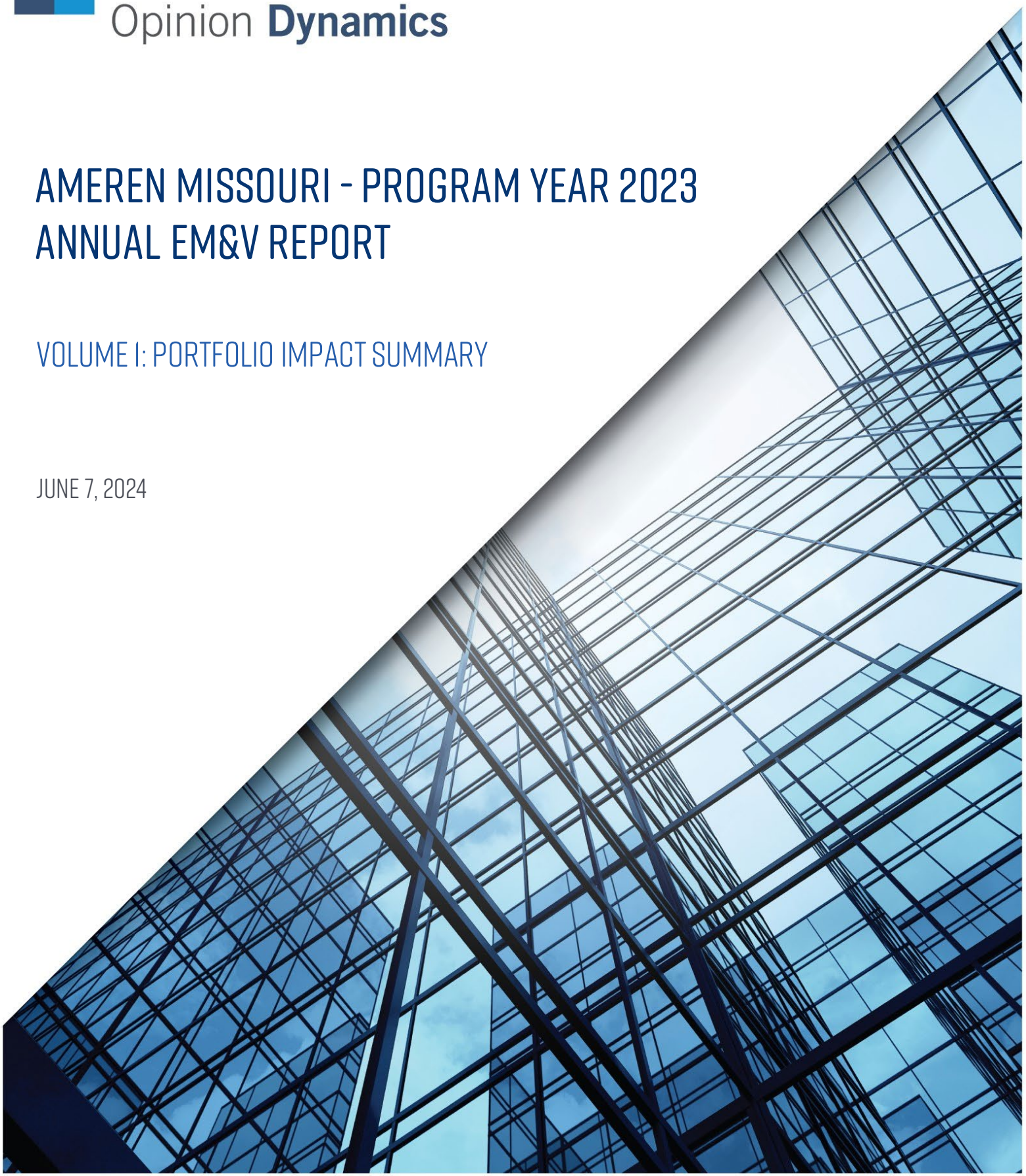
Opinion Dynamics

AMEREN MISSOURI - PROGRAM YEAR 2023 ANNUAL EM&V REPORT

VOLUME I: PORTFOLIO IMPACT SUMMARY

JUNE 7, 2024



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I. INTRODUCTION

This volume (Volume 1) presents a summary of impact evaluation and cost-effectiveness results for the Ameren Missouri PY2023 portfolio of energy efficiency and demand response programs as described in Ameren Missouri's 2019-2021 Missouri Energy Efficiency Investment Act (MEEIA) Energy Efficiency Plan, the subsequent *Unanimous Stipulation and Agreement Regarding the Implementation of Certain MEEIA Programs Through Plan Year 2022* (Stipulation PY2022), and the *Non-Unanimous Stipulation and Agreement Regarding the Implementation of Certain MEEIA Programs Through Plan Year 2023 and Motion for Expedited Treatment* ("Stipulation PY2023"). This Portfolio Summary is the first of four volumes that comprise the Ameren Missouri PY2023 Annual Evaluation, Measurement, and Verification (EM&V) Report.

The overall goal of this evaluation effort was to determine the electric energy and demand savings from Ameren Missouri's program offerings. Process research was limited to the Pay As You Save (PAYS) Program, in accordance with Stipulation PY2023. Findings from the evaluation may be used by Ameren Missouri and relevant stakeholders to demonstrate progress against savings goals, modify program design and operations, inform strategies to achieve deeper program savings, and ensure customer satisfaction and cost-effectiveness.

Ameren Missouri's MEEIA Cycle III PY2023 portfolio of energy efficiency and demand response programs consists of four sector-level portfolios: the Income Eligible Portfolio, the Residential Portfolio, the Business Portfolio, and the Demand Response Portfolio. Each portfolio includes multiple programs that target specific market segments and/or equipment types. The overall portfolio includes 14 programs (see Table 1).

