Residential Energy Efficiency Program-Specific Evaluation Plans

Energy Efficient Lighting

The Residential Lighting Program continues Ameren Missouri's long-standing efforts to increase the presence of energy efficient lighting in the market. Through the program, Ameren Missouri offers discounts for LEDs through the markdown channel (including online store) to reach a broad range of customers.

The table below outlines potential evaluation approaches, some or all of which will be used for the Evaluation, Measurement, and Verification ("EM&V") process.

Evaluation Component	Potential Methods
Gross Impacts	• Review measure savings algorithms and associated inputs (Technical Reference Manual ("TRM") Review) • Update savings algorithm input parameters based on market evaluation activities and secondary sources as appropriate • Review program tracking data to verify measure quantities • In-home metering and lighting product inventory research via market evaluation • Geo-mapping or store intercepts to determine leakage
Net Impacts	• Estimate based on preponderance of evidence leveraging mixed method approach • Participant interviews via in-store intercepts to estimate free ridership and participant spillover • Leverage market evaluation studies for non-participant surveys, in-home saturation studies, supplier interviews to estimate non-participant spillover • Demand modeling to estimate price elasticity of demand for program eligible products based on the changes in sales during periods of differing prices
Process Evaluation	• Program theory/logic model review, program staff interviews, customer journey mapping, website usability testing, vendor interviews, participant surveys, market study surveys, and a program materials review
Market Evaluation	• Participating and non-participating customer surveys • In-home audits • Supply side research (e.g. market actor interviews/Delphi panels, sales data analysis, secondary market data research/analysis, product stocking studies)

Energy Efficient HVAC

The Efficient HVAC Program offers incentives for retrofit and replacement upgrades of air conditioners and heat pumps, ductless heat pumps, and variable speed blower motor fans (electronically commutated motors), as well as system tune ups.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Database and TRM review, all savings algorithms and input parameters – update as appropriate • Participant surveys for measure verification and baseline information • Metering for several categories of measures (e.g. heat pumps, central a/c systems) • Verification through engineering desk review of representative sample of projects • Monthly consumption analysis using matched comparison group
Net Impacts	• Estimate based on preponderance of evidence leveraging mixed method approach • Participant survey to estimate free ridership and participant spillover • Leverage market evaluation studies for non-participant surveys, in-home saturation studies • Contractor/distributor interviews to estimate non-participant spillover
Process Evaluation	• Program logic review, data tracking and program material review, program staff interviews, program implementer interviews, • Participating and non-participating trade ally interviews, ride-alongs, and focus groups • Participant surveys
Market Evaluation	• Participating and non-participating customer surveys • In-home audits • Supply side research (e.g. market actor interviews/Delphi panels, sales data analysis, secondary market data research/analysis, product stocking studies)

Energy Efficient Products

The Residential Efficient Products Program continues Ameren Missouri's long-standing efforts to increase the presence of energy efficient products in the market. The program is an umbrella offering, incorporating various partners, products, and delivery strategies with the goal of increasing customer awareness of the benefits of high-efficiency products (ENERGY STAR®, Consortium for Energy Efficiency ("CEE") Tiers, or better). Through the program, Ameren Missouri will offer incentives for efficient products including ENERGY STAR® appliances, water heaters, window air conditioning units, pool pumps, and learning thermostats (also called smart thermostats).

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Review measure savings algorithms and associated inputs (TRM Review) • Update savings algorithm input parameters based on market evaluation activities and secondary sources as appropriate • Review of program tracking data to verify measure quantities • In-home product inventory research via market evaluation • Energy consumption analysis with matched comparison group for select measures as appropriate
Net Impacts	• Estimate based on preponderance of evidence leveraging mixed method approach • Participant surveys to estimate free ridership and participant spillover • Leverage market evaluation studies for non-participant surveys, in-home saturation studies, supplier interviews to estimate non-participant spillover
Process Evaluation	• Program theory/logic model review, program staff interviews, customer journey mapping, website usability testing, vendor interviews, participant surveys, market study surveys, and a program materials review
Market Evaluation	• Participating and non-participating customer surveys • In-home audits • Supply side research (e.g. market actor interviews/Delphi panels, sales data analysis, secondary market data research/analysis, product stocking studies)

