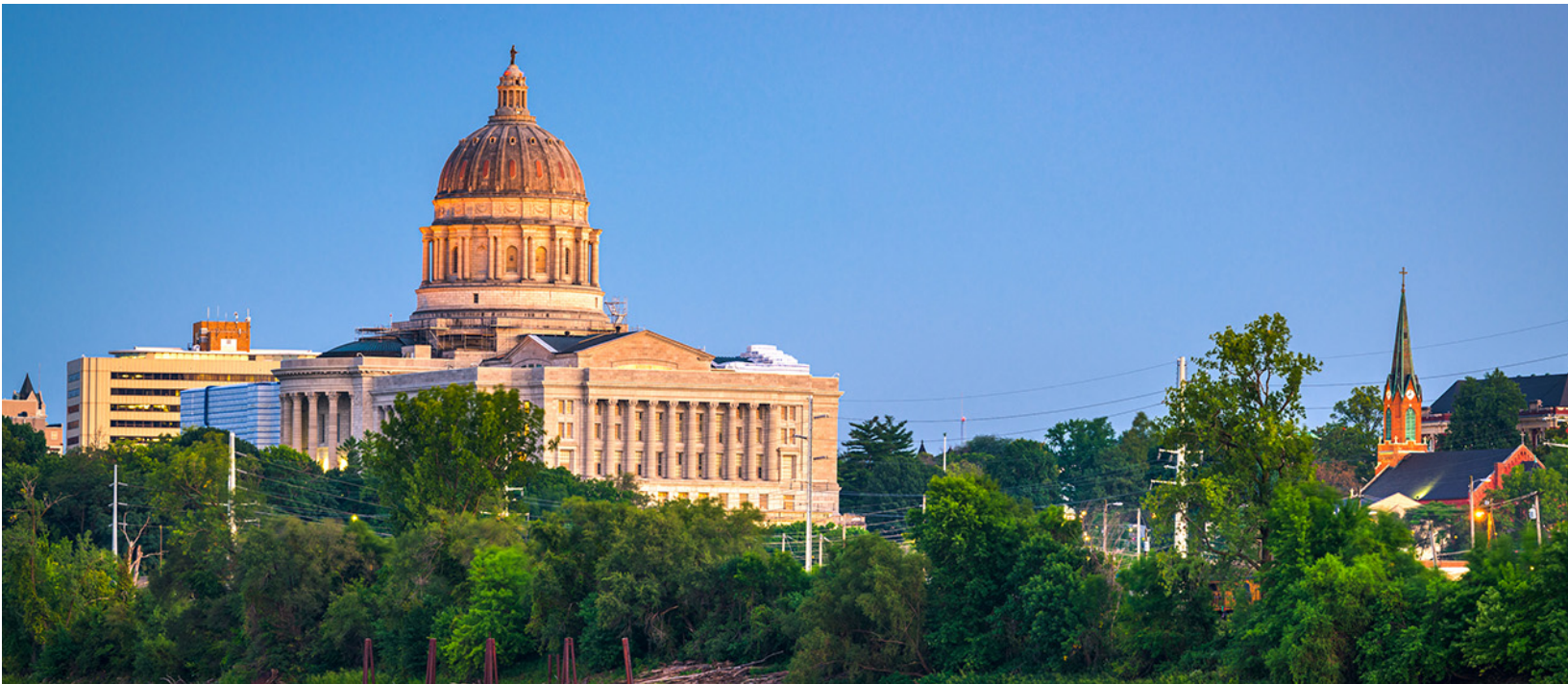




# Independent EM&V Audit of the Ameren Missouri PY2022 Program Evaluations



## Final Report

Submitted by Evergreen Economics

June 23, 2023



**Michaels**Energy



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# 1 Executive Summary

In 2022, Ameren Missouri continued implementing its Missouri Energy Efficiency Investment Act (MEEIA) Cycle 3 DSM Programs (Case No. EO-2018-00211). The programs covered in this audit include:

- **Heating and Cooling (HVAC)** – The Heating, Ventilation, and Air Conditioning (HVAC) Program obtains energy and demand savings through improvements in the operating performance of existing residential cooling units or replacement of central air conditioning (CAC) units and heat pumps. The program offers measures through two channels: a Downstream Channel that focuses on improving the efficiency of HVAC systems at the point of installation and a Midstream Channel that focuses on making super-efficient HVAC systems more broadly available to Ameren Missouri customers.
- **Residential Efficient Products (REP)** – This program is designed to raise customer awareness of the benefits of high-efficiency products and to educate residential customers to save energy cost-effectively.
- **Multifamily Market Rate (MFMR)** – The Multifamily Market Rate Program was designed to provide a one-stop-shop approach to assist owners and operators of multifamily Market Rate 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 (PAYS)** – The PAYS Program is a tariff on-bill financing offering that provides energy efficient measures including LEDs, domestic hot water, insulation, air sealing, and HVAC to residential customers. The program targets residential customers with energy usage higher than anticipated given housing characteristics.
- **Single-Family Income Eligible (SFIE)** – The Residential Single-Family Income Eligible Program, formerly known as the CommunitySavers Program, is designed to provide whole-home energy efficiency upgrades that result in long-term energy savings and bill reduction opportunities to low-income Ameren Missouri customers living in single family properties. The program includes two participation channels: (1) the Single-Family channel; (2) the Grant channel.
- **Multifamily Income Eligible (MFIE)** – The Multifamily Income Eligible Program is designed to deliver long-term energy savings and bill reduction opportunities to income eligible Ameren Missouri customers living in multifamily properties. Property owners and managers of multifamily properties with three or more units and high populations of low-income residents are targeted for the program.
- **Community LED Lighting Program** – The Community LED Lighting Program was launched in PY2022 by Ameren Missouri and is an upstream offering that provides discounted or free LEDs to income eligible communities throughout its service territory. Similar to the

Residential Lighting Program offered in previous MEEIA cycles, Ameren Missouri continued to offer the rebates through the Discount Retailer channel. Additionally, a new delivery channel was introduced, which provides free LEDs to residential customers through partnerships with foodbanks located in communities with high concentrations of income eligible customers.

- **Business Social Services (BSS)** – This program targets commercial, nonprofit, and tax-exempt business customers that provide social services to the low-income public in federally designated opportunity zones. The program provides lighting and other measures at low- or no-cost to social services business customers with qualifying facilities.
- **Business Portfolio** – Designed to help businesses identify and implement energy saving projects, the Business portfolio includes the Custom, Standard, Retro-Commissioning, and Small Business Direct Install programs.
- **Demand Response** – The Residential and Business Demand Response programs are designed to control the cooling load with the help of smart thermostats to achieve peak demand savings and energy savings.

Ameren Missouri contracted with Opinion Dynamics and its subcontractors to conduct comprehensive impact and process evaluations of Ameren Missouri’s energy efficiency portfolio for Program Year 2022 (PY2022).<sup>1</sup>

In 2022, the Missouri Public Service Commission (PSC) contracted with the Evergreen Economics team to serve in the capacity of Independent Auditor to review the evaluation, measurement, and verification (EM&V) work undertaken by the Opinion Dynamics evaluation team. Figure 1 shows the audit team members and organization, the individual team members by firm, and the associated audit responsibilities.

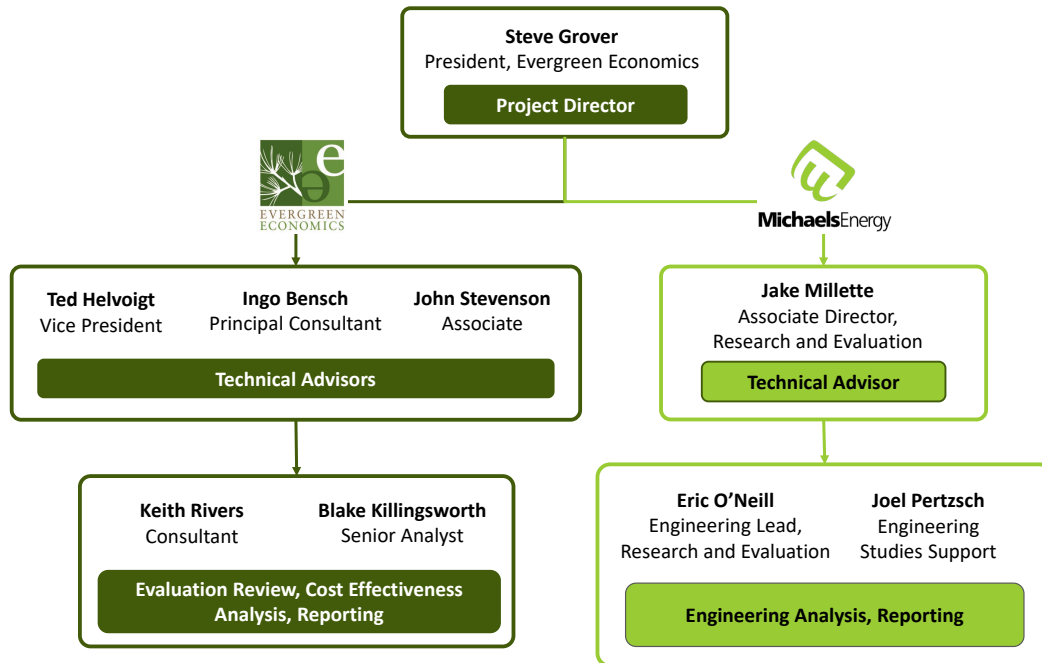
The audit team is required to review program evaluation activities and provide comments on compliance with 4 CSR 240-22.070(8) and the overall quality, scope, and accuracy of the program evaluation reports, as well as recommendations to improve the evaluation and reporting process.

A review of the PY2022 evaluation indicates that all evaluation reports are well written, complete, and meet the minimum requirements for impact and process evaluations stipulated in 4 CSR 240-22.070(8).

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<sup>1</sup> In accordance with “Stipulation PY2022” process evaluations were not conducted for PY2022 programs with the exception of the PAYS program.

**Figure 1: Evergreen Audit Team Organization**



## 1.1 Summary of Audit Conclusions and Recommendations

Over the last year, the audit team has had several meetings with Opinion Dynamics on analysis methods and were able to reach an agreement on a few remaining evaluation issues. Opinion Dynamics has also addressed the comments the audit team made on a draft version of the PY2022 evaluation report. As a consequence, we have no additional comments or recommendations relating to the PY2022 evaluation.

Many of the audit issues in prior years were related to net impact estimation methods. For PY2022, however, the unanimous stipulation agreement directed the evaluation to use a net-to-gross ratio of 0.825 for most programs, while maintaining the existing 1.0 net-to-gross ratio assigned to the low income programs. As a result, there were no net impact issues remaining for the audit team to address in the current evaluation report. Opinion Dynamics will be conducting new net impact research in the coming months, and the audit team will review and comment on these results once they are available for review.

Our sole recommendation is that all the evaluation reports include the comparison tables of net savings with the net savings goals established for Ameren MO. The net savings/net goals tables were included in prior years' reports but were omitted from the PY2022 reports. We recommend that these be reinstated in PY2023 and beyond, as net savings (rather than gross savings) are a key determinant of program cost effectiveness.

## 2 Introduction

The Missouri Energy Efficiency Investment Act (MEEIA) was passed in 2009, launching a new era for energy efficiency programs in Missouri. The Missouri Public Service Commission (the PSC) adopted four administrative rules (4 CSR 240-3.163, 4 CSR 240-3.164, 4 CSR 240-20.093, and 4 CSR 240-20.094, referred to as “MEEIA rules”) to implement MEEIA.<sup>2</sup> MEEIA directs the PSC to permit electric corporations to implement PSC-approved demand side management (DSM) programs, with a goal of achieving cost-effective demand-side savings.

In 2009, the State of Missouri and Ameren Missouri reached an agreement to create Ameren Missouri’s suite of residential and commercial energy efficiency programs, which began in 2013 as MEEIA Cycle 1. The MEEIA Cycle 1 programs ended on December 31, 2015 for Ameren Missouri (Case No. EO-2012-0142). In early 2016, the PSC approved MEEIA Cycle 2 DSM programs for Ameren Missouri (Case No. EO-2015-0055). All Cycle 2 programs were implemented no later than the second quarter of 2016 and ended by February 28, 2019. In 2019, Ameren Missouri began implementing its Missouri Energy Efficiency Investment Act (MEEIA) Cycle 3 DSM Programs (Case No. EO-2018-00211).

The MEEIA Cycle 3 programs covered in this audit include:

- **Heating and Cooling (HVAC)** – The Heating, Ventilation, and Air Conditioning (HVAC) Program obtains energy and demand savings through improvements in the operating performance of existing residential cooling units or replacement of central air conditioning (CAC) units and heat pumps. The program offers measures through two channels: a Downstream Channel that focuses on improving the efficiency of HVAC systems at the point of installation and a Midstream Channel that focuses on making super-efficient HVAC systems more broadly available to Ameren Missouri customers.
- **Residential Efficient Products (REP)** – This program is designed to raise customer awareness of the benefits of high-efficiency products and to educate residential customers to save energy cost-effectively.
- **Multifamily Market Rate (MFMR)** – The Multifamily Market Rate Program was designed to provide a one-stop-shop approach to assist owners and operators of multifamily Market Rate 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 (PAYS)** – The PAYS Program is a tariff on-bill financing offering that provides energy efficient measures including LEDs, domestic hot water, insulation, air

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<sup>2</sup> The PSC is currently in the process of revising the MEEIA rules.

sealing, and HVAC to residential customers. The program targets residential customers with energy usage higher than anticipated given housing characteristics.

- **Single-Family Income Eligible (SFIE)** – The Residential Single-Family Income Eligible Program, formerly known as the CommunitySavers Program, is designed to provide whole-home energy efficiency upgrades that result in long-term energy savings and bill reduction opportunities to low-income Ameren Missouri customers living in single family properties. The program includes two participation channels: (1) the Single-Family channel; (2) the Grant channel.
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- **Community LED Lighting Program** – The Community LED Lighting Program was launched in PY2022 by Ameren Missouri and is an upstream offering that provides discounted or free LEDs to income eligible communities throughout its service territory. Similar to the Residential Lighting Program offered in previous MEEIA cycles, Ameren Missouri continued to offer the rebates through the Discount Retailer channel. Additionally, a new delivery channel was introduced, which provides free LEDs to residential customers through partnerships with foodbanks located in communities with high concentrations of income eligible customers.
- **Business Social Services (BSS)** – This program targets commercial, nonprofit, and tax-exempt business customers that provide social services to the low-income public in federally designated opportunity zones. The program provides lighting and other measures at low- or no-cost to social services business customers with qualifying facilities.
- **Business Portfolio** – Designed to help businesses identify and implement energy saving projects, the Business portfolio includes the Custom, Standard, Retro-Commissioning, and Small Business Direct Install programs.
- **Demand Response** – The Residential and Business Demand Response programs are designed to control the cooling load with the help of smart thermostats to achieve peak demand savings and energy savings.