As part of Stipulation PY2022, the portfolio underwent several changes in PY2022 relative to PY2021 that have continued in PY2023:

- In the Residential Portfolio, the Home Energy Reports Program, the Energy Efficiency Kits Program, and the Appliance Recycling Program were discontinued.
- The PAYS Program, introduced in PY2021, became part of portfolio targets and earnings opportunities.
- The Residential Lighting Program moved into the Income Eligible Portfolio with a new focus on low-income populations.
- In the Business Portfolio, the New Construction Program was discontinued as a stand-alone offering, and the Custom Incentive Program served new construction projects.

Table 1. Ameren Missouri 2023 Energy Efficiency and Demand Response Programs

Income Eligible Programs	Residential Programs	Business Programs	Demand Response
▪ Residential Single Family Income Eligible ▪ Residential Multifamily Income Eligible ▪ Residential Community Lighting ▪ Business Social Services	▪ HVAC ▪ Efficient Products ▪ Multifamily Market Rate (MFMR) ▪ PAYS	▪ Standard ▪ Custom ▪ Retro-Commissioning ▪ Small Business Direct Install	▪ Residential Demand Response ▪ Business Demand Response

Volume 1 provides a high-level summary of the evaluation's impact and cost-effectiveness findings. The other three volumes, and associated technical appendices, provide more detailed information on evaluation methodologies and results, including gross impact, process, and cost-effectiveness analyses. Income Eligible Portfolio programs are included within the residential and business volumes based on their target market and program implementer. The remainder of the EM&V Report is organized as follows:

- Volume 2: Residential Portfolio Evaluation Report
- Volume 3: Business Portfolio Evaluation Report
- Volume 4: Demand Response Portfolio Evaluation Report

2. PROGRAM YEAR 2023 IMPACT RESULTS

This section summarizes PY2023 gross and net impact evaluation results, overall and by portfolio. In accordance with Stipulation PY2023, our evaluation focused on gross energy and demand impacts and developed net impacts based on deemed net-to-gross ratios (NTGRs) of 82.5% for the Residential and Business portfolios. Per industry standard practice, we assume a NTGR of 100% for the Income Eligible and Demand Response portfolios.

2.1 OVERALL IMPACTS

The combined portfolio of PY2023 Ameren Missouri energy efficiency programs fell slightly short of its net energy and demand savings goals (86% and 85%, respectively). The Residential and Business portfolios fell below energy savings goals (81% and 75%, respectively) and demand savings goals (82% and 78%, respectively), while the Income Eligible Portfolio exceeded both energy and demand goals (180% and 162% of net goal for energy and demand, respectively). The PY2023 Business Portfolio accounted for the largest share of ex post net energy savings (56%) and demand savings (52%), excluding the Demand Response Portfolio.[1]

All three portfolios achieved first year gross energy savings realization rates of 82% or above. Demand realization rates were lower than energy realization rates for the Income Eligible and Residential Portfolios, yet slightly higher for the Business portfolio. Table 2 summarizes annual gross and net savings for the three portfolios, including net energy and demand performance relative to goal.

Table 2. PY2023 Combined Portfolio Impact Summary

Portfolio	Ex Ante Gross	Gross RR	Ex Post Gross	NTGR [A]	Ex Post Net	Goal Net	% of Goal
Energy Savings (MWh)							
Income Eligible	22,222	125.9%	27,974	100.0%	27,974	15,562	180%
Residential	49,910	82.4%	41,116	82.5%	33,921	41,794	81%
Business	106,147	89.0%	94,453	82.5%	77,924	104,286	75%
Portfolio Total	**178,279**	**91.7%**	**163,543**	**85.5%**	**139,819**	**161,642**	**86%**
Demand Savings (MW)							
Income Eligible	5.13	112.9%	5.79	100.0%	5.79	3.58	162%
Residential	29.32	77.0%	22.58	82.5%	18.63	22.58	82%
Business	34.30	92.7%	31.79	82.5%	26.23	33.50	78%
Portfolio Total	**68.75**	**87.5%**	**60.16**	**84.2%**	**50.65**	**59.66**	**85%**

[A] In accordance with Stipulation PY2023, PY2023 NTGRs are deemed at 82.5% for the Residential and Business portfolios. Per industry standard practice, we assume a NTGR of 100% for the Income Eligible portfolio.

2.2 INCOME ELIGIBLE PORTFOLIO

Ameren Missouri's 2019–2021 MEEIA Energy Efficiency Plan incorporated a significant investment increase in energy efficiency programs targeting low-income customers. This emphasis was further underscored by the addition of the Community Lighting Program in PY2022. The PY2023 Income Eligible Portfolio is designed to achieve savings in various distinct market segments through four programs:

[1] These summaries exclude the Demand Response Portfolio because we do not estimate incremental impacts for these programs, as discussed in more detail in Volume 4.

