BizSavers Program Evaluation Report

Volume I of II

March 2018 - February 2019

Prepared For:

Ameren Missouri

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Opinion Dynamics

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1. Executive Summary

This report presents the results of the impact, process, and cost effectiveness evaluations of the Standard Program, the Custom Program including the Energy Management System (EMS) Pilot Program, New Construction Program, Retro-Commissioning Program, and the Small Business Direct Install (SBDI) Program implemented during program year 2018 (PY2018), which occurred from the start of March 2018 to the end of February 2019. The PY2018 cost effectiveness analysis is premised on cost data received to date (end of March 2019). The evaluation, measurement and verification (EM&V) team was led by ADM Associates, Inc. ADM was joined by Research Into Action, Inc. (now part of Opinion Dynamics Corp.), which performed the process evaluation of the programs. These demand-side management (DSM) programs are implemented by Lockheed Martin Energy Solutions. The electric distribution and transmission utility is Ameren Missouri. The primary evaluation activities are listed in the following paragraphs.

The evaluation team collected data for the evaluation through review of program materials, on-site inspections, end use metering, and interviews with Ameren Missouri staff members, Lockheed Martin staff members, and participating customers and contractors.

The evaluation team developed sampling for the five BizSavers programs with completed projects to perform on site verification and estimation of the energy savings. The sampling plan for each program was intended to facilitate estimation of energy savings with ±10% statistical precision at the 90% confidence level. The actual statistical precision of energy savings estimates is ±7.3% for the Custom Program, ±4.9% for the Standard Program, ±9.7% for New Construction, ±8.1% for Retro-Commissioning Program and ±5.0% for the SBDI Program. A census approach was performed for the EMS Pilot Program.

Analysts performed ex post gross kWh energy savings calculations for each sampled project. Additionally, measures identified as High Impact Measures (HIM) were sampled within the projects. The evaluation team used the project-level and HIM gross realization rates to estimate the energy savings associated with non-sampled measures.

Program participant surveys provided insight into the participants' decision-making processes, levels of satisfaction, and tendencies to invest in energy efficiency in the future. The results informed the net-to-gross analysis, spillover data collection, as well as the process evaluation.

Trade ally surveys provided insight into the quantitative non-participant spillover impacts.

Program staff interviews provided insight into the continuous improvement of the program to meet the customer's needs.

The evaluation team administered surveys to participants at the Ameren Missouri trade ally training event to assess how well these events deliver program information.

The evaluation team provided data required to perform cost effectiveness analyses to determine portfolio-level and program-level cost benefit ratios with datasets for net energy savings, effective useful life (EUL) and the corresponding end use classification along with measure installation costs.

Table 1- provides a summary of the EM&V data collection efforts. The table lists data sources used for the evaluation, the data collection method, the dates during which data collection and/or analysis was performed, the research objectives, and the type of analysis performed (qualitative vs. quantitative).

Table 1-1 Summary of BizSavers EM&V Data Collection Efforts

Data Source	*Method*	*Dates*	*Key Research Topics*	*Analysis Type*
Pre-install site visit (20)	On-site M&V	March 2018 to February 2019	Verify baseline operating conditions	Quantitative and Qualitative
Post-install sample visits (329)	On-site M&V	March 2018 to February 2019	Verify measure installation and collect end use metering data	Quantitative and Qualitative
Program implementer staff (3)	Telephone in-depth interview	November 2018	Program management; communication; current and new offerings; goals and progress; trade ally relations; marketing and outreach; tracking and reporting; quality assurance	Qualitative
Participants, all programs (568)	Online survey	October to December 2018	Program awareness, decision-making, equipment preferences; experience and satisfaction	Quantitative and Qualitative
Trade allies, all programs (102)	Online survey	April 2019	Awareness and effect of program changes; customer awareness of BizSavers; awareness of and interest in new programs; spillover.	Quantitative and Qualitative
Nonparticipant customers (334)	Online	April 2019	Program awareness, interest, and barriers to participating; equipment decisions	Quantitative and Qualitative
Program documentation	Document review	July 2018 to April 2019	Program function; tracking and reporting; quality control	Qualitative

Data Source	*Method*	*Dates*	*Key Research Topics*	*Analysis Type*
Database analysis	Database review	January to April 2019	Number of projects; project type and details; data quality	Database analysis

Table 1-2 provides a summary of the PY2018 evaluated energy savings of the portfolio of BizSavers Programs. The table presents the ex ante kWh, ex post gross kWh, and ex post net kWh energy savings as compared with the PY2018 energy savings goals.

Table 1-2 Summary of kWh Savings for BizSavers Programs

Program	*PY2018 Savings Targets kWh*	*Ex Ante kWh Savings*	*Ex Post Gross kWh Savings*	*Gross kWh Savings Realization Rate*	*Ex Post Net kWh Savings*	*Net-to-Gross Ratio*	*Percent of Goal Achieved*
Custom[1]	71,138,714	99,779,831	96,011,416	96%	82,204,813	86%	122%
EMS		5,354,280	4,817,575	90%	4,838,146	100%	
Standard	34,349,695	196,012,730	175,944,805	90%	174,513,168	99%	508%
New Construction	6,016,434	21,829,656	20,892,536	96%	19,732,167	94%	328%
Retro-Commissioning	8,128,890	6,701,547	6,609,545	99%	6,630,413	100%	82%
SBDI	12,600,000	16,072,490	14,333,892	89%	14,565,040	102%	116%
Total	132,233,733	345,750,534	318,609,770	92%	302,483,747	95%	229%

Net savings are equal to gross savings, minus free ridership, plus participant spillovers and non-participant spillovers. ADM completed a net program impact analysis to determine what portion of gross energy savings and kWh reductions achieved by participants in the program are attributable to the effects of the program.

$$Net\ Savings = Gross\ Savings - Free\text{-}ridership + (SO_{part} + SO_{non\text{-}part})$$

BizSavers Programs achieved ex post net kWh savings equal to 229% of the PY2018 kWh savings target. The Standard Program ex post net kWh savings equal 508% of the PY2018 savings target, and the New Construction Program ex post net kWh savings equal 328% of the PY2018 savings target. The relative share of BizSavers savings achieved by the Standard Program may have been heightened by the expansion of

[1] While the EMS Pilot Program is a component of the Custom Program, in this report EMS Pilot Program results are generally presently separately from those associated with the rest of the Custom Program. In this report, "Custom Program" generally refers to the non-EMS Pilot Program component of the Custom Program.

prescriptive offerings during the course of the program cycle. Additionally, long-lead new construction projects concluded during PY2018.

The evaluation team collected data from trade allies to gain an understanding of how the BizSavers Program is influencing the un-incented lighting equipment being sold in the Ameren Missouri service territory. The report refers to program-influenced, un-incented lighting sales as program non-participant spillover. Volume II of this report presents detailed information regarding the non-participant spillover evaluation methodology and findings.

Table 1-3 summarizes the PY2018 ex post peak kW savings. The table presents the ex ante peak kW, ex post gross peak kW, and ex post net peak kW savings as compared with the PY2018 peak kW savings goals.

Table 1-3 Summary of Peak kW Savings for BizSavers Programs

Program Component	*PY2018 Peak Kw Savings Targets*	*Ex Ante Peak kW Savings*	*Ex Post Gross Peak kW Savings*	*Gross kW Savings Realization Rate*	*Ex Post Net Peak kW Savings*	*Percent of Goal Achieved*
Custom	15,073.20	28,729.49	27,758.06	97%	23,313.46	164%
EMS		3,159.48	2,790.79	88%	2,804.18	
Standard	6,278.60	37,089.08	33,270.09	90%	33,003.29	498%
New Construction	1,861.40	6,677.02	6,263.66	94%	6,120.19	309%
Retro-Commissioning	1,737.90	3,277.93	3,116.95	95%	3,128.81	169%
SBDI	2,150.80	3,051.77	2,720.17	89%	2,764.08	116%
Total	27,101.90	81,984.78	75,919.73	93%	71,134.01	247%

1.1 Impact Conclusions

Below is a summary of conclusions from the impact evaluation.

- With the exception of Retro-Commissioning, all BizSavers programs exceeded their energy savings goals, and in several instances by a large amount. On the high end, Standard ex post net kWh savings were equal to 508% of the goal. Retro-commissioning ex post net kWh savings were equal to 82% of the savings goal. The savings for the portfolio as a whole were equal to 229% of the savings goal.
- Ex ante kWh energy savings estimates were, on average, relatively accurate relative to ex post gross kWh savings, with program-level gross realization rates ranging from 89% for SBDI, to 99% for New Construction.

- High Impact measures within the Standard program have average ex post gross realization rates of 94% and 82% for HIM Measure 3025 and 3026, respectively. Of the input variables for the kWh savings algorithm, the hours-of-use input has the largest variation from the application hours to the measured ex post hours of use. The differences in hours occurs similarly in both the above expected hours and less than expected hours.
- Overall, goal attainment followed a similar pattern for kW savings as for kWh. One exception is that kW savings for Retro-Commissioning savings exceeded the program goal – kW savings equaled 169% of the savings goal, whereas kWh savings equaled 82% of the goal. The high kW reductions achieved are likely a function of the savings concentration in end-uses with high peak demand factors. More than one-half Retro-Commissioning savings resulted from cooling and HVAC end-uses.
- During PY2018, ADM recommended that the New Construction Program protocol for determining applicable baselines cease to reference ASHRAE 2001, and instead reference ASHRAE 2007 – this recommendation was implemented by the program.

1.2 Impact Recommendations

The evaluation team offers the following impact recommendations for consideration.

- Modify the New Construction application to require input of both a baseline equipment cost and the proposed efficient equipment cost, to calculate incremental cost.
- Modify the lighting tabs with the program application to encourage the disaggregation of unique usage areas within a measure. Add a method to permit applicants that have already created a lighting survey to transfer data to the application. The application currently uses two merged cells per field, which hinders the applicant's ability to cut/paste lighting data. Add an additional worksheet to permit transfer of applicant's data to the formatted lighting application.

1.3 Regulatory Research Questions – Process Conclusions and Recommendations

The results of the process evaluation research are largely positive. Program participant satisfaction was high across all most program facets. This report provides an overview of program operations and suggests recommendations for consideration as the program evolves.

Below, conclusions and recommendations are organized according to the five regulatory research questions specified in 4 CSR 240-22.070(8) Evaluation of Demand-

Side Program and Demand-Side Rates subsection of the Resource Acquisition Strategy Selection section. The conclusions address the first four questions; the fifth question speaks to recommendations.

Research Question 1: What are the primary market imperfections common to target market segment?

One factor that would prevent Ameren Missouri customers from taking advantage of the BizSavers programs is not being aware of the programs. This year's evaluation found that somewhat less than half (41%) of nonparticipants were aware of the BizSavers program. By contrast, most of the evaluations in the past several years had found that about half of surveyed nonparticipants were aware of the programs (47% in PY2017). It is possible that awareness has not actually decreased since PY2017: the 95% confidence intervals for the PY2018 and PY2017 awareness estimates overlap, with the former going as high as 46% and the former going as low as 43%.

Still, the best guess is that awareness has dipped at least slightly. Slightly decreased program awareness in the general customer population did not keep the program from achieving enough savings this program year to exceed most savings targets. However, starting the next program cycle with reduced awareness in the customer population may put the program at a disadvantage. Recall that the PY2016 evaluation found a very low program awareness rate (20%), assessed a few months after the end of the program's three-month suspension, possibly suggesting that maintaining program awareness depends on continuous program marketing, outreach, and trade ally engagement.

High up-front costs continue to be commonly cited barriers to efficiency upgrades, and the continued high net-to-gross ratios for the BizSavers Program, together with feedback from participants about the value of the incentives, again emphasize the importance of incentives in driving the efficiency upgrades. In this context, it is worth noting that trade allies reported that the decreased lighting incentives made it more difficult to sell lighting projects.

Another potential barrier is time: in particular (for the current evaluation), small businesses reported that lack of time is the primary barrier to scheduling a free walk-through assessment through the SBDI Program. This did not prevent that program from achieving its target savings for the current cycle, but as the program achieves greater penetration, this factor may begin to come into play.

Findings from evaluations in an earlier program cycle indicated that smaller businesses and those in remote parts of the Ameren Missouri service territory were underrepresented in program participation, suggesting that business size and geography may have affected those customers' ability to take advantage of the BizSavers programs. Analyses of PY2018 program participation data as it compares to

customer population data indicate that various business sizes and geographic areas are well represented in the program.