Home Energy Reports Evaluation Plan

The Home Energy Reports (Residential Behavior Program) provide Ameren Missouri customers with personalized reports focused on behavioral changes that reduce energy consumption and peak demand. The program does not include financial incentives.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Gross impacts are typically not applicable to behavioral programs given the randomized control trial research design
Net Impacts	• Regression analysis using energy consumption data • Usage equivalency analysis to assess equivalence of baseline energy consumption between treatment and control group customers • Joint savings adjustment analysis to avoid double-counting savings associated with participation in other Ameren Missouri programs • Assessment of net savings persistence (Effective Useful Life) via selective stoppage of treatment and regression analysis using energy consumption data
Process Evaluation	• Program theory/ logic model review, program staff interviews, participant and control group surveys, and review of customer reports • Multi-level modeling to identify customer types and characteristics that drive participant savings
Market Evaluation	• Participating and non-participating customer surveys • In-home audits

Single and Multifamily Low-Income Evaluation Plan

The Residential Low-Income Programs provide holistic energy savings to income qualified households (both single family and multifamily) through direct installation services, incentives for standard and custom common area and whole building efficiency improvements, one-stop-shop engagement and services, and qualified installations of energy efficiency measures by grant receiving organizations.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Program tracking database and TRM review, all savings algorithms and input parameters – update as appropriate • Participant surveys (on-site, telephone, web) for measure verification and baseline information • Engineering desk reviews and analyses of savings based on TRM algorithms • On-site audit for measure verification and short-term metering of common area and HVAC measures as deemed appropriate • Weather normalized regression analysis of participant consumption data using matched comparison (will provide net impact estimate)
Net Impacts	• Apply net-to-gross ratio ("NTGR") of 1.0 to gross savings per UMP Chapter 17
Process Evaluation	• Review and evaluate program materials, program theory/logic models, implementation plans, implementer progress reports, program Quality Assurance or Quality Control ("QA/QC") procedures and associated documentation • Contractor ride-along to observe program delivery • Tenant and property manager interviews • In-depth interviews with Ameren Missouri program staff, program implementation staff • Analysis of census program tracking data to assess historic participation rates in income-qualified communities • Non-participant interviews to assess barriers to participation
Non-Energy Benefits Assessment	• Estimate non-energy benefits associated with reduced arrearages and disconnections among program participants

Multi-family Market Rate Evaluation Plan

The Multi-family Market Rate Program provides energy savings to multi-family households through distribution of no and low-cost energy efficiency measures, and provides incentives for common area and whole building efficiency improvements.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Program tracking database and TRM review, all savings algorithms and input parameters – update as appropriate • Participant surveys for measure verification and baseline information • Engineering desk reviews and analyses of savings based on TRM algorithms • On-site audit for measure verification and short-term metering of common area and HVAC measures as deemed appropriate • Weather normalized regression analysis of participant consumption data using matched comparison • Building modeling
Net Impacts	• Self-report NTGR questions in surveys with participating property managers, and tenants (if applicable), to calculate free ridership and participant spillover.
Process Evaluation	• Program theory/ logic model review, program process mapping, program staff interviews, implementer interviews, multi-family property manager surveys, and tenant surveys • Program materials, delivery and QA/QC process review • Customer journey mapping
Market Evaluation	• Participating and non-participating customer surveys • In-home audits • Supply side research (e.g. market actor interviews/Delphi panels, secondary market data research/analysis)

Energy Efficient Kits Evaluation Plan

The Residential Energy Efficiency Kits Program was designed with the goals of increasing customer awareness of the benefits of high-efficiency products (ENERGY STAR®, CEE Tiers, or better), educating residential customers and their families about energy use, and providing resources for cost-effective energy savings. Through the program, Ameren Missouri provides energy efficiency kits containing energy efficient items through schools and property managers of multifamily buildings.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Program tracking database and TRM review, all savings algorithms and input parameters – update as appropriate • Participant surveys (on-site, telephone, web) for measure verification and baseline information • Engineering desk reviews and analyses of savings based on TRM algorithms
Net Impacts	• Self-report NTGR questions in participant surveys to calculate free ridership and participant spillover.
Process Evaluation	• Survey research to evaluate participant knowledge gain, participant satisfaction with experience and measures, and teacher satisfaction with program support and curriculum (school kits only) • Program theory/ logic model review, program staff interviews, program partner and/or implementer interviews, and teacher interviews • Program materials, delivery and QA/QC process review
Market Evaluation	• N/A