- **Community Lighting Program:** In PY2022, Ameren Missouri launched a new program aimed at providing LEDs to income eligible populations throughout its service territory. The Community Lighting Program is an upstream and direct distribution offering that provides deeply discounted or free LEDs to Ameren Missouri customers through two separate delivery channels. Through the upstream Discount Retailer channel, Ameren Missouri continued to offer deeply discounted LEDs at participating discount stores within their service territory. This program channel functioned similarly to the Residential Lighting Program offered in previous program years but focuses solely on discount retailers. Ameren Missouri also introduced a new delivery channel in PY2022, which provides free LEDs to residential customers through partnerships with foodbanks located in communities with high concentrations of income eligible customers. Ameren Missouri and the implementation team partnered with foodbanks to provide packs of A-lamp LEDs free of charge to residential customers.
- **Multifamily Income Eligible (MFIE) Program**: Ameren Missouri has been offering energy efficiency programs for multifamily income eligible properties since 2015. In PY2023, Ameren Missouri continued to deliver the MFIE Program, designed to offer a one-stop-shop approach that assists owners and operators of multifamily properties where residents meet certain income-related requirements. The ultimate goal of the program is to overcome barriers to completing comprehensive retrofits in multifamily buildings and deliver long-term energy savings and bill reductions opportunities to Ameren Missouri customers.
- **Single Family Income Eligible (SFIE) Program**: The Residential SFIE Program was a new program for Ameren Missouri in PY2019. The program is designed to provide whole-home energy efficiency upgrades that result in long-term energy savings and bill reduction opportunities to Ameren Missouri low-income customers living in single family properties, including mobile homes and duplexes. The program leverages two participation channels: (1) the Single Family channel and (2) the Grant channel.
- **Business Social Services (BSS) Program:** The BSS Program was a new program for Ameren Missouri in PY2019. The target market consists of commercial, nonprofit, and tax-exempt business customers that provide social services to the low-income public in federally designated opportunity zones. In PY2023, the program also started serving government buildings in low-income municipalities.[2] The BSS Program offers no-cost LED interior lighting equipment and low-cost equipment of other enduses. Service Providers supply and install measures, finalize paperwork for eligible participants, and identify additional energy efficiency opportunities not covered under the BSS Program.

The SFIE and MFIE programs are implemented by Ameren Missouri's MFMR program implementer, while the Community LED Program is implemented by Ameren Missouri's residential program administrator, and the BSS Program is implemented by the business program implementer.

At the portfolio level, the income eligible programs achieved 180% of their net energy savings goal and 162% of their net demand savings goals (Table 3). The portfolio gross energy realization rate (125.9%) and demand realization rate (112.9%) reflect high realization rates across all four programs, most notably the Community LED program, which achieved the highest energy and demand realization rates (162.8% and 162.9%, respectively)

Table 3. PY2023 Income Eligible Portfolio Impact Summary

	Ex Ante Gross	Gross RR	Ex Post Gross	NTGR [A]	Ex Post Net	Goal Net	% of Goal
Energy Savings (MWh)	22,222	125.9%	27,974	100.0%	27,974	15,562	180%
Demand Savings (MW)	5.13	112.9%	5.79	100.0%	5.79	3.58	162%

[A] Per industry standard practice, we assume a NTGR of 100% for the Income Eligible portfolio.

[2] Municipal and government facilities qualify under BSS if that municipality's residents qualify under the filed Eligibility Guidelines for All Residential Low-Income Programs.

At the program level, performance against savings goals was mixed. The MFIE Program, Community Lighting Program, and SFIE Program exceeded their first year energy and demand savings goals (121%, 444%, and 103% of goal, respectively, for energy, and 127%, 455%, and 123%, respectively, for demand). Only the BSS Program did not meet its first year energy and demand savings goals (75% and 76% of goal, respectively)). Additionally, the MFIE Program performed well against the average percent of energy savings per property metric established in Stipulation PY2023 (i.e., achieving at least 15% per property for MFIE). The MFIE Program achieved an average of 31% savings per property (see Volume 2). Despite underperforming compared to goal in PY2023, the BSS Program supported more projects (123) and achieved higher ex ante energy savings (3,738 MWh) than in any prior year of program implementation (See Volume 3).

Table 4. PY2023 Income Eligible Portfolio First Year Impact Summary by Program

Portfolio	Ex Ante Gross	Gross RR	Ex Post Gross	NTGR [A]	Ex Post Net	Goal Net	% of Goal
First Year Energy Savings (MWh)							
Community Lighting	9,843	162.8%	16,022	100.0%	16,022	3,610	444%
MFIE	7,371	95.7%	7,055	100.0%	7,055	5,853	121%
SFIE	1,270	88.4%	1,122	100.0%	1,122	1,087	103%
BSS	3,738	101.0%	3,775	100.0%	3,775	5,012	75%
Total Income Eligible	**22,222**	**125.9%**	**27,974**	**100.0%**	**27,974**	**15,562**	**180%**
First Year Demand Savings (MW)							
Community Lighting	1.51	162.9%	2.46	100.0%	2.46	0.54	455%
MFIE	2.26	89.5%	2.03	100.0%	2.03	1.60	127%
SFIE	0.63	89.6%	0.56	100.0%	0.56	0.46	123%
BSS	0.73	102.0%	0.75	100.0%	0.75	0.98	76%
Total Income Eligible	**5.13**	**112.9%**	**5.79**	**100.0%**	**5.79**	**3.58**	**162%**

[A] Per industry standard practice, we assume a NTGR of 100% for the Income Eligible portfolio.

2.3 RESIDENTIAL PORTFOLIO

The PY2023 Residential Portfolio included the following four energy efficiency programs:

- **Heating, Ventilation, and Air Conditioning (HVAC) Program:** The HVAC Program aims to improve the efficiency of newly installed central air conditioning (CAC) systems and heat pumps by providing incentives for new high-efficiency systems. It also provides incentives for smart thermostats. The program offers measures through two channels: The Downstream channel focuses on encouraging customers to improve the efficiency of their HVAC systems at the point of installation while the Midstream channel, introduced in PY2020, focuses on making super-efficient HVAC systems more broadly available to Ameren Missouri customers. Trade Allies play a critical role in delivering both channels, while HVAC distributors are key to delivering the new Midstream channel.
- **Residential Efficient Products (REP) Program:** The REP Program is designed to raise customer awareness of the benefits of high-efficiency products, educate residential customers about energy use in their homes, and offer information, products, and services to residential customers to achieve cost-effective energy savings. The target market consists of all residential customers within the Ameren Missouri service territory. The REP Program is designed to be an umbrella program, incorporating various program partners, products, and program delivery strategies.
- **Multifamily Market Rate (MFMR) Program:** The MFMR Program is designed to provide a one-stop-shop approach to assist owners and operators of MFMR properties to overcome barriers to completing comprehensive retrofits. The

program serves multifamily properties that have three or more tenant units and receive electric service from Ameren Missouri.