Research Question 2: Is target market segment appropriately defined, or does it need further subdivision or merging with other segments?

In general, the BizSavers Program does a good job of reaching all parts of the nonresidential market: for most building end uses, the distribution of program participants matches relatively well with the distribution of businesses in the population.

Evaluation findings continue to support the establishment of the SBDI Program to serve small businesses, with savings in the 2M rate class now at or above par with electric usage for several years in a row since the program's establishment. Surveyed nonparticipants indicated moderate-to-high likelihood of agreeing to schedule a walk-through assessment if approached by an SBDI Service Provider.

Research Question 3: Do program measures reflect the diversity of end-use needs and available technologies for target segment?

Participant surveys and interviews showed satisfaction with the range of program-eligible equipment, delivery time for ordered equipment, and the quality of the equipment and the installation. The evaluation identified several measure-specific findings.

A variety of analyses of project tracking data provide evidence that the Energy Management System (EMS) pilot program, introduced in PY2016 to help non-profit and other tax-exempt entities install EMS, has had a positive effect on EMS savings in the current program year. Specifically, it appears to have reduced the decline in kWh savings from EMS projects and increased kW savings compared to what might have occurred without the pilot. This suggests the EMS pilot program has met certain end-use needs.

In the current program year, the implementer introduced some changes to incentive structures to promote certain measure types. One such change was a large increase in the incentive for cooling measures. Analysis of project tracking data suggests that this change may have stimulated more cooling projects and savings, increasing the overall amount of demand savings.

Another change was to allow lighting fixture replacements to be made with Standard incentives, whereas previously they could be made only with Custom incentives. Surveyed trade allies were largely in favor of this change because it increased the speed and reduced the complication of making such replacements.

A class of measure types that may warrant attention in the future are lighting controls. The number of projects with lighting control measures, such as occupancy sensors, daylight sensors, and other dimming controls, declined sharply in PY2018 from previous

years, possibly because of a perceived decrease in the value of controlling lighting as highly efficient LEDs become more pervasive. A large opportunity exists for increased penetration of lighting controls. Four out of five surveyed nonparticipants reported no lighting controls in their buildings. Those who have controls were twice as likely to report plans for more controls than those without controls, which suggests high satisfaction with controls among those who have them. Program staff reportedly have had discussions about how to drive ethernet-controlled lights and more integration with building controls.

Finally, it should be noted that about one in five surveyed trade allies commented on the need for exterior lighting incentives – these were unsolicited open-ended comments, and so they may represent a higher percentage of all trade allies. Most of the comments seemed to suggest a belief that there were no incentives at all for exterior lighting, which may suggest a need for better communication of program rules with trade allies (see below), some explicitly called for reinstating incentives for dusk-to-dawn exterior lighting.

Research Question 4: Are communication and delivery channels/mechanisms appropriate for the target market segment?

The program implementer continued using a wide range of marketing outreach channels and methods to reach end-use customers and service providers (e.g., contractors, vendors, and distributors), including targeted outreach to decision makers representing customer account aggregates or “towers.”

Program staff reported continued efforts at targeting outreach to specific industries. This year’s targeted efforts involved development of website infographics with industry-focused information on energy use, energy-saving tips, program savings, and program contact information. This industry-focused effort is a follow-on to an effort targeting schools in PY2017, which produced results in the current program year.

Another newly reported outreach activity is an effort to capitalize on a new St. Louis ordinance requiring benchmarking on all buildings above a certain size. The business development team identified owners of buildings above the threshold, helped them benchmark the buildings, and then steered them to the incentive program. Project tracking data suggest this effort so far may have had some limited effect.

The importance of the program trade allies as a program marketing channel is clear. Equipment vendors and contractors continue to be the main sources of BizSavers program awareness and to have the greatest influence on equipment selection. For this reason, it is noteworthy that trade allies reported that the BizSavers program communicates well with them and has a consistent approach to managing the trade ally network.

Still, it appears that overall program awareness in the nonparticipant customer population has dipped somewhat – awareness of New Construction incentives was particularly low, even among those who had recently completed or were planning to complete a new construction project. Moreover, BizSavers participants had low awareness of incentive types that they had not used, as well as low awareness of recent changes to the incentive structure. As noted above, while the program met and exceeded most savings targets this program year, starting the next program cycle with reduced awareness in the customer population may put the program at a disadvantage.

One further evaluation finding that is pertinent to this research question is the fact that it was difficult for many surveyed program nonparticipants to find information on energy efficiency on the Ameren Missouri website. Just over one-third of those who visited the website to look for that information reported being able to find it easily, and the same proportion reported there was some information they were not able to find. This issue is important in light of the fact that one of the channels that staff mentioned for the planned industry-focused marketing and outreach is the use of web-based infographics, which may have limited impact if they are difficult to find.

Finally, some evidence suggests that communication of some program rules and incentive changes has not reached some trade allies and customers. Awareness of the change to the incentives for Custom cooling measures was low, including among Custom program participants. Even one-third of trade allies who deal with cooling equipment were not aware of it. In addition, as noted above, many trade allies made comments that seemed to suggest a belief that the program provided no incentives at all for exterior lighting.

Research Question 5: Are there better ways to address market imperfections to increase adoption of each program measure?

As indicated above, the BizSavers program met or exceeded all savings targets and has done a good job of delivering the program to all segments of the nonresidential market. The following recommendations may help ensure continued effective program delivery and achievement of goals:

Process recommendation 1: Ameren Missouri and Lockheed Martin should assess how customers use the website, particularly to find information on energy efficiency and incentives to identify ways to make this information easier to find. Such an assessment could include web-use analytics as well as interviews or focus groups with customers.

Process recommendation 2: Lockheed Martin should continue efforts to educate trade allies and customers about the change in incentives for Custom cooling measures, such as through additional email blasts, webinars, and group events as well as tying information on the cooling incentives to industry-focused marketing and outreach activities.

Process recommendation 3: Lockheed Martin should put effort into increasing implementation of lighting controls such as by developing messaging that controls are valuable even with LED lighting and by working with trade allies that specialize in either lighting or building automation to encourage them to promote controls in their jobs.

Process recommendation 4: Lockheed Martin should consider developing and implementing training for SBDI Service Providers to help them overcome resistance by business owners to scheduling a free walk-through assessment, thereby increasing the value of the Service Providers' outreach efforts and the savings achieved.

Process recommendation 5: Lockheed Martin should ensure that trade allies accurately understand the incentives available for external lighting so that opportunities are not lost because trade allies believe there are no incentives, and should consider re-introducing incentives for dusk-to-dawn external lighting if doing so will help ensure that other lighting replacements get made.

2. Introduction

This report presents the results of the impact, process, and cost effectiveness evaluations of the BizSavers Custom, Standard, Energy Management System (EMS) Pilot, New Construction, Retro-Commissioning, and Small Business Direct Install (SBDI) programs. These programs are available to Ameren Missouri's business sector customers. This report presents results of activity during program year 2018 (PY2018), which occurred during March 2018 through February 2019.

2.1 Program Descriptions

The design of the BizSavers Program is to help businesses identify and implement energy saving projects. The programs evaluated in this report are as follows:

Standard Program: prescriptive incentives for purchasing and installing efficient equipment and prescriptive delamping incentives when installing incentivized lighting equipment.

Custom Program[2]: incentives were paid at six levels per kWh saved, depending on the end use or equipment type, subject to caps and payback timing:

- Cooling – $.15
- HVAC, VFDs, cooking, miscellaneous – $.08.
- Interior lighting, exterior 24/7 lighting, lighting controls, water heating – $.075.
- Compressed air, efficient motors – $.07.
- Refrigeration – $.06.
- Exterior or Garage lighting operating dusk to dawn - $.05

New Construction Program incents building with increased energy efficient design and equipment.

[2] While the EMS Pilot Program is a component of the Custom Program, in this report results and narrative associated with the Custom Program generally account refer to the non-EMS component of the Custom Program. Results associated with the EMS Pilot Program are generally reported separately.

Table 2-1 New Construction Program Incentives

From Baseline	*Whole Building (Design)*	*LPD (watt reduced)*	*Custom (lighting)*	*Custom (non-lighting)*	*Standard*
0-19% energy savings	$0.02/kWh	$.40/W	$0.06/kWh	$0.07/kWh	Per unit
20-29% energy savings	$0.03/kWh		$0.06/kWh	$0.07/kWh	Per unit
>=30% energy savings	$0.04/kWh		$0.06/kWh	$0.07/kWh	Per unit

Interior lighting incentives are based on the installed reduced wattage under the most stringent guideline from applicable ASHRAE standard, Initial Design if completed or construction requirements, using the allowed lighting watts per square feet by building type or usage area, multiplied by the building area or usage area.

Standard non-lighting and Custom incentives within New Construction are approved following the Design Team meeting and subject to incentive caps.

Retro-Commissioning Program: Incentives are based on estimated energy savings at the same rate as the Custom program by End Use. The study incentive is payable up to 100% of the program approved study cost, based on the table below when the recommended measures have been installed and verified.

Table 2-2 Retro-Commissioning Study Incentive

Total Verified Annual kWh Saved	*RCx Study Incentive Tracks & Rates*			*Verification Type*
	Compressed Air	*Refrigeration*	*Buildings*	
≤ 500,000kWh	$0.01/kWh	$0.01/kWh	$0.02/kWh	Installation
> 500,000kWh	$0.02/kWh	$0.02/kWh	$0.03/kWh	Operational

SBDI Program: To qualify for this program, participants must be classified under the Ameren Missouri 2M Small General Service electric rate category and use an approved Small Business Direct Install Service Provider. SBDI incentives are capped at $2,500 per electric account, after which the applicant may receive the Standard incentives. The service provider will purchase and install the lighting equipment as well as handle the application process.

EMS Pilot Program[3]: The EMS Pilot Program provides incentives for the installation of EMS equipment and software designed to control, monitor, and log real-time energy consumption. Incentives to eligible public and private schools and tax-exempt organizations, can cover 50% of the total EMS project cost.

[3] While the EMS Pilot Program is a component of the Custom Program, in this report results associated with the EMS Pilot Program are generally presented separately from those associated with the non-EMS component of the Custom Program.

Table 2-3 shows the PY2018 ex ante kWh savings by program.

Table 2-3 Ex Ante kWh and Peak kW Savings of BizSavers Programs

Program	*Number of Program-Projects*	*Ex Ante kWh Savings*	*Ex Ante Peak kW Savings*
Custom	1,456	99,779,831	28,729.49
EMS Pilot	38	5,354,280	3,159.48
Standard	5,276	196,012,730	37,089.08
New Construction	88	21,829,656	6,677.02
Retro-Commissioning	15	6,701,547	3,277.93
SBDI	1,357	16,072,490	3,051.77
Total	8,230	345,750,534	81,984.78

2.2 Program Trends in PY2018

The program year started in March with the continued offering of the Custom, Standard, New Construction, Retro Commissioning, EMS and SBDI programs.

Figure 2-1 plots the Custom Program ex ante energy savings by project completion month and cumulative energy savings through the program year.

Figure 2-1 Custom Program Ex Ante kWh Savings by Project Completion Month

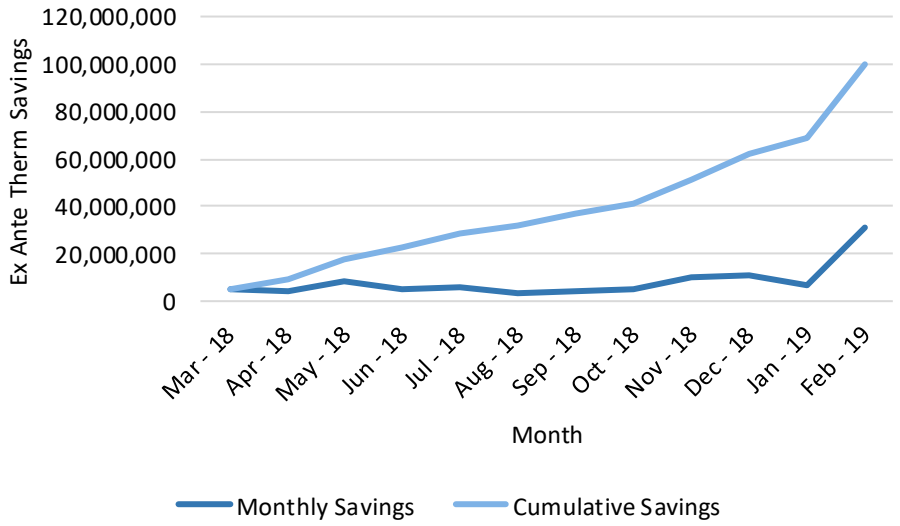


Figure 2-2 plots the Standard Program ex ante energy savings by project completion month and cumulative ex ante energy savings through the program year.

