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Ameren Missouri Program Year 2022 Annual EM&V Report

Volume 1: Portfolio Impact Summary

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Opinion Dynamics

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1. Introduction

This volume (Volume 1) presents a summary of impact evaluation and cost-effectiveness results for Program Year 2022 (PY2022)[1] of Ameren Missouri's 2019–2021 portfolio of energy efficiency and demand response programs, approved under the third cycle of the Missouri Energy Efficiency Investment Act (MEEIA).[2] This Portfolio Summary is the first of four volumes that comprise the Ameren Missouri PY2022 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 PY2022. 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 PY2022 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 relative to PY2021:

- 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 Low-Income Portfolio with a new focus on low-income communities.
- In the Business Portfolio, the New Construction Program was discontinued as a stand-alone offering, and new construction projects were served by the Custom Incentive Program.

[1] PY2022 was implemented from January 1, 2022, to December 31, 2022.

[2] The *Unanimous Stipulation and Agreement Regarding the Implementation of Certain MEEIA Programs Through Plan Year 2022* ("Stipulation PY2022") added PY2022 and the subsequent *Non-Unanimous Stipulation and Agreement Regarding the Implementation of Certain MEEIA Programs through Plan Year 2023* ("Stipulation PY2023") added PY2023 to MEEIA Cycle III.

Table 1. Ameren Missouri 2022 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 LED 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 2022 Impact Results

This section summarizes PY2022 gross and net impact evaluation results, overall and by portfolio. In accordance with Stipulation PY2022, 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 PY2022 Ameren Missouri energy efficiency programs fell slightly short of its first year gross energy and gross demand savings goals (79% and 94%, respectively). All three portfolios fell below energy savings goals (98%, 75%, and 78% for the Income Eligible, Residential, and Business portfolios, respectively) and demand savings goals (80%, 92%, and 97% for the Income Eligible, Residential, and Business portfolios, respectively).[3] The PY2022 Business Portfolio accounted for the largest share of first year ex post gross energy savings (68%) and demand savings (56%), excluding the Demand Response Portfolio.

All three portfolios achieved first year gross energy savings realization rates of 84% or above. Demand realization rates were lower than energy realization rates across all three portfolios, particularly for the Income Eligible Portfolio, which achieved a demand realization rate of 48.8%. Table 2 summarizes first year gross energy and demand performance of the portfolio relative to goal, as well as ex post net savings.

Table 2. PY2022 Combined Portfolio First Year Impact Summary

Portfolio	Ex Ante Gross	Gross RR	Ex Post Gross	Goal Gross	% of Goal	NTGR [a]	Ex Post Net
Energy Savings (MWh)							
Income Eligible	18,520	94.5%	17,495	17,859	98%	100%	17,495
Residential	50,045	84.4%	42,237	56,302	75%	82.5%	34,846
Business	138,112	90.2%	124,535	158,681	78%	82.5%	102,741
Portfolio Total	**206,678**		**184,266**	**232,842**	**79%**		**155,081**
Demand Savings (MW)							
Income Eligible	8.74	48.8%	4.26	5.35	80%	100%	4.26
Residential	30.06	80.4%	24.17	26.18	92%	82.5%	19.94
Business	45.47	85.3%	38.78	39.89	97%	82.5%	31.99
Portfolio Total	**84.27**		**67.22**	**71.42**	**94%**		**56.20**

[a] In accordance with Stipulation PY2022, PY2022 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.

[3] These summaries exclude the Demand Response Portfolio because we do not estimate incremental impacts for these programs, as discussed in more detail in Volume 3.

