vendor
16. Evergy website
17. Evergy workshops or webinars
18. Evergy email
19. Evergy bill insert
20. Other mailing from Evergy
21. Evergy field representative
22. Newspaper, magazine, or other print media advertisement
23. Colleague, friend, or word of mouth
24. Evergy call center
25. Information received after participating in another Evergy program
26. Social media post or advertisement

97. Other, Please Describe: [OPEN ENDED]
98. Not sure

A2. Prior to the compressed air leak survey, did you know that there were leaks that needed to be repaired?

11. Yes, I knew there were major leaks
12. Yes, I knew there were minor leaks
13. I suspected there were leaks
14. No, the equipment was not working well but I did not suspect leaks
15. No, the equipment was working normally to my knowledge
97. Other, please describe: [OPEN ENDED]
98. Not sure

A3. Prior to the compressed air leak survey, what was your organization's typical approach to identifying and fixing compressed air leaks?

[OPEN ENDED]

Participant Free Ridership

FR0. Prior to learning about the program, were you aware of any service providers (i.e., contractors or vendors) who performed compressed air leak surveys and repairs?

3. Yes
4. No, but my organization has in-house staff that can repair leaks
5. No, and my organization does not have in-house staff to repair leaks
98. Not sure

FR1. Had you already decided to have a compressed air leak <u>survey</u> performed before you learned about the program?

1. Yes
2. No
98. Not sure

[Ask if FR0=1 and FR1=1, else skip to FR3]

FR2a. Prior to learning about the Leak Survey & Repair incentive, had you received a cost estimate for the full cost of a leak survey?

3. Yes
4. No
98. Not sure

[Ask if FR0=1 and FR1=1, else skip to FR3]

FR2b. Prior to learning about the Leak Survey & Repair incentive, had you received a cost estimate for repairs to your compressed air equipment?

1. Yes
2. No
98. Not sure

[Ask if FR2a=1 or FR2b=1, else skip to FR3]

FR2c. Did you have funding arranged for the full cost of the entire project without any utility incentives prior to learning about the Leak Survey & Repair incentive?

3. Yes, we had full funding arranged
4. No
98. Not sure

FR3. <u>If the program incentive was not available,</u> would you have pursued repairs to your compressed air equipment at the same time or <u>within a year</u> of when you completed this project? [ALLOW ONE RESPONSE]

4. Yes
5. No
98. Not sure

[Ask if FR3 = 1]

FR3b. <u>If the program incentive was not available</u>, would you have done both a comprehensive leak survey as well as repair leaks, or just repair known leaks? [ALLOW ONE RESPONSE]

6. Both leak survey and repairs
7. Just repair known leaks
98. Not sure

[Ask if FR3b = 1 or 2]

FR3c. <u>If the program incentive was not available</u>, would you have repaired all of the known leaks at the same time or within a year, or just some of them?

1. All of the leaks
2. Most of the leaks
3. Just the major leaks
4. Just the easy-to-repair leaks
98. Not sure

[Ask if FR3a = 1 and FR3b=1 and FR3c=1]

FR3d. You stated that without the program incentive, you would have completed exactly the same project. Does that mean your business would have paid an additional <RebateAmount_Evergy> to cover the entire cost of the leak survey and repairs project?

3. Yes
4. No
99. Not sure

FR4a. On a scale of 1 to 5, where 5 is "very influential" and 1 is "not at all influential," how influential were the following elements when you were deciding to <u>conduct the comprehensive leak survey</u>?

[Response options include 1 through 5 and NA for each one]

5. Program incentive
6. Educational or marketing materials from an Evergy program
7. Information from Evergy program staff
8. Information from a contractor/Retro-Commissioning service provider

FR4b. On a scale of 1 to 5, where 5 is "very influential" and 1 is "not at all influential," how influential were the following elements on your decision to complete the leak survey and repairs project <u>at the time that you did</u> rather than at a later time?
[Response options include 1 through 5 and NA for each one]

5. Program incentive
6. Educational or marketing materials from an Evergy program
7. Information from Evergy program staff
8. Information from a contractor/Retro-Commissioning service provider

Participant Spillover

SO0. What is your plan for identifying and repairing compressed air leaks moving forward?
[OPEN ENDED]

SO1. Since participating in the program, did you install any *additional* energy efficient equipment or make any additional energy efficiency upgrades at the same facility or at any other facility within Missouri that receives electric service from Evergy?