- **Pay As You Save Program:** The PAYS Program is a tariff on-bill financing offering that launched in PY2021. The program provides packages of energy efficiency measures—among them LEDs, domestic hot water, insulation, air sealing, and HVAC—to residential customers. The on-bill financing incentive design allows participating customers to pay back the cost of energy efficiency projects incrementally through their utility bill in the form of a tariff charge, which means that the cost of the project and the payback remains with the premise rather than the customer. That is, if the customer moves out of the treated home prior to paying back the cost of the project, the new occupant will pay the remaining balance of the project cost through their utility bill.

At the portfolio level, the PY2023 Ameren Missouri residential programs (not including the income eligible programs) achieved 33,921 MWh in ex post net energy savings and 18.63 MW in ex post net demand savings, achieving 81% and 82%, respectively, of their goal. The savings-weighted portfolio-level gross realization rates (RRs) were 82% for energy savings and 77% for demand savings (see Table 5).

Table 5. PY2023 Residential Portfolio Impact Summary

	Ex Ante Gross	Gross RR	Ex Post Gross	NTGR	Ex Post Net	Goal Net	% of Goal
Energy Savings (MWh)	49,910	82.4%	41,116	82.5%	33,921	41,794	81%
Demand Savings (MW)	29.32	77.0%	22.58	82.5%	18.63	22.58	82%

Portfolio performance in PY2023 was largely driven by the Residential HVAC Program, which contributed approximately 73% of Ameren Missouri's first year residential energy savings. Notably, the HVAC Program came close to its first year energy savings goal and demand savings goal (93% and 98%, respectively). The PAYS Program, on the other hand, which had the second highest savings goals, fell well short of its net savings goals, achieving only 8% of its energy and 7% of its demand savings goal.

Table 6 summarizes annual gross and net savings for all market rate programs in the PY2023 Residential Portfolio.

Table 6. PY2023 Residential Portfolio First Year Impact Summary

	Ex Ante Gross	Gross RR	Ex Post Gross	NTGR	Ex Post Net	Goal Net	% of Goal
First Year Energy Savings (MWh)							
HVAC	38,239	78.4%	29,996	82.5%	24,747	26,571	93%
REP	7,599	99.7%	7,575	82.5%	6,250	3,747	167%
MFMR	3,207	87.7%	2,814	82.5%	2,321	3,763	62%
PAYS	865	84.4%	731	82.5%	603	7,713	8%
Total Residential	**49,910**	**82.4%**	**41,116**	**82.5%**	**33,921**	**41,794**	**81%**
First Year Demand Savings (MW)							
HVAC	25.03	74.1%	18.55	82.5%	15.30	15.61	98%
REP	2.76	99.7%	2.76	82.5%	2.27	1.32	172%
MFMR	1.21	81.4%	0.98	82.5%	0.81	2.06	39%
PAYS	0.32	91.2%	0.29	82.5%	0.24	3.59	7%
Total Residential	**29.32**	**77.0%**	**22.58**	**82.5%**	**18.63**	**22.58**	**82%**

2.4 BUSINESS PORTFOLIO

The PY2023 Business Portfolio included four energy efficiency programs, all of which were offered in the previous MEEIA cycle:

- **Standard Incentive Program:** The Standard Incentive Program is designed to promote the installation of energy-efficient technologies by providing incentives for a range of prescriptive measures. The program employs simple and streamlined program processes and leverages a network of Trade Allies to assist with project implementation and raising customer awareness. Similar to prior years, the PY2023 program was heavily focused on LED interior lighting equipment.
- **Custom Incentive Program:** The Custom Incentive Program applies to processes, technologies, and energy efficiency measures that are not deemed and therefore do not fall under the Standard Program. Custom projects are sometimes complex and always unique, requiring customer-specific incentive applications and calculations of estimated energy savings. The Custom Program also relies on a network of Trade Allies. HVAC equipment was the predominant enduse in PY2023, but the program also incented lighting, compressed air, and other measures. Beginning in PY2022, the Custom Program also serves new construction projects, including new construction indoor agriculture projects, which were previously served under a stand-alone New Construction Program.
- **Small Business Direct Install (SBDI) Program:** The SBDI Program encourages small business customer participation through a simple, immediate, and streamlined program process. A group of approved SBDI Program Service Providers delivers energy-efficient measures at low-cost to small business customers. These Service Providers supply and install eligible equipment and finalize paperwork for participants. They are also tasked with identifying additional energy efficiency opportunities not covered under the SBDI Program.
- **Retro-Commissioning (RCx) Program:** The RCx Program is designed to help customers retro-commission existing facilities. Program activities include conducting a retro-commissioning study, benchmarking existing building system performance levels, identifying operating system performance optimization improvements, and, where applicable, providing financial incentives to support implementation of program recommendations. The program relies on qualified Retro-Commissioning Service Providers to deliver measurable energy savings. Although planned for PY2023, the Smart Meter Commissioning subcomponent of the RCx Program was delayed and is now planned for launch in PY2024.

The PY2023 Business Portfolio (not including the BSS Program) achieved 77,924 MWh of ex post net energy savings and 26.23 MW of ex post net demand savings, achieving 75% and 78%, respectively, of its net goals (as outlined in the Stipulation PY2023). The savings-weighted portfolio-level gross realization rates (RRs) were 89.0% for energy savings and 92.7% for demand savings (see Table 7).