To ensure that programs comply with Missouri’s rules regarding electric utility resource planning, the PSC has long-term resource planning rules that contain requirements for impact evaluations and process evaluations. The goal of the impact and process evaluations is “to develop the information necessary to evaluate the cost-effectiveness and improve the design of existing and future demand-side programs and demand-side rates, to improve the forecasts of customer energy consumption and responsiveness to demand-side programs and demand-side rates and to gather data on the implementation costs and load impacts of demand-side programs and demand-



side rates for use in future cost-effectiveness screening and integrated resource analysis.”<sup>3</sup> Additionally, in accordance with “Stipulation PY2022” there were no process evaluations conducted for existing programs with the exception of the Pay As You Save program.

Key requirements of the evaluations as outlined in 4 CSR 240-22.070(8) include the following:

- Utilities are expected to complete annual full process and impact evaluations for each DSM program.
- At a minimum, impact evaluations should
  1. “develop methods of estimating the actual load impacts of each demand-side program” using one or both of the following methods:
    - a. Comparisons of pre-adoption and post-adoption loads of program participants, corrected for the effects of weather and other intertemporal differences”; and
    - b. “Comparisons between program participants’ loads and those of an appropriate control group over the same time period”.
  2. “develop load-impact measurement protocols that are designed to make the most cost-effective use of the following types of measurements, either individually or in combination: monthly billing data, load research data, end-use load metered data, building and equipment simulation models, and survey responses or audit data on appliance and equipment type, size and efficiency levels, household or business characteristics, or energy-related building characteristics”.
  3. Develop protocols to collect data regarding demand-side program market potential, participation rates, utility costs, participant costs, and total costs.
- At a minimum, the following five questions should be addressed:
  1. What are the primary market imperfections that are common to the target market segment?
  2. Is the target market segment appropriately defined or should it be further subdivided or merged with other segments?
  3. Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target segment?
  4. Are the communication channels and delivery mechanisms appropriate for the target segment?
  5. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?

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<sup>3</sup> 4 CSR 240-22.070(8) Evaluation of Demand-Side Programs and Demand-Side Rates

Ameren Missouri contracted with Opinion Dynamics and its subcontractors to conduct comprehensive impact and process evaluations of Ameren Missouri’s energy efficiency portfolio for Program Year 2022 (PY2022).<sup>4</sup>

In 2022, the PSC contracted with Evergreen Economics and Michaels Energy (the Evergreen team) to serve in the capacity of EM&V Auditor to review program evaluation activities. The audit involved verifying compliance with 4 CSR 240-22.070(8) in addition to assessing the overall quality, scope, and accuracy of the program evaluation reports. The following report presents the Evergreen team’s review of the Ameren Missouri program evaluations for program year 2022 (PY2022).

To conduct this review, the Evergreen team conducted the following activities:

- Reviewed each program’s evaluation report in its entirety, including impact, process, and cost effectiveness methodologies and results;
- Reviewed the evaluation survey instruments and responses (where available) to confirm that the methodologies used were reasonable and consistent with best practices and that reported findings aligned with the data collected; and
- Reviewed specific evaluation tools and methodologies used for calculating program savings, including selected measure-level savings calculations.

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<sup>4</sup> In accordance with “Stipulation PY2022” process evaluations were not conducted for PY2022 programs with the exception of the PAYS program.



## 3 Impact Evaluation Summary

This section summarizes the key findings and recommendations from the impact evaluations of Ameren Missouri's low-income, residential, and business energy efficiency program portfolio.

### 3.1 Summary of Impact Evaluation Methods and Results

The evaluation teams conducted an array of impact evaluation approaches summarized by program below.

#### *Single Family Income-Eligible*

The Residential Single-Family Income-Eligible program is designed to provide whole-home energy efficiency upgrades to low-income customers living in single family properties. The program includes two participation channels: (1) the Single-Family channel; (2) the Grant channel.

Evaluation activities included program material and tracking systems reviews, an engineering analysis to verify ex ante savings values and estimate ex post gross impacts using Missouri Statewide Technical Reference Manual (TRM) algorithms, and interviews with the program manager and implementation staff.

#### *Multifamily Income-Eligible*

The Multifamily Income-Eligible program is designed to offer a one-stop-shop approach to assist 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. Eligible measures include lighting, HVAC, building shell, domestic hot water, and refrigeration measures.

Evaluation activities included program material and database reviews, an engineering analysis to verify ex ante savings values and estimate ex post gross impacts using Missouri Statewide Technical Reference Manual (TRM) algorithms, a net impact analysis, and interviews with the program manager and implementation staff.

#### *Business Social Services Program*

The Business Social Services (BSS) Programs 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 end uses.

PY2022 evaluation activities included reviewing program materials, an engineering analysis for lighting measures, and interviews with the program manager and implementation staff.

### *Efficient Products Program*

The Efficient Products Program is an umbrella program that incorporates various program partners, products, and program delivery strategies and is flexible by design. As the program evolves and program performance is tracked, Ameren Missouri may revise the assortment of eligible measures, incentive amounts, or qualification criteria. As in past years, the Efficient Products Program used two delivery channels including the downstream Mail-In channel and Online Store channel. However, the Online Store channel is the path that almost all participating Ameren Missouri customers use. The following measures are offered through the program:

- Advanced thermostats
- Tier 1 power strips
- Tier 2 power strips
- ENERGY STAR-certified heat pump water heaters (HPWHs)

A total of 18,156 rebates were delivered to Ameren Missouri participants for the Efficient Products Program in PY2022.

Evaluation activities included program material and database reviews, an engineering analysis to verify ex ante savings values and estimate ex post gross impacts using Missouri Statewide Technical Reference Manual (TRM) algorithms, and program manager and implementation staff interviews.

### *Heating Ventilation and Air Conditioning (HVAC) Program*

The Heating, Ventilation, and Air Conditioning (HVAC) Program obtains energy and demand savings through improvements in the operating performance of existing residential cooling units or replacement of central air conditioning (CAC) units and heat pumps. The program offers measures through two channels: a Downstream Channel that focuses on encouraging improving the efficiency of HVAC systems at the point of installation and a Midstream Channel that focuses on making super-efficient HVAC systems more broadly available to Ameren Missouri customers.

For the impact evaluation, Opinion Dynamics began reviewing program-tracking data in order to identify variables necessary for impact calculations. To calculate verified gross energy and demand savings, Opinion Dynamics used engineering algorithms and the Missouri Statewide Technical Reference Manual (TRM).

Furthermore, the evaluation team conducted surveys and interviews for the PY2022 evaluation. These surveys sought to verify measure installation to develop in-service rates (ISR), develop

estimates of early replacement (ER), and estimate free ridership for potential prospective application.

### *Multifamily Market Rate Program*

In PY2022, Ameren Missouri continued to deliver the Multifamily Market Rate Program, which was a new program in PY2019. The program is designed to provide a one-stop-shop approach to assist owners and operators of multifamily Market Rate properties to overcome barriers to completing comprehensive retrofits.

PY2022 evaluation activities for the Multifamily Market Rate Program included reviewing program materials and the program tracking database, an engineering analysis, and interviews with program manager and implementation staff. To calculate verified gross energy and demand savings, Opinion Dynamics used engineering algorithms and the Missouri Statewide Technical Reference Manual (TRM).

### *Pay As You Save (PAYS) Program*

The PAYS program is a tariff on-bill financing. The program provides energy efficient measures including LEDs, domestic hot water, insulation, air sealing, and HVAC to residential customers. The program targets residential customers with energy usage higher than anticipated given housing characteristics.

The evaluation activities for PY2022 included program manager and implementer interviews, program material review, participant and non-participant surveys, trade ally interviews, and an impact review.

### *Community Lighting*

The Community Lighting program is new to PY2022 and is an upstream offering that provides discounted or free LEDs to income eligible communities throughout its service territory. The program offers LEDs through the Discount Retailer channel and through partnerships with foodbanks located in communities with high concentrations of income eligible customers.

The evaluation activities included interviews with the program manager and implementation staff, program material review, and an engineering analysis to calculate verified gross energy and demand savings.

### *Standard Incentive Program*

The Standard program is designed to promote energy awareness and installation of energy-efficient technologies or services by providing incentives to offset the higher cost associated with completing these projects. The program provides incentives for a range of prescriptive measures.

The PY2022 evaluation included an engineering analysis of lighting measures, engineering desk reviews, and onsite verification for select end uses. Evaluation activities also included a program material review and prospective attribution analysis.

### *Custom Incentive Program*

The Custom program is designed to promote energy awareness and installation of energy-efficient technologies or services by providing incentives to offset the higher cost associated with completing these projects. The program applies to measures that are not deemed and do not fall under the Standard Program.

The PY2022 evaluation of the Custom program included engineering desk reviews and onsite verification for select end uses. Evaluation activities also included a program material review and prospective attribution analysis.

### *Retro-Commissioning Program*

The Retro-Commissioning Program (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 most common optimization measures involve compressed air, refrigeration, and building systems.

Opinion Dynamics conducted interviews with program managers and implementers before and after the program to inform evaluation planning and analysis. In addition, the evaluation team conducted engineering desk reviews and on-site verifications, reviewing supporting project documentation for a sample of projects to ensure that original data were correctly entered from invoices and other documentation.

### *Small Business Direct Install (SBDI) Program*

The SBDI Program is designed to promote the installation of energy-efficient technologies in small businesses by removing barriers such as high upfront cost, lack of knowledge, and lack of time and resources to investigate energy efficiency opportunities.

Opinion Dynamics conducted interviews with program managers and implementers before and after the program to inform evaluation planning and analysis. Additionally, an engineering analysis was conducted for lighting measures to develop ex post savings using TRM algorithms.

## **3.1.1 Portfolio Level Findings**

In this section, we provide a summary of the energy savings goals and accomplishments across Ameren Missouri's PY2022 energy efficiency program portfolio, as reported by the evaluation teams.

Table 1 and Table 2 show Ameren Missouri's energy efficiency targets, *ex ante* gross values, *ex post* gross values, the *ex post* net savings (evaluated) and gross achievement compared to the targets for energy savings (MWh) and demand reductions (MW), respectively. To ensure clarity, these terms are defined as follows:

- **PSC-Approved Targets:** Annualized savings targets for the residential and commercial and industrial (C&I) sectors.
- **Ex Ante Gross Savings:** Annualized savings reported by Ameren Missouri or calculated using tracked program activity and the Ameren Missouri TRM savings values.
- **Ex Post Gross Savings:** Annualized savings calculated and provided by the evaluation team.
- **Ex Post Net Savings:** *Ex post* gross savings multiplied by the net-to-gross ratio, accounting for free ridership, participant spillover, and non-participant spillover.
- **Net-to-Gross (NTG) Ratio:** *Ex post* net savings divided by *ex post* gross savings.

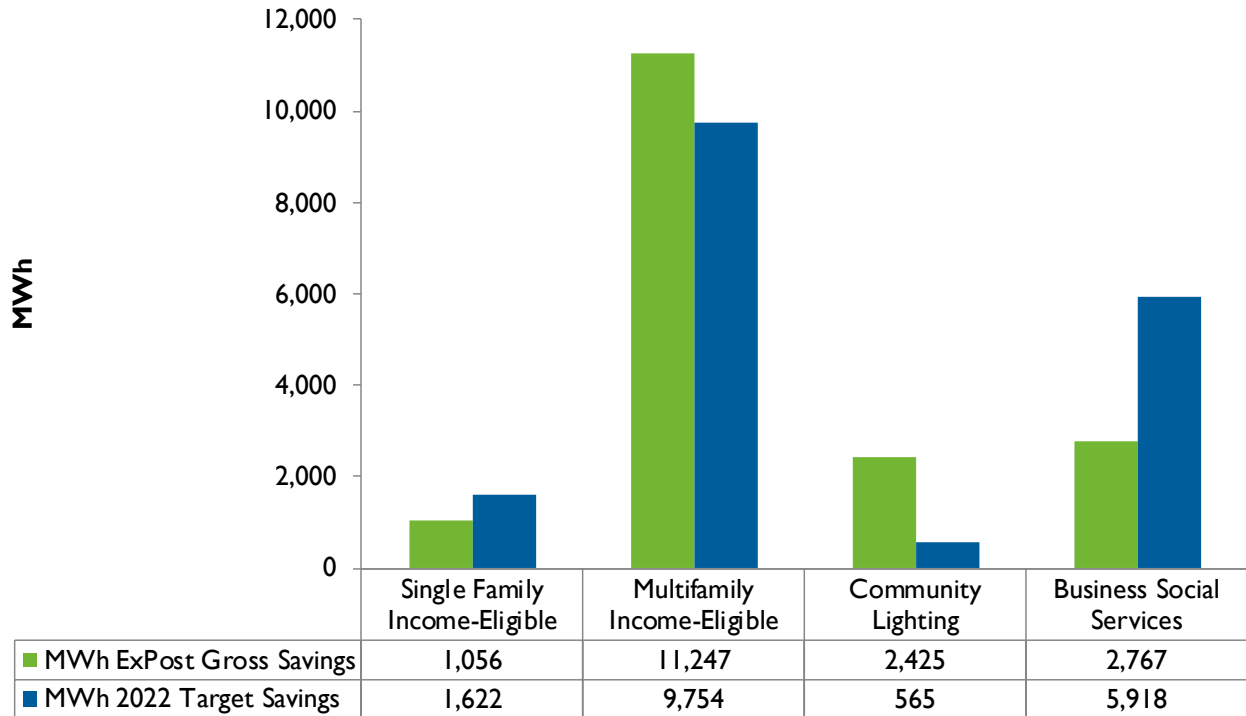
Table 1: Ameren Missouri Portfolio Energy Savings in PY2022, MWh

Program	PSC – Approved Gross Targets	<i>Ex Ante</i> Gross Savings	<i>Ex Post</i> Gross Savings	<i>Ex Post</i> Net Savings	NTG Ratio	% of Gross Target Reached
Single Family Income-Eligible	1,622	1,110	1,056	1,056	100%	65%
Multifamily Income-Eligible	9,754	12,086	11,247	11,247	100%	115%
Community Lighting	565	2,625	2,425	2,425	100%	429%
Business Social Services	5,918	2,699	2,767	2,767	100%	47%
<b>Total Low-Income Portfolio</b>	<b>17,859</b>	<b>18,520</b>	<b>17,495</b>	<b>17,495</b>	<b>100%</b>	<b>98%</b>
HVAC	33,087	38,158	30,668	25,301	83%	93%
Efficient Products	10,161	8,070	8,050	6,641	83%	79%
Multifamily Market Rate	4,319	2,801	2,621	2,162	83%	61%
Pay As You Save	8,735	1,016	899	741	83%	10%
<b>Total Residential Portfolio</b>	<b>56,302</b>	<b>50,045</b>	<b>42,237</b>	<b>34,846</b>	<b>83%</b>	<b>75%</b>
Standard	61,072	61,344	59,902	49,419	83%	98%
Custom	77,722	68,396	56,375	46,509	83%	73%
Small Business Direct Install	11,777	6,307	6,216	5,128	83%	53%
Retro-Commissioning	8,111	2,066	2,042	1,684	83%	25%
<b>Total C&amp;I Portfolio</b>	<b>158,681</b>	<b>138,112</b>	<b>124,535</b>	<b>102,741</b>	<b>83%</b>	<b>78%</b>
<b>Total</b>	<b>232,842</b>	<b>206,678</b>	<b>184,266</b>	<b>155,081</b>		<b>79%</b>

The low-income portfolio did not meet the target savings goal, achieving 98 percent of the gross savings target. While the Multifamily Income-Eligible and Community Lighting programs surpassed their savings target by 115 percent and 429 percent, respectively, the Single-Family Income-Eligible program achieved 65 percent of its savings target and the Business Social Services program only achieved 47 percent (Figure 2).