Appliance Recycling Evaluation Plan

The Appliance Recycling Program offers Ameren Missouri customers incentives and free pick-up service for recycling operable refrigerators and standalone freezers. All participating appliances are generally decommissioned in an environmentally responsible manner and permanently removed from within a utility's service territory.
The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Program tracking database and TRM review, all savings algorithms and input parameters – update as appropriate • Participant surveys to verify appliance pick up and operating condition • Regression modeling per UMP protocol
Net Impacts	• Self-report NTGR questions in participant surveys to calculate free ridership
Process Evaluation	• Participant survey research • Program theory/ logic model review, program staff interviews, program partner and/or implementer interviews • Program materials, delivery and QA/QC process review
Market Evaluation	• Supply side research (e.g. market actor interviews/Delphi panels, secondary market data research/analysis)

In the first year, we will have laid the groundwork for an effective evaluation in 2019 with evaluability assessments and the quarterly program monitoring dashboard. We can then assign and prioritize process and impact evaluation tasks strategically.

Demand Response – Residential Smart Thermostat Demand Response Program

This Residential Smart Thermostat Demand Response Program will provide Ameren Missouri with peak demand capacity from residential customers. It is expected that in return for a bill credit or a rebate towards the purchase of a smart thermostat, participating customers will allow Ameren Missouri to adjust the thermostat setting during a limited number of demand response events.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Process Evaluation	• Interviews with program and implementer staff to develop program theory narrative, assess program evaluability and data requirements • Participant surveys to assess program experience, barriers to reducing energy use during peak periods and validate load impact results
Load Impact Analysis	• Data request, processing, aggregation of participant usage, device run time, weather and event data • Sample design and regression analysis to estimate ex ante (forecasted) and ex post (actual) load reductions associated with dispatchable events • Mine device run-time data (such as smart thermostat logs or two-way switch logs) to identify opt-out, failure rate, and customer engagement patterns to optimize program delivery
Market Evaluation	• Leverage market evaluation data from customers and relevant trade allies regarding program interest, barriers, and motivations regarding DR technology adoption

Business Program-Specific Evaluation Plans

Business Standard Incentive Program

The Business Standard Incentive Program provides rebates for energy efficient products that are readily available in the marketplace and for which there are savings opportunities for a large number of customers. Commercial, government, institutional, and industrial customers of all sizes will be eligible for the program, but it is expected that many participants will be smaller customers undertaking simpler, single-measure projects. Measures targeted through the program are of two types.

- Measures for which energy savings can be reliably deemed or stipulated (e.g., premium efficiency motors, vending machine sensors, many lighting measures).
- Measures for which energy savings can be calculated using simple threshold criteria (e.g., variable frequency drives, air compressors, refrigeration measures).

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Database and TRM review, all savings algorithms and input parameters – update as appropriate • Participant surveys (telephone or on-site) for measure verification and baseline information • Measure verification through engineering desk review of representative sample of projects • Engineering desk reviews and analysis of savings based on TRM algorithms • On-site Measurement and Verification ("M&V") including short term metering • Regression analysis of building consumption data as appropriate
Net Impacts	• Participant survey to estimate free ridership and participant spillover • Leverage market evaluation studies for non-participant surveys, on-site saturation studies • Contractor/distributor/key trade ally interviews to estimate non-participant spillover
Process Evaluation	• Program logic review, data tracking and program material review, program staff interviews, program implementer interviews • Participant surveys • Participating and non-participating trade ally interviews and focus groups
Market Evaluation	• Participating and non-participating customer surveys • On-site facility audits • Supply side research (e.g. market actor interviews/Delphi panels, sales data analysis, secondary market data research/analysis, product stocking studies)