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. The PY2022 Income Eligible Portfolio included fours programs designed to achieve savings in three distinct market segments:

- **Multifamily Income Eligible (MFIE) Program**: Ameren Missouri has been offering energy efficiency programs for multifamily income eligible properties since 2015. In PY2022, 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.
- **Community LED Lighting Program**: In PY2022, Ameren Missouri launched a new program aimed at providing LEDs to income eligible communities throughout its service territory. The Community LED Lighting Program is an upstream offering that provides deeply discounted or free LEDs to Ameren Missouri customers through two separate delivery channels. Through the 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 MEEIA cycles but focuses solely on discount retailers. Ameren Missouri has also introduced a new delivery channel, which provided 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.
- **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. 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 98% of their first year gross energy savings goal and 80% of its first year gross demand savings goals (Table 3). The portfolio gross energy realization rate (94.5%) reflects high realization rates across all four programs. The portfolio demand realization rate was somewhat lower (48.8%), which was driven by a low realization rate in the MFIE Program, by far the largest contributor to ex ante demand in the Income Eligible Portfolio.

Table 3. PY2022 Income Eligible Portfolio Impact Summary

	Ex Ante Gross	Gross RR	Ex Post Gross	Goal	% of Goal	NTGR [a]	Ex Post Net
Energy Savings (MWh)	18,520	94.5%	17,495	17,859	98%	100%	17,495
Demand Savings (MW)	8.74	48.8%	4.26	5.35	80%	100%	4.26

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

At the program level, performance against savings goals was mixed. While the MFIE Program and Community Lighting Program exceeded their first year energy savings goals (115% and 429% of goal, respectively), the SFIE Program and the BSS Program did not (65% and 47% of goal, respectively). Only the Community LED Program met its first year demand savings goals (470% of goal). Additionally, the MFIE Program performed well against the average percent of energy savings per property metric established in the Stipulation PY2022 (i.e., achieving at least 15% per property for MFIE). The MFIE Program achieved an average of 41% savings per property (see Volume 2). Despite underperforming compared to goal in PY2022, the BSS Program supported more projects (67) and achieved higher ex ante energy savings (2,699 MWh) than the prior three years of program implementation combined (66 projects and 2,120 MWh).

Table 4. PY2022 Income Eligible Portfolio First Year Impact Summary by Program

Program	Ex Ante Gross	Gross RR	Ex Post Gross	Goal Gross	% of Goal	NTGR	Ex Post Net
First Year Energy Savings (MWh)							
MFIE	12,086	93.1%	11,247	9,754	115%	100%	11,247
Community LED	2,625	92.4%	2,425	565	429%	100%	2,425
SFIE	1,110	95.1%	1,056	1,622	65%	100%	1,056
BSS	2,699	102.5%	2,767	5,918	47%	100%	2,767
Total Income Eligible	**18,520**	**94.5%**	**17,495**	**17,859**	**98%**	**100%**	**17,495**
First Year Demand Savings (MW)							
MFIE	7.34	39.3%	2.88	3.29	88%	100%	2.88
Community LED	0.41	92.4%	0.38	0.08	470%	100%	0.38
SFIE	0.49	97.7%	0.48	0.59	81%	100%	0.48
BSS	0.51	103.5%	0.53	1.39	38%	100%	0.53
Total Income Eligible	**8.75**	**48.8%**	**4.26**	**5.35**	**80%**	**100%**	**4.26**

2.3 Residential Portfolio

The PY2022 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 PY2022 Ameren Missouri residential programs fell short of their first year gross energy and demand savings goals, achieving 42,237 MWh and 24.17 MW respectively (Table 5).

Table 5. PY2022 Residential Portfolio Impact Summary

	Ex Ante Gross	Gross RR	Ex Post Gross	Goal Gross	% of Goal	NTGR [a]	Ex Post Net
Energy Savings (MWh)	50,045	84.4%	42,237	56,302	75%	82.5%	34,846
Demand Savings (MW)	30.06	80.4%	24.17	26.18	92%	82.5%	19.94

[a] In accordance with Stipulation PY2022, PY2022 NTGRs are deemed at 82.5% for the Residential portfolio.

Portfolio performance in PY2022 was largely driven by the Residential HVAC Program, which accounted for 73% of ex post energy savings and 82% of ex post demand savings. As shown in Table 6, the residential portfolio achieved 75% of first year energy savings goals and 92% of first year demand savings goals. Notably, the HVAC Program came close to its first year energy savings goal (93%) and exceeded its first year demand savings goal (114%). The PAYS Program, on the other hand, fell well short of its gross savings goals, achieving only 10% of its energy and 9% of its demand savings goal.