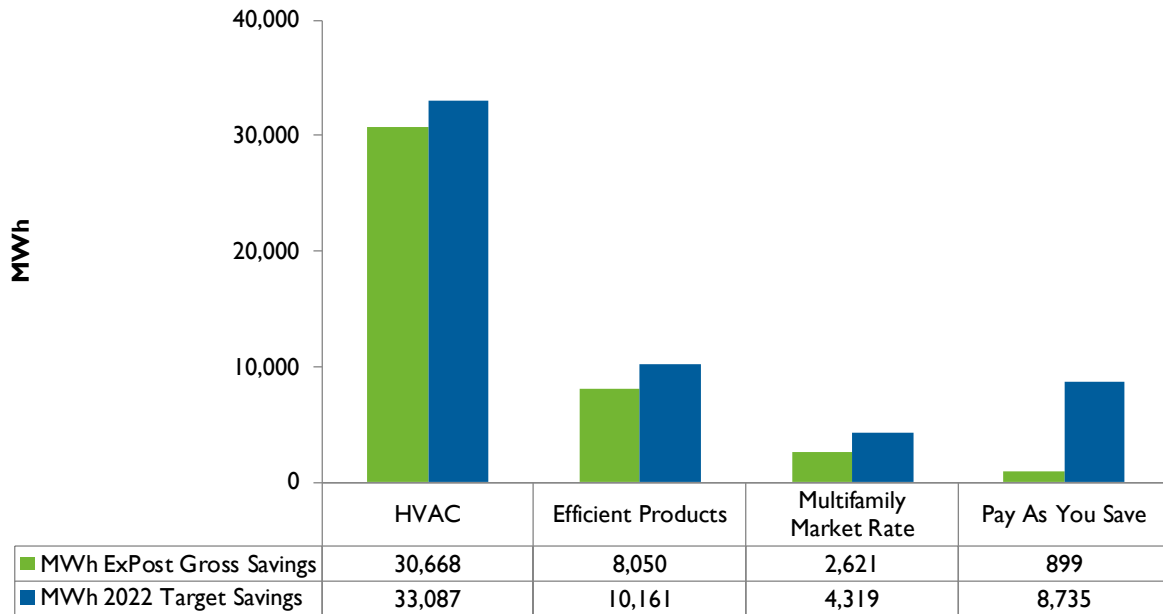


**Figure 2: Low-Income Programs Planned and Evaluated Savings: PY2022 MWh**



The residential portfolio also did not achieve the target savings goal, achieving 75 percent of the gross savings target. The HVAC program had the highest savings relative to its target, meeting 93 percent of its goal. The Pay As You Save program achieved the lowest savings relative to its target, meeting only 10 percent of its goal (Figure 3).

**Figure 3: Residential Programs Planned and Evaluated Savings: PY2022 MWh**



The 2022 C&I portfolio did not meet its approved targets, achieving 78 percent of the gross savings target. The Standard program came the closest to meeting its goal, achieving 98 percent of its target. The Retro-Commissioning program was the lowest achieving program in relation to its goal, meeting 25 percent of its target (Figure 4).

**Figure 4: C&I Programs Planned and Evaluated Savings: PY2022 MWh**

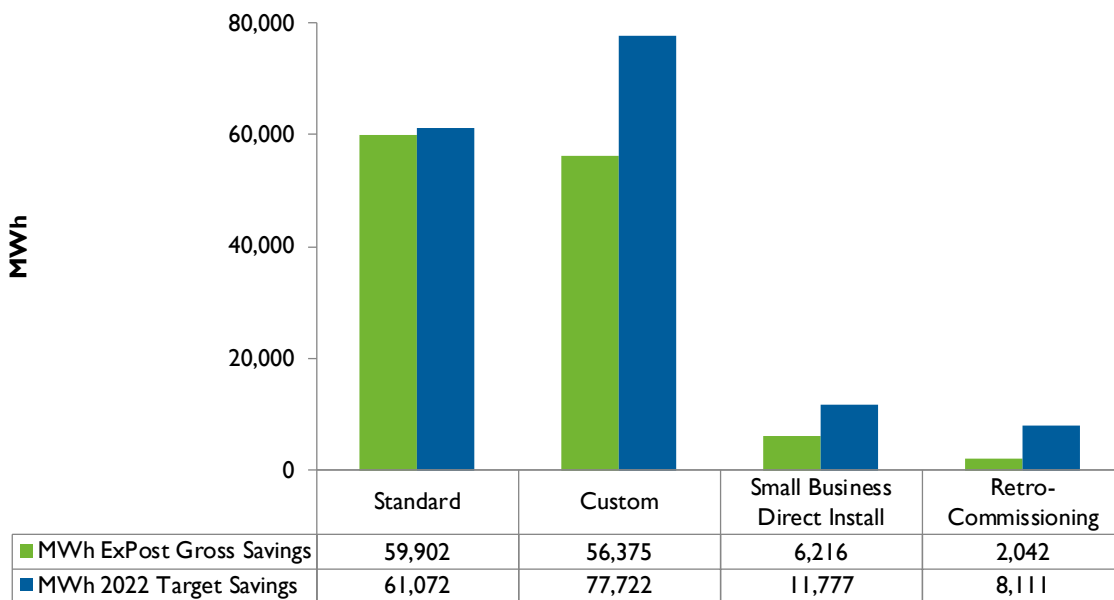


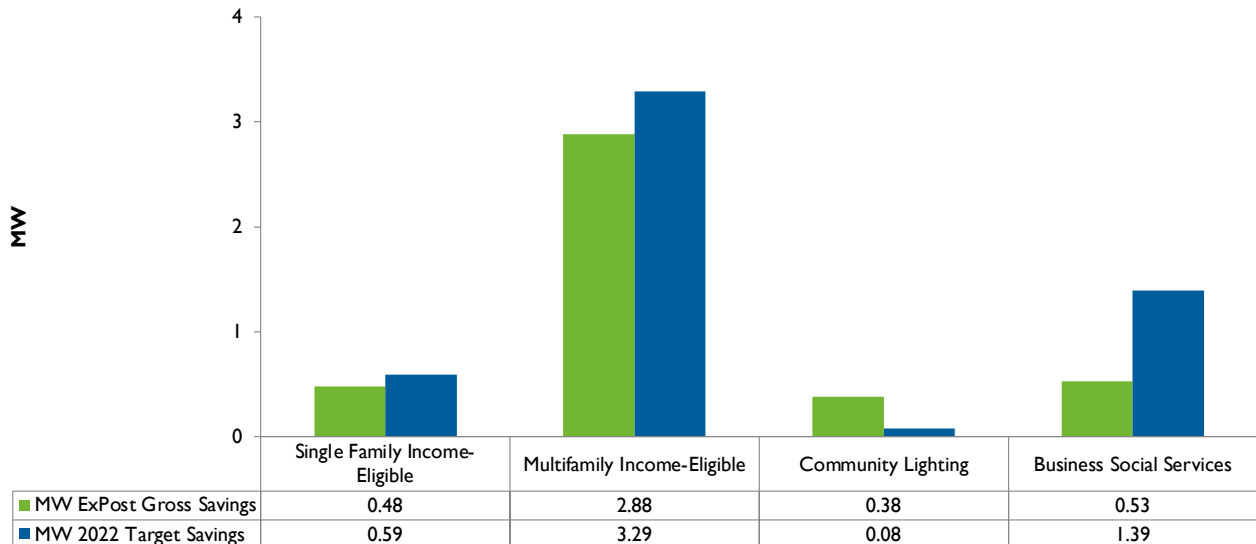
Table 2 displays approved targets for demand savings.

**Table 2: Ameren Missouri Portfolio Demand Savings in PY2022, MW**

Program	PSC – Approved Gross Targets	<i>Ex Ante</i> Gross Savings	<i>Ex Post</i> Gross Savings	<i>Ex Post</i> Net Savings	NTG Ratio	% of Gross Target Reached
Single Family Income-Eligible	0.59	0.49	0.48	0.48	100%	81%
Multifamily Income-Eligible	3.29	7.34	2.88	2.88	100%	88%
Community Lighting	0.08	0.41	0.38	0.38	100%	470%
Business Social Services	1.39	0.51	0.53	0.53	100%	38%
<b>Total Low-Income Portfolio</b>	<b>5.35</b>	<b>8.75</b>	<b>4.26</b>	<b>4.26</b>	<b>100%</b>	<b>80%</b>
HVAC	17.23	25.49	19.72	16.27	83%	114%
Efficient Products	3.36	2.97	2.97	2.45	83%	88%
Multifamily Market Rate	1.52	1.19	1.12	0.93	83%	74%
Pay As You Save	4.07	0.41	0.37	0.30	83%	9%
<b>Total Residential Portfolio</b>	<b>26.18</b>	<b>30.06</b>	<b>24.17</b>	<b>19.94</b>	<b>83%</b>	<b>92%</b>
Standard	12.20	16.63	17.24	14.23	83%	141%
Custom	22.60	27.23	19.92	16.43	83%	88%
Small Business Direct Install	2.12	1.20	1.22	1.01	83%	58%
Retro-Commissioning	2.97	0.41	0.40	0.33	83%	13%
<b>Total C&amp;I Portfolio</b>	<b>39.89</b>	<b>45.47</b>	<b>38.78</b>	<b>31.99</b>	<b>83%</b>	<b>97%</b>
<b>Total</b>	<b>71.42</b>	<b>84.27</b>	<b>67.22</b>	<b>56.20</b>		<b>94%</b>

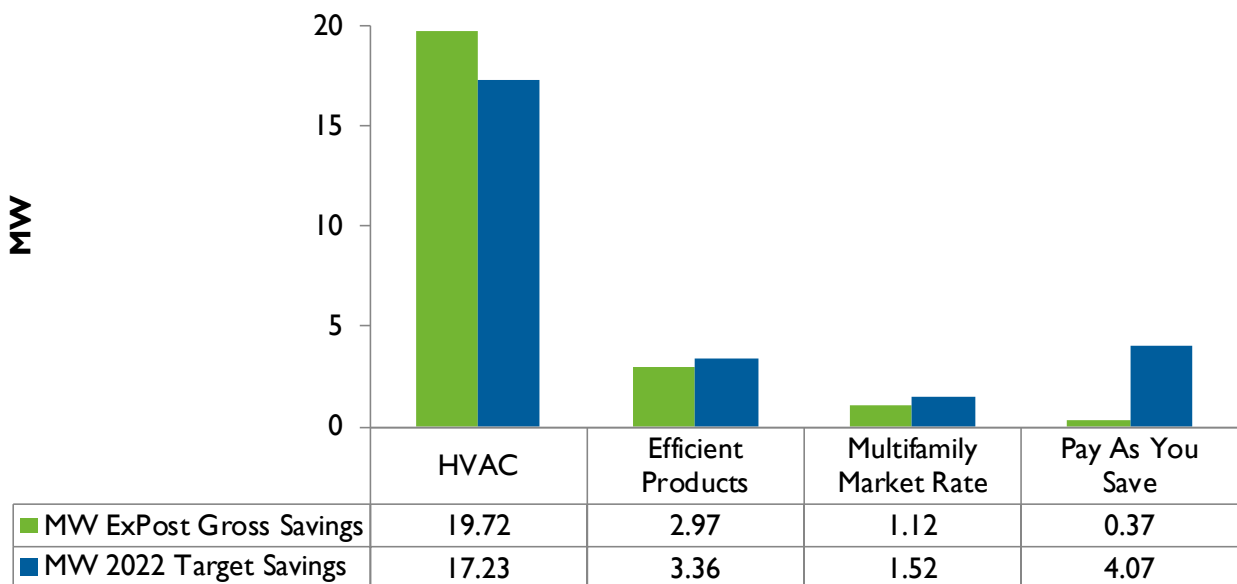
The low-income portfolio did not reach its demand savings targets, achieving 80 percent of target savings. The Community Lighting program was the only low-income program to exceed its goal, achieving 470 percent of its target. The three other low-income programs did not meet their target goals, with the Multifamily Income-Eligible achieving 88 percent of their target, followed by Single-Family Income-Eligible meeting 81 percent of their goal, and Business Social Services achieving 38 percent of their target goal (Figure 5).

**Figure 5: Low-Income Programs Planned and Evaluated Savings: PY2022 MW**



The residential portfolio also did not meet its demand target, achieving 92 percent of gross target savings. The HVAC program performed best, achieving 114 percent of its demand goals. The Pay As You Save program performed the worst relative to its gross target savings, meeting only nine percent of its goal (Figure 6).