Table 7. PY2023 Business Portfolio Savings Summary

	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR [A]	Ex Post Net	Goal/Target Net	% of Goal
Energy Savings (MWh)	106,147	89.0%	94,453	82.5%	77,924	104,286	75%
Demand Savings (MW)	34.30	92.7%	31.79	82.5%	26.23	33.50	78%

[A] In accordance with Stipulation PY2023, PY2023 net-to-gross ratios (NTGRs) are deemed at 82.5% for the Business portfolio.

The Standard and Custom programs were the largest programs in Ameren Missouri's PY2023 Business Portfolio, contributing, respectively, 49% and 44% of ex post net energy savings and 44% and 49% of ex post net demand savings. Despite relatively strong gross realization rates, all programs fell just short of net energy and demand savings goals. Portfolio-wide, the primary driver of low program-specific performance relative to net savings goals was lack of

participation: For all programs, other than Custom (both energy and demand savings) and Standard (demand savings only), even gross ex ante savings are below net goals, in some cases significantly.

Table 8 summarizes annual gross and net savings for all programs in the PY2023 Business Portfolio.

Table 8. PY2023 Business Portfolio First Year Savings Summary by Program

A	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net	Goal/Target Net	% of Goal
Energy Savings (MWh)							
Standard	50,743	90.9%	46,149	82.5%	38,073	51,715	74%
Custom	48,082	85.5%	41,109	82.5%	33,915	37,075	91%
SBDI	4,174	97.8%	4,085	82.5%	3,370	10,781	31%
RCx	3,148	98.8%	3,110	82.5%	2,566	4,715	54%
Total Business	**106,147**	**89.0%**	**94,453**	**82.5%**	**77,924**	**104,286**	**75%**
Demand Savings (MW)							
Standard	14.29	98.6%	14.09	82.5%	11.63	12.85	90%
Custom	17.95	87.3%	15.67	82.5%	12.93	16.55	78%
SBDI	0.80	101.0%	0.81	82.5%	0.67	2.14	31%
RCx	1.26	96.7%	1.22	82.5%	1.00	1.96	51%
Total Business	**34.30**	**92.7%**	**31.79**	**82.5%**	**26.23**	**33.50**	**78%**

2.5 DEMAND RESPONSE PORTFOLIO

The PY2023 Demand Response Portfolio included two programs, one for residential customers and one for business customers, both new in MEEIA Cycle III:

- **Residential Demand Response Program:** The Residential Demand Response Program is designed to control cooling load with the help of smart thermostats to achieve peak demand savings and energy savings. Eligible customers include Ameren Missouri electric customers with central air conditioning systems, including heat pumps and a program-qualifying smart thermostat. Qualifying smart thermostats in PY2023 included ecobee®, Nest®, and Sensi™ and Honeywell devices. Franklin Energy administers the program, while Uplight is responsible for program delivery. While the program was originally designed as an integrated program aiming to deliver energy savings using optimization strategies alongside demand reductions, the program's pursuit of energy optimization savings in PY2023 was limited to Sensi devices.
- **Business Demand Response Program:** The Business Demand Response Program is designed to reduce load during periods of peak demand. Enel X is the program aggregator responsible for recruiting and enrolling customers, developing customized load reduction nominations and load curtailment strategies, dispatching demand response events, and maintaining customer relationships with participating businesses. Through this program, eligible business customers can participate in demand response events through a variety of strategies, including direct load control and manual response. Each enrolled facility receives a customized load curtailment strategy focusing on a variety of energy loads, such as lighting, HVAC, chillers, motors, and processing equipment. In PY2023 the Business Demand Response Program expanded eligibility to include opt-out customers.[3]

[3] In September 2023, tariffs were approved to allow opt-out customers to participate in Ameren Missouri's DR programs.

At the end of the PY2023 event season, the demand response portfolio achieved 103.40 MW in average load reduction as well as 1,626.21 MWh in energy savings (Table 9).

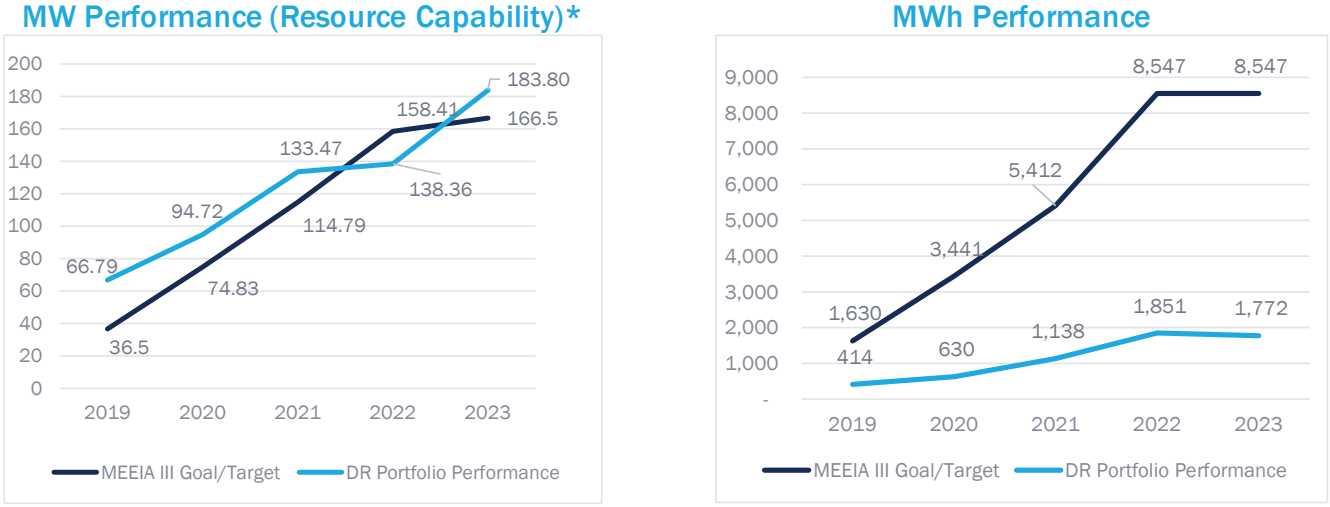
Table 9. PY2023 Event Season Performance Summary