Figure 2-2 Standard Program Ex Ante kWh Savings by Project Completion Month

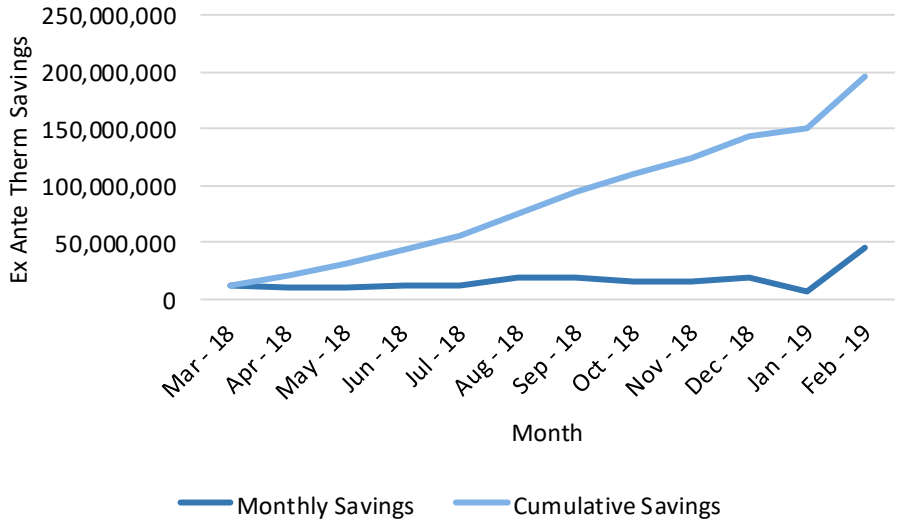


Figure 2-3 and Figure 2-4 below display the ex ante program energy savings by month as well as cumulatively for the New Construction Program and Retro-Commissioning Program respectively. Projects completed through these programs typically have a longer project life cycle than Standard Program projects.

Figure 2-3 New Construction Ex Ante kWh Savings by Project Completion Month

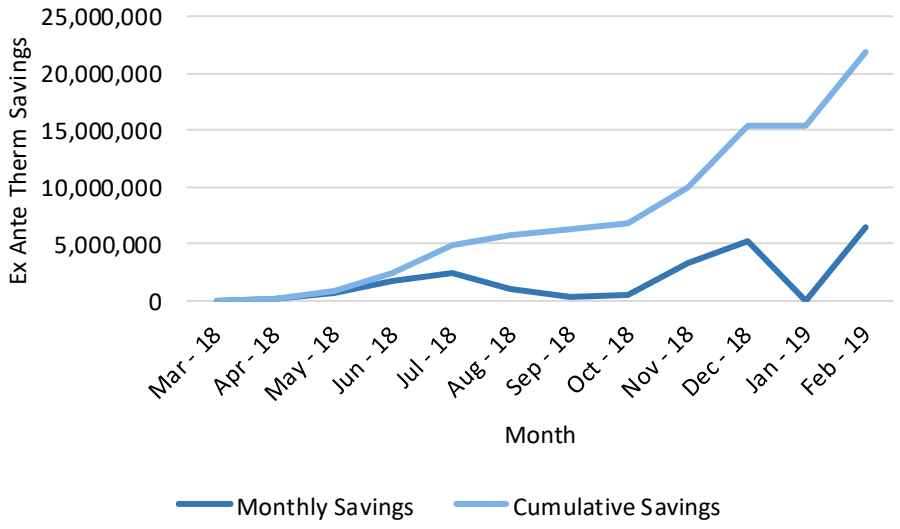


Figure 2-4 Retro-Commissioning Ex Ante kWh Savings by Project Completion Month

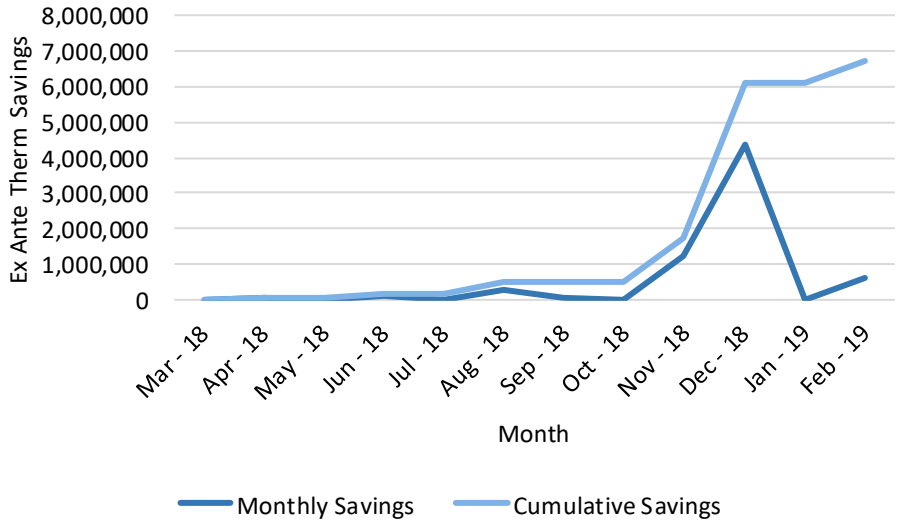


Figure 2-5 plots the SBDI ex ante savings by project completion month and cumulative ex ante energy savings through the program year.

Figure 2-5 Small Business Direct Install Ex Ante kWh Savings by Project Completion Month

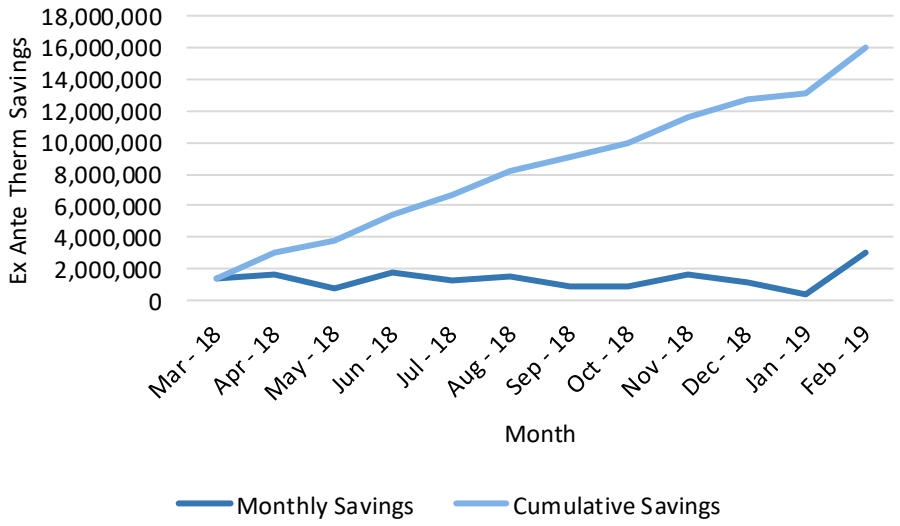
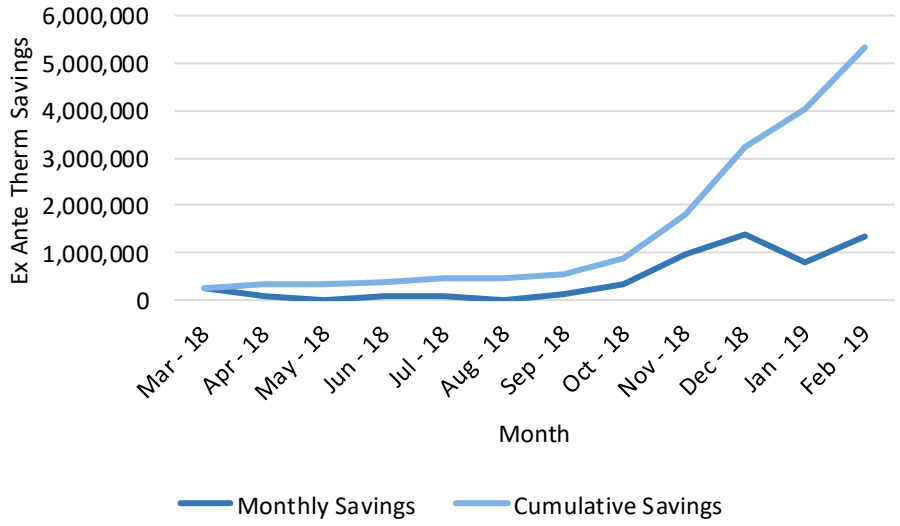


Figure 2-6 charts the EMS Pilot ex ante energy savings by project completion month and cumulative ex ante energy savings through the program year. The increase in completed projects was primarily from school building types that installed or upgraded EMS control systems during the summer break period.

Figure 2-6 Energy Management System Ex Ante kWh Savings by Project Completion Month



2.3 Organization of Report

This report is divided into two volumes providing information on the impact, process, and cost effectiveness evaluation of the BizSavers portfolio of programs for the period March 2018 through February 2019. Volume I is organized as follows:

- Chapter 3 presents and discusses the methods used for and the results obtained from estimating ex post gross savings.
- Chapter 4 contains the ex post net savings methodology and results.
- Chapter 5 presents and discusses the methods used for and results obtained from the process evaluation.
- Chapter 6 presents and discusses the methods used for and results obtained from the cost effectiveness evaluation.
- Chapter 7 presents evaluation conclusions and recommendations.

See report Volume II for appendices presenting detailed information regarding evaluation methodologies, data collection instruments, and evaluation results.

3. Estimation of Ex Post Gross Savings

This chapter explains the estimation of ex post gross kWh savings and ex post gross peak kW savings associated with BizSavers measures installed during program year 2018 (PY2018), which occurred during March 2018 through February 2019. ADM performed impact analyses in accordance with evaluation requirement in Missouri 4 CSR 240-20.093 Demand-Side Programs Investment Mechanism and 4 CSR 240-20.094 Demand-Side Programs. Section 3.1 describes the methodology used for estimating ex post gross energy and demand impacts. Section 3.2 presents the results of the effort to estimate savings for BizSavers program M&V samples. Volume II of this report presents the specific, applied methodologies used to estimate ex post gross savings and the savings estimation results for each sampled measure.

3.1 Methodology for Estimating Gross Savings

The program gross kWh and kW savings are determined by evaluating a sample of individually completed projects receiving incentives that is statistically significant. The population for sampling includes both projects aggregated by ex ante kWh savings and high impact measures aggregated by ex ante kWh savings. High impact measures are those that produce at least 50% of the program ex ante savings in aggregate. Project measures and complete projects without high impact measures will be referred to as non-HIM measures in the following tables.

3.1.1 Sampling Plan

Program tracking data was continually reviewed during PY2018 for project sampling selection. During PY2018, there were 1,456 projects with Custom Program measures for an ex ante savings of 99,779,831 kWh. Within the Custom Program, the EMS Pilot Program completed an additional 38 EMS projects with ex ante savings of 5,354,280 kWh. There were 5,276 Standard Program projects associated with ex ante energy savings of 196,012,730 kWh. The New Construction Program completed 88projects with ex ante savings of 21,829,656 kWh savings, the Retro-Commissioning Program completed 15 projects with ex ante savings of 6,701,547 kWh, and the SBDI Program completed 1,357 projects associated with ex ante savings of 16,072,490 kWh. The evaluation team used stratified statistical sampling for the Custom Program, Standard Program, New Construction Program, Retro-Commissioning Program, and the Small Business Direct Install Program. Additionally, a census of the EMS Pilot Program projects was selected.

The basis for the estimation of savings for the programs is a ratio estimation procedure that allows the measured and verified (M&V) sample to, with a specific statistical precision, explain the annual ex post gross savings for all completed projects. The

sampling statistical precision for each program is shown in Table 3-1. The Custom Program sample facilitated estimation of energy savings with statistical precision of 7.3%, while the precision of the Standard Program sample is 4.9%. The sampling precision of the New Construction Program sample is 9.7%, while the precision of the Retro-Commissioning Program is 8.1%, and the precision of the Small Business Direct Install Program sample is 5.0%. There was an M&V census performed for the EMS Program.