Business Custom Incentive Program

The Custom Incentive Program provides incentives for energy efficient products and services that reduce Commercial and Industrial ("C&I") customers' electricity use. Customized incentives are based on calculated savings for specific customer projects that can involve multiple measures with interactive effects, process improvements, and/or complex measures for which ex ante deemed savings/simple savings algorithms combined with standard incentives are not appropriate.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Database and custom project application review • Participant surveys (telephone or on-site) for measure verification and baseline information • Savings and measure verification through engineering desk review of representative sample of projects • On-site M&V including short term metering • Regression analysis of building consumption data or building/system simulation modeling as appropriate
Net Impacts	• Participant survey to estimate free ridership and participant spillover • Leverage market evaluation studies for non-participant surveys, on-site saturation studies • Contractor/distributor/key trade ally interviews to estimate non-participant spillover
Process Evaluation	• Program logic review, data tracking and program material review, program staff interviews, program implementer interviews • Participant surveys • Participating and non-participating trade ally interviews and focus groups
Market Evaluation	• Participating and non-participating customer surveys • On-site facility audits • Supply side research (e.g. market actor interviews/Delphi panels, sales data analysis, secondary market data research/analysis, product stocking studies)

Small Business Direct Install Program

The Small Business Direct Install Incentive Program offers incentives (discounts) to encourage the completion of energy efficient equipment retrofits for facilities under the Small General Service (2M) rate class. The incentives allow for small business customers to implement low-cost and/or no-cost measures in their facilities through a group of pre-approved service providers. The objective of this program is to reduce participation barriers for small business through a simple and streamlined process[1]. Eligible measures include HVAC, lighting, refrigeration, motors, and water heating.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Database and TRM review, all savings algorithms and input parameters – update as appropriate • Participant surveys (telephone or on-site) for measure verification and baseline information • Measure verification through engineering desk review of representative sample of projects • Engineering desk reviews and analysis of savings based on TRM algorithms • On-site M&V including short term metering • Regression analysis of building consumption data as appropriate
Net Impacts	• Participant survey to estimate free ridership and participant spillover • Leverage market evaluation studies for non-participant surveys, on-site saturation studies • Contractor/distributor/key trade ally interviews to estimate non-participant spillover
Process Evaluation	• Program logic review, data tracking and program material review, program staff interviews, program implementer interviews • Participant surveys • Participating and non-participating trade ally interviews and focus groups
Market Evaluation	• Participating and non-participating customer surveys • On-site facility audits • Supply side research (e.g. market actor interviews/Delphi panels, sales data analysis, secondary market data research/analysis, product stocking studies)

[1] Ameren Missouri UEC Sheet 206, https://q9u5x5a2.ssl.hwcdn.net/-/Media/Missouri-Site/Files/rates/UECSheet206EEBusSmallBusinessDirectInstall.pdf?la=en

New Construction Program

The New Construction Program is targeted at any new C&I building, major renovation, or tenant build-out project in the planning or design stage. The program goal is to promote higher energy efficiency products and systems than required by the local building jurisdiction for the design and construction of new buildings, major renovations, and tenant build-outs.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Database and new construction project application review • Tenant, developer, design engineer, architect interviews (telephone or on-site) for measure verification and baseline information • Savings and measure verification through engineering desk review of project documentation • On-site M&V including short term metering • Regression analysis of building consumption data or building/system simulation modeling as appropriate
Net Impacts	• Participant survey to estimate free ridership and participant spillover • Leverage market evaluation studies for non-participant surveys, on-site saturation studies • Contractor/developer/design engineer/architect and other key trade ally interviews to estimate non-participant spillover
Process Evaluation	• Program logic review, data tracking and program material review, program staff interviews, program implementer interviews • Participant surveys • Program logic review, data tracking and program material review, program staff interviews, program implementer interviews • Participant surveys • Participating and non-participating contractor/developer/design engineer/architect and other key trade ally interviews and focus groups
Market Evaluation	• Participating and non-participating customer surveys • On-site facility audits • Supply side research (e.g. market actor interviews/Delphi panels, secondary market data research/analysis)