3. Yes
4. No
99. Not sure

[Ask if SO1 = 1, else skip to A6a]
SO2. Did you apply for an incentive from Evergy for the additional energy-efficient equipment or upgrade?

4. Yes, and I received an incentive from Evergy
5. Yes, but I did not receive an incentive from Evergy
6. No
98. Not sure

[Ask if SO2=1]
SO3. Please describe the equipment or upgrades that you received incentives for through another Evergy program.
[OPEN ENDED]
98. Not sure

[Ask if SO2=2]
SO4. Do you know why you did not receive an incentive from Evergy for the additional energy-efficient equipment or upgrades?

1. Yes, equipment or upgrades were not eligible for an incentive
97. Other, please describe [OPEN ENDED]
98. Not sure

[Ask if SO4=1]
SO4a. Do you know why the equipment or upgrades were not eligible for an incentive from Evergy?
[OPEN ENDED]

98. Not sure

[Ask if SO2=3]
SO5. Why didn't you apply for an incentive from Evergy for the additional energy-efficient equipment or upgrade?
[OPEN ENDED]
98. Not sure

[Ask if SO2 = 2 or 3, else skip to next section]
SO6. How influential was Evergy's Retro-Commissioning Program on your decision to install the *additional* energy efficient equipment which did not receive incentives? Please rate on a 5-point scale in which 5 means "very influential" and 1 means "not at all influential."

[1-5, Not sure]

[Ask if SO6=2, 3, 4, or 5, else skip to next section]
SO7. Please describe the energy efficient equipment that was installed without incentives:
e. Enter description:
f. Enter quantity: [NUMERIC]
g. Enter approximate installation date [DATE]
h. How do you know this equipment is high efficiency? [OPEN ENDED]

SO8. Was this additional energy-efficient equipment installation or upgrades performed by the same contractor that completed the leak survey and repair project?
5. Same contractor
6. Different contractor
7. Not applicable; we did not use a contractor to install the additional equipment
8. Not sure

Awareness and Participant Journey Part 2

A6a. On a scale of 1 to 5 where 1 means "strongly disagree" and 5 means "strongly agree," please rate your agreement with the following statements: [MATRIX STYLE QUESTION; COLUMNS ARE 1-5 and Not sure]

4. The program is easy to work with and understand.
5. When I had questions, I knew who to contact.
6. I had enough information about project eligibility and incentives to make decisions about whether to proceed with the leaks survey and which leaks to repair.

[Ask if A_A6a 1-3 is less than 4]
A6b_1. Please describe what aspects of the program were not easy to work with or understand. [OPEN ENDED]

A6b_2. Please describe any confusion there may have been regarding who to contact. [OPEN ENDED]
A6b_3. **Please describe the lack of clarity there may have been regarding the project eligibility or incentives.** [OPEN ENDED]

A7. Did you have to submit a pre-approval application for your project?
[Single Response]

4. Yes, I submitted it
5. Yes, but my contractor/vendor submitted it
6. No
99. Not sure

[Ask if A7 = 1; else skip to next section]
A8. How easy was it to complete your Retro-Commissioning project pre-approval application? Please use a scale of 1 to 5, where 1 is "not at all easy" and 5 is "extremely easy."
[Record 1-5, Not sure]

Participant Satisfaction

PS1. How would you rate your satisfaction with the following aspects of the Evergy Retro-Commissioning Program? Please rate on a 5-point scale in which 5 means "very satisfied" and 1 means "not at all satisfied."