Table 3-1 Sample Statistical Precision by Program

Program	*Statistical Precision*
Custom	7.3%
EMS	N/A (Census)
Standard	4.9%
New Construction	9.7%
Retro-Commissioning	8.1%
SBDI	5.0%

The sample selection is from the population of projects with completion dates during PY2018, from March 1, 2018 through February 28, 2019. The evaluation team developed periodic samples to allow for analysis of projects throughout the program year. Table 3-2 is a summary of the sampling statistics. Additional data pertaining to the sampling plans is presented in Volume II of this report. The sampling groups include projects and the high impact measure groups within the project. The total ex ante kWh savings of the sampled projects is 64,135,442 kWh from the population of 345,750,534kWh, for 19% of the BizSavers' savings.

Table 3-2 Population and Sample Statistics

Program -Sample	*Population size*	*Sample*	*Strata*	*Total Ex Ante kWh Savings*	*Sample Ex Ante kWh Savings*	*Percent Ex Ante Savings in Sample*
Custom	1,456	88	6	99,779,831	22,680,020	23%
Standard - Non HIM	2,550	91	5	72,719,369	9,769,590	13%
Standard - HIM 3025	2,373	125	5	71,856,312	9,480,528	13%
Standard - HIM 3026	2,846	86	5	51,437,049	2,799,122	5%
New Construction	88	17	5	21,829,656	7,582,421	35%
Retro-Commissioning	15	9	4	6,701,547	4,493,979	67%
SBDI - Non HIM	720	61	3	3,140,275	393,484	13%
SBDI - HIM 3025	438	44	4	2,399,300	353,755	15%
SBDI - HIM 3026	1,149	122	4	10,532,915	1,228,263	12%
EMS	38	38	Census	5,354,280	5,354,280	100%
Total				345,750,534	64,135,442	19%

3.1.2 Review of Documentation

After the sample selection, ADM obtained project documentation from the tracking database maintained by Ameren Missouri's program implementation contractor. ADM analysts then reviewed this documentation and other program materials that were relevant to the evaluation effort.

The available documentation (e.g., audit reports, savings calculation work papers, invoices, etc.) for each incentivized measure was reviewed, with attention given to the calculation procedures and documentation for ex ante energy saving estimates. The reviewed documentation for all selected projects included program forms, databases, invoices, product spec sheets, reports, billing system data, weather data, and any other potentially useful data. Examination of each application to determine whether the following types of information is included:

- Documentation for the equipment changed, including (1) descriptions, (2) schematics, (3) performance data, and (4) other supporting information
- Documentation for the new equipment installed, including (1) descriptions, (2) schematics, (3) performance data, and (4) other supporting information
- Information about the savings calculation methodology, including (1) what methodology was used, (2) specifications of assumptions and sources for these specifications, and (3) correctness of calculations

If there was uncertainty regarding a project or incomplete project documentation, then ADM staff contacted the implementation contractor to seek further information to ensure the development of an appropriate project-specific M&V plan.

3.1.3 On-Site Data Collection Procedures

Field technicians made on-site visits to sampled facilities in order to collect data used in calculating ex post energy and peak demand impacts for the implemented measures. During the site visits of the sampled projects, field technicians collected primary data on the participants' facilities and the implemented energy efficiency measures.

ADM provided Ameren Missouri energy efficiency staff with a list of projects for which ADM planned to schedule M&V activities. This list included the company name, the project ID, the site address or other premise identification, and the customer representatives' contact information with whom ADM intended to schedule an appointment.

During an on-site visit, the field staff accomplished three major tasks:

- First, they verified the implementation status of all measures for which customers received incentives. They verified the installation of energy efficiency

measures, that the installation was complete, and that the measures still functioned properly.

- Second, they collected the data needed to analyze the ex post energy and peak demand impacts associated with the measures that were implemented. Data were collected in accordance with the site-specific M&V plans developed through detailed documentation review for each sampled facility.
- Third, they interviewed the facilities' representatives to obtain additional information that may support the calculation of ex post energy savings. These interviews covered various topics depending on the nature of the specific project. Potential areas for discussion include facility operating schedules, details of process driven upgrades.

Volume II of this report presents information regarding site-specific M&V data collection activities.

3.1.4 Procedures for Estimating kWh Savings from Measures Installed through the Program

The method ADM employs to determine ex post gross impacts depends on the types of measures implemented. Categories of measures include the following:

- Lighting;
- HVAC;
- VFDs;
- Refrigeration; and
- Compressed Air.

Table 3-3 summarizes the general methods used by ADM to determine gross savings for the BizSavers measures. Volume II of this report presents the specific, applied methodologies used to estimate ex post gross savings for each sampled measure.

Table 3-3 Typical Methods to Determine Savings for Custom Measures

Type of Measure	*Method to Determine Savings*
Lighting	Reference to data on wattages of newly-installed measures, hours-of-use data obtained from field monitoring, with baseline data informed by applicable standards or pre-existing equipment characteristics.
HVAC (including packaged units, chillers, cooling towers, controls/EMS)	eQUEST model using DOE-2 as its analytical engine for estimating HVAC loads and calibrated with site-level billing data to establish a benchmark.
VFDs	eQUEST model using DOE-2 as its analytical engine for estimating HVAC loads and calibrated with site-level billing data to establish a benchmark.
Refrigeration	Engineering analysis referencing Energy Star equations and variables.
Compressed Air Systems	Engineering analysis, with monitored data of power and schedule of operation.

The activities specified in Table 3-3 were used to estimate gross savings for each sample unit (project or measure). Energy savings gross realization rates were calculated for each site for which on-site data collection and engineering analysis/building simulations were conducted. The gross realization rates represent the ratio of ex post gross savings to ex ante gross savings. Estimates of program-level gross savings were then aggregated by applying a ratio estimation procedure in which achieved savings levels estimated for the sample units are statistically extrapolated to the program-level ex ante savings.

ADM also conducted an analysis of sites with relatively high or low gross realization rates to determine the reasons for the discrepancy between ex ante and ex post energy savings. Volume II of this report presents information on the results of this analysis at the site-level, and the program- and portfolio-level analysis results are presented in section 3.2 of this document.

The following discussion describes the basic procedures used for estimating savings from various measure types.

3.1.4.3. Method for Analyzing Savings from Lighting Measures

Lighting measures examined include retrofits of existing fixtures, lamps and/or ballasts with energy efficient fixtures, lamps or LED lamps/drivers. These types of measures reduce demand, while not affecting operating hours. Participants often complete retrofit projects in combination with the installation of lighting control measures, such as motion sensors or daylight controls. Controls reduce the operating hours and/or current passing thorough the connected fixture or group of fixtures.

Analyzing the savings from such lighting measures requires data for retrofitted fixtures on (1) baseline wattages and post-retrofit wattages and (2) hours of operation before and

after the retrofit. Hours of operation are typically determined based on metered data collected after measure installation for a sample of fixtures.

Data collected determines the average operating hours for retrofitted fixtures by using light intensity loggers where lighting efficiency measures have been installed. Usage areas are areas within a facility with comparable average operating hours. For industrial customers, expected usage areas include production, warehouse, and office areas. Usage areas are assigned to lighting logger data for analysis.

Annual energy savings for each sampled fixture/lamp is determined by the following formula:

$$Annual\ Energy\ Savings = kWh_{baseline} - kWh_{after}$$

The input values for this formula are determined through the following steps:

- Results from the monitored sample calculate the average operating hours of the metered lights in each period for every unique building type/usage area.
- Applying this average operating hours to the baseline and post-installation average demand for each usage area to calculate the respective energy usage and peak period demand for each usage area.
- The annual baseline energy usage is the sum of the baseline kWh for each costing period for all the usage areas. Similarly, the post-retrofit energy usage is calculated. The calculated energy savings are the difference between baseline and post-installation energy usage.
- For conditioned spaces, region-specific, building type-specific heating interaction factors (HIF) and cooling interaction factors (CIF) account for the energy impacts of implemented lighting measures on HVAC operation. The applied factors, presented in report Volume II, were developed based on energy simulation of DEER eQUEST prototypical buildings, referencing Ameren Missouri service territory weather data. The kWh heating and cooling interaction factor (HCIF) is calculated as 1 + *HIF* + *CIF*.
- Energy savings for lighting are determined by one of two methods. With sufficient monitoring data, applying an algorithm to time series monitoring data to estimate the lighting operating hours prior to implementation of lighting controls. For each monitored hour during which there was any lighting use, survey data is applied to determine the behavior with the absence of lighting controls. This survey asks questions by usage area for the manual lighting control behavior both within the workday, and at the end of the workday.

3.1.4.4. Method for Analyzing Savings from HVAC Measures

Savings estimates of HVAC measures were determined using DOE-2 energy simulations and/or engineering calculations. Each approach is supplemented with data collected through on-site visits. Typical HVAC measures which were evaluated using the following methods are:

- Installation of VFDs on pump and fan motors;
- Retrofit/upgrade of distribution system controls (i.e. supply air reset, economizers, demand control ventilation, optimized start, etc.);
- Retrofit/upgrade of central plant controls (i.e. chiller sequencing, chilled and condensing water reset, etc.); and
- Replacement of HVAC or central plant (i.e. chillers) equipment with more efficient models.

When practical, building simulation software is our preferred approach, as it allows calculation of secondary energy impacts which quantify a measure's impacts on other building systems. Building simulation software also enables us to more accurately account for the interactive effects that multiple measures have on one another when installed in the same facility. Each simulation produces estimates of HVAC energy and demand usage under different assumptions about equipment and/or construction conditions.

In cases in which DOE-2 simulation was inappropriate because data were not available to properly calibrate a simulation model and engineering analysis provided more accurate M&V results, engineering spreadsheet models were developed referencing a secondary literature source and primary data collected on-site. A measure for which engineering spreadsheet modeling was developed included retrofit/upgrade of a single chiller.

3.1.4.5. Method for Analyzing Savings for VFDs

Estimates of energy savings for VFDs were determined using DOE-2 energy simulations as described in section 3.1.4.4.

3.1.4.6. Method for Analyzing Savings from Refrigeration Measures

Energy savings were determined by referencing data collected on-site and using engineering equations from a secondary literature source (i.e. Energy Star).

3.1.4.1. Method for Analyzing Savings from Compressed Air Measures

Energy savings of compressed air leak repairs were calculated through engineering analysis of compressor performance curves, supported by data collected through short-

term baseline metering. Current data was used to calculate power, using the following algorithm:

$$P = \frac{\sqrt{3} \times V \times A \times pf}{1{,}000}$$

Where:

P	*= Power (kW)*
V	*= Voltage (460)*
A	*= Amperage*
pf	*= Power factor (0.9 assumed)*

The load (cfm) at each monitoring point was determined using the performance curve (%Power vs %Flow) for the applicable control type (inlet modulation without blowdown) from the Uniform Methods Project.

The effect of the measure was then imposed on the established load profile by subtracting the total leaks repaired from each data point. This "new" load profile represented the decreased demand because of repaired leaks. The compressor performance curve was then once again used to determine power requirements at each data point.

Energy savings were calculated by taking the difference in energy requirements of baseline and post-RCx compressed air systems, at each monitoring point, summing over the monitoring period, and scaling to an annual basis.

3.1.5 Procedures for Estimating Peak kW Savings from Measures Installed through the Program

The system peak net demand (kW) savings for PY2018 measures is determined by factoring the first year annual energy savings by end use-specific energy-to-demand ratios. Table 3-4 shows the applicable business energy to peak demand factors, which are presented in Appendix E to the *Non-Unanimous Stipulation and Agreement* in File No. EO-2015-0055[4]. The *Non-Unanimous Stipulation and Agreement* in File No. EO-2015-0055 states: "Only measures that are expected to deliver energy savings in 2023 and beyond are counted towards the demand goal in the EO included in Appendix A." ADM referenced the Ameren Missouri TRM for secondary data on measure EUL in order

[4] https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935982981

to assess whether or not measures are sufficiently long-lived to apply the stipulated energy-to-demand ratio to determine 2023-persistent kW savings.