Table 6. PY2022 Residential Portfolio First Year Impact Summary

Program	Ex Ante Gross	Gross RR	Ex Post Gross	Goal Gross	% of Goal	NTGR	Ex Post Net
First Year Energy Savings (MWh)							
HVAC	38,158	80.4%	30,668	33,087	93%	82.5%	25,301
REP	8,070	99.7%	8,050	10,161	79%	82.5%	6,641

Program	Ex Ante Gross	Gross RR	Ex Post Gross	Goal Gross	% of Goal	NTGR	Ex Post Net
MFMR	2,801	93.6%	2,621	4,319	61%	82.5%	2,162
PAYS	1,016	88.5%	899	8,735	10%	82.5%	741
Total Residential	**50,045**	**84.4%**	**42,237**	**56,302**	**75%**	**82.5%**	**34,846**
First Year Demand Savings (MW)							
HVAC	25.49	77.4%	19.72	17.23	114%	82.5%	16.27
REP	2.97	99.7%	2.97	3.36	88%	82.5%	2.45
MFMR	1.19	94.6%	1.12	1.52	74%	82.5%	0.93
PAYS	0.41	89.4%	0.37	4.07	9%	82.5%	0.30
Total Residential	**30.06**	**80.4%**	**24.17**	**26.18**	**92%**	**82.5%**	**19.94**

2.4 Business Portfolio

The PY2022 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. The PY2022 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 PY2022, 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 and are 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.

The PY2022 Business Portfolio achieved 124,535 MWh of first year ex post gross energy savings and 38.78 MW of first year ex post gross demand savings, achieving 78% and 97%, respectively, of its goals (as outlined in the Stipulation PY2022). The savings-weighted, portfolio-level gross realization rates were 90.2% for energy savings and 85.3% for demand savings.

Table 7 summarizes first year annual gross savings for the Business Portfolio in PY2022.

Table 7. PY2022 Business Portfolio Savings Summary

	Ex Ante Gross	Gross RR	Ex Post Gross	Goal Gross	% of Goal	NTGR [a]	Ex Post Net
Energy Savings (MWh)	138,112	90.2%	124,535	158,681	78%	82.5%	102,741
Demand Savings (MW)	45.47	85.3%	38.78	39.89	97%	82.5%	31.99

[a] In accordance with Stipulation PY2022, PY2022 NTGRs are deemed at 82.5% for the Business portfolio.

The Standard Program was the largest contributor to portfolio ex post gross energy savings (48%) while the Custom Program accounted for the largest share of ex post gross demand savings (52%). The Standard Program exceeded its first year gross demand savings goal but fell just short of its energy savings goal. All other programs fell short of both energy and demand savings goals.

Portfolio-wide, the primary driver of low program-specific performance relative to gross savings' goals was lack of participation. For all programs other than Standard and Custom (demand savings only), even gross ex ante savings fell below goals (in some cases significantly), indicating that the shortfall was not primarily a result of low realization rates.

Table 8 summarizes annual gross savings for all programs in the PY2022 Business Portfolio.

Table 8. PY2022 Business Portfolio First Year Savings Summary by Program

Program	Ex Ante Gross	Gross RR	Ex Post Gross	Goal Gross	% of Goal	NTGR	Ex Post Net
First Year Energy Savings (MWh)							
Standard	61,344	97.6%	59,902	61,072	98%	82.5%	49,419
Custom	68,396	82.4%	56,375	77,722	73%	82.5%	46,509
SBDI	6,307	98.6%	6,216	11,777	53%	82.5%	5,128
RCx	2,066	98.8%	2,042	8,111	25%	82.5%	1,684
Total Business	**138,112**	**90.2%**	**124,535**	**158,681**	**78%**	**82.5%**	**102,741**
First Year Demand Savings (MW)							
Standard	16.63	103.7%	17.24	12.20	141%	82.5%	14.23
Custom	27.23	73.1%	19.92	22.60	88%	82.5%	16.43
SBDI	1.20	101.9%	1.22	2.12	58%	82.5%	1.01
RCx	0.41	96.7%	0.40	2.97	13%	82.5%	0.33
Total Business	**45.47**	**85.3%**	**38.78**	**39.89**	**97%**	**82.5%**	**31.99**