[ROTATE a-f, RECORD 1-5, Not sure]

c. Amount of rebate or bill credit
c. Time it took to receive the rebate or bill credit
l. Requirements to participate in program
m. Program communications
n. [ASK IF A7 != 1] Application process
o. [ASK IF A7 = 1] Pre-approval application process
p. [ASK IF A7 = 1] Final approval process
q. The leaks survey
r. The program representative
s. The contractor or vendor you worked with
t. Overall satisfaction with the program

[Ask PS2a if PS1a was < 3]
PS2a. Why did you provide this rating for the amount of the rebate or bill credit?
[OPEN ENDED]

[Ask PS2b if PS1b was < 3]
PS2b. Why did you provide this rating for the time it took to receive the rebate or bill credit?
[OPEN ENDED]

[Ask PS2c if PS1c was < 3]
PS2c Why did you provide this rating for the requirements to participate in the program?
[OPEN ENDED]

[Ask PS2d if PS1d was < 3]
PS2d. Why did you provide this rating for the program communications?
[OPEN ENDED]

[Ask PS2e if PS1e was < 3]
PS2e. Why did you provide this rating for the application process?
[OPEN ENDED]

[Ask PS2f if PS1f was < 3]
PS2f. Why did you provide this rating for the pre-approval application process?
[OPEN ENDED]

[Ask PS2g if PS1g was < 3]
PS2g. Why did you provide this rating for the final approval application process?
[OPEN ENDED]

[Ask PS2h if PS1h was < 3]
PS2h. Why did you provide this rating for the leaks survey process?
[OPEN ENDED]

[Ask PS2i if PS1i was < 3]
PS2i. Why did you provide this rating for the program representative?
[OPEN ENDED]

Ask PS2j if PS1j was < 3]
PS2j. Why did you provide this rating for the contractor or vendor that you worked with?
[OPEN ENDED]

[Ask all]
PS2k. Why did you provide this rating for your overall satisfaction with the program?
[OPEN ENDED]

[ASK ALL]

PS3. How likely you would be to participate in Evergy rebate programs again? Please rate on a 5-point scale in which 5 is "very likely" and 1 is "not at all likely."

[Record responses 1 through 5, Not sure]

PS4. Have you recommended the Evergy Retro-Commissioning Program to colleagues?

3. Yes
4. No
99. Not sure

PS5. Were there any other types of energy saving equipment or upgrades that you wanted to install but that Evergy did not offer incentives for?

[OPEN ENDED, None]

PS6. Please share any suggestions you may have for improving the Evergy Retro-Commissioning Program.

[OPEN ENDED, None]

PS7. Based on your overall experience as a customer of Evergy, how would you rate your satisfaction with the company on a scale of 1 to 5, where 5 is "very satisfied" and 1 is "not at all satisfied"?

[1-5, Not Sure]

[Ask if PS7<3, else skip to Firmographics; F1]

PS8. What were the reasons that you give it that rating?

[OPEN-ENDED]

Firmographics

Just a few questions left.

F1. What type of organization is <OrganizationName_Evergy>?

[ROTATE]

15. Light Manufacturing
16. Heavy Manufacturing
97. Other; please describe: [OPEN ENDED]
98. Not sure

F2. Which of the following descriptions best fits the facility at <StreetAddress_Evergy>?

7. Your organization's only location
8. One of several locations within Evergy service territory
9. One of several locations both within and outside of Evergy service territory
10. Your organization's headquarters, with several locations within Evergy service territory
11. Your organization's headquarters, with several locations both within and outside of Evergy service territory
97. Other, please describe: [OPEN ENDED]
99. Not sure

Close

We would like to offer you a $50 Tango e-gift card in thanks for completing our survey. If you would like to receive this gift card, please enter your preferred email address below. Tango e-gift cards can be used at a variety of retailers and restaurants, such as Amazon, Chipotle, etc. If you would not like the gift card, please check "No thanks."

Your email address will only be used to send the e-gift card. You will receive the gift card within four to six weeks of completing the survey. Be sure to click the forward arrow below to record your response.

a. Please enter your email address: [OPEN ENDED]
b. No thanks, I do not wish to receive a Tango gift card

Survey Completion Message
Thank you for your time in completing this survey. Your responses will help Evergy improve their programs to better serve customers like you!

H.3 Process Efficiency Trade Ally Online Survey

***Landing Page* and Screening Questions (1 question)**

Thank you for participating in the Evergy Retro-Commissioning Program Trade Ally Survey. This survey effort will provide Evergy with valuable feedback to improve program offerings and ultimately help you better serve your customers. This survey is being administered by Evergy's independent third-party evaluator, Guidehouse, and your responses will remain confidential and will be presented to Evergy only in aggregate form.