Table 3-4 End-Use Category Energy to Peak Demand Factors

End Use	*Factor*
Air Comp	0.0001379439
Building Shell	0.0004439830
Cooking	0.0001998949
Cooling	0.0009106840
Exterior Lighting	0.0000056160
Heating	0.0000000000
HVAC	0.0004439830
Lighting	0.0001899635
Miscellaneous	0.0001379439
Motors	0.0001379439
Process	0.0001379439
Refrigeration	0.0001357383
Water Heating	0.0001811545

3.2 Results of Ex Post Gross Savings Estimation

To estimate ex post gross kWh savings and ex post gross peak kW reductions for the BizSavers programs, data were collected and analyzed for the samples identified in section 3.1.1. ADM analyzed the sample measure data using the methods described in section 3.1 to estimate project energy savings, peak kW reductions, and determine gross realization rates. In this section are the results of that analysis results. Note that detailed, site-level analysis methods and results are presented in Volume II of this report, along with summary information regarding measure-level and site-level energy savings of sampled measures.

3.2.1 Ex Post Gross kWh Savings

3.1.4.2. Custom Program Ex Post Gross kWh Savings

The ex ante and ex post gross kWh savings of the PY2018 Custom Program sample projects are summarized by sampling stratum in Table 3-5. Overall, ex post gross energy savings of 21,416,963 kWh are equal to 94% of the ex ante savings.

Table 3-5 Ex Ante and Ex Post Annual kWh Savings for Custom Program by Sample Stratum

Stratum	*Ex Ante kWh Savings*	*Ex Post Gross kWh Savings*	*Gross kWh Savings Realization Rate*
1	5,848,131	4,856,655	83%
2	4,811,870	5,044,315	105%
3	3,196,394	2,773,456	87%
4	3,786,455	3,856,872	102%
5	3,726,724	3,689,773	99%
6	1,310,446	1,195,892	91%
Total	22,680,020	21,416,963	94%

Table 3-6 presents information on ex ante and ex post kWh energy savings of sampled Custom Program measures by end use.

Table 3-6 Ex Ante and Ex Post Annual kWh Savings for Custom Program Sample Measures by End Use

End Use	*Ex Ante kWh Savings*	*Ex Post Gross kWh Savings*	*Gross kWh Savings Realization Rate*
Building Shell	27,307	26,155	96%
Cooling	4,141,339	3,423,021	83%
Ext Lighting	3,906,505	3,850,617	99%
HVAC	318,816	290,297	91%
Lighting	7,474,999	7,099,328	95%
Miscellaneous	135,812	135,769	100%
Motors	2,056,320	1,836,937	89%
Process	4,618,922	4,754,839	103%
Total	22,680,020	21,416,963	94%

3.1.4.3. EMS Pilot Program Ex Post Gross kWh Savings

For the EMS Pilot Program, M&V was performed for a census of the 38 projects completed during PY2018. The EMS Pilot Program realized 90% of the ex ante kWh savings of 5,354,280 kWh, with ex post gross savings of 4,817,575 kWh. Table 3-7

presents information on ex ante and ex post kWh energy savings of the EMS Pilot Program measures by end use.

Table 3-7 Ex Ante and Ex Post Annual kWh Savings for EMS Pilot Program Measures by End Use

End Use	*Ex Ante kWh Savings*	*Ex Post Gross kWh Savings*	*Gross kWh Savings Realization Rate*
Cooling	2,123,736	1,900,649	89%
Heating	424,654	499,452	118%
HVAC	2,729,984	2,368,217	87%
Lighting	55,618	31,914	57%
Miscellaneous	20,288	17,344	85%
Total	5,354,280	4,817,575	90%

3.1.4.4. Standard Program Ex Post Gross kWh Savings

The gross kWh savings of the PY2018 Standard Program sample projects are summarized by sampling stratum in Table 3-8. The ex post gross kWh savings for the Standard Program non-HIM sample of 8,209,310 kWh are equal to 84% of the ex ante kWh savings. For Standard Program HIMs:

- The gross kWh savings of Standard HIM 3025 sample projects (LED linear lamp replacing T8 fluorescent lamp) of 8,952,422 kWh are equal to 94% of the ex ante kWh savings.
- Standard HIM 3026 sample projects (LED linear lamp replacing T12 fluorescent lamps) had ex post gross kWh savings of 2,296,875 kWh are equal to 82% of the ex ante kWh savings.

In the aggregate, the gross realization rate of the Standard Program is 88%.

Table 3-8 Ex Ante and Ex Post Gross Annual kWh Savings for the Standard Program by Sample Stratum

Standard Program	*Stratum*	*Ex Ante kWh Savings*	*Ex Post Gross kWh Savings*	*Gross kWh Savings Realization Rate*
Non Him	1	7,700,232	6,364,742	83%
	2	614,086	492,066	80%
	3	478,476	375,680	79%
	4	927,114	940,512	101%
	5	49,682	36,311	73%
HIM 3025	1	2,902,217	3,012,519	104%
	2	1,004,997	744,655	74%
	3	2,223,455	2,018,666	91%
	4	2,191,504	1,961,151	89%
	5	1,158,355	1,215,431	105%
HIM 3026	1	1,261,446	923,623	73%
	2	1,071,674	917,941	86%
	3	143,519	146,230	102%
	4	177,129	152,355	86%
	5	145,354	156,726	108%
Total		22,049,240	19,458,607	88%

Table 3-9 presents information on ex ante and ex post kWh energy savings of sampled Standard Program measures by end use.

Table 3-9 Ex Ante and Ex Post Annual kWh Savings for Standard Program Sample Measures by End Use

End Use	*Ex Ante kWh Savings*	*Ex Post Gross kWh Savings*	*Gross kWh Savings Realization Rate*
Lighting	21,284,908	18,966,893	89%
Miscellaneous	535,806	262,937	49%
Water Heating	228,526	228,777	100%
Total	22,049,240	19,458,607	88%

3.1.4.5. New Construction Program Ex Post Gross kWh Savings

The gross kWh savings of the PY2018 New Construction Program sample projects are summarized by sampling stratum in Table 3-10.

Overall, ex post gross kWh savings of 7,481,704 kWh are equal to 99% of the ex ante kWh savings.

Table 3-10 Ex Ante and Ex Post Gross Annual kWh Savings for New Construction Program by Sample Stratum

Stratum	*Ex Ante kWh Savings*	*Ex Post Gross kWh Savings*	*Gross kWh Savings Realization Rate*
1	2,778,672	2,810,351	101%
2	1,592,560	1,531,880	96%
3	1,602,564	1,756,414	110%
4	911,459	725,347	80%
5	697,166	657,712	94%
Total	7,582,421	7,481,704	99%

New Construction measures by End Use are shown in Table 3-11.

Table 3-11 Ex Ante and Ex Post Annual kWh Savings for New Construction Program Sample Measures by End Use

End Use	*Ex Ante kWh Savings*	*Ex Post Gross kWh Savings*	*Gross kWh Savings Realization Rate*
Building Shell	402,995	380,209	94%
Cooling	383,017	351,048	92%
HVAC	326,764	317,994	97%
Lighting	6,365,531	6,328,347	99%
Miscellaneous	104,114	104,106	100%
Total	7,582,421	7,481,704	99%

3.1.4.6. Retro-Commissioning Program Ex Post Gross kWh Savings

The ex post gross kWh savings of the PY2018 Retro-Commissioning Program sample projects are presented in Table 3-12. The ex post kWh savings of 4,209,210 kWh are equal to 94% of the ex ante kWh savings.

Table 3-12 Ex Ante and Ex Post Gross Annual kWh Savings for Retro-Commissioning Program

Stratum	*Ex Ante kWh Savings*	*Ex Post Gross kWh Savings*	*Gross kWh Savings Realization Rate*
1	2,999,610	2,684,909	90%
2	916,880	1,035,161	113%
3	257,449	152,184	59%
4	320,040	336,956	105%
	4,493,979	4,209,210	94%

The Retro-Commissioning Program sample, shown in Table 3-13, included air compressor optimization and leak repair along with whole building retro-commissioning.

Table 3-13 Ex Ante and Ex Post Annual kWh Savings for Retro-Commissioning Program Sample Measures by End Use

End Use	*Ex Ante kWh Savings*	*Ex Post Gross kWh Savings*	*Gross kWh Savings Realization Rate*
Air Comp	1,253,383	1,267,870	101%
Cooling	1,828,312	1,647,378	90%
HVAC	1,412,284	1,293,962	92%
Total	4,493,979	4,209,210	94%

3.1.4.7. SBDI Program Ex Post Gross kWh Savings

The gross kWh savings of the PY2018 SBDI Program sample projects are summarized by sampling stratum in Table 3-14. Overall, for SBDI non-HIMs, ex post gross kWh savings of 356,534 kWh are equal to 91% of the ex ante kWh savings. For SBDI HIMs:

- HIM 3026 for LED lamps or fixtures replacing T12 lamps or fixtures realized 87% of the ex ante savings
- The HIM 3025 LED lamps or fixtures replacing T8 lamps or fixtures realized 99% of the ex ante savings.

Table 3-14 Ex Ante and Ex Post Gross Annual kWh Savings for the SBDI Program by Sample Stratum

SBDI Program	*Stratum*	*Ex Ante kWh Savings*	*Ex Post Gross kWh Savings*	*Gross kWh Savings Realization Rate*
Non-HIM	1	146,568	118,303	81%
	2	110,803	130,109	117%
	3	136,113	108,122	79%
HIM 3026	1	371,855	317,784	85%
	2	490,701	412,411	84%
	3	285,218	251,719	88%
	4	80,489	83,611	104%
HIM 3025	1	60,596	68,501	113%
	2	112,360	105,999	94%
	3	131,364	123,802	94%
	4	49,435	51,362	104%
Total		1,975,502	1,771,723	90%

All PY2018 SBDI energy savings is associated with the lighting end use or miscellaneous end use.

3.2.2 Ex Post Gross Peak kW Savings

Table 3-15 contains the ex post gross peak kW reductions of the Custom, EMS Pilot, Standard, New Construction, Retro-Commissioning, and SBDI Programs during PY2018.

Table 3-15 Ex Ante and Ex Post Gross Peak kW Savings for BizSavers Programs

Program	*Ex Ante Peak kW Savings*	*Ex Post Gross Peak kW Savings*	*Gross kW Savings Realization Rate*
Custom	28,729.5	27,758.1	97%
EMS	3,159.5	2,790.8	88%
Standard	37,089.1	33,270.1	90%
New Construction	6,677.0	6,263.7	94%
Retro-Commissioning	3,277.9	3,117.0	95%
SBDI	3,051.8	2,720.2	89%
Total	81,984.8	75,919.7	93%

Table 3-16 aggregates the same ex post gross kW in the above table, but by measure sampling groups.

Table 3-16 Ex Ante and Ex Post Gross Peak kW Savings for BizSavers Programs and Measure Sampling Group

Program	*Measure Sampling Group*	*Ex Ante Peak kW Savings*	*Ex Post Gross Peak kW Savings*	*Gross kW Savings Realization Rate*
Custom	Non HIM	28,729.5	27,758.1	97%
Standard	Non HIM	13,667.9	11,903.7	87%
Standard	Standard3025	13,650.1	12,721.2	93%
Standard	Standard3026	9,771.2	8,645.1	88%
New Construction	Non HIM	6,677.0	6,263.7	94%
Retro-Commissioning	Non HIM	3,277.9	3,117.0	95%
SBDI	Non HIM	595.1	539.9	91%
SBDI	SBDI3026	2,000.9	1,738.7	87%
SBDI	SBDI3025	455.8	441.6	97%
EMS	Non HIM	3,159.5	2,790.8	88%
Total		81,984.8	75,919.7	93%

The 2023-persistent gross kW savings by end-use category and equipment EUL are shown below for each program. Table 3-17 presents the portfolio-level 2023-presistent kW savings by end-use category and equipment EUL.