Program	Participants	Event Season MW Performance	Event Season MWh Performance
Residential DR Program	43,340	39.53	843.65
Business DR Program	1,025	63.87	782.56
Total DR Portfolio	**44,365**	**103.40**	**1,626.21**

Note: The participant count for the Residential DR Program represents the average number of participants among whom events were dispatched. Energy and Demand savings for the Business DR Program only include event season events.

To compare the DR portfolio demand savings performance against MEEIA III MW targets, the evaluation team calculated weather-normalized resource capability estimates. Resource capability reflects total demand under control by the programs at program year-end and available to be called under conditions consistent with Ameren Missouri's peak forecasting weather assumptions. Figure 1 summarizes portfolio performance toward MEEIA III cumulative targets. The portfolio achieved a total of 183.80 MW (or 110% of target), exceeding the demand goal of 166.5 MW by 17.30 MW, but falling considerably short of the energy savings goal, achieving 1,772 MWh (or 21%) of the 8,547 MWh target.[4] Notably, the MEEIA III target for the Residential DR Program relied on the expectation that device optimization through the program would be performed across all participating devices. However, following the release of the energy optimization algorithms by Nest and ecobee across all of their devices, program-driven optimization was no longer possible. Consequently, MEEIA targets are not feasible for the program to achieve.

Figure 1. DR Portfolio Performance Against MEEIA III Cumulative Goals/Targets



*Includes a very small number (~35) of accounts that unenrolled prior to the end of the year.

Table 10 provides a detailed summary of each program's performance against MEEIA III targets. The Residential DR Program did not meet its resource capability targets, achieving 79% of its target; however, the Business DR Program exceeded its resource capability target, achieving 131% of its target. Combined, the two programs exceeded the PY2023 target by 10%.

Both programs underperformed against their energy savings targets (13% for the Residential Program and 46% for the Business Program). Energy savings for the Residential DR Program include event day impacts during the event season

[4] Energy savings for the Business DR program includes savings from the December test event in addition to the event season events.

as well as energy savings achieved through optimization of Sensi devices on non-event days. Energy savings for the Business DR Program include savings achieved during the December test event, in addition to the savings achieved during the three events called during the event season.

Table 10. DR Portfolio Performance Against MEEIA III Goals/Targets

Program Year	Cumulative 2023 MEEIA III Goal/Target	PY2023 Performance	Goal/Target Achieved (%)
Resource Capability (MW)			
Residential DR Program	66.50	52.37*	79%
Business DR Program	100.00	131.43	131%
Total DR Portfolio	**166.50**	**183.80**	**110%**
Energy Savings (MWh)			
Residential DR Program	6,547.00	846.59	13%
Business DR Program	2,000.00	925.63	46%
Total DR Portfolio	**8,547.00**	**1,772.22**	**21%**

*Includes a very small number (~35) of accounts that unenrolled prior to the end of the year.

In addition to the event season performance and resource capability performance, we also calculated cumulative DR capability (Table 11). For the Residential DR Program, the cumulative DR capability mirrors the resource capability; however, per the MEEIA III Plan, the cumulative DR capability is based on the performance of tested participants only, as opposed to all participants enrolled in the program at year-end.[5] In PY2023, all Business DR participating customers were tested as part of either summer or winter test events. Therefore, cumulative DR capability is equal to resource capability.

Table 11. PY2023 Event Season Performance Summary

Program	Target (MW)	PY2023 Performance (MW)	% of Target Achieved
Residential DR Program	66.50	52.37	79%
Business DR Program	100.00	131.43	131%
Total DR Portfolio	**166.50**	**183.80**	**110%**

[5] Including event season DR or test events as well as winter test events.

3. EARNINGS OPPORTUNITIES

This section provides the inputs necessary for calculating Ameren Missouri's PY2023 achieved Earnings Opportunity metrics. Stipulation PY2023 established a total potential Earnings Opportunity of $12,667,500, which is composed of a maximum $12,155,000 core earnings opportunity plus an additional performance bonus incentive of up to $512,500.

Section 11 of the Stipulation PY2023 specifies the terms of the PY2023 Earnings Opportunity as follows:

- Core Earnings Opportunity:
  - The Core Earnings Opportunity vests at $59 million actual spend and is calculated as $12.155 million multiplied by Ameren's actual overall PY2023 spend, divided by $74.65 million.
  - To be eligible for the full Core Earnings Opportunity, Ameren Missouri must meet or surpass the minimum spend in its four program areas (i.e., the Residential Portfolio, Business Portfolio, MFIE Program, and the PAYS Program). The Core Earnings Opportunity will be reduced by $1 million for each spending floor missed.
  - As a subcomponent of the $1 million spending floor penalty, the Core Earnings Opportunity is reduced by:
    - $250,000 if the MFIE Program does not achieve 15% or greater Average Percent Energy Savings Per Property.
    - $150,000 if administrative overhead for income eligible programs exceeds 30% of spend.
    - $500,000 if a minimum spend of $10 million is not achieved within the HVAC Program.
    - $500,000 if Commercial programs do not spend at least $6.5 million on non-lighting measures.
    - $500,000 if a minimum spend of $2.5 million is not achieved with small business customers (defined as Electric Service Classification No.2(M) Small General Service Rate). Note that this spend floor can be achieved across the core business programs but not the BSS Program
- Earnings Opportunity Performance Bonus:
  - The maximum Earnings Opportunity Performance Bonus is $512,500 ($51,250 per DR event called, with a maximum of 10 events). No more than 5 test events will be included, unless those test events are specifically called for:
    - Locational demand purposes
    - Off-peak capability, such as during a winter peaking period