2.5 Demand Response Portfolio

The PY2022 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 PY2022 included ecobee®, Nest®, and Emerson™ devices. Through this program, customers either bring their own thermostats (also known as the Bring Your Own Thermostat channel) or purchase and install qualifying devices through the Ameren Missouri Online Marketplace (also known as the Marketplace channel). 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 PY2022 was limited to Emerson 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.

At the end of the PY2022 event season, the Demand Response Portfolio achieved 127.80 MW in average load reduction, as well as 1,836 MWh in energy savings (Table 9). A limited number of events were dispatched across both the Residential and Business Demand Response programs over the course of the season.

Table 9. PY2022 Event Season Performance Summary

Program	Participants [A]	Event Season MW Performance	Event Season MWh Performance [B]
Residential Demand Response Program	39,774	48.82	983
Business Demand Response Program	940	78.98	853
Total Demand Response Portfolio	**40,714**	**127.80**	**1,836**

[A] The participant count for the Residential Demand Response Program represents the average number of participants among whom events were dispatched.

[B] Energy and Demand savings for the Business Demand Response Program only include event season events.

To compare the Demand Response Portfolio demand savings performance against MEEIA III MW targets, the evaluation team estimated weather-normalized resource capability. Resource capability reflects the total demand under control by the programs at their 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. As shown in the figure, the portfolio achieved a total of 138.36 MW (or 87% of target), failing to meet the demand goal of 158.41 MW by 20.05 MW and falling considerably short of

the energy savings goal in achieving 1,851 MWh of the 8,547 MWh (or 22% of the target).[4] Notably, for the Residential DR program, the MEEIA III target 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. As such, MEEIA targets are not feasible for the program to achieve.

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

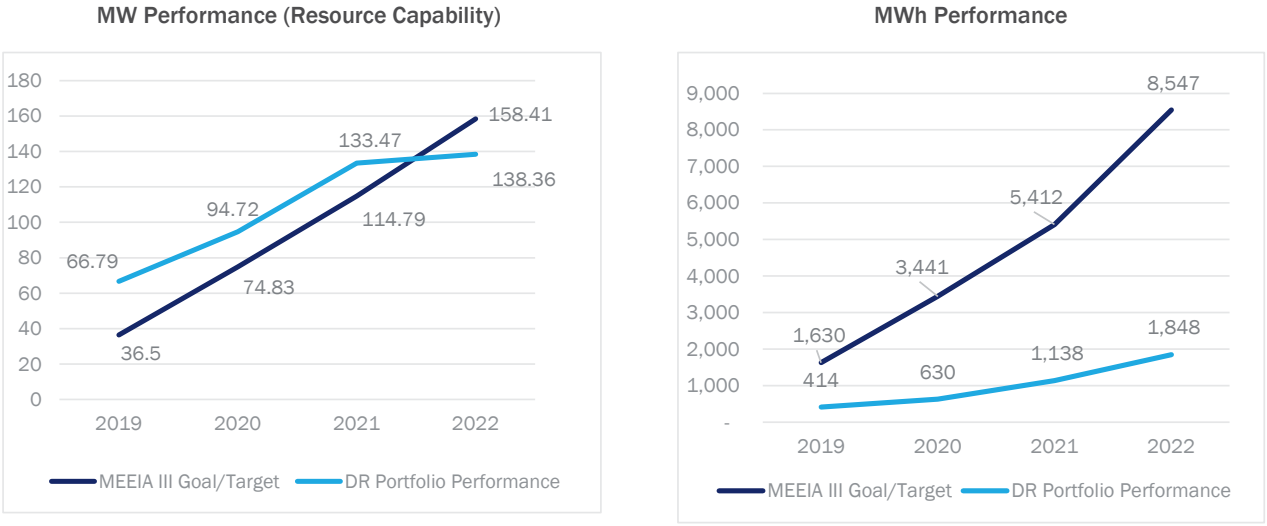

Table 10 provides a detailed summary of each program's performance against MEEIA III targets. As shown in the table, the Residential and Business Demand Response programs did not meet their resource capability targets, achieving 93% and 84% of their respective targets. Combined, the two programs fell short of the PY2022 target by 13%.