Table 3-17 Custom Program End-Use Category and 2023-Persistent kW Savings

End Use	*EUL*	*Ex Post Gross kWh Savings*	*End-Use Category Energy to Coincident Peak Demand Factor*	*2023-Persistent Gross kW Savings*
Custom				
Air Comp	10	1,681,768	0.0001379439	232.0
Air Comp	15	4,907,294	0.0001379439	676.9
Building Shell	20	26,155	0.0004439830	11.6
Cooling	10	184,974	0.0009106840	168.5
Cooling	15	16,220,116	0.0009106840	14,771.4
Cooling	20	931,104	0.0009106840	847.9
Ext Lighting	12	286,154	0.0000056160	1.6
Ext Lighting	15	25,164,616	0.0000056160	141.3
Heating	15	563,935	0.0000000000	0.0
HVAC	10	4,091,953	0.0004439830	1,816.8
HVAC	15	6,508,976	0.0004439830	2,889.9
Lighting	10	570,679	0.0001899635	108.4
Lighting	12	797,206	0.0001899635	151.4
Lighting	15	23,885,778	0.0001899635	4,537.4
Miscellaneous	15	358,927	0.0001379439	49.5
Motors	15	2,846,218	0.0001379439	392.6

End Use	*EUL*	*Ex Post Gross kWh Savings*	*End-Use Category Energy to Coincident Peak Demand Factor*	*2023-Persistent Gross kW Savings*
Process	10	352,834	0.000137944	48.7
Process	15	504,613	0.000137944	69.6
Process	20	4,836,317	0.000137944	667.1
Refrigeration	12	433,700	0.000135738	58.9
Refrigeration	15	858,100	0.000135738	116.5
Custom Total		96,011,416		27,758.1
EMS				
Cooling	15	1,900,649	0.000910684	1,730.9
Heating	15	499,452	0.00000000	0.0
HVAC	15	2,368,217	0.0004439830	1,051.4
Lighting	15	31,914	0.0001899635	6.1
Miscellaneous	15	17,344	0.0001379439	2.4
EMS Total		4,817,575		2,790.8
Custom with EMS		100,828,991		30,548.9

Table 3-18 Standard Program End-Use Category and 2023-Persistent kW Savings

End Use	*EUL*	*Ex Post Gross kWh Savings*	*End-Use Category Energy to Coincident Peak Demand Factor*	*2023-Persistent Gross kW Savings*
Ext Lighting	9	293	0.0000056160	0.0
Ext Lighting	12	262,489	0.0000056160	1.5
Ext Lighting	17	155	0.0000056160	0.0
Lighting	8	256,707	0.0001899635	48.8
Lighting	9	9,012,785	0.0001899635	1,712.1
Lighting	10	913,252	0.0001899635	173.5
Lighting	11	446,547	0.0001899635	84.8
Lighting	12	25,177,691	0.0001899635	4,782.8
Lighting	15	2,365,197	0.0001899635	449.3
Lighting	16	451,182	0.0001899635	85.7
Lighting	17	134,967,971	0.0001899635	25,639.0
Miscellaneous	9	36,498	0.0001379439	5.0
Miscellaneous	12	1,858,711	0.0001379439	256.4
Miscellaneous	16	7,917	0.0001379439	1.1
Miscellaneous	17	5,607	0.0001379439	0.8
Motors	15	1,835	0.0001379439	0.3
Refrigeration	12	78,253	0.0001357383	10.6
Water Heating	15	101,714	0.0001811545	18.4
		175,944,805		33,270.1

Table 3-19 New Construction Program End-Use Category and 2023-Persistent kW Savings

End Use	*EUL*	*Ex Post Gross kWh Savings*	*End-Use Category Energy to Coincident Peak Demand Factor*	*2023-Persistent Gross kW Savings*
Air Comp	15	13,405	0.0001379439	1.8
Building Shell	15	538,019	0.0004439830	238.9
Building Shell	20	71,530	0.0004439830	31.8
Cooling	15	1,795,554	0.0009106840	1,635.2
Cooling	20	245,020	0.0009106840	223.1
HVAC	10	551,421	0.0004439830	244.8
HVAC	15	2,167,428	0.0004439830	962.3
Lighting	8	27,740	0.0001899635	5.3
Lighting	10	71,145	0.0001899635	13.5
Lighting	11	9,381	0.0001899635	1.8
Lighting	15	15,004,476	0.0001899635	2,850.3
Miscellaneous	15	104,106	0.0001379439	14.4
Motors	15	14,543	0.0001379439	2.0
Process	10	231,427	0.0001379439	31.9
Process	20	41,318	0.0001379439	5.7
Refrigeration	12	4,585	0.0001357383	0.6
Water Heating	15	1,440	0.0001811545	0.3
		20,892,536		6,263.7

Table 3-20 Retro-Commissioning Program End-Use Category and 2023-Persistent kW Savings

End Use	*EUL*	*Ex Post Gross kWh Savings*	*End-Use Category Energy to Coincident Peak Demand Factor*	*2023-Persistent Gross kW Savings*
Air Comp	10	2,047,040	0.0001379439	282.4
Cooling	10	21,444	0.0009106840	19.5
Cooling	15	2,220,650	0.0009106840	2,022.3
HVAC	10	274,041	0.0004439830	121.7
HVAC	15	1,275,925	0.0004439830	566.5
Refrigeration	20	770,445	0.0001357383	104.6
		6,609,545		3,117.0

Table 3-21 SBDI Program End-Use Category and 2023-Persistent kW Savings

End Use	*EUL*	*Ex Post Gross kWh Savings*	*End-Use Category Energy to Coincident Peak Demand Factor*	*2023-Persistent Gross kW Savings*
Ext Lighting	12	6,500	0.0000056160	0.0
Ext Lighting	17	3,724	0.0000056160	0.0
Lighting	8	2,717	0.0001899635	0.5
Lighting	9	1,268,654	0.0001899635	241.0
Lighting	10	8,433	0.0001899635	1.6
Lighting	11	26,427	0.0001899635	5.0
Lighting	12	1,155,420	0.0001899635	219.5
Lighting	15	20,885	0.0001899635	4.0
Lighting	16	75,555	0.0001899635	14.4
Lighting	17	11,748,993	0.0001899635	2,231.9
Miscellaneous	12	16,585	0.0001379439	2.3
		14,333,892		2,720.2

Table 3-22 Portfolio End-Use Category and 2023-Persistent kW Savings

End Use	*EUL*	*Ex Post Gross kWh Savings*	*End-Use Category Energy to Coincident Peak Demand Factor*	*2023-Persistent Gross kW Savings*
Air Comp	10	3,728,808	0.0001379439	514.4
Air Comp	15	4,920,699	0.0001379439	678.8
Building Shell	15	538,019	0.0004439830	238.9
Building Shell	20	97,685	0.0004439830	43.4
Cooling	10	206,418	0.0009106840	188.0
Cooling	15	22,136,969	0.0009106840	20,159.8
Cooling	20	1,176,124	0.0009106840	1,071.1
Ext Lighting	9	293	0.0000056160	0.0
Ext Lighting	12	555,143	0.0000056160	3.1
Ext Lighting	15	25,164,616	0.0000056160	141.3
Ext Lighting	17	3,879	0.0000056160	0.0
Heating	15	1,063,387	0.0000000000	0.0
HVAC	10	4,917,414	0.0004439830	2,183.2
HVAC	15	12,320,546	0.0004439830	5,470.1
Lighting	8	287,163	0.0001899635	54.6
Lighting	9	10,281,439	0.0001899635	1,953.1
Lighting	10	1,563,509	0.0001899635	297.0
Lighting	11	482,355	0.0001899635	91.6
Lighting	12	27,130,317	0.0001899635	5,153.8
Lighting	15	41,308,251	0.0001899635	7,847.1
Lighting	16	526,737	0.0001899635	100.1

End Use	*EUL*	*Ex Post Gross kWh Savings*	*End-Use Category Energy to Coincident Peak Demand Factor*	*2023-Persistent Gross kW Savings*
Lighting	17	146,716,964	0.0001899635	27,870.9
Miscellaneous	9	36,498	0.0001379439	5.0
Miscellaneous	12	1,875,296	0.0001379439	258.7
Miscellaneous	15	480,377	0.0001379439	66.3
Miscellaneous	16	7,917	0.0001379439	1.1
Miscellaneous	17	5,607	0.0001379439	0.8
Motors	15	2,862,596	0.0001379439	394.9
Process	10	584,261	0.0001379439	80.6
Process	15	504,613	0.0001379439	69.6
Process	20	4,877,635	0.0001379439	672.8
Refrigeration	12	516,537	0.0001357383	70.1
Refrigeration	15	858,100	0.0001357383	116.5
Refrigeration	20	770,445	0.0001357383	104.6
Water Heating	15	103,154	0.0001811545	18.7
		318,609,770		75,919.7

4. Estimation of Ex Post Net Savings

This chapter reports the results from estimating the net impacts of the program during program year 2018 (PY2018), where net ex post savings represent the portion of ex post gross savings by program participants that can be directly attributed to the effects of the program. Net savings estimated in this report equal gross savings, *minus* free ridership, *plus* participant spillovers, and non-participant spillovers.

4.1 Procedures Used to Estimate Net Savings

The same procedures were used to estimate net savings for all the BizSavers programs. The following sub-sections describe the methodology used to estimate free ridership, participant spillover, and non-participant spillover.

4.1.1 Procedures Used to Estimate Free Ridership

Free riders are those program participants that would have installed the same energy efficiency measures without the program incentives. Net savings may be less than gross savings because of free ridership impacts, which arise to the extent that participants in a program would have adopted energy efficiency measures and achieved the observed energy changes even in the absence of the program. Conversely, net savings may be greater than gross savings due to energy savings spillovers or market transformation impacts attributable to the program. Participants or non-participants may implement energy efficiency measures due to the influence of the program, without receiving program incentives for implemented measures.

Survey response data collected from a sample of program participants was used to support the net-to-gross analysis. A copy of the survey instrument is presented in Volume II of this report. Based on review of this information, the preponderance of evidence regarding free ridership inclinations was used to attribute a customer's savings to free ridership.

Several criteria determine which portion of a participant's savings should be attributed to free ridership. The first criterion comes from the response to the following two questions:

- "Would you have been financially able to install the equipment or measures without the financial incentive from the BizSavers Program?"
- "To confirm, your organization would NOT have allocated the funds to complete a similar energy saving project if the program incentive was not available. Is that correct?"

Respondents answering “No” to the first question and “Yes” to the second question were considered to require program financial assistance to undertake the project and were not deemed to be free riders.

For decision makers who did not indicate a lack of financial ability to undertake energy efficiency projects without financial assistance from the program, three additional factors determined what percentage of savings is attributable to free ridership. The three factors were:

- Plans and intentions of the firm to install a measure even without support from the program;
- Influence that the program had on the decision to install a measure; and
- A firm’s previous experience with a measure installed under the program.

For each of these factors, rules were applied to decision-maker survey responses to develop binary variables indicating whether a participant showed free ridership behavior.

The first step was to determine if a participant stated that his or her intention was to install an energy efficiency measure without the help of the program incentive. Two binary variables were constructed to account for customer plans and intentions: one, based on a more restrictive set of criteria that describe a high likelihood of free ridership, and a second, based on a less restrictive set of criteria that describe a relatively lower likelihood of free ridership.

The first, more restrictive criteria (Definition 1) indicating customer plans and intentions that likely signify free ridership were as follows:

- The respondent answered “yes” to the following two questions: “Did you have plans to install the measure before participating in the program?” and “Would you have completed the [Equipment/Measure] project even if you had not participated in the BizSavers Program?”
- The respondent answered, “definitely would have installed” to the following question: “If the financial incentive from the BizSavers Program had not been available, how likely is it that you would have installed [Equipment/Measure] anyway?”
- The respondent answered, “did not affect timing of purchase and installation” to the following question: “How did the availability of information and financial incentives through the BizSavers Program affect the timing of your purchase and installation of [Equipment/Measure]?”
- The respondent answered “no, the program did not affect level of efficiency that we chose for equipment” in response to the following question: “How did the availability of information and financial incentives through the BizSavers

Program affect the level of energy efficiency you chose for [Equipment/Measure]?

The second, less restrictive criteria (Definition 2) indicating customer plans and intentions that likely signify free ridership were as follows:

- The respondent answered “yes” to the following two questions: “Did you have plans to install the measure before participating in the program?” and ““Would you have completed the [Equipment/Measure] project even if you had not participated in the BizSavers Program?”
- Either the respondent answered, “definitely would have installed” or “probably would have installed” to the following question: “If the financial incentive from the BizSavers Program had not been available, how likely is it that you would have installed [Equipment/Measure] anyway?”
- Either the respondent answered “did not affect timing of purchase and installation” to the following question: “How did the availability of information and financial incentives through the BizSavers Program affect the timing of your purchase and installation of [Equipment/Measure]?” or the respondent indicated that while program information and financial incentives did affect the timing of equipment purchase and installation, in the absence of the program they would have purchased and installed the equipment within the next two years.
- The respondent answered “no, the program did not affect level of efficiency that we chose for equipment” in response to the following question: “How did the availability of information and financial incentives through the BizSavers Program affect the level of energy efficiency you chose for [Equipment/Measure]?