According to Ameren Missouri's general ledger, the company forecasts to spend $70,038,241 on PY2023 MEEIA programs. Further, based on Ameren Missouri's general ledger, analysis of Business Portfolio implementation costs, and the evaluated average savings per MFIE participating electric property, Ameren did meet or exceeded all potential penalty thresholds. Therefore, based on the framework outlined above, Ameren Missouri achieved a Core Earnings Opportunity of $11,404,083, or 93.8% of the maximum potential payout of $12,155,000. Ameren did meet the Earnings Opportunity Performance Bonus target for demand response events by calling ten total events (including three peak load shaving events, three locational test events, and four non-locational test events), for a full payout of $512,500. This results in a total estimated earnings opportunity payout of $11,916,583.

Table 12 below summarizes Ameren Missouri's PY2023 earnings opportunity metrics, including actual spending, floors and caps and the associated potential penalties, and resulting total payouts.

Table 12. Earnings Opportunity

Core Earnings Opportunity	Actual	Floor Budget Spend/(%) Savings	Cap Budget Spend	2023 Target/Penalty	2023 Payout	2023 Payout Cap
Residential [A]	$20,990,918	$15,000,000		-$1,000,000	$0	
HVAC [A]	$13,926,781	$10,000,000		-$500,000	$0	
PAYS [A]	$1,589,366	$1,000,000		-$1,000,000	$0	
Business [A]	$21,100,426	$20,000,000		-$1,000,000	$0	
Bus spend on non-lighting measures [B,C]	$10,402,350	$6,500,000		-$500,000	$0	
Bus spend on (2M) Small General Service Rate [B,C]	$4,133,564	$2,500,000		-$500,000	$0	
Low Income [A]	$13,305,323	$12,000,000	$18,000,000	N/A	N/A	
MFLI - Floor Spend [A]	$5,805,032	$5,000,000		-$1,000,000	$0	
Admin overhead for all low income programs exceeds 30% of low-income spend [A]	25%	30%		-$150,000	$0	
MFLI: Average savings per participating electric property below 15% [D]	31%	15%		-$250,000	$0	
Portfolio Spend	**$69,470,464**	**N/A**	**$74,650,000**	**100%**	**$11,311,634**	**$12,155,000**
Performance Bonus Metric	**Actual**	**Payout Rate**	**Payout Metric**	**2023 Target**	**2023 Payout**	**2023 Payout Cap**
Qualifying Residential Demand Response Events [E]	10 events	$51,250	$/event	10 events	$512,500	$512,500
Total Earnings Opportunity					**$11,824,134**	**$12,667,500**

[A] Source: Ameren Missouri General Ledger
[B] Source: Ameren Analysis
[C] Note: These metrics include both incentives and administrative costs
[D] Source: Vol. 2 Table 44
[E] Source: Vol. 4 Figure 4

4. COST-EFFECTIVENESS RESULTS

The cost-effectiveness analysis compares the benefits of Ameren Missouri's energy efficiency and demand response programs with the cost of delivering them, expressed as the ratio of the net present value (NPV) of lifetime benefits to the costs. A cost-effectiveness ratio of greater than 1.0 means that the benefits generated by the program exceeded its costs. Cost-effectiveness can be assessed from several different "perspectives" using different tests, with each test including a slightly different set of benefits and costs.

The evaluation team assessed the cost-effectiveness of all 14 Ameren Missouri energy efficiency and demand response programs as well as three sector-level portfolios (i.e., Income Eligible, Residential, and Business) and the overall combined portfolio of programs. We assessed cost-effectiveness using all five costs-effectiveness tests recommended by the California Standard Practice Manual and used in prior evaluations:[6]

- **Total Resource Cost (TRC) Test:** Perspective of all utility customers (participants and nonparticipants) in the utility service territory
- **Utility Cost Test (UCT):** Perspective of utility, government agency, or third-party program implementer
- **Ratepayer Impact Measure (RIM) Test:** Impact of efficiency measure on nonparticipating ratepayers overall
- **Participant Cost Test (PCT):** Perspective of the customers installing the measures
- **Societal Cost Test (SCT):** Perspective of all utility customers (participants and nonparticipants) in the utility service territory[7]

The TRC test is the primary test of cost-effectiveness, per Ameren Missouri's 2019–2021 Energy Efficiency Plan. It compares all program benefits (in terms of avoided energy production, transmission and distribution, and capacity) against the utility administrative costs and any out-of-pocket costs incurred by participating customers. Because incentives are both a cost to the utility and a benefit to participants, they are excluded from calculations using the TRC test.

The PY2023 cost-effectiveness analysis was completed by Integral Analytics, based in Cincinnati, Ohio, using DSMore software. DSMore is a financial analysis tool designed to evaluate the costs, benefits, and risks of energy efficiency programs and measures. Developed and licensed by Integral Analytics, DSMore estimates the value of an energy efficiency measure at an hourly level across distributions of weather and/or energy costs or prices. The software references over 30 years of historic weather variability to model weather variances.