Both programs underperformed against their energy savings targets as well (15% for the Residential Program and 43% for the Business Program). Energy savings for the Residential Demand Response Program includes event-day impacts during the event season as well as energy savings achieved through the optimization of Emerson devices on non-event days. Energy savings for the Business Demand Response Program include savings achieved during the December test event, in addition to the savings achieved during the three events called during the event season.

Despite falling short of these targets and the challenging economic and grid conditions, Enel X successfully added 354 participants in 2022, with only 19 participants unenrolling.

Table 10. Demand Response Portfolio Performance Against MEEIA III Goals/Targets

Program	Cumulative 2022 MEEIA III Goal/Target	PY2022 Performance	Goal/Target Achieved (%)
Resource Capability (MW)			
Residential Demand Response Program	58.41	54.25	93%

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

Program	Cumulative 2022 MEEIA III Goal/Target	PY2022 Performance	Goal/Target Achieved (%)
Business Demand Response Program	100.00	84.12	84%
Total Demand Response Portfolio	**158.41**	**138.36**	**87%**
Energy Savings (MWh)			
Residential Demand Response Program	6,547	983	15%
Business Demand Response Program	2,000	868	43%
Total Demand Response Portfolio	**8,547**	**1,851**	**22%**

In addition to the event season performance and resource capability performance, we also calculated the cumulative demand response capability (Table 11). Cumulative demand response capability is a component of Ameren Missouri's "Portfolio-wide Gross MW Target" performance bonus metric. For the Residential Demand Response Program, the cumulative demand response capability mirrors the resource capability; however, per the MEEIA III Plan, the cumulative demand response capability is based on the performance of tested participants only, as opposed to all participants enrolled in the program at year-end.[5] In PY2022, four Business Demand Response Program participants were not tested as part of either summer events or the winter test event. Therefore, the cumulative demand response capability is not equal to resource capability.

Table 11. Demand Response Portfolio Summary of Cumulative Demand Response Capability Estimated Impacts by Program

Program	Target (MW)	PY2022 Performance (MW)	% of Target Achieved
Residential Demand Response Program	58.41	54.25	93%
Business Demand Response Program	100.00	83.84	84%
Total Demand Response Portfolio	**158.41**	**138.09**	**87%**

[5] Including event season demand response or test events, as well as winter test events.

3. Earnings Opportunities

This section provides the evaluated inputs necessary for calculating Ameren Missouri's PY2022 achieved Earnings Opportunity metrics. Stipulation PY2022 established a total potential Earnings Opportunity of $11.905 million, which is composed of a maximum $10.745 million core earnings opportunity plus an additional $1.160 million performance bonus incentive:

- Core Earnings Opportunity:
  - The Core Earnings Opportunity vests at $52.5 million actual spend and is calculated as $10.745 million multiplied by Ameren's actual overall PY2022 spend, divided by $70 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, Income Eligible Portfolio, Business Portfolio, 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 for the Income Eligible Portfolio, the Core Earnings Opportunity is reduced by $250,000 if the MFIE Program does not achieve 10% or greater Average Percent Energy Savings Per Property.
- Earnings Opportunity Performance Bonus:
  - The maximum Earnings Opportunity Performance Bonus is $1,160,000, comprised of $410,000 for demand response events plus $750,000 for ex post gross MW performance.
    - Ameren Missouri is eligible for a maximum $410,000 bonus for eight qualifying residential demand response events ($51,250 per event).
    - The portfolio-wide gross MW performance bonus is equal to the ratio of ex post gross MW achieved to the gross MW target of 229.8 MW, minus one (to develop a percentage), then multiplied by the core earnings opportunity target of $10.745 million. The gross MW for demand response is based on event season performance and will be measured the same for PY2022 as for PY2021.