The second factor indicated if a customer reported that a recommendation from a program representative or past experience with the program was influential in the decision to install a particular piece of equipment or measure.

This criterion indicated that the program’s influence lowers the likelihood of free ridership when either of the following conditions are true:

- The respondent answered “very important” to the following question: “How important was previous experience with the BizSavers Program in making your decision to install [Equipment/Measure]?”
- The respondent answered “yes” to the following question: “Did a representative of the BizSavers Program recommend that you install [Equipment/Measure]?”

The third factor was based on whether a participant in the program indicated that he or she had previously installed an energy efficiency measure similar to one that they installed under the program without an energy efficiency program incentive during the

last three years. A participant indicating that he or she had installed a similar measure is considered to have a higher likelihood of free ridership.

The criteria indicating that previous experience may signify a higher likelihood of free ridership are as follows:

- The respondent answered “yes” to the following question: “Before participating in the BizSavers Program, had you installed any equipment or measure similar to [Incentivized Equipment/Measure] at your facility?”
- The respondent answered “yes, purchased energy efficient equipment but did not apply for financial incentive.” to the following question: “Has your organization purchased any energy efficient equipment in the last three years for which you did not apply for a financial incentive through the BizSavers Program?”

The four sets of rules just described were used to construct four different indicator variables that address free ridership behavior. For each customer, a free ridership value was assigned based on the combination of variables. With the four indicator variables, there were 12 applicable combinations for assigning free ridership scores for each respondent, depending on the combination of answers to the questions creating the indicator variables. Table 4-1 shows these values. A free ridership score of 100% indicates total free ridership, and a free ridership score of 0% indicates no free ridership.

ADM recognizes that there are potential survey respondent biases, including social desirability bias, which may impact self-report data. The free ridership assessment methodology employed by ADM is constructed with the intention of mitigating those impacts by asking a *series* of questions in assessing the likelihood of free ridership. Additionally, decision maker responses and project documentation were reviewed to assess the reasonableness of free ridership estimates developed using the methodology described above, and to ensure that reported free ridership estimates account for available data regarding the decision-making process.

Table 4-1 Free Ridership Scores for Combinations of Indicator Variable Responses

Indicator Variables				*Free Ridership Score*
Had Plans and Intentions to Install Measure without BizSavers Program? (Definition 1)	*Had Plans and Intentions to Install Measure without BizSavers Program? (Definition 2)*	*BizSavers Program had influence on Decision to Install Measure?*	*Had Previous Experience with Measure?*	
Y	N/A	Y	Y	100%
Y	N/A	N	N	100%
Y	N/A	N	Y	100%
Y	N/A	Y	N	67%
N	Y	N	Y	67%
N	Y	Y	Y	33%
N	N	N	Y	33%
N	Y	N	N	33%
N	Y	Y	N	0%
N	N	N	N	0%
N	N	Y	N	0%
N	N	Y	Y	0%

4.1.2 Procedures Used to Estimate Participant Spillover

ADM used two data sources for calculation of program participant spillover: the Lockheed Martin measure-level spillover report and participant self-reported spillover from the participant survey. The Lockheed Martin measure-level spillover report includes all measures that were flagged as an “Installed Spillover Measure.” Generally, the non-incented measures were small components of a broader project comprised of incentivized measures. The spillover ex ante savings estimates were reviewed by ADM and determined to be reasonable and aligned with ex ante savings estimates for incentivized measures. The savings were calculated as equal to the ex ante savings of the non-incented measure, factored by 1) the project-specific gross realization and 2) the project-specific non-free ridership rate [(Ex Post Gross kWh - Free Ridership Ex Post kWh) / Ex Post Gross kWh].

The second source of participant spillover was additional measures installed without incentives identified by decision makers that completed the online participant survey. Survey respondents provided information on the installation of additional equipment implemented without a program incentive, including information on the program’s influence on the decision to the install the additional equipment, and information on the measure specifications used to estimate the energy saving impacts of the equipment.

Specifically, respondents were asked:

- Since participating in the BizSavers Program has your organization installed any ADDITIONAL energy efficiency measures at this facility or at your other facilities within Ameren Missouri's service territory that did NOT receive incentives through Ameren Missouri's BizSavers Program?

Customers who indicated "yes" were identified as potential spillover candidates. Potential spillover candidates were also asked to identify the type of additional equipment installed and provide information about the equipment for use in estimating energy savings. For each type of equipment that respondents reported installing, respondents were asked the following two questions to assess if any savings resulting from the additional equipment installed were attributable to the program:

- [SP1] How important was your experience with the BizSavers Program in your decision to install this [EQUIPMENT TYPE], using a scale of 0 to 10, where 0 is not at all important and 10 is extremely important?"
- [SP2] If you had not participated in the BizSavers Program, how likely is it that your organization would still have installed this [EQUIPMENT TYPE], using a 0 to 10 scale, where 0 means you definitely WOULD NOT have installed this equipment and 10 means you definitely WOULD have installed this equipment?

A spillover score was developed based on these responses as follows:

Spillover Score = Average(SP1, 10-SP2)

The energy savings of equipment installations associated with a spillover score of greater than five were attributed to the program.

The energy savings of the spillover measures were estimated using the deemed values from the Ameren Missouri TRM.

In total, spillover impacts were calculated for fifteen survey respondents. Table 4-2 summarizes the spillover measures reported by program participants.

Table 4-2 Summary of Participant Reported Spillover

Respondent	*Measure Description*	*Building Type*	*Ameren Missouri TRM Number*	*kWh per Unit*	*kWh total*
Respondent 1	15 LED Wall Packs	Exterior	3004-1	924	13,863
Respondent 2	3 LED flood lights	Exterior	3006-1	539	1,616
Respondent 3	G24D 10watt	Exterior	3009	149	1,786
Respondent 4	130 T8 4-foot lamps	Exterior	3023	33	4,342
Respondent 4	400 LED Par	Exterior	3008	210	83,800
Respondent 4	Occupancy Sensor - 100 square feet controlled	Office	787-8	503	168
Respondent 5	1000 LED linear 4-ft lamps	College or university	3023	33	33,400
Respondent 6	87 LED Par	Light industry	3008	210	18,227

Respondent	*Measure Description*	*Building Type*	*Ameren Missouri TRM Number*	*kWh per Unit*	*kWh total*
Respondent 7	4 LED lamps	Light industry	3005-1	1,130	4,520
Respondent 8	400 LED lamps	Manufacturing	3023	33	13,360
Respondent 9	1 LED exit sign	n/a	8000	243	243
Respondent 10	20 LED Lamps	Garage	3023	33	668
Respondent 11	40 4-foot T8	Hotel/Motel – Guest Rooms	3023	33	1,336
Respondent 12	20 Linear LED - 4-foot	Heavy industry	3026	55	930
Respondent 13	300 Linear LED	Light industry	3026	55	16,410
Respondent 13	Centralized lighting control system - 175,000 square feet controlled	Light industry	776-9	18,120	317,097
Respondent 14	10 LED Par	Hotel/Motel – Guest Rooms	3008	210	2,095
Respondent 15	Occupancy Sensor - 20,000 square feet controlled	Heavy industry	786-11	1,660	44,267

Survey respondent net savings were adjusted based on the reported spillover savings. To extrapolate spillover savings to non-survey respondents, a spillover ratio was calculated as follows:

> Spillover Ratio = Sum of Sample Reported Spillover/ Sum of Sample Ex Post Gross Savings

4.1.3 Procedures Used to Estimate Non-Participant Spillover

The evaluation team assessed PY2018 non-participant spillover energy savings through data collected via trade ally surveys.

A detailed description of the methodology used for the analysis is presented in Volume II of this report. The evaluation team's objective was to take a conservative approach to estimate non-participant spillover energy savings that occurred outside of the program but were influenced through upstream program partners, program trade allies. The evaluation team deemed it appropriate to focus only on lighting measure groups for which kWh energy savings could be reliably estimated.

4.2 Results of Net Savings Estimation

The procedures described in the preceding section were used to estimate net-to-gross ratios for the BizSavers Program for program year 2018 (PY2018). The following subsections detail the results of the free ridership and spillover analyses.

4.2.1 Results of Estimation of Free Ridership

The data used to assign free ridership scores were collected through a customer survey of 545 customer decision makers for projects completed during PY2018. Individual free ridership rates were estimated for all five programs in the table below.

For purposes of adjusting gross savings to account for free ridership, the gross savings of projects associated with decision makers that were surveyed by ADM were adjusted by that decision makers specific free-ridership *score (Gross Savings * (1 – Free Ridership Score))*. Gross savings of projects associated with decision makers that were *not* surveyed by ADM were adjusted by the program-level free ridership score. For the programs for which free ridership research was conducted, Table 4-3 below provides a summary of the program-level free ridership.

Table 4-3 Percent of net ex post kWh Savings Associated with Free-Ridership

Program Component	*Percent of kWh Savings Associated with Free Ridership*
Custom EMS	17.3% 0.0%
Standard	4.3%
New Construction	7.1%
Retro-Commissioning	0.0%
SBDI	3.5%
Total	8.2%

Table 4-4 summarizes the number of responses for each of the free ridership categories developed from the indicator variables, excluding respondents who were determined to not have the financial ability to complete the project in the absence of the program.

Table 4-4 Number of Responses for Customers for Each Free Ridership Group (Excludes those Who Did Not Have Financial Ability)

Indicator Variables				Free Ridership Score	Count of Responses	Percent of Ex Post Gross kWh Savings
Had Plans and Intentions to Install Measure without BizSavers Program? (Definition 1)	Had Plans and Intentions to Install Measure without BizSavers Program? (Definition 2)	BizSavers Program had influence on Decision to Install Measure?	Had Previous Experience with Measure?			
Y	N/A	Y	Y	100%	1	<0.0%
Y	N/A	N	N	100%	13	7.2%
Y	N/A	N	Y	100%	1	0.1%
Y	N/A	Y	N	67%	1	0.3%
N	Y	N	Y	67%	8	1.3%
N	Y	Y	Y	33%	1	0.1%
N	N	N	Y	33%	5	1.3%
N	Y	N	N	33%	35	12.0%
N	Y	Y	N	0%	10	6.4%
N	N	N	N	0%	174	39.5%
N	N	Y	N	0%	45	25.9%
N	N	Y	Y	0%	8	5.9%

Table 4-5 summarizes the results of a sensitivity analysis of how respondents would have been scored on free ridership if they had not been determined to not be a free rider based on the financial ability criterion. As shown, 11 responses would have been assigned free ridership of 33% if the financial ability criterion was not applied. For each of these responses, the participant would have been assigned free ridership because they reported previous experience with the measure.

Table 4-5 Financial Ability Sensitivity Analysis

Free Ridership Score without Accounting for Financial Ability	Number of Responses Indicating Lack of Financial Ability
100%	0
67%	0
33%	11
0%	181
Total	192

4.2.2 Results of Estimation of Spillover Energy Savings

PY2018 spillover energy impacts were assessed from program participants and non-participants. Table 4-6 summarizes the results. EMS, New Construction and Retro Commissioning all have zero Non-Participant Spillover, as the identified installed lighting spillover products were attributed to similar measures within the Standard and SBDI programs.

Table 4-6 Summary of Spillover kWh Energy Savings

Program Component	*Spillover Total*	*Participant Spillover (Tracked)*	*Participant Spillover (Survey)*	*Non-Participant Spillover*
Custom	2,804,035	2,086,741	703,180	14,114
EMS	20,571	0	20,571	0
Standard	6,220,854	1,206	3,844,696	2,374,951
New Construction	324,486	316,841	7,645	0
Retro-Commissioning	20,868	0	20,868	0
SBDI	732,590	0	453,497	279,093
Total	10,123,404	2,404,789	5,050,458	2,668,158

4.3 Ex Post Net kWh Savings

Table 4-7 summarizes the program-level ex post net kWh savings along with associated net-to-gross ratios.

Table 4-7 Summary of Free Ridership, Spillover, and Net kWh Savings by Program

Program	*Estimated Free Ridership*	*Spillover*	*Ex Post Gross kWh Savings*	*Ex Post Net kWh Savings*	*Net-to-Gross Ratio*
Custom	16,610,639	2,804,035	96,011,416	82,204,813	86%
EMS Pilot	0	20,571	4,817,575	4,838,146	100%
Standard	7,652,490	6,220,854	175,944,805	174,513,168	99%
New Construction	1,484,856	324,486	20,892,536	19,732,167	94%
Retro-Commissioning	0	20,868	6,609,545	6,630,413	100%
SBDI	501,442	732,590	14,333,892	14,565,040	102%
Total	26,249,427	10,123,404	318,609,770	302,483,747	95%

Table 4-5 below provides the free-ridership and spillover values as a percent of ex post net kWh savings. At the portfolio level, kWh savings associated with free ridership represents 8.2% of total ex post gross kWh savings. Additionally, at the portfolio level, spillover kWh savings represents 3.2% of total BizSavers ex post gross kWh savings.