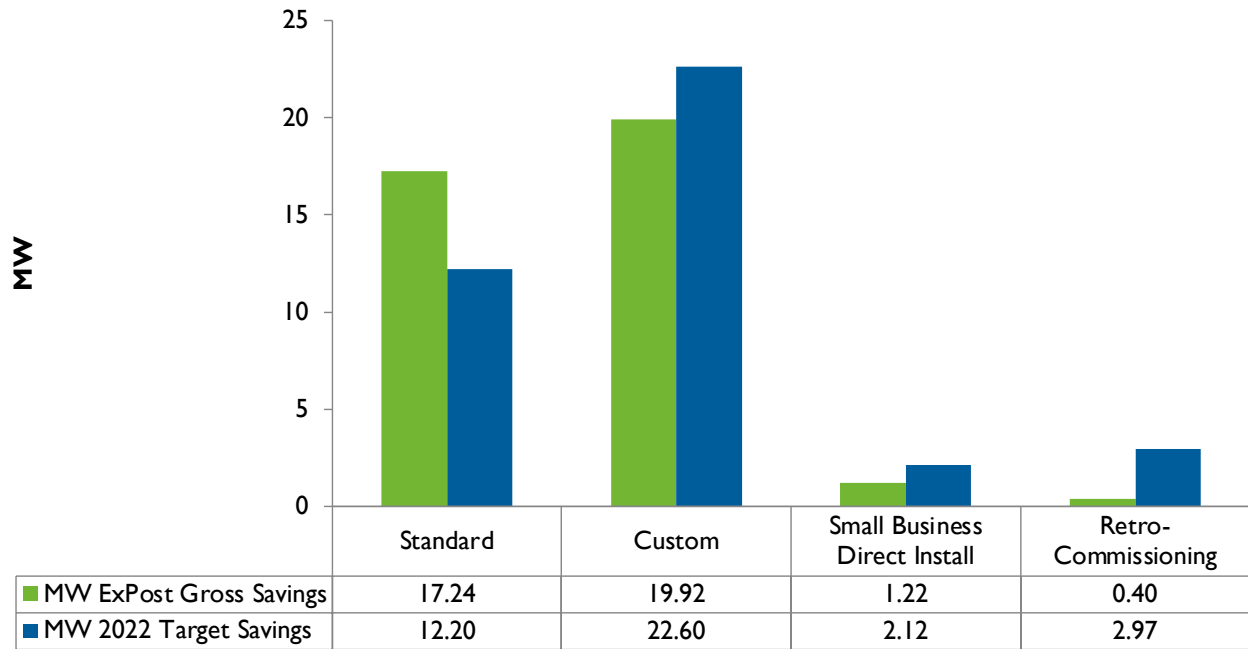
**Figure 6: Residential Programs Planned and Evaluated Savings: PY2022 MW**



The 2022 C&I portfolio did not achieve its gross demand target, achieving 97 percent of its target demand savings. The Standard Program performed the best, achieving 141 percent of its target demand savings goals. The rest of the C&I programs did not meet their demand savings goals, with

the lowest program achieving 13 percent of its demand target (the Retro-Commissioning program; Figure 7).

**Figure 7: C&I Programs Planned and Evaluated Savings: PY2022 MW**

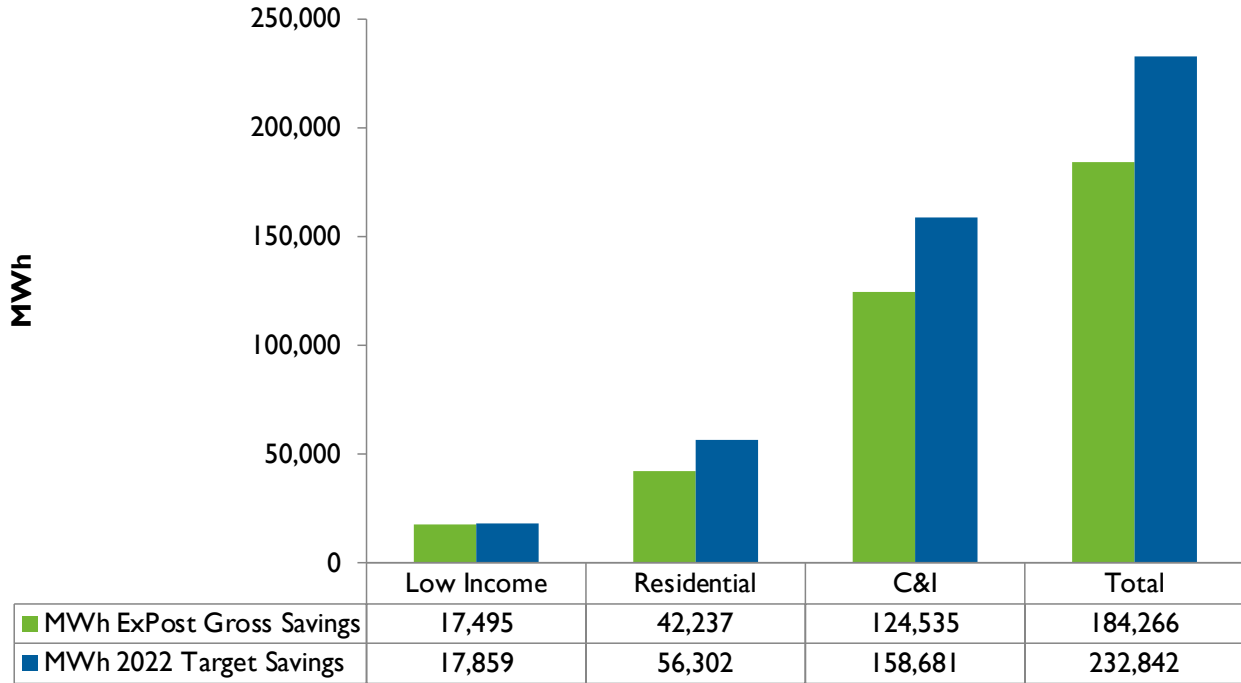


The following figures present summaries of program achievements in comparison with program goals. Figure 8 and

Figure 9 display the PY2022 energy and demand savings targets and achievements by sector, as reported by evaluators.

The PY2022 portfolio had a gross target energy savings goal of 232,842 MWh and actual gross savings of 184,266 MWh, equating to approximately 79 percent of the program year gross energy goal. All three portfolios fell short of meeting their PY2022 gross targets (Figure 8).

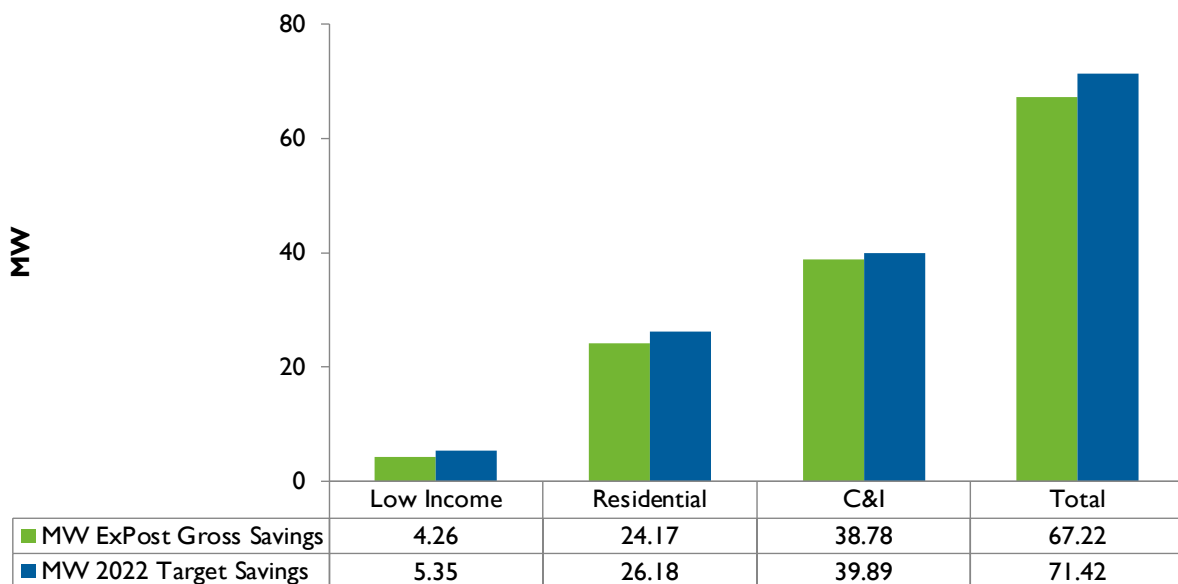
**Figure 8: Energy Savings and Achievements by Sector: PY2022 MWh**



Finally, PY2022 had a gross target demand savings goal of 71.42 MW and actual gross savings of 67.22 MW, equating to approximately 94 percent of the year's demand goal. Similar to the energy savings goals, all three portfolios fell short of meeting their PY2022 gross targets. (

Figure 9).

**Figure 9: Demand Savings Targets and Achievements by Sector: PY2022 MW**





## 4 Process Evaluation Summary

In accordance with “Stipulation PY2022” there were no process evaluations conducted for existing programs with the exception of the Pay As You Save program. However, to meet the requirements for demand-side process evaluations as set by the Public Service Commission in 4 CSR 240-22.070(8),<sup>5</sup> the evaluation team did respond to the five required process evaluation questions, which are as follows:

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

The audit team found that the evaluation team provided substantive, updated responses to the five key questions that are clearly linked to the most recent evaluation findings. Each program evaluation provided a response to all five questions, and the full text response to these questions is provided as Appendix A to this report.

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<sup>5</sup> *Rules of Department of Economic Development, Division 240 - Public Service Commission, Chapter 22 - Electric Utility Resource Planning*. 2011. <https://www.sos.mo.gov/cmsimages/adrules/csr/current/4csr/4c240-22.pdf>

## 5 Review of Cost Effectiveness

The Evergreen team reviewed low-income, residential, and business summary findings from the portfolio reports and the appropriate DSMore output files. This process involved reviewing the low-income, residential, and business program DSMore aggregate files to confirm that calculations were performed correctly. This review was similar to those conducted in prior audits, with specific tasks including the following:

- Confirm that the reported program summary values matched those in the DSMore results file;
- Confirm that the reported costs matched the costs included in the DSMore input files (both incentive and overhead);
- Report current (PY2022) program results and compare against previous year results (PY2021).

### *Confirm summary values reported matched the values in the DSMore results files*

The Evergreen team reviewed the reported summary cost-effectiveness values as well as the net lifetime benefit and cost of conserved energy values to confirm the reported values matched the DSMore aggregate file results. The review consisted of checking all five cost-effectiveness tests for both the residential and business portfolio files. No discrepancies were found.

### *Confirm that the reported costs matched the costs input into the DSMore cost-effectiveness input files (both incentive and overhead);*

The Evergreen team reviewed the costs reported in each DSMore aggregate file for each program and compared them against the reported costs in the evaluation reports. No discrepancies were found.

Table 3 presents the total net lifetime benefits from low-income, residential, and business programs reported in the PY2022 EM&V reports and compares the current year net benefits to previously reported PY2021 net benefits totals.



**Table 3: Net Lifetime Benefits per Program**

Program	Net UCT Lifetime Benefit (Reported) 2021	Net UCT Lifetime Benefit (Reported) 2022
Single Family – Income Eligible	(\$1,737,626)	(\$1,782,682)
Multifamily – Income Eligible	(\$1,845,142)	(\$1,342,838)
Community Lighting	N/A	(\$27,248)
Pay As You Save	(\$164,542)	(\$264,760)
Business Social Services	(\$91,532)	\$787,318
Heating and Cooling	\$6,596,104	\$10,926,197
Efficient Products	\$887,065	\$1,088,968
Multifamily Market Rate	\$931,097	\$620,021
Residential DR	\$3,799,497	(\$331,966)
Business Standard	\$25,581,730	\$26,395,697
Business Custom	\$13,253,947	\$28,054,144
Small Business Direct Install	\$1,549,722	\$1,879,863
Retro- Commissioning	\$2,948,464	\$482,505
Business DR	(\$12,102)	\$1,765,455

Table 4 compares the results of the four cost effectiveness tests between PY2021 and PY2022.<sup>6</sup>

<sup>6</sup> SCT results were calculated as part of the evaluation; however, they are excluded from the table below 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.

**Table 4: Cost Effectiveness Test Results**

Program	UCT		TRC		RIM		PCT	
	2021	2022	2021	2022	2021	2022	2021	2022
Single Family – Income Eligible	0.50	0.29	0.65	0.38	0.27	0.22	4.50	3.19
Multifamily – Income Eligible	0.57	0.81	0.64	1.30	0.28	0.37	4.32	5.31
Community Lighting	N/A	0.98	N/A	1.74	N/A	0.38	N/A	N/A
Pay As You Save	0.76	0.71	0.68	0.61	0.39	0.40	4.08	3.03
Business Social Services	0.71	1.95	1.71	3.41	0.35	0.56	6.06	7.56
Heating and Cooling	1.49	1.90	1.25	1.74	0.48	0.66	3.89	4.06
Efficient Products	1.38	1.36	0.99	1.24	0.42	0.53	3.41	3.94
Multifamily Market Rate	1.98	1.61	1.71	1.59	0.50	0.58	5.82	4.47
Residential DR	1.62	0.93	1.62	1.33	1.91	0.92	N/A	N/A
Business Standard	3.01	3.97	2.89	3.22	0.61	0.79	6.41	6.24
Business Custom	3.30	3.60	1.47	1.55	0.93	0.92	1.73	1.86
Small Business Direct Install	2.73	2.51	2.71	3.02	0.55	0.61	6.68	8.00
Retro-Commissioning	3.04	2.53	2.66	2.61	0.92	0.65	3.96	6.09
Business DR	1.00	1.44	1.00	1.44	0.96	1.36	N/A	N/A

\*Includes lifetime costs and benefits of Demand Response programs over a 10-year effective useful life.



## 6 Audit Conclusions

Over the last year, the audit team has had several meetings with Opinion Dynamics on analysis methods and were able to reach an agreement on a few remaining evaluation issues. Opinion Dynamics has also addressed the comments the audit team made on a draft version of the PY2022 evaluation report. As a consequence, we have no additional comments or recommendations relating to the PY2022 evaluation.

Many of the audit issues in prior years were related to net impact estimation methods. For PY2022, however, the unanimous stipulation agreement directed the evaluation to use a net-to-gross ratio of 0.825 for most programs, while maintaining the existing 1.0 net-to-gross ratio assigned to the low income programs. As a result, there were no net impact issues remaining for the audit team to address in the current evaluation report. Opinion Dynamics will be conducting new net impact research in the coming months, and the audit team will review and comment on these results once they are available for review.