In thanks for your time, Evergy would like to offer you a $50 Tango gift card for participation in the survey. You must complete the entire survey to receive the gift card. At the end of the survey, you will be asked to provide the email address at which you wish to receive the gift card.

S1. What type of role(s) do you play on projects that participate in Evergy's Retro-Commissioning Program? Please check all that apply.

1. Making sales calls via phone
2. Making sales calls in person
3. Preparing project specifications/proposals for customers
4. Conducting compressed air leak surveys
5. Repairing compressed air leaks
6. Processing incentive applications

97. Other [Please describe _____]
98. Not sure [SCREEN OUT]

Program Experiences (3-14 questions)

PE1. On a scale of 1 to 5 where 1 means "strongly disagree" and 5 means "strongly agree," please rate your agreement with the following statements:

[MATRIX – COLUMNS: "Strongly disagree" (1), 2, 3, 4, "Strongly agree" (5), Not sure]

1. The Retro-Commissioning program is easy to work with and understand
2. When I had questions, I knew who to contact.
3. I had enough information about measure eligibility and incentives to make decisions about which equipment to install.

[Ask PE1a-c for any elements rated a 3 or lower in PE1]

PE1a. Please describe which aspects of the Retro-Commissioning program were not easy to work with or understand. [OPEN ENDED]
PE1b. Please describe any confusion regarding who to contact. [OPEN ENDED]
PE1c. Please describe any lack of information regarding the measure eligibility or incentives. [OPEN ENDED]

PE2. How would you rate your satisfaction with the following aspects of the Retro-Commissioning Program? [MATRIX – COLUMNS: Not at all satisfied (1), 2, 3, 4, "Very satisfied" (5), Not sure, Not applicable; ROTATE ROWS]

1. The Program Representative
2. Marketing materials provided by the program
3. Amount and type of communication and support received from the program
4. Amount and type of training provided by the program
5. Project application process
6. Time to complete a project through the program
7. The amount of the program incentives

[Ask if PE2_1<4]
PE2b. Why did you rate your satisfaction with **the Program Representative** as a [insert response value from PE2_1]?
[OPEN ENDED]

[Ask if PE2_2<4]
PE2b. Why did you rate your satisfaction with **the marketing materials provided by the program** as a [insert response value from PE2_2]?
[OPEN ENDED]

[Ask if PE2_3<4]
PE2c. Why did you rate your satisfaction with **the amount and type of communication received from the program** as a [insert response value from PE2_3]?
[OPEN ENDED]

[Ask if PE2_4<4]
PE2d. Why did you rate your satisfaction with **the amount and type of training provided from the program** as a [insert response value from PE2_4]?
[OPEN ENDED]

[Ask if PE2_5<4]
PE2e. Why did you rate your satisfaction with the **project application process** as a [insert response value from PE2_5?
[OPEN ENDED]

[Ask if PE2_6<4]
PE2f. Why did you rate your satisfaction with **the time to complete a project through the program** as a [insert response value from PE2_6]?
[OPEN ENDED]

[Ask if PE2_7<4]
PE2g. Why did you rate your satisfaction with **the amount of the program incentive** as a [insert response value from PE2_7]?
[OPEN ENDED]

PE9. How would you rate your overall satisfaction with the Retro-Commissioning program?
[1-5 rating scale, endpoints labeled "Not at all satisfied (1)" and "Very satisfied (5)" plus "Not sure"]

[If PE9 not equal to Not Sure]
PE9a. Why did you provide that rating?
[OPEN ENDED]

Participant Insights (4-5 questions)

PA1. What types of customers do you typically perform retro-commissioning services for?
[OPEN ENDED]

PA2. Are there any types of customers (e.g., in specific markets or industries) that you think would particularly benefit from participating in the Retro-commissioning program who aren't currently participating? Can you describe these customers (in terms of size, industry, building type, geography, etc.)?
1. Yes; please describe: [OPEN ENDED]
2. No
98. Not sure