Based on the framework outlined above, Ameren Missouri achieved the full Core Earnings Opportunity payout of $10.745 million but only met the Performance Bonus Earnings Opportunity target for demand response events, for a payout of $410,000. The portfolio did not meet its portfolio-wide gross MW target and was therefore not eligible for that portion of the performance bonus. The total estimated earnings opportunity payout is $11.155 million. Table 12 below shows the core earnings opportunity, including PY2022 spending performance, spending floors per each of the four program areas, and resulting total payouts. Table 13 shows the Performance Bonus Earnings Opportunity, including PY2022 performance, payout rates, and resulting total payouts.[6]

[6] Actual spending is preliminary and reflects expected total spend. Therefore, the achieved Earnings Opportunity is also preliminary. Ameren will update these values once all invoices related to PY2022 have been finalized.

Table 12. Core Earnings Opportunity

Core Earnings Opportunity	Actual	Floor Budget Spend	EO Payout Amount	Source of Actual
Residential	$24,249,700	$15,250,000	$0	Ameren General Ledger
PAYS	$986,668	$750,000	$0	Ameren General Ledger
Business	$28,404,525	$18,250,000	$0	Ameren General Ledger
Low-Income [a]	$13,933,477	$10,000,000	$0	Ameren General Ledger
Portfolio Spend [b]	**$70,167,085**	**N/A**	**$10,745,000**	Ameren General Ledger

[a] A penalty of $250,000 is incurred if the MFIE Program does not achieve 10% or greater Average Percent Energy Savings Per Property. As presented in Volume 2 and in Section 2.2 above, the program achieved 41% savings per property.

[b] The total portfolio spend includes additional expenditures not included in each subcomponent, such as evaluation costs.

Table 13. Performance Bonus Earnings Opportunity

Performance Bonus Metric	Actual	Payout Rate	Payout Metric	2022 Target	2022 Payout	Source of Evaluated Value
Qualifying Residential Demand Response Events	9 events	$51,250	$/event	8 events	$410,000	Vol 3. Figure 4
Portfolio-Wide Gross MW Target	205.58	$10,745,00 x (Actual/Target)	Actual/Target	229.83	$0.0	Sum of MW results in Vol 1. Table 2 and Vol 1. Table 10
Total Bonus	**N/A**	**N/A**	**N/A**	**N/A**	**$410,000**	

4. Cost-Effectiveness Results

The cost-effectiveness analysis compares the benefits of an energy efficiency or demand response program with the cost of delivering it, 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:[7]

- **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[8]

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 PY2022 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.

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

[8] 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.

Beginning in PY2022, we transitioned away from a measure life-based valuation of demand response impacts, effectively assigning a measure life of one year. Best practices in cost-effectiveness analysis explicitly treat energy efficiency programs and demand response differently. Specifically, the industry has come to recognize demand response as a dispatchable resource with the lifecycle value of benefits and costs tied to program operational goals rather than the technology measure life. The regulatory trend in performance measures has been to count the total available annual resource rather than the annual incremental additions in annual reconciliation proceedings. In these cases, "utilities can count load-management measures as having a one-year measure life; that is, they can count the same loads toward their goal each year rather than having to add new load-reduction measures."[9] Using a one-year measure life better aligns program benefits with program costs. Previously enrolled loads apply to program demand savings every year, recognizing the annual demand savings benefit without increasing demand reduction investment.[10]

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.