Our sole recommendation is that all the evaluation reports include the comparison tables of net savings with the net savings goals established for Ameren MO. The net savings/net goals tables were included in prior years' reports but were omitted from the PY2022 reports. We recommend that these be reinstated in PY2023 and beyond, as net savings (rather than gross savings) are a key determinant of program cost effectiveness.

# Appendix A: Full Process Evaluation Responses to Minimum Question Requirements



This appendix provides a summary of the detailed responses to minimum process evaluation requirement questions.

**Table 5: Minimum Process Evaluation Questions**

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



**Table 6: Issue 1 - What are the primary market imperfections common to the target market segment?**

Program	2021 Summary Response	2022 Summary Response
<b>Single Family Income Eligible</b>	<p>Income-eligible households face multiple barriers to investing in energy efficiency either through Ameren Missouri programs or outside of them. Market imperfections include:</p> <ul style="list-style-type: none"> <li>• The high upfront cost of energy-efficient products relative to household capital and available credit, even when taking into account traditional utility program incentives,</li> <li>• Lack of access to traditional forms of information about energy efficiency programs</li> <li>• Housing stock that may need health and safety improvements, which can preclude efficiency upgrades unless these issues are addressed first</li> <li>• Split incentives between property owners and renters, for those who rent their home.</li> </ul>	<p>Income-eligible households face multiple barriers to investing in energy efficiency either through Ameren Missouri programs or outside of them. Market imperfections include:</p> <ul style="list-style-type: none"> <li>• The high upfront cost of energy-efficient products relative to household capital and available credit, even when taking into account traditional utility program incentives,</li> <li>• Lack of access to traditional forms of information about energy efficiency programs</li> <li>• Housing stock that may need health and safety improvements, which can preclude efficiency upgrades unless these issues are addressed first</li> </ul> <p>Split incentives between property owners and renters, for those who rent their home.</p>
<b>Multifamily Income Eligible</b>	<p>Market imperfections specific to the multifamily sector include (1) the split incentive for in-unit measures between property owners, managers, and residents; (2) awareness of the potential for saving money and energy through energy efficiency upgrades; (3) costs associated with energy efficiency upgrades; (4) knowledgeable staff available to install energy-efficient upgrades; and (5) the time investment to plan, budget, and implement energy efficiency upgrades.</p>	<p>Market imperfections specific to the multifamily sector include (1) the split incentive for in-unit measures between property owners, managers, and residents;<sup>a</sup> (2) a lack of awareness about the potential for saving money and energy through energy efficiency upgrades; (3) costs associated with energy efficiency upgrades; (4) knowledgeable staff available to install energy-efficient upgrades; and (5) the time investment to plan, budget, and implement energy efficiency upgrades.</p>
<b>Efficient Products</b>	<p>The primary market imperfections for the REP Program are lack of customer awareness of energy-efficient product options and their benefits, and the higher price of efficient products. In terms of knowledge, many customers are not aware of energy efficiency and energy-efficient technologies. And even those</p>	<p>The primary market imperfections for the REP Program are lack of customer awareness of energy-efficient product options and their benefits, and the higher price of efficient products. In terms of knowledge, many customers are not aware of energy efficiency and energy-efficient technologies. And even those who are aware</p>



Program	2021 Summary Response	2022 Summary Response
	<p>who are aware are often not informed of actual energy savings opportunities available in their homes.</p> <p>For programs like the REP Program, customer awareness of the availability of the rebate is paramount. Customers need to either be proactive and search out the rebates, or they need to be informed of them via marketing or a contractor. For PY2019, we found that only 36% of residential customers were aware of the REP Program, which limits participation.</p> <p>Other market imperfections are measure-specific and generally apply to the market potential:</p> <ul style="list-style-type: none"> <li>• Only 4% of homes in the Ameren Missouri service territory have inground pools. Thus, the market for pool pumps is very limited, and the product selection is largely driven by contractor recommendations.</li> </ul> <p>While nearly every home has at least one thermostat, thermostats do not routinely fail, so customers will need another reason to replace existing thermostats. The desire for advanced technology is a factor driving advanced thermostat uptake. Thermostats have become a consumer product, and like other advanced technologies, many people appreciate and want the technology. Still, others do not and could view advanced thermostats as overly complicated or expensive. Greater customer awareness of new thermostat technology and its energy savings potential could help drive customers to advanced thermostats.</p>	<p>are often not informed of actual energy savings opportunities available in their homes.</p> <p>For programs like the REP Program, customer awareness of the availability of the rebate is paramount. Customers need to be proactive and search out the rebates, or they need to be informed of them via marketing or a contractor. For PY2019, we found that only 36% of residential customers were aware of the REP Program, which limits participation.</p> <p>Additionally, while nearly every home has at least one thermostat, thermostats do not routinely fail, so customers will need another reason to replace existing thermostats. The desire for advanced technology is a factor driving advanced thermostat uptake. Thermostats have become a consumer product, and like other advanced technologies, many people appreciate and want the technology. Still, others do not and could view advanced thermostats as overly complicated or expensive. Greater customer awareness of new thermostat technology and its energy savings potential could help drive customers to advanced thermostats.</p>
<b>HVAC</b>	At a high level, the primary market imperfections include the high upfront cost of high efficiency HVAC equipment and a lack	The primary market imperfections for the HVAC program include the upfront cost of high efficiency heating and cooling equipment.



Program	2021 Summary Response	2022 Summary Response
	<p>of customer awareness regarding the benefits of such systems (i.e., energy and utility bill savings). Contractors play an important role in addressing these market imperfections by educating customers and promoting program incentives to make the high efficiency equipment affordable alternatives to standard efficiency equipment.</p> <p>Midstream research conducted for PY2020 suggested, however, that there is an organic segmentation to the customer population that warrants consideration. Different segments of customers face different barriers and the importance of the certain barriers can vary by customer. For example, customers of higher sociodemographic attainment do not encounter the same barriers as customers whose income is too high to qualify as a low-income customer, but are nonetheless unable to afford the initial costs of an energy-efficient system upgrade. While the former may easily be a candidate for super-efficient equipment, the latter is not really a candidate for any equipment, regardless of efficiency level. Another customer segment may be able to bear the cost of higher efficiency equipment but might not be able to overcome the additional cost barrier associated with super-efficient equipment. While each of these different segments of customer face the same general barriers, the significance and importance of the different barriers certainly varies.</p>	<p>Incentives are designed to defray this high upfront cost. The Downstream channel is more accessible to low- to moderate-income households as the systems incented through this channel typically cost less than systems incented through the Midstream channel. Contractors play an important role in educating customers about the benefits of higher efficiency equipment compared to standard efficiency equipment and promoting program incentives. The Midstream channel’s market imperfections include the upfront cost of high-efficiency HVAC equipment and a lack of customer awareness regarding the benefits of such systems (e.g., energy and utility bill savings). Distributors educate and encourage contractors to purchase high-efficiency equipment through the Midstream channel who in turn educate and upsell customers looking to replace their HVAC equipment. Similar to previous program years, there are differences between customer segments in Midstream and Downstream channels.</p> <p>Midstream participants tend to be highly educated and have moderate to high incomes. Downstream participants have similar education levels to Midstream participants but tend to have lower incomes than Midstream participants. A summary of survey participant demographics is included in the Appendix to this volume.</p> <p>Another potential market imperfection the Midstream channel is designed to address relates to the availability of the highest-efficiency equipment. The channel seeks to encourage distributors to increase their inventory of this highest-efficiency equipment to ensure it is available when customers need it. Notably, responses to the participant survey indicate that some Midstream customers would only wait a short period of time for a new, highest-</p>



Program	2021 Summary Response	2022 Summary Response
		<p>efficiency system if it was not immediately available to them; otherwise, they would select a less efficient system. The forthcoming prospective FR research explores this potential market imperfection in more detail.</p>
<b>Multifamily Market Rate</b>	<p>Market imperfections specific to the multifamily sector include (1) the split incentive<sup>7</sup> for in-unit measures between property owners, managers, and residents; (2) awareness of the potential for saving money and energy through energy efficiency upgrades; (3) costs associated with larger non-lighting measure upgrades; (4) knowledgeable staff available to install energy-efficient upgrades; and (5) the time investment to plan, budget and implement energy efficiency upgrades.</p>	<p>Market imperfections specific to the multifamily sector include (1) the split incentive<sup>22</sup> for in-unit measures between property owners, managers, and residents; (2) a lack of awareness of the potential for saving money and energy through energy efficiency upgrades; (3) costs associated with larger non-lighting measure upgrades; (4) limitations to the knowledgeable staff available to install energy-efficient upgrades; and (5) the time investment to plan, budget, and implement energy efficiency upgrades.</p>
<b>Pay As You Save</b>	<p>At a high level, the primary market imperfection that the program addresses is the high cost of energy efficiency home upgrades. Financing plays an important role in addressing this market imperfection by offsetting the upfront cost and ensuring manageable payments over time.</p> <p>Another market imperfection the program seeks to alleviate is split incentives. By tying the program cost to the premises rather than the participant, the program is designed to include renters that may not have been willing to make an investment in a temporary home previously. It also entices landlords who may have been unwilling to incur the cost of equipment upgrades that would provide cost savings for their tenants.</p>	<p>At a high level, the primary market imperfection that the program addresses is the high cost of energy efficiency home upgrades. Financing plays an important role in addressing this market imperfection by offsetting the upfront cost and ensuring manageable payments over time.</p> <p>Another market imperfection the program seeks to alleviate is split incentives. By tying the program cost to the premises rather than the participant, the program is designed to include renters that may not have been willing to make an investment in a temporary home previously. It also entices landlords who may have been unwilling to incur the cost of equipment upgrades that would provide cost savings for their tenants.</p>
<b>Community Lighting</b>	<p>Community Lighting was new to PY2022</p>	<p>While LEDs are now broadly available in the residential lighting market, the higher price of LEDs continues to remain one</p>

<sup>7</sup> The split incentive occurs when the tenant pays the cost of the electricity use, but the owner is responsible for choices that affect building and equipment efficiency.





Program	2021 Summary Response	2022 Summary Response
		<p>challenge to increasing adoption amongst income- eligible populations.</p> <p>Based on evaluations and other market research conducted in previous years, we understand that customer use of efficient bulbs varies by household income and use case (i.e., socket type). Lower-income customers have lower LED penetration and efficient bulb saturation than other customers. Low-income customers are also more likely to purchase the lowest cost bulb rather than consider factors like energy efficiency. Sockets that take a standard bulb also have greater efficient bulb saturation than reflector or specialty sockets.</p>
<b>BizSavers</b>	<p>Based on PY2019 research, the primary market barriers to adoption of energy-efficient equipment in the business sector are lack of awareness of energy saving opportunities and programs, the high cost of energy efficiency equipment, access to financing or capital, and uncertainty about expected bill savings.</p> <p>In PY2021, business customers experienced different barriers as a result of the COVID-19 pandemic, including material shortages and difficulty hiring or maintaining staff, although the impacts of these barriers on planned capital projects appears limited.</p>	<p>Based on PY2019 research, the primary market barriers to adoption of energy- efficient equipment in the business sector are lack of awareness of energy saving opportunities and programs, the high cost of energy efficiency equipment, access to financing or capital, and uncertainty about expected bill savings.</p> <p>In PY2021, business customers experienced different barriers as a result of the COVID-19 pandemic, including material shortages and difficulty hiring or maintaining staff, although the impacts of these barriers on planned capital projects appear limited. In PY2022, the vast majority (92%) of surveyed Standard and Custom participants indicated material shortages had not caused capital project delays or cancellations during 2022.</p>
<b>Residential DR</b>	<p>Smart thermostat penetration in the Ameren Missouri service territory was relatively low in PY2019, with smart thermostats comprising only 8% of all thermostats. It is likely that most, if not all, of the devices enrolled in the program in PY2021 were newly purchased devices as the program marketed to and enrolled all interested existing smart thermostat owners as part of the PY2019 outreach. Program participation goals for PY2022 will</p>	<p>Based on research conducted in PY2019, customers have a variety of concerns about participating in the central air conditioning DR solution, including concerns about allowing the utility to control customer’s thermostats, potential negative impact on comfort, data security, and knowledge of the participation process. While none of these concerns emerged as extreme barriers, comfort was the barrier about which customers reported the most worry.</p>



Program	2021 Summary Response	2022 Summary Response
	<p>require continued strong sales of smart thermostats and strong engagement to sustain future enrollment goals.</p> <p>Broadband internet access, which is presently at 85% in Ameren Missouri service territory, limits the number of homes that can participate in the program.</p> <p>Based on research conducted in PY2019, customers have a variety of concerns about participating in the central air conditioning (CAC) DR solution, including concerns about allowing the utility to control customer’s thermostats, potential negative impact on comfort, data security, and knowledge of the participation process. While none of these concerns emerged as extreme barriers, comfort was the one about which customers reported the most worry.</p>	
<b>Business DR</b>	<p>Ameren Missouri customers generally lack experience with demand response programs and therefore are less used to the load reduction strategies and not as skilled at estimating their load reduction potential during peak periods in the summer. As the program enters its fourth year, some program participants are gaining more experience.</p> <p>Lack of interval data in Ameren Missouri service territory limits visibility into customer hourly load profile to ensure more effective targeting and more accurate goal setting.</p>	<p>Ameren Missouri customers generally lack experience with demand response programs and therefore are less used to the load reduction strategies and not as skilled at estimating their load reduction potential during peak periods in the summer. As the program enters its fourth year, some program participants are gaining more experience. Inflationary pressures and staff turnover impact customer knowledge, comfort with, as well as willingness to curtail load.</p>



**Table 7: Issue 2 - Is the target market segment appropriately defined, or should it be further subdivided or merged with other market segments?**