[IF PA2=1]
PA2a. What would it take to engage these types of customers in Evergy energy efficiency programs?
1. Please describe: [OPEN ENDED]
98. Not sure

PA3. Which of the following benefits do you think have the most significant influence on a customer's decision to pursue retro-commissioning projects? [ALLOW MULTIPLE SELECTIONS, ROTATE 1-6]
1. Lower utility bills
2. Improved equipment performance
3. Improved work environment
4. Chance to make the company more "green"/reduce carbon emissions
5. Increased property value
6. Lower operating and maintenance cost
7. Quick payback period
8. None of these benefits influence a customer's decision [MAKE ANSWER EXCLUSIVE]
98. Not sure [MAKE ANSWER EXCLUSIVE]

PA4. Which of those benefits of retro-commissioning projects do you discuss with customers? [ALLOW MULTIPLE SELECTIONS, ROTATE 1-6]

1. Lower utility bills
2. Improved equipment performance
3. Improved work environment
4. Chance to make the company more "green"/reduce carbon emissions
5. Increased property value
6. Lower operating and maintenance cost
7. Quick payback period
8. None of the above; I do not talk to customers about these benefits [MAKE ANSWER EXCLUSIVE]
98. Not sure [MAKE ANSWER EXCLUSIVE]

Program Improvements (2 questions)

PIM1. How can Evergy help you complete more retro-commissioning projects?

1. Please describe: [OPEN ENDED]
98. Not sure

PIM2. How can the Evergy Retro-Commissioning Program be improved? [ROTATE RESPONSES, ALLOW MULTIPLE RESPONSES]

1. Offer incentives for additional measures [OPEN ENDED]
2. More marketing directly to customers [OPEN ENDED]
3. More marketing support for contractors and other trade allies [OPEN ENDED]
4. More training/technical support for contractors and other trade allies [OPEN ENDED]
5. More administrative support for contractors and other trade allies [OPEN ENDED]
6. Target marketing to specific customer groups; note which groups: [OPEN ENDED]
97. Other, please describe: [OPEN ENDED]
7. No improvements necessary [Exclusive response]
98. Not sure [Exclusive response]

Program Influence on Trade Allies (4-7 questions)

PITA1. Have you participated in any program webinars, meetings, or training sessions, or received any educational materials from the program?

1. Yes
2. No
98. Not sure

PITA2. Have you ever brought a Evergy or TRC program staff member to virtual or on-site sales calls at customer sites with you?

1. Yes
2. No
98. Not sure

[IF PITA2=1, ASK PITA2a, ELSE SKIP TO PITA3]

PITA2a. About how many times have you brought a Evergy or TRC program staff member on sales calls with you?

1. Please enter the approximate number: [NUMERIC OPEN ENDED]
98. Not sure

PITA2b. How helpful are those joint sales calls with Evergy/TRC staff in selling retro-commissioning projects?

[1-5 rating scale, endpoints labeled "Not at all helpful (1)" and "Very helpful (5)" plus "Not sure"]

PITA3. Have you received any marketing materials from the Retro-Commissioning Program for you to pass along to your customers?

1. Yes
2. No
98. Not sure

[IF PITA3=1, ASK PITA3a, ELSE SKIP TO PITA4]

PITA3a. How much influence have those marketing materials had on your ability to market retro-commissioning services to your customers?

[1-5 rating scale, endpoints labeled "Not at all influential (1)" and "Very influential (5)" plus "Not sure"]