Overall, Ameren Missouri's combined portfolio of energy efficiency and demand response programs was cost-effective as delivered in PY2022, according to every test except the RIM test. The combined portfolio achieved a TRC score of 1.79 and a UCT score of 2.15. 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.[11]

Table 14 summarizes the cost-effectiveness results for all programs in the Low-Income, Residential, and Business portfolios.[12]

Table 14. Summary of PY2022 Income Eligible, Residential, and Business Program Cost-Effectiveness

Program	TRC	UCT	RIM	PCT
Income Eligible Portfolio				
MFIE	1.30	0.81	0.37	5.31
Community Lighting	1.74	0.98	0.38	n/a
SFIE	0.38	0.29	0.22	3.19
BSS	3.41	1.95	0.56	7.56
Income Eligible Total	**1.25**	**0.80**	**0.37**	**5.99**
Residential Portfolio				
HVAC	1.74	1.90	0.66	4.06
REP	1.24	1.36	0.53	3.94

[9] Rachel Gold, Amanda Myers, Michael O'Boyle, and Grace Relf, 2020, Performance Incentive Mechanisms for Strategic Demand Reduction, 2020, Report U200.
[10] Beville, R., and B. Howell. 2017. Examining the History of Texas Energy Efficiency Programs: The Effect of Changes in the EERS Goal.
[11] 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.
[12] For cost-effectiveness testing, the demand response programs are included in the respective Business and Residential portfolios.

Program	TRC	UCT	RIM	PCT
MFMR	1.59	1.61	0.58	4.47
PAYS	0.61	0.71	0.40	3.03
Residential Demand Response	1.33	0.93	0.92	n/a
Residential Total	**1.54**	**1.56**	**0.65**	**4.16**
Business Portfolio				
Standard	3.22	3.97	0.79	6.24
Custom	1.55	3.60	0.92	1.86
RCx	2.61	2.53	0.65	6.09
SBDI	3.02	2.51	0.61	8.00
Business Demand Response	1.44	1.44	1.36	n/a
Business Total	**2.10**	**3.53**	**0.87**	**3.07**
Portfolio				
Portfolio Total	**1.79**	**2.15**	**0.72**	**3.55**

Overall, Ameren Missouri's combined portfolio of energy efficiency programs generated $127 million in lifetime benefits at a cost of $71 million, resulting in $56 million in net benefits (based on the TRC test). The UCT test results in a higher total net benefit ($68 million). The Residential Portfolio generated just under $12 million of TRC-lifetime net benefits while the Business Portfolio generated $42.5 million.

Table 15 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.

Table 15. 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					
MFIE	$5,811,887	$4,458,307	$1,353,580	$7,154,725	-$1,342,838
Community Lighting	$1,471,365	$844,213	$627,152	$1,498,613	-$27,248
SFIE	$727,410	$1,903,482	-$1,176,071	$2,510,092	-$1,782,682
BSS	$1,610,671	$471,630	$1,139,041	$823,353	$787,318
Income Eligible Total	**$9,621,333**	**$7,677,631**	**$1,943,702**	**$11,986,784**	**-$2,365,450**
Residential Portfolio					
HVAC	$23,091,768	$13,237,790	$9,853,978	$12,165,571	$10,926,197
REP	$4,104,557	$3,317,634	$786,923	$3,015,589	$1,088,968
MFMR	$1,640,776	$1,033,174	$607,602	$1,020,755	$620,021
PAYS	$652,271	$1,069,222	-$416,951	$917,031	-$264,760
Residential Demand Response	$4,229,269	$3,187,439	$1,041,831	$4,561,236	-$331,966
Residential Total	**$33,718,642**	**$21,845,259**	**$11,873,383**	**$21,680,181**	**$12,038,460**
Business Portfolio					
Standard	$35,289,847	$10,950,373	$24,339,474	$8,894,149	$26,395,697

Program	Lifetime Benefits	TRC Test		UCT Test	
		Program Costs	Net Benefits	Program Costs	Net Benefits
Custom	$38,855,326	$25,035,395	$13,819,930	$10,801,181	$28,054,144
RCx	$798,547	$306,154	$492,393	$316,042	$482,505
SBDI	$3,121,096	$1,035,183	$2,085,913	$1,241,233	$1,879,863
Business Demand Response	$5,818,765	$4,053,310	$1,765,455	$4,053,310	$1,765,455
Business Total	**$83,883,580**	**$41,380,415**	**$42,503,165**	**$25,305,915**	**$58,577,665**
Portfolio					
Portfolio Total	**$127,223,555**	**$70,903,305**	**$56,320,249**	**$58,972,880**	**$68,250,675**

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