To maintain consistency with Ameren Missouri's planning assumptions, the evaluation team relied on the same DSMore planning tools used to develop Ameren Missouri's planning values. It was important to ensure differences in cost-effectiveness results compared to planning values were driven by deviations between planned and realized costs and benefits of delivering energy efficiency programs as opposed to differences in the underlying financial assumptions within in the DSMore model itself.

A number of overall and sector-level costs are reflected in the program-level cost-effectiveness analysis. These overarching costs include those for EM&V, education and outreach, portfolio administration, and data tracking. These costs were allocated by each program's share of the portfolio's avoided cost benefits. All results shown in the tables below account for portfolio and indirect costs allocated to each program on this basis.

[6] *California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects.* October 2001.

[7] Although we developed SCT results as a part of our evaluation, this section does not show the results because they are equivalent to TRC results due to two factors: (1) Ameren Missouri does not include non-energy impacts in cost-effectiveness testing and (2) Ameren Missouri uses the same planning assumptions for both tests, including the discount rate.

Overall, Ameren Missouri's combined portfolio of energy efficiency and demand response programs was cost-effective as delivered in PY2023, according to every test except the RIM test. The combined portfolio achieved a TRC score of 2.22 and a UCT score of 2.37. According to the TRC test, all three sector-level portfolios were also cost effective. All individual programs were cost-effective, according to the TRC test, except for the SFIE and PAYS programs.[8]

Table 13 summarizes the cost-effectiveness results for all programs in the Income Eligible, Residential, and Business portfolios.[9]

Table 13. Summary of PY2023 Income Eligible, Residential, and Business Program Cost Effectiveness

Program	TRC	UCT	RIM	PCT
Income Eligible Portfolio				
Community Lighting	14.37	4.51	0.36	n/a
MFIE	2.40	1.25	0.35	11.43
SFIE	0.61	0.35	0.23	6.46
BSS	3.61	1.82	0.42	9.91
Income Eligible Total	**3.78**	**1.83**	**0.36**	**22.36**
Residential Portfolio				
HVAC	1.75	1.94	0.51	6.01
REP	1.42	1.55	0.46	5.59
MFMR	1.67	1.35	0.39	11.87
PAYS	0.37	0.40	0.24	3.45
Residential Demand Response	1.38	1.03	0.99	n/a
Residential Total	**1.55**	**1.55**	**0.53**	**6.25**
Business Portfolio				
Standard	3.20	3.88	0.58	7.98
Custom	1.68	3.82	0.69	2.78
RCx	3.65	4.26	0.80	7.26
SBDI	3.20	2.44	0.45	11.47
Business Demand Response	4.26	2.43	2.35	n/a
Business Total	**2.43**	**3.48**	**0.71**	**4.56**
Portfolio				
Portfolio Total	**2.22**	**2.37**	**0.57**	**6.11**

Overall, Ameren Missouri's combined portfolio of energy efficiency programs generated $131 million in lifetime benefits at a cost of $59 million, resulting in $72 million in net benefits (based on the TRC test). The UCT test results in a higher total net benefit ($76 million). The Residential Portfolio generated just over $12 million of TRC-lifetime net benefits while the Business Portfolio generated just under $45 million.

Table 14 provides a summary of the total cost and benefits associated with each program in the Income Eligible, Residential, and Business portfolios under the TRC and UCT tests.

[8] MEEIA and the Revised Statues of Missouri (RSMo) acknowledge low-income programs as a special circumstance and do not require the programs to be cost-effective as implemented. Results are shown for comparative and planning purposes.

[9] For cost-effectiveness testing, the demand response programs are included in the respective Business and Residential portfolios.

Table 14. Summary of TRC Cost and Benefits (2019 Dollars)

Program	Lifetime Benefits	TRC Test		UCT Test	
		Program Costs	Net Benefits	Program Costs	Net Benefits
Income Eligible Portfolio					
Community Lighting	$10,675,008	$742,765	$9,932,243	$2,366,722	$8,308,286
MFIE	$5,832,957	$2,425,436	$3,407,521	$4,682,291	$1,150,666
SFIE	$845,735	$1,393,973	-$548,238	$2,421,505	-$1,575,770
BSS	$2,444,834	$677,556	$1,767,278	$1,344,636	$1,100,198
Income Eligible Total	**$19,798,534**	**$5,239,730**	**$14,558,804**	**$10,815,154**	**$8,983,381**
Residential Portfolio					
HVAC	$22,669,211	$12,932,571	$9,736,640	$11,693,191	$10,976,020
REP	$4,165,778	$2,940,703	$1,225,075	$2,679,467	$1,486,311
MFMR	$1,853,571	$1,111,183	$742,388	$1,372,538	$481,033
PAYS	$547,025	$1,473,684	-$926,660	$1,367,097	-$820,073
Residential Demand Response	$5,630,983	$4,073,172	$1,557,811	$5,449,852	$181,131
Residential Total	**$34,866,568**	**$22,531,313**	**$12,335,255**	**$22,562,145**	**$12,304,422**
Business Portfolio					
Standard	$29,667,293	$9,264,142	$20,403,151	$7,653,380	$22,013,914
Custom	$30,369,472	$18,026,305	$12,343,167	$7,940,935	$22,428,537
RCx	$2,043,659	$560,566	$1,483,093	$480,180	$1,563,479
SBDI	$2,213,945	$691,486	$1,522,459	$908,197	$1,305,748
Business Demand Response	$12,080,631	$2,835,386	$9,245,245	$4,980,505	$7,100,126
Business Total	**$76,375,001**	**$31,377,886**	**$44,997,115**	**$21,963,197**	**$54,411,803**
Portfolio					
Portfolio Total	**$131,040,103**	**$59,148,929**	**$71,891,174**	**$55,340,497**	**$75,699,606**

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