Program	2021 Summary Response	2022 Summary Response
<p><b>Single Family Income Eligible</b></p>	<p>Ameren Missouri has defined the target customer market as occupants of single-family housing who live in areas where most residents have an annual income at or below 80% of AMI. This criterion is aligned with income-eligible program eligibility requirements in other states and should not be merged with any other income-based market segments.</p> <p>Additionally, the program’s typical community-driven components each target a specific housing stock subsegment (single family and mobile homes). This helps to target community and measure selection, as well as audits and measure installation assumptions, but the program team should consider that the program is set up to serve one type of housing at a time.</p> <p>Still, implementation experience shows many neighborhoods have mixed housing stock (including single family, small multifamily, and mobile homes). Notably, Ameren Missouri gained approval through the 11-step stakeholder process to change program eligibility to allow the program team to serve attached dwellings of four or fewer units in addition to detached homes and duplexes. Going forward, this change will help the program serve a larger share of homes per neighborhood.</p>	<p>Ameren Missouri has defined the target customer market as occupants of single-family housing who live in areas where most residents have an annual income at or below 80% of AMI. This criterion is aligned with income-eligible program eligibility requirements in other states and should not be merged with any other income-based market segments.</p> <p>Additionally, the program targets specific housing stock subsegments (e.g., single family and mobile homes). This helps to target community and measure selection, as well as audits and measure installation assumptions, but the program team should consider that the program is set up to serve one type of housing at a time.</p>
<p><b>Multifamily Income Eligible</b></p>	<p>Yes, the target market is appropriately defined as a building including three or more units with Ameren Missouri electric service and located in an area where most residents have an annual income at or below 80% of AMI. This program also addresses multifamily property needs for both common area and in-unit upgrades.</p>	<p>Yes, the target market is appropriately defined as a building including three or more units with Ameren Missouri electric service and located in an area where most residents have an annual income at or below 80% of AMI. This program also addresses multifamily property needs for both common area and in-unit upgrades.</p>



Program	2021 Summary Response	2022 Summary Response
<b>Efficient Products</b>	<p>Officially (per MEEIA III), the target market for the REP Program is all residential customers within the Ameren Missouri service territory. When the measure mix is considered (heat pump water heaters, pool pumps, and advanced thermostats), however, the actual market is predominantly homeowners. That said, virtually all residences (even rentals) could benefit from Tier 1 or Tier 2 advanced power strips. Some measures, like pool pumps, should be targeted at residences with pools, but no further subdivision seems needed.</p>	<p>Officially (per MEEIA III), the target market for the REP Program is all residential customers within the Ameren Missouri service territory. However, when we consider the program’s mix of measures (heat pump water heaters, advanced power strips, and advanced thermostats), the actual market is predominantly homeowners and does not seem to require further subdivision.</p>
<b>HVAC</b>	<p>The HVAC Program’s target market segment includes single family and multifamily residential homeowners with central cooling systems that are older or in need of replacement due to their operating condition. Our research in PY2020 suggests the target market segment should be revised to incorporate the added complexity that the addition of the Midstream channel revealed.</p> <p>There are at least three customer segments that fall under the program-described target market but are not actually served by the program. First, there are low-income customers who qualify for the CommunitySavers® Program. Though the program was changed in PY2020 to address challenges posed by the COVID-19 pandemic, these customers would typically be the target of the CommunitySavers® Program and not the HVAC Program. Second, are customers who have incomes that exceed the criteria for low-income but are still unable to overcome the cost barrier of upgrading to an energy-efficient system. Though savings opportunities surely exist with this segment, accessing them will likely require alternative program designs. The third and final unserved customer segment includes those who are willing to</p>	<p>The HVAC Program’s target market segment includes single family and multifamily residential homeowners with central cooling systems that are older or in need of replacement prior to failure. Low-income customers are served by the CommunitySavers® Program and are not part of the program’s target market. The introduction of the Midstream channel, which focuses on more costly systems of the highest efficiency, resulted in a de facto sub-segmentation of the non-low-income market, by income: Based on contractor research conducted in PY2020, systems available through the Midstream channel tend to be inaccessible to a large portion of the non-low income market, due to the even higher upfront cost compared to equipment incented through the Downstream channel.</p>



Program	2021 Summary Response	2022 Summary Response
	<p>make energy-efficient HVAC upgrades but can only overcome the cost barrier of these upgrades with rebates.</p> <p>The COVID-19 pandemic continued to impact the accessibility of the HVAC Program for all customer segments as the cost of equipment increased across all efficiency levels. Supply chain disruptions and inflation in 2021 triggered price increases of approximately 20% across all equipment incented in the Midstream and Downstream channels. Nonetheless, the program experienced significant growth from PY2020 to PY2021.</p>	
<b>Multifamily Market Rate</b>	<p>Yes, the target market is appropriately defined as a building including three or more units with Ameren Missouri electric service. This program addresses the need for both common area and in-unit upgrades.</p>	<p>Yes, the target market is appropriately defined as owners, managers and residents of buildings that include three or more units with Ameren Missouri electric service. This program addresses the need for both common area and in-unit upgrades.</p>
<b>Pay As You Save</b>	<p>The PAYS Program’s target algorithms are proprietary, but the target market segment includes customers with single and multifamily residential homes that have higher usage than the housing characteristics would suggest. Only homes expected to have the required savings potential receive targeted marketing materials.</p> <p>There is no income requirement for the target market segment. As the program is intended to have no up-front cost; however, it is well-positioned to serve moderate-income customers who do not qualify for low-income incentives but would be unable to afford the up-front costs of weatherization and HVAC upgrades. Our PY2021 interviews found the targeted marketing was not performing as expected. As a result, the program team was considering introducing an additional mass marketing strategy with modified messaging. Rather than advertising the PAYS Program as having “no upfront cost,” it would state that PAYS</p>	<p>The PAYS Program’s target algorithms are proprietary, but the target market segment includes customers with single-family and multifamily residential homes that have higher usage than the housing characteristics would suggest. Only homes expected to have the required savings potential receive targeted marketing materials.</p> <p>There is no income requirement for the target market segment. As the program is intended to have no up-front cost, however, it is well-positioned to serve moderate-income customers who do not qualify for low-income incentives but would be unable to afford the up-front costs of weatherization and HVAC upgrades.</p>



Program	2021 Summary Response	2022 Summary Response
	<p>could help to “offset your upgrade.” This would extend the target market to customers that could afford a copay to meet the 80/20 rule rather than just trying to target customers that would qualify with little to no upfront cost</p>	
<b>Community Lighting</b>	<p>Community Lighting was new to PY2022</p>	<p>Yes, the target market is appropriately defined as income-qualified individuals located in communities with large portion of income-eligible customer within Ameren Missouri service territory. This program addresses multiple incomes levels through both channels of the Program.</p>
<b>BizSavers</b>	<p>Ameren Missouri's BizSavers portfolio serves businesses of varying sizes and sectors. The SBDI Program recognizes the unique challenges of small businesses though small businesses can still participate in the Standard or Custom programs if the offerings are a better match to customer needs. The current target audience for the SBDI Program is commercial electric customers that are classified as Small General Service Rate 2(M). This covers a wide range of market segments. The SBDI Program is generally serving the majority of the market segments existing in the General Service Rate 2(M), although participation has been concentrated in a few segments (58% of PY2021 projects were completed in the office and retail segments). Savings realized through this program have decreased over the PY2019-PY2021 program cycle, likely due, in part, to the COVID-19 pandemic.</p> <p>The SBDI program appears to have been less successful in serving renters, a frequently underserved market segment by business portfolios, than in prior program years. According to program tracking data renters accounted for 25% of PY2021 SBDI Program participants, compared to 54% of PY2020 SBDI Program participants and 36% of Ameren Missouri’s population of</p>	<p>Ameren Missouri's BizSavers portfolio serves businesses of varying sizes and sectors. The SBDI Program recognizes the unique challenges of small businesses although small businesses can still participate in the Standard or Custom programs if the offerings are a better match to customer needs. The current target audience for the SBDI Program is commercial electric customers that are classified as Small General Service Rate 2(M). This covers a wide range of market segments. The SBDI Program is generally serving the majority of the market segments existing in the General Service Rate 2(M), although participation has been concentrated in a few segments (55% of PY2022 projects were completed in the office and retail segments, compared to 58% in PY2021). Savings realized through this program have decreased over the PY2019–PY2021 program cycle, likely due, in part, to the COVID-19 pandemic, but have rebounded in PY2022.</p> <p>The SBDI Program appears to have been less successful in serving renters, a frequently underserved market segment, than in prior program years. According to program-tracking data, renters accounted for 21% of PY2022 SBDI Program participants, compared to 25% in PY2021, and 54% in PY2020. According to market research in support of Ameren Missouri’s 2019 potential</p>



Program	2021 Summary Response	2022 Summary Response
	<p>business customers (according to market research in support of Ameren Missouri’s 2019 potential study).</p> <p>The new BSS Program serves nonprofit organizations that provide services to the low-income public. The program is small in scope, with 31 projects completed by 14 organizations in PY2019; 12 projects completed by eight organizations in PY2020; and 23 projects completed by 16 organizations in PY2021. Given the extremely small participation and targeted outreach strategy to-date, insights into the reach of the program and appropriateness of market segmentation are still limited.</p>	<p>study, 36% of Ameren Missouri’s population of business customers are renters.</p> <p>BSS Program, introduced in 2019, serves nonprofit organizations that provide services to the low-income public. The program is small in scope, completing between 12 and 67 projects annually. Notably, the PY2022 BSS Program supported more projects (67) and achieved higher ex ante energy savings (2,699 MWh) than the prior three years combined. The BizSavers team expects this program to grow in focus in PY2023. Still, given the historically small participation and targeted outreach strategy to date, insights into the reach of the program and appropriateness of market segmentation are still limited.</p>
<b>Residential DR</b>	<p>All residential customers with central air conditioning (CAC) systems (including heat pumps) and a program-supported smart thermostat are eligible to participate. Given the nature of the program design, which relies on smart thermostats to deliver demand impacts during DR events, the target market is appropriately defined, and further market segmentation is not necessary.</p>	<p>All residential customers with central air conditioning systems (including heat pumps) and a program-supported smart thermostat are eligible to participate. Given the nature of the program design, which relies on smart thermostats to deliver demand impacts during DR events, the target market is appropriately defined, and further market segmentation is not necessary.</p>
<b>Business DR</b>	<p>Targeting medium and large facilities with a customized DR offering is appropriate due to the heterogeneity of facility types, operations, and appropriate load reduction strategies. The program has been focused on customers with the highest load reduction opportunities during the peak summer period, which is consistent with the program goals of shaving peak load.</p>	<p>Targeting facilities with a customized DR offering is appropriate due to the heterogeneity of facility types, operations, and appropriate load reduction strategies. The program has been focused on customers with the highest load reduction opportunities during the peak summer period, which is consistent with the program goals of shaving peak load.</p>



**Table 8: Issue 3 - Does the mix of end-use measures included in the program appropriately reflect the diversity of end-use energy service needs and existing end-use technologies within the target market segment?**

Program	2021 Summary Response	2022 Summary Response
<p><b>Single Family Income Eligible</b></p>	<p>The baseline study of residential Ameren Missouri customers completed in PY2019 shows that income-eligible households tend to have lower-efficiency products in their home compared to their non-income-eligible counterparts, including lighting. These results are consistent with findings from around the United States. The program’s mix of end use measures appropriately reflects these needs.</p> <p>The program offers measures that cover major single family and mobile home energy-saving needs, including building envelope, HVAC and thermostats, refrigeration, lighting, domestic hot water, and plug load measures. Additionally, the program cross-promotes opportunities for additional savings through the Ameren Missouri HVAC Program. In PY2021, differently from the previous year, the program team was able to offer its full suite of measures to homes that had only partially benefited from the program in PY2020 and to new participants. This was possible by leveraging the relationships built with CBOs and housing organizations and offering relocation incentives to customers to vacate their homes while COVID-19 restrictions were in place.</p>	<p>The baseline study of residential Ameren Missouri customers completed in PY2019 shows that income-eligible households tend to have lower-efficiency products in their home compared to their non-income-eligible counterparts, including lighting. These results are consistent with findings from around the United States. The program’s mix of end uses measures appropriately reflects these needs.</p> <p>The program offers measures that cover major single family and mobile home energy-saving needs, including building envelope, HVAC and thermostats, refrigeration, lighting, domestic hot water, and plug load measures. Additionally, the program cross-promotes opportunities for additional savings through the Ameren Missouri HVAC Program.</p>
<p><b>Multifamily Income Eligible</b></p>	<p>Yes, the program offers measures that cover all major multifamily common area and in-unit end use needs, including lighting, appliances, space cooling, space heating, building shell (e.g., insulation and windows), and water heating. While COVID-19 impacted the range of projects that could be completed in PY2021, the implementation team delivered a comprehensive set of solutions to the target market segment through the one-stop-shop model. The tracking data indicates 91% of measures that produced electric savings were installed in tenant units.</p>	<p>Yes, the program offers measures that cover all major multifamily common area and in- unit end use needs, including lighting, appliances, space cooling, space heating, building shell (e.g., insulation and windows), and water heating. The program team can continue to increase the comprehensiveness of solutions offered to the target market segment by encouraging participation in the one-stop-shop channel.</p>





Program	2021 Summary Response	2022 Summary Response
	<p>Additionally, at least 17 of the 31 unique properties treated through the program in PY2021 received both tenant and common area upgrades.<sup>8</sup> The program team can continue to increase the comprehensiveness of solutions offered to the target market segment by encouraging participation in the one-stop-shop channel.</p>	
<b>Efficient Products</b>	<p>The REP Program currently offers only five measures: (1) advanced thermostats, (2) Tier 1 power strips, (3) Tier 2 power strips, (4) heat pump water heaters, and (5) pool pumps. When one considers the diversity of energy-consuming items in the typical residence (the target market), a very wide range of other end use measures appear potentially applicable to the REP Program. Of course, cost-effectiveness and overlap with other programs needs to be considered. ENERGY STAR<sup>®9</sup> room air conditioners, air purifiers, and dehumidifiers were included when developing targets/goals in 2018, so they may be good candidates for measure expansion.</p>	<p>The REP Program currently offers only four measures: (1) advanced thermostats, (2) Tier 1 power strips, (3) Tier 2 power strips, and (4) heat pump water heaters. When one considers the diversity of energy-consuming items for typical residential customers (the target market), a very wide range of other end use measures appear potentially applicable to the REP Program. Of course, we need to consider cost-effectiveness and overlap with other programs. The development of program targets/goals in 2018 included ENERGY STAR room air conditioners, air purifiers, and dehumidifiers, so these devices may be good candidates for measure expansion.</p>
<b>HVAC</b>	<p>The HVAC Program offers incentives for heating and cooling equipment at various efficiency levels. The HVAC Program also correctly accounts for market and federal code changes.</p> <p>The program requirement that the existing unit cannot exceed 12 SEER will change for PY2022. The new 13.99 SEER limit should enable more customers to access the program and incented technologies.</p>	<p>The HVAC Program is one of several residential programs offered by Ameren Missouri. It focuses on major heating and cooling equipment (central air conditioners and HPs) at various efficiency levels and offers smart thermostats to achieve additional savings by better managing the use of the new equipment. While the HVAC Program does not offer the full range of potential HVAC measures (and measures of other end uses) that might be of interest to the target market, this focus is appropriate given the program’s specialized delivery through a network of approved</p>

<sup>8</sup> This represents a minimum because some properties that did not receive both common area and in-unit installations in PY2021, could have had phases of their projects completed in previous years.