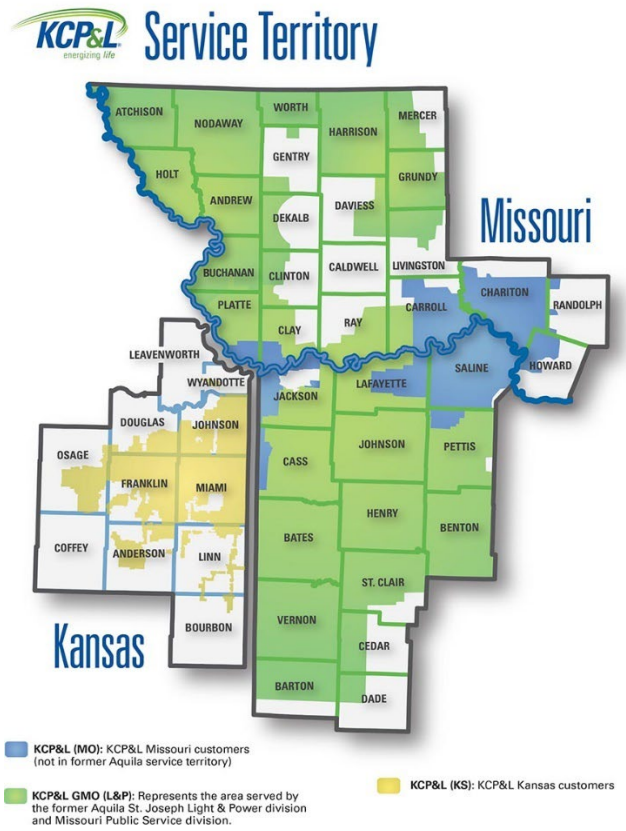
PITA4. If the Evergy Retro-Commissioning Program did not exist, how would your business be different (if at all)?

1. Please describe: [OPEN ENDED]
2. No difference
98. Not sure

Spillover (1-6 questions)

SO1. Did you perform any retro-commissioning or compressed air leak survey/repair projects *without* Evergy program incentives this past year? Please consider only projects in

Evergy's Missouri territory to the extent possible (see the **green and blue** areas of the map below).



1. Yes, compressed air leak survey and repair projects only [CONTINUE]
2. Yes, full retro-commissioning projects only [CONTINUE]
3. Yes, both compressed air leak survey/repair and full retro-commissioning projects [CONTINUE]
4. None of the above [SKIP TO NEXT SECTION]
98. Not sure [SKIP TO NEXT SECTION]

[ASK SO1a IF SO1=1-3, ELSE SKIP TO NEXT SECTION]

SO1a. Approximately how many additional retro-commissioning projects did you complete this past year without incentives, in Evergy's Missouri territory? An estimate is fine.

Project Type	Number of Additional Projects Completed <u>Without</u> Incentives this past year
[If SO1=1 or 3] Compressed Air Leak Survey/Repair	[NUMERIC OPEN END]
[If SO1=2 or 3] Full Retro-Commissioning Project	[NUMERIC OPEN END]

SO1b. How large were these additional projects relative to the project(s) you completed through the Evergy Retro-Commissioning program, in terms of estimated energy savings?

1. Significantly higher savings than the project(s) completed through the program
2. Somewhat higher savings
3. About the same
4. Somewhat lower savings
5. Significantly lower savings
98. Not sure

SO1c. How influential do you think your experiences with the Evergy program were on these additional projects completed without incentives, if at all?

[1-5 rating scale, endpoints labeled "Not at all influential (1)" and "Very influential (5)" plus "Not sure"]

SO1d. How influential do you think the Evergy program's efforts to educate the market and raise awareness of retro-commissioning were on these additional projects completed without incentives, if at all?

[1-5 rating scale, endpoints labeled "Not at all influential (1)" and "Very influential (5)" plus "Not sure"]

SO1e. Why didn't you seek Evergy incentives for these additional projects?

1. Projects were not eligible for an incentive
97. Other, please describe: [OPEN ENDED]
98. Not sure

[ASK SO1ea IF SO1e=1]

SO1ea. Do you know why the projects were not eligible for an incentive?

[OPEN ENDED]
98. Not sure

Closing (1 question)

C1. Those are all of our questions. We would like to offer you a $50 Tango e-gift card in thanks for completing our survey. If you would like to receive this gift card, please enter your preferred email address below. Tango e-gift cards can be used at a variety of retailers and restaurants, such as Amazon, Chipotle, etc. If you would prefer not to receive the gift card, please check "No thanks."

Your email address will only be used to send the e-gift card. You will receive the gift card within six to eight weeks of completing the survey. Be sure to click the forward arrow below to record your response.

1. Enter email address: [EMAIL ADDRESS]
2. No thanks – I do not wish to receive a $50 gift card.

Thank you for your time. Your input will help Evergy improve their program offerings.