Retro-Commissioning/Continuous Commissioning Incentive Program

The Retro-Commissioning/Continuous Commissioning Incentive Program will help C&I building owners identify building operating system performance improvements, and, where applicable, provide incentives to assist with their implementation.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Database and custom project application review • Participant surveys (telephone or on-site) for measure verification and baseline information • Savings and measure verification through engineering desk review of representative sample of projects • On-site M&V including short term metering • Regression analysis of building consumption data or system energy simulation modeling as appropriate
Net Impacts	• Participant survey to estimate free ridership and participant spillover • Leverage market evaluation studies for non-participant surveys, on-site saturation studies • Contractor/distributor/key trade ally interviews to estimate non-participant spillover
Process Evaluation	• Program logic review, data tracking and program material review, program staff interviews, program implementer interviews • Participant surveys • Participating and non-participating trade ally interviews and focus groups
Market Evaluation	• Participating and non-participating customer surveys • On-site facility audits • Supply side research (e.g. market actor interviews/Delphi panels, sales data analysis, secondary market data research/analysis, standard O&M practice research)

Strategic Energy Management Program

The Strategic Energy Management Program will educate C&I customers on how to implement their own in-house energy efficiency team. The main goal of this program is to help a company achieve continuous improvement in its energy performance over a longer-term period. The benefits include energy use awareness, reduced energy costs, improved peak demand management, and customer satisfaction. The Program Administrator will work with company leaders and key employees, by leading training and assisting with developing an energy team. This energy team will develop a plan to coordinate energy efficient projects.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Participant surveys (telephone or on-site) for measure verification and baseline information • Savings and measure verification through engineering desk review of representative sample of projects • On-site M&V including short term metering • Regression analysis of building consumption data or building/system simulation modeling as appropriate
Net Impacts	• Participant survey to estimate free ridership and participant spillover • Leverage market evaluation studies for non-participant surveys, on-site saturation studies • Contractor/distributor/key trade ally interviews to estimate non-participant spillover
Process Evaluation	• Program logic review, data tracking and program material review, program staff interviews, program implementer interviews • Participant surveys • Participating and non-participating trade ally interviews and focus groups
Market Evaluation	• Participating and non-participating customer surveys • On-site facility audits

Business Social Services Program

The Business Social Services Program provides rebates for energy efficient products that are readily available in the marketplace and for which there are savings opportunities. Organizations that are eligible for the program include those that are predominately doing business to provide social services to the under-privileged and low-income public, including food banks, food pantries, soup kitchens, homeless shelters, employment services, worker training, job banks, and childcare facilities.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Gross Impacts	• Database and TRM review, all savings algorithms and input parameters – update as appropriate • Participant surveys (telephone or on-site) for measure verification and baseline information • Measure verification through engineering desk review of representative sample of projects • Engineering desk reviews and analysis of savings based on TRM algorithms • On-site M&V including short term metering • Regression analysis of building consumption data as appropriate
Net Impacts	• Participant survey to estimate free ridership and participant spillover • Leverage market evaluation studies for non-participant surveys, on-site saturation studies • Contractor/distributor/key trade ally interviews to estimate non-participant spillover
Process Evaluation	• Program logic review, data tracking and program material review, program staff interviews, program implementer interviews • Participant surveys • Participating and non-participating trade ally interviews and focus groups
Market Evaluation	• Participating and non-participating customer surveys • On-site facility audits • Supply side research

Business Demand Response Program

This Business Demand Response will provide Ameren Missouri with peak demand capacity reductions from business customers. The business Demand Response ("DR") program will engage customers to participate in DR events through direct load control, manual response and the use of behind the meter assets. Participants will benefit from a customized energy reduction plan and may receive enhanced control technology.

The table below outlines potential evaluation approaches, some or all of which will be used for the EM&V process.

Evaluation Component	Potential Methods
Process Evaluation	• Interviews with program and implementer staff to develop program theory narrative, assess program evaluability and data requirements • Participant surveys to assess program experience, barriers to reducing energy use during peak periods and validate load impact results • Eligible customer surveys to elicit barriers, perceptions, and characteristics of nonparticipating eligible customers to improve program targeting and marketing
Load Impact Analysis	• Conduct regression analysis or individual verification of baseline to estimate ex ante (forecasted) and ex post (actual) load reductions associated with dispatchable events (depending on program and business type). Data request, processing, aggregation of participant usage, weather and event data
Market Evaluation	• Leverage market evaluation data from customer and relevant trade ally data regarding program interest, barriers, and motivations regarding DR technology adoption