<sup>9</sup> The ENERGY STAR<sup>®</sup> name and mark are registered trademarks owned by the US EPA.



Program	2021 Summary Response	2022 Summary Response
<b>Multifamily Market Rate</b>	<p>Yes, the program offers measures that cover all major multifamily common area and in-unit enduse needs, including lighting, appliances, space cooling, space heating, ventilation, building shell (e.g., insulation and windows), and water heating. While COVID-19 impacted the range of projects that could be completed in PY2021, as well as the measures that could be installed as part of those projects, the implementation team delivered a comprehensive set of solutions to the target market segment through the one-stop-shop model. The tracking data indicates that 66% of measures were installed in tenant units and 34% were installed in common areas or exterior locations in PY2021. The program team can continue to increase the comprehensiveness of solutions offered to the target market segment by encouraging participation in the one-stop-shop channel.</p>	<p>trade allies (and distributors, in the case of the Midstream channel).</p> <p>Yes, the program offers measures that cover all major multifamily common area and in-unit enduse needs, including lighting, appliances, space cooling, space heating, ventilation, building shell (e.g., insulation and windows), and water heating. The program team can continue to increase the comprehensiveness of solutions offered to the target market segment by encouraging participation in the one-stop-shop channel.</p>
<b>Pay As You Save</b>	<p>The PAYS program includes a mix of derive measures that are customized based on the needs of each home. The upgrades include the installation of LEDs, domestic hot water, insulation, HVAC, and air sealing measures, among others.</p> <p>In our interviews we found the lack of natural gas-derived technologies in the program did not reflect the diversity of the energy needs within the target market segment. Given the prevalence of gas heating in Ameren Missouri territory, the program could benefit from including natural gas-derived technologies. Ameren Missouri staff indicated this is being planned for future years.</p>	<p>The PAYS Program includes a mix of enduse measures that are customized based on the needs of each home. Upgrades include LED lighting, domestic hot water, insulation, HVAC, and air sealing measures, among others.</p> <p>The addition of natural gas-derived technologies for PY2022 reflect an improvement from PY2021 to better reflect the diversity of the energy needs within the target market segment.</p>
<b>Community Lighting</b>	<p>Community Lighting was new to PY2022</p>	<p>Standard bulbs are the most used bulb in customer homes and have long been the focus of the now discontinued Residential Lighting Program. This focus made sense when socket saturation</p>



Program	2021 Summary Response	2022 Summary Response
<p><b>BizSavers</b></p>	<p>PY2019 evaluation research found that participants were relatively dissatisfied with the breadth of measure offerings. In some cases, participants and market partners were dissatisfied with the list of eligible measures; in other cases, they indicated low incentives rendered an officially eligible measure effectively ineligible. The most common suggestion was to add outdoor lighting to the list of available measures, which the program did for the Standard and SBDI programs during PY2020, but then discontinued again in PY2021.</p> <p>In PY2019, the SBDI Program only provided incentives for lighting measures. For PY2020, the program added HVAC measures, increased incentive caps, and developed a simplified, stand-alone HVAC application form. Despite these changes, uptake of non-lighting measures in PY2020 was limited to 15 smart thermostats, accounting for 0.2% of program savings. There was no uptake of non-lighting measures in PY2021.</p> <p>While the BSS Program offers a range of measures across different technologies, the program was almost exclusively focused on lighting measures in PY2019, PY2020, and PY2021. The PY2019 evaluation found that incentive levels for non-lighting equipment were insufficient to induce adoption in this market segment. While the program added a few new measures</p>	<p>of efficient bulbs was low across all use cases. In our PY2019 evaluation, we found that 70% of light sockets in market rate households that take a standard bulb contain an efficient bulb. However, as noted previously, we understand that adoption of standard LED bulbs is less prevalent amongst income eligible populations. As such, the mix of standard, reflector, and specialty bulb types still makes sense to offer to this population of Ameren Missouri residential customers.</p> <p>PY2019 evaluation research found that participants were relatively dissatisfied with the breadth of measure offerings. In some cases, participants and market partners were dissatisfied with the list of eligible measures; in other cases, they indicated low incentives rendered an officially eligible measure effectively ineligible. The most common suggestion was to add outdoor lighting to the list of available measures, which the program did for the Standard and SBDI Programs during PY2020, but then discontinued again for PY2021 and PY2022.</p> <p>In PY2019, the SBDI Program only provided incentives for lighting measures. For PY2020, the program added HVAC measures, increased incentive caps, and developed a simplified, stand-alone HVAC application form. Despite these changes, uptake of non-lighting measures in PY2020 was limited to 15 smart thermostats, accounting for 0.2% of program savings. There was no uptake of non-lighting measures in PY2021, and only a single non-lighting measure was incented in PY2022.</p> <p>While the BSS Program offers a range of measures across different technologies, the program was almost exclusively focused on lighting measures during the current program cycle. The PY2019 evaluation found that incentive levels for non-lighting equipment were insufficient to induce adoption in this market segment. While the program added a few new measures to the program in</p>

Program	2021 Summary Response	2022 Summary Response
	<p>to the program in PY2020—including occupancy sensors, VFDs, and kitchen ventilation controls—incentive levels remained largely unchanged over the 3-year program cycle. The cost of delivering the program remains a concern to implementation staff and appears to affect the number and types of projects pursued.</p>	<p>PY2020— including occupancy sensors, VFDs, and kitchen ventilation controls—incentive levels remained largely unchanged over the 3-year program cycle, save for the Business portfolio-wide increase to incentives implemented in September 2022.</p>
<b>Residential DR</b>	<p>Program-eligible devices cover the most prominent device manufacturers—Nest, Ecobee, and Emerson. Inclusion of devices from other manufacturers, however, could help increase the program’s reach. It is our understanding that Uplight and Franklin Energy are working on introducing those devices as part of the program in PY2022.</p>	<p>Program-eligible devices cover the most prominent device manufacturers— Nest, Ecobee, and Emerson. Inclusion of devices from other manufacturers, however, could help increase the program’s reach. It is our understanding that Uplight and Franklin Energy are working on introducing additional device manufacturers as part of the program in PY2023.</p>
<b>Business DR</b>	<p>The program’s approach to load reduction is customized to each facility, which is appropriate given unique energy demands of medium and large customers and the resulting load shaving opportunities.</p>	<p>The program’s approach to load reduction is customized to each facility, which is appropriate given unique energy demands of medium and large customers and the resulting load shaving opportunities.</p>

**Table 9: Issue 4 - Are the communication channels and delivery mechanisms appropriate for the target market segment?**

Program	2021 Summary Response	2022 Summary Response
<b>Single Family Income Eligible</b>	<p>The program team’s typical communication and delivery channels are appropriate to the target market segment. Staff use a variety of community-centric approaches to promote the program, including through community groups and mobile home park owners; conducting direct outreach to residents through neighborhood canvassing; holding meet-and-greet events with community leaders in popular community gathering places like restaurants; and working with Ameren Missouri to identify community non-profit organizations serving income-eligible areas that could distribute efficient products to their constituents. These approaches are appropriate for the target</p>	<p>The program team’s communication and delivery channels are appropriate to the target market segment. Staff use a variety of community-centric approaches to promote the program, including through housing organizations with large property portfolios, community groups, and mobile home park owners; holding meet-and-greet events with community leaders in popular community gathering places like restaurants; and working with Ameren Missouri to identify community non-profit organizations serving income-eligible areas that could distribute efficient products to their constituents. These approaches are appropriate for the target market segment because they work around traditional</p>



Program	2021 Summary Response	2022 Summary Response
	<p>market segment because they work around traditional time, geographic, and other barriers to learning about energy efficiency and the availability of utility-sponsored programs.</p> <p>In PY2020, the program team adapted their approach due to COVID-19. The program team targeted housing organizations with large portfolios of properties rather than contacting customers directly. This streamlined outreach strategy allowed the program team to treat many more properties in PY2020 compared to PY2019. The program team continued to take advantage of this outreach strategy in PY2021, which added greater efficiency to the implementation of the program and was able to target both single family and mobile home customers.</p> <p>For the Grant Channel, the program team is targeting CBOs that are prepared to distribute and install energy efficiency measures outside of the Single-Family Channel. While most of the measures distributed or installed through this channel in PY2020 went through CBOs in and around St. Louis, the Grant Channel had a broader geographic reach in PY2021 incorporating CBOs from Central and West Central Missouri, and other locations in the territory. The program team should continue to focus on CBO recruitment in 2022 with an aim of expanding the number of actively participating CBOs, especially those serving rural communities, and those prepared to complete eligible direct installation.</p>	<p>time, geographic, and other barriers to learning about energy efficiency and the availability of utility-sponsored programs.</p>
<p><b>Multifamily Income Eligible</b></p>	<p>The program uses a mix of communication channels including traditional channels such as e-mail blasts and distribution of collateral at industry events. The primary recruitment channel used is ICAST’s network of existing relationships with larger property ownership and management companies. The program also leverages more tailored outreach to smaller scale property</p>	<p>The primary recruitment channel is RI’s network of relationships with local contractors and larger property management companies. The program also leverages relationships with community-based organizations and trade organizations. This varied approach generates participation from varying customer types in the target market segment.</p>



Program	2021 Summary Response	2022 Summary Response
	<p>owners. This varied approach generates participation from varying customer types in the target market segment.</p>	
<p><b>Efficient Products</b></p>	<p>In PY2020, program marketing activities included TV/radio ads, social media ads, paid search optimization, e-mail campaigns, including rebate information on energy statements or Home Energy Reports, and location-based ads and promotions. In PY2019, most participants who purchased products through the Online Store reported learning about the program through direct communication from Ameren Missouri or the Ameren Missouri website. Mass marketing does not appear to have been that effective. Customers who purchased pool pumps and heat pump water heaters were more likely to learn about the program through a contractor than other communication channels. Increasing outreach to contactors to increase their involvement with the program could increase participation for these measures.</p>	<p>Similar to previous years, program marketing efforts in PY2022 included social media posts/ads, TV/radio ads, direct e-mail marketing, newsletters, paid search optimization, and rebates and discounts particularly during holiday sales such as Black Friday and Cyber Monday. For heat pump water heaters, marketing was targeted at contractors via discounts or larger savings offers. In PY2022, program staff reported that these marketing efforts have helped encourage program participation. Among these marketing activities, direct e-mail marketing helped generate the most participation in PY2022. Continuing to market to contractors for heat pump water heaters and other HVAC measures to be offered and increasing direct e-mail activity particularly at specific times of the year such as before and during holidays may help increase participation.</p>
<p><b>HVAC</b></p>	<p>The HVAC Program’s participation is primarily driven by contractors and customer-facing marketing materials. In PY2020, a majority of participants reported having first heard about the program through contractors. Marketing materials such as e-mails, newsletters, bill inserts, the Ameren Missouri website, home energy reports, and mass media advertising also contributed to program awareness. Collectively, these channels are effectively reaching a wide range of customers, but as noted above, some customers are still likely limited from accessing energy-efficient HVAC equipment for various reasons.</p>	<p>The HVAC Program’s participation is primarily driven by contractors and customer-facing marketing materials. Aside from contractors, marketing materials such as e-mails, newsletters, bill inserts, the Ameren Missouri website, home energy reports, and mass media advertising contribute to program awareness. Collectively, these channels are effectively reaching a wide range of customers, but as noted above, some customers are still likely limited from accessing energy-efficient HVAC equipment for various reasons.</p>
<p><b>Multifamily Market Rate</b></p>	<p>The program uses a mix of communication channels including traditional channels such as e-mail blasts and distribution of collateral at industry events. The primary recruitment channel used is ICAST’s network of existing relationships with larger property ownership and management companies. The program</p>	<p>The primary recruitment channel is RI’s network of relationships with local contractors and larger property management companies. The program also leverages relationships with community-based organizations and trade organizations. This</p>



Program	2021 Summary Response	2022 Summary Response
	<p>also leverages more tailored outreach to smaller scale property owners. This varied approach generates participation from varying customer types in the target market segment.</p>	<p>varied approach generates participation from varying customer types in the target market segment.</p>
<p><b>Pay As You Save</b></p>	<p>The program uses a targeted marketing approach with “good fit” customers based on high energy usage and property characteristics. Targeted customers receive a home energy report as the primary marketing approach.</p>	<p>The program uses a targeted marketing approach with “good fit” customers based on high energy usage and property characteristics. Targeted customers receive a home energy report as the primary marketing approach.</p> <p>Customers most often learned of the program via the Ameren Missouri website, but the vast majority suggested they would prefer to receive program information and communications via email.</p>
<p><b>Community Lighting</b></p>	<p>Community Lighting was new to PY2022</p>	<p>Yes, for the upstream channel, the implementation team uses a combination of in-store and out of store marketing materials. In the PY2019 evaluation of the market rate Residential Lighting Program, we found that in-store marketing was the most effective mechanism for driving sales of efficient bulbs. We expect that discount retailers and thrift stores are a more targeted delivery mechanism for reaching income-qualified segments of the market.</p> <p>Further, providing free LEDs through partnerships with foodbanks within Ameren Missouri’s service territory is an effective means of reaching a specific portion of the income-eligible segment; likely those in greater need of this type of assistance in lowering their energy burden.</p>
<p><b>BizSavers</b></p>	<p>According to market research in support of Ameren Missouri’s 2019 potential study, awareness of Ameren Missouri BizSavers Programs is relatively low among the target market. Just over one-third of customers (36%) are aware of the programs offered. Medium and large businesses are much more likely to be aware of Ameren Missouri BizSavers Programs than small businesses (60% compared to 33%). These results suggest that additional</p>	<p>According to market research in support of Ameren Missouri’s 2019 potential study, awareness of Ameren Missouri BizSavers Programs is relatively low among the target market. Just over one-third of customers (36%) are aware of the programs offered. Medium and large businesses are much more likely to be aware of Ameren Missouri BizSavers Programs than small businesses (60% compared to 33%). These results suggest that additional</p>



Program	2021 Summary Response	2022 Summary Response
	<p>communication or delivery of messages through alternative channels is needed for small businesses.</p> <p>Trade allies remain a key communication channel for the BizSavers Program and much of the program’s outreach efforts are focused on them. However, the program is expanding its direct customer outreach through social media, search engine marketing, segment-specific collateral, email blasts, and other efforts. While trade allies/contractors are still the primary source of information for program participants (reported by 57% of Standard and 53% of Custom PY2021 survey respondents), these numbers have decreased over the 3-year program cycle (62% Standard and 59% Custom in PY2020: 77% Standard and 83% Custom in PY2019), with other information channels (including BizSavers representatives, Ameren Missouri’s website, and e-mail blasts) becoming more important. This trend likely reflects a change in outreach strategy by the implementer due to COVID-19. Notably, almost half (44%) of Standard/Custom participants prefer e-mail outreach or electronic newsletters as an information channel for energy efficiency opportunities.</p>	<p>communication or delivery of messages through alternative channels is needed for small businesses.</p> <p>Trade allies remain a key communication channel for the BizSavers Program and much of the program’s outreach efforts are focused on them. Trade allies/contractors are still the primary source of information for program participants (reported by 62% of Standard and 57% of Custom PY2022 survey respondents), which is similar to the prior two years, although somewhat lower than in PY2019 (77% Standard and 83% Custom). Notably, over one-third (38%) of Standard/Custom participants prefer e-mail outreach or electronic newsletters as an information channel for energy efficiency opportunities. By program, Custom Program participants show a strong preference for outreach via Ameren Missouri or BizSavers representatives (29% of survey respondents) compared to Standard Program participants (13% of respondents). During PY2022, the BizSavers team also shifted back towards in-person events instead of virtual events. Participant survey results reflect this, with 7% of Standard/Custom Program participants reporting that they heard of the program through an in-person event compared to only 1% who heard about it through a virtual event.</p> <p>During PY2021, the Ameren Missouri and the BizSavers Program revised BSS Program processes to allow for Trade Allies to bring in their own leads. PY2022 was the first full year where this policy was in effect. In addition, the team created a BSS website to inform customers of the program and help Trade Allies generate leads. While these new communication strategies appear to be appropriate additions, their impact is difficult to isolate, given other program changes (most notably the increase budget).</p>
<b>Residential DR</b>	E-mail outreach along with outreach via devices and device apps are cost-effective and targeted given program design and the	E-mail outreach, along with outreach via devices, device apps, and manufacturers are cost-effective and targeted given program





Program	2021 Summary Response	2022 Summary Response
	target market segment. The “virtual” aspect of program enrollment and event dispatch ensured program operations remained uninterrupted during the second year of the COVID-19 pandemic.	design and the target market segment. Recent changes to customer channeling via the Marketplace channel presented challenges to effective enrollment of customers with newly purchased devices into the program. Choice of pre- conditioning strategies can impact both the depth of load impacts, customer experiences, and total energy consumption.
<b>Business DR</b>	Program implementer feedback indicates no program delivery issues.	Program implementer feedback indicates no program delivery issues.

**Table 10: Issue 5 - What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end-use measure included in the program?**

Program	2021 Summary Response	2022 Summary Response
<b>Single Family Income Eligible</b>	The program team can increase the rate of customer acceptance by continuing to expand the network of participating CBOs in both the Grant Channel and the Single-Family Channel. This collaborative work with community partners offers the opportunity to engage with many Ameren Missouri customers across the service territory. The distribution and installation arms of both programs offer opportunities for participants to install measures across a range of end uses.	The program team can increase the rate of customer acceptance by continuing to expand the network of participating CBOs. This collaborative work with community partners offers the opportunity to engage with many Ameren Missouri customers across the service territory. The distribution and installation arms offer opportunities for participants to install measures across a range of end uses.
<b>Multifamily Income Eligible</b>	One potential strategy to overcome split incentive issues is the promotion of Green Leases. Green Leases are contracts between landlords and tenant(s) that negotiate the mutual benefit of installing energy-efficient or green measures in shared buildings. For shared buildings, owners are burdened with green upgrade costs, while tenants benefit from lower operating costs. Without green leases, there is little incentive for owners to make green upgrades to tenant units. Green leases are designed to allow	One potential strategy to overcome split incentive issues is the promotion of Green Leases. Green Leases are contracts between landlords and tenant(s) that negotiate the mutual benefit of installing energy-efficient or green measures in shared buildings. For shared buildings, owners are burdened with green upgrade costs, while tenants benefit from lower operating costs. Without green leases, there is little incentive for owners to make green upgrades to tenant units. Green leases are designed to allow both



Program	2021 Summary Response	2022 Summary Response
	<p>both parties financial benefits and incentives, and multifamily building types are ideal buildings for their use.</p> <p>The other market imperfections outlined above are largely targeted by the program’s one-stop-shop model. As such, increasing participation and/or the share of projects in the program utilizing those services should help to overcome imperfections, such as lack of awareness and information, project costs, limited staff knowledge, and the time needed to plan efficiency projects more effectively.</p>	<p>parties financial benefits and incentives, and multifamily building types are ideal buildings for their use.</p>
<b>Efficient Products</b>	<p>In PY2019, customers seemed largely satisfied with both the Online Store and Mail-in Channels. Increased participation can likely be attained by expanding the breadth of measures rebated under the program; however, focusing additional marketing efforts on contractors, and increasing general customer awareness of the energy efficiency opportunities as well as available rebates.</p>	<p>In PY2019, customers seemed largely satisfied with both the Online Store and Mail-In Channels. Increased participation can likely be attained by expanding the breadth of measures rebated under the program; however, it may be more effective to focus additional marketing efforts on contractors and increasing general customer awareness of the energy efficiency opportunities as well as available rebates.</p>
<b>HVAC</b>	<p>Leverage the insights that arose with the introduction of the Midstream Channel. Acknowledge that the contractors operating in each channel are different, and much of this is likely based on the sociodemographic attainment of their targeted customer base. Segment the HVAC customer population to ensure that the program design and messaging are in alignment with the unique set of barriers and needs faced by the different segments.</p>	<p>Segment the HVAC customer population with respect to outreach to ensure alignment of messaging with the unique set of barriers and needs faced by the different segments.</p> <p>The Midstream channel should continue to work with distributors to increase their inventory of the highest-efficiency units to ensure that systems are available when customers need/want them. (The degree to which the program has been successful at this will be explored as part of the forthcoming prospective FR research.)</p>



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<p><b>Multifamily Market Rate</b></p>	<p>One potential strategy to overcome split incentive issues is the promotion of Green Leases.<sup>10</sup> Green Leases are contracts between landlords and tenant(s) that negotiate the mutual benefit of installing energy-efficient or green measures in shared buildings. For shared buildings, owners are burdened with green upgrade costs, while tenants benefit from lower operating costs. Without green leases, there is little incentive for owners to make green upgrades to tenant units. Green leases are designed to allow both parties financial benefits and incentives, and multifamily building types are ideal buildings for their use.</p> <p>The other market imperfections outlined above are largely targeted by the program’s one-stop-shop model. As such, increasing participation and/or the share of projects in the program utilizing those services should help to overcome imperfections, such as lack of awareness and information, project costs, limited staff knowledge, and the time needed to plan efficiency projects, more effectively.</p>	<p>One potential strategy to overcome split incentive issues is the promotion of Green Leases. Green Leases are contracts between landlords and a tenant or tenants that negotiate the mutual benefit of installing energy-efficient or green measures in shared buildings. For shared buildings, owners are burdened with green upgrade costs, while tenants benefit from lower operating costs. Without green leases, there is little incentive for owners to make green upgrades to tenant units. Green leases allow both parties financial benefits and incentives, and multifamily building types are ideal buildings for their use.</p> <p>The other market imperfections we outline above are largely targeted by the program’s one-stop-shop model. As such, increasing participation and/or the share of projects in the program utilizing those services should help to overcome imperfections, such as lack of awareness and information, project costs, limited staff knowledge, and the time needed to plan efficiency projects more effectively.</p>
<p><b>Pay As You Save</b></p>	<p>Given the high prevalence of gas heat in Missouri and the importance of HVAC savings in qualifying projects under PAYS 80/20 savings rules, the program should consider gas co-delivery to maximize eligibility and associated savings.</p> <p>After addressing this issue, the program would be positioned to implement targeted marketing strategies among renters/landlords and moderate-income residents who the PAYS Program is situated to serve.</p>	<p>The implementation team should prioritize consistent and timely communication with customers at each stage of participation and maintain regular communication with trade ally staff to minimize customer wait times and maximize participation levels and participant satisfaction.</p> <p>Implementer staff can also consistently install all provided equipment and educate customers about proper use of items like</p>

<sup>10</sup> Consortium for Building Energy Innovation (CBEI). “Creating an Energy Savings Win-Win for Owners and Tenants.” *Split Incentives and Green Leases*. Last modified July 27, 2020. <http://www.cbei.psu.edu/split-incentives-and-green-leases/index.html>.



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<b>Community Lighting</b>	Community Lighting was new to PY2022	<p>advanced power strips or smart thermostats that require proper setup to achieve their savings potential.</p> <p>The higher price of LEDs continues to be the largest market barrier to increasing adoption amongst income-eligible populations. The program team should continue to expand partnerships with discount retailers and thrift stores within Ameren Missouri’s service territory and expand distribution through local food banks. Additionally, the program team might consider expanding the food bank channel to include other community partners. Finally, the program team might consider expanding the program offerings to include additional bulb types (e.g., in PY2023 the program team will offer LED night lights through the food bank channel).</p>
<b>BizSavers</b>	<p>The PY2021 evaluation did not include process research designed to answer this question. The PY2019 evaluation provided the following recommendations, some of which were adapted in PY2020 or PY2021:</p> <p>Continue to expand the slate of program-eligible measures. Outdoor lighting is the only one that arose as a specific recommendation, but others likely offer potential.</p> <ul style="list-style-type: none"> <li>• The program added exterior lighting (offered in combination with interior lighting projects) in the summer of 2020 but discontinued the measure in PY2021.</li> <li>• Other new measures introduced in PY2020 included occupancy sensors, VFDs for certain applications, kitchen ventilation controls, compressed air measures, and high-volume low-speed fans.</li> </ul>	<p>The PY2022 evaluation did not include process research designed to answer this question. The PY2019 evaluation provided the following recommendations, some of which were adapted in PY2020, PY2021, or PY2022:</p> <p>Continue to expand the slate of program-eligible measures. Outdoor lighting is the only one that arose as a specific recommendation, but others likely offer potential. ♣ The program added exterior lighting (offered in combination with interior lighting projects) in the summer of 2020 but discontinued the measure in PY2021.</p> <ul style="list-style-type: none"> <li>• Other new measures introduced in PY2020 included occupancy sensors, VFDs for certain applications, kitchen ventilation controls, compressed air measures, and high-volume low-speed fans.</li> <li>• In PY2022 the program introduced HVAC Chip technologies to the Custom Program.</li> </ul>



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	<p>Revisit incentive levels to improve the uptake of non-lighting measures.</p> <ul style="list-style-type: none"> <li>In the spring of 2021, the program offered a temporary trade ally incentive to increase the uptake of HVAC measures.</li> <li>While the program offered a 15% bonus incentive for HVAC measures (compared to 10% for lighting measures) in PY2020, the only bonus incentive in PY2021 was for certain Standard lighting measures.</li> <li>Notably, the Standard Program saw a substantial increase in HVAC projects and savings over the 3-year program cycle.</li> </ul> <p>Continue to expand the network of trade allies and Service Providers, focusing on increasing the diversity of services offered and market segments targeted.</p> <ul style="list-style-type: none"> <li>In light of the COVID-19 pandemic, the program undertook considerable effort re-engaging and supporting its trade ally network. However, any expansion of the network in PY2020 or PY2021 was limited.</li> </ul> <p>Increase customer-focused, strategic, targeted marketing to customers.</p> <p>As noted above, the program has been expanding its direct customer outreach through social media, search engine marketing, segment-specific collateral, email blasts, and other</p>	<p>Revisit incentive levels to improve the uptake of non-lighting measures.</p> <ul style="list-style-type: none"> <li>In the spring of 2021, the program offered a temporary trade ally incentive to increase the uptake of HVAC measures.</li> <li>While the program offered a 15% bonus incentive for HVAC measures (compared to 10% for lighting measures) in PY2020, the only bonus incentive in PY2021 was for certain Standard lighting measures.</li> <li>Notably, the Standard Program saw a substantial increase in non-lighting projects and savings over the program cycle. Non-lighting measures collectively increased from 2.5% of Standard Program ex ante gross energy savings in PY2019 to 15% in PY2022.</li> <li>In PY2022, the BizSavers team increased incentives for most measures across all programs.</li> </ul> <p>Continue to expand the network of trade allies and Service Providers, focusing on increasing the diversity of services offered and market segments targeted.</p> <ul style="list-style-type: none"> <li>In light of the COVID-19 pandemic, the program undertook considerable effort re-engaging and supporting its trade ally network. However, any expansion of the network between PY2020 and PY2022 was limited.</li> </ul>



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<b>Residential DR</b>	<p>efforts. These efforts have been successful as more participants now hear about the program through these channels.</p> <p>Aligning acquisition channels and introducing new device manufacturers into the program could help capture more customers as well as different customers; thus ensuring achievement of participation goals in future years and serving a broad spectrum of Ameren Missouri customer segments.</p> <p>Monitoring de-enrollment trends and reasons can help anticipate additional enrollment needs, as well as craft program engagement to minimize participant attrition.</p> <p>Working to ensure sustained performance over multi-hour events by better understanding override behaviors and tailoring messaging and engagement strategies to minimize those behaviors, thus increasing the depth of demand impacts, will be important to continued effectiveness of the program.</p>	<p>Aligning acquisition channels and introducing new device manufacturers into the program could help capture more customers as well as different customers, thus ensuring achievement of participation goals in future years and serving a broad spectrum of Ameren Missouri customer segments.</p> <p>Monitoring de-enrollment trends and reasons can help anticipate additional enrollment needs, as well as craft program engagement to minimize participant attrition.</p> <p>Working to ensure sustained performance over multi-hour events by better understanding override behaviors and tailoring messaging and engagement strategies to minimize those behaviors, thus increasing the depth of demand impacts, will be important to continued effectiveness of the program.</p>
<b>Business DR</b>	<p>Enel X is actively working on developing processes for expediting participant payment. Enel X is also exploring strategies for streamlined and cost-effective enrollment of customers with smaller nominations to ensure cost-effective recruitment and engagement of customers. Enel X is actively working to explore ways to achieve more performance among already enrolled participants. Enel X plans to deploy additional metering to ensure timely communication of event performance with a larger share of participating customers.</p>	<p>Enel X is actively working to explore ways to achieve more performance among already enrolled participants. Enel X plans to continue deploying additional customer engagement to provide training, education, and update customer contacts to increase performance and retention.</p>