Table 4-8 Summary of Free Ridership and Spillover as Percent of Ex Post Gross kWh

Program Component	*Net Ex Post kWh Savings*	*Estimated Free Ridership*	*FR as a % of Ex Post Gross kWh*	*Spillovers*	*SO as a % of Ex Post Gross kWh*
Custom	82,204,813	16,610,639	17.3%	2,804,035	2.9%
EMS	4,838,146	0	0.0%	20,571	0.4%
Standard	174,513,168	7,652,490	4.3%	6,220,854	3.5%
New Construction	19,732,167	1,484,856	7.1%	324,486	1.6%
Retro-Commissioning	6,630,413	0	0.0%	20,868	0.3%
SBDI	14,565,040	501,442	3.5%	732,590	5.1%
Total	302,483,747	26,249,427	8.2%	10,123,404	3.2%

4.3.1 Program Level Net Energy Savings by End Use

The following tables provide program-level net kWh energy savings summarized by end use category.

Table 4-9 Custom Program and EMS Pilot Program Net kWh Savings by End Use Category

Custom End Use Category	*Ex Post Net kWh Savings*	*Percent of Total Ex Post Net kWh Savings*
Custom		
Air Comp	5,168,779	6%
Building Shell	21,803	<1%
Cooling	14,437,284	17%
Ext Lighting	22,530,682	26%
Heating	469,984	1%
HVAC	8,865,608	10%
Lighting	22,040,951	25%
Miscellaneous	303,397	<1%
Motors	2,415,479	3%
Process	4,747,832	5%
Refrigeration	1,203,012	1%
EMS		
Cooling	1,911,095	2%
Heating	500,718	1%

Custom End Use Category	*Ex Post Net kWh Savings*	*Percent of Total Ex Post Net kWh Savings*
HVAC	2,376,863	3%
Lighting	32,017	<1%
Miscellaneous	17,453	<1%
Custom with EMS Total	87,042,959	100%

Table 4-10 Standard Program Net kWh Savings by End Use Category

End Use Category	*Ex Post Net kWh Savings*	*Percent of Total Ex Post Net kWh Savings*
Ext Lighting	258,685	<1%
Lighting	172,249,510	99%
Miscellaneous	1,827,574	1%
Motors	1,799	<1%
Refrigeration	75,870	<1%
Water Heating	99,730	<1%
Total	174,513,168	100%

Table 4-11 New Construction Program Net kWh Savings by End Use Category

End Use Category	*Ex Post Net kWh Savings*	*Percent of Total Ex Post Net kWh Savings*
Air Comp	12,452	<1%
Building Shell	566,308	3%
Cooling	2,228,306	11%
HVAC	2,526,430	13%
Lighting	14,029,496	71%
Miscellaneous	96,707	<1%
Motors	13,509	<1%
Process	253,361	1%
Refrigeration	4,259	<1%
Water Heating	1,338	<1%
Total	19,732,167	100%

Table 4-12 Retro-Commissioning Program Net kWh Savings by End Use Category

End Use Category	*Ex Post Net kWh Savings*	*Percent of Total Ex Post Net kWh Savings*
Air Comp	2,050,944	31%
Cooling	2,250,998	34%
HVAC	1,556,838	23%
Refrigeration	771,634	12%
Total	6,630,413	100%

Table 4-13 SBDI Program Net kWh Savings by End Use Category

End Use Category	*Ex Post Net kWh Savings*	*Percent of Total Ex Post Net kWh Savings*
Ext Lighting	10,217	<1%
Lighting	14,538,324	100%
Miscellaneous	16,500	<1%
Total	14,565,040	100%

4.4 Ex Post Net Peak kW Savings

The PY2018 ex post net peak kW savings are summarized by program in Table 4-14.

Table 4-14 Summary of Free Ridership, Spillovers, and Net Peak kW Impacts by Program

Program	*Estimated Free Ridership kW*	*Spillovers kW Savings*	*Ex Post Gross Peak kW Savings*	*Ex Post Net Peak kW Savings*
Custom	4,830.74	386.13	27,758.06	23,313.46
EMS	0.00	13.39	2,790.79	2,804.18
Standard	1,445.09	1,178.28	33,270.09	33,003.29
New Construction	434.28	290.81	6,263.66	6,120.19
Retro-Commissioning	0.00	11.86	3,116.95	3,128.81
SBDI	95.16	139.08	2,720.17	2,764.08
Total	6,805.26	2,019.54	75,919.73	71,134.01

Below, Table 4-15 through Table 4-19 present, for each program, the 2023-presistent net kW savings by end-use category and equipment EUL. Then Table 4-20 presents the portfolio-level 2023-presistent kW savings by end-use category and equipment EUL.

Table 4-15 Custom Program and EMS Pilot Program End-Use Category and 2023-Persistent Net kW Savings

End Use Category	*End-Use Category Energy to Coincident Peak Demand Factor*	*Ex Post Net kWh Savings*	*2023-Persistent Net kW Savings*
Custom			
Air Comp	0.000137944	5,168,779	713.00
Building Shell	0.000443983	21,803	9.68
Cooling	0.000910684	14,437,284	13,147.80
Ext Lighting	0.000005616	22,530,682	126.53
Heating	0.000000000	469,984	0.00
HVAC	0.000443983	8,865,608	3,936.18
Lighting	0.000189964	22,040,951	4,186.98
Miscellaneous	0.000137944	303,397	41.85
Motors	0.000137944	2,415,479	333.20
Process	0.000137944	4,747,832	654.93
Refrigeration	0.000135738	1,203,012	163.29
EMS Pilot			
Cooling	0.000910684	1,911,095	1,740.40
Heating	0.000000000	500,718	0.00
HVAC	0.000443983	2,376,863	1,055.29
Lighting	0.000189964	32,017	6.08
Miscellaneous	0.000137944	17,453	2.41
Custom with EMS Total		87,042,959	26,117.64

Table 4-16 Standard Program End-Use Category and 2023-Persistent Net kW Savings

End Use Category	*End-Use Category Energy to Coincident Peak Demand Factor*	*Ex Post Net kWh Savings*	*2023-Persistent Net kW Savings*
Ext Lighting	0.000005616	258,685	1.45
Lighting	0.000189964	172,249,510	32,721.12
Miscellaneous	0.000137944	1,827,574	252.10

End Use Category	*End-Use Category Energy to Coincident Peak Demand Factor*	*Ex Post Net kWh Savings*	*2023-Persistent Net kW Savings*
Motors	0.000137944	1,799	0.25
Refrigeration	0.000135738	75,870	10.30
Water Heating	0.000181155	99,730	18.07
Total		174,513,168	33,003.29

Table 4-17 New Construction Program End-Use Category and 2023-Persistent Net kW Savings

End Use Category	*End-Use Category Energy to Coincident Peak Demand Factor*	*Ex Post Net kWh Savings*	*2023-Persistent Net kW Savings*
Air Comp	0.000137944	12,452	1.72
Building Shell	0.000443983	566,308	251.43
Cooling	0.000910684	2,228,306	2,029.28
HVAC	0.000443983	2,526,430	1,121.69
Lighting	0.000189964	14,029,496	2,665.09
Miscellaneous	0.000137944	96,707	13.34
Motors	0.000137944	13,509	1.86
Process	0.000137944	253,361	34.95
Refrigeration	0.000135738	4,259	0.58
Water Heating	0.000181155	1,338	0.24
Total		19,732,167	6,120.19

Table 4-18 Retro-Commissioning Program End-Use Category and 2023-Persistent kW Savings

End Use Category	*End-Use Category Energy to Coincident Peak Demand Factor*	*Ex Post Net kWh Savings*	*2023-Persistent Net kW Savings*
Air Comp	0.000137944	2,050,944	282.92
Cooling	0.000910684	2,250,998	2,049.95
HVAC	0.000443983	1,556,838	691.21
Refrigeration	0.000135738	771,634	104.74
Total		6,630,413	3,128.81

Table 4-19 SBDI Program End-Use Category and 2023-Persistent Net kW Savings

End Use Category	*End-Use Category Energy to Coincident Peak Demand Factor*	*Ex Post Net kWh Savings*	*2023-Persistent Net kW Savings*
Ext Lighting	0.000005616	10,217	0.06
Lighting	0.000189964	14,538,324	2,761.75
Miscellaneous	0.000137944	16,500	2.28
Total		14,565,040	2,764.08

Table 4-20 Portfolio End-Use Category and 2023-Persistent Net kW Savings

End Use Category	*End-Use Category Energy to Coincident Peak Demand Factor*	*Ex Post Net kWh Savings*	*2023-Persistent Net kW Savings*
Air Comp	0.0001379439	7,232,175	997.63
Building Shell	0.0004439830	588,111	261.11
Cooling	0.0009106840	20,827,683	18,967.44
Ext Lighting	0.0000056160	22,799,584	128.04
Heating	0.0000000000	970,702	0.00
HVAC	0.0004439830	15,325,740	6,804.37
Lighting	0.0001899635	222,890,298	42,341.02
Miscellaneous	0.0001379439	2,261,631	311.98
Motors	0.0001379439	2,430,788	335.31
Process	0.0001379439	5,001,193	689.88
Refrigeration	0.0001357383	2,054,775	278.91
Water Heating	0.0001811545	101,068	18.31
Total		302,483,747	71,134.01

5. Process Evaluation

Chapter 5 presents the results of the process evaluation for the BizSavers programs for the 2018 program year. The purpose of the process evaluation is to examine program operations and results throughout the program operating year, and from that examination to identify potential program improvements that may prospectively increase program efficiency or effectiveness in terms of customer participation and satisfaction levels.

5.1 Summary of Primary Data Collection

The evaluation team collected and analyzed both qualitative and quantitative data to understand program process and outcomes. As summarized in Table 5-1, the team interviewed or surveyed Ameren Missouri's EM&V staff for BizSavers to clarify evaluation objectives; Lockheed Martin's BizSavers Associate Program Manager, Marketing Manager, and one Business Development (BD) Analyst; 568 program participants; 334 Ameren Missouri customers who did not participate in BizSavers programs; and 102 contractors and vendors who completed BizSavers projects. The team also conducted a review and analysis of the program database for this program year to characterize program activity.

Table 5-1 Evaluation Data Collection Activities

*Data Source**	*Method*	*Dates*	*Key Research Topics*	*Analysis Type*
Program implementer staff (3)	Telephone in-depth interview	November 2018	Program management; communication; current and new offerings; goals and progress; trade ally relations; marketing and outreach; tracking and reporting; quality assurance	Qualitative
Participants, all programs (568)	Online survey	October to December 2018	Program awareness, decision-making, equipment preferences; experience and satisfaction	Quantitative and Qualitative
Trade allies, all programs (102)	Online survey	April 2019	Awareness and effect of program changes; customer awareness of BizSavers; awareness of and interest in new programs; spillover.	Quantitative and Qualitative
Nonparticipant customers (334)	Online	April 2019	Program awareness, interest, and barriers to participating; equipment decisions	Quantitative and Qualitative
Program documentation	Document review	July 2018 to April 2019	Program function; tracking and reporting; quality control	Qualitative
Database analysis	Database review	January to April 2019	Number of projects; project type and details; data quality	Quantitative

Following are details of the data collection methods and descriptions of the respondents for the participant, nonparticipant, and trade ally surveys, which constituted the large bulk of primary data collection. The large sample sizes for all three of those surveys provide high levels of precision (greater than 5% precision at greater than 95% confidence for the participant and nonparticipant surveys; greater than 7% precision at 90% confidence for the trade ally survey).

When examining differences between subgroups of survey respondents, the evaluation team tested the statistical significance of the difference (typically using Pearson Chi-square, Mann-Whitney U, or Kruskal-Wallis for differences in proportions and t-test for differences in means). Only differences that were statistically significant ($p \leq .05$) are reported.

5.1.1 Participant Online Survey Method and Response

The evaluation team sent all program participants an invitation to take an online survey about their program experiences. A total of 2,655 invitations were sent in October and November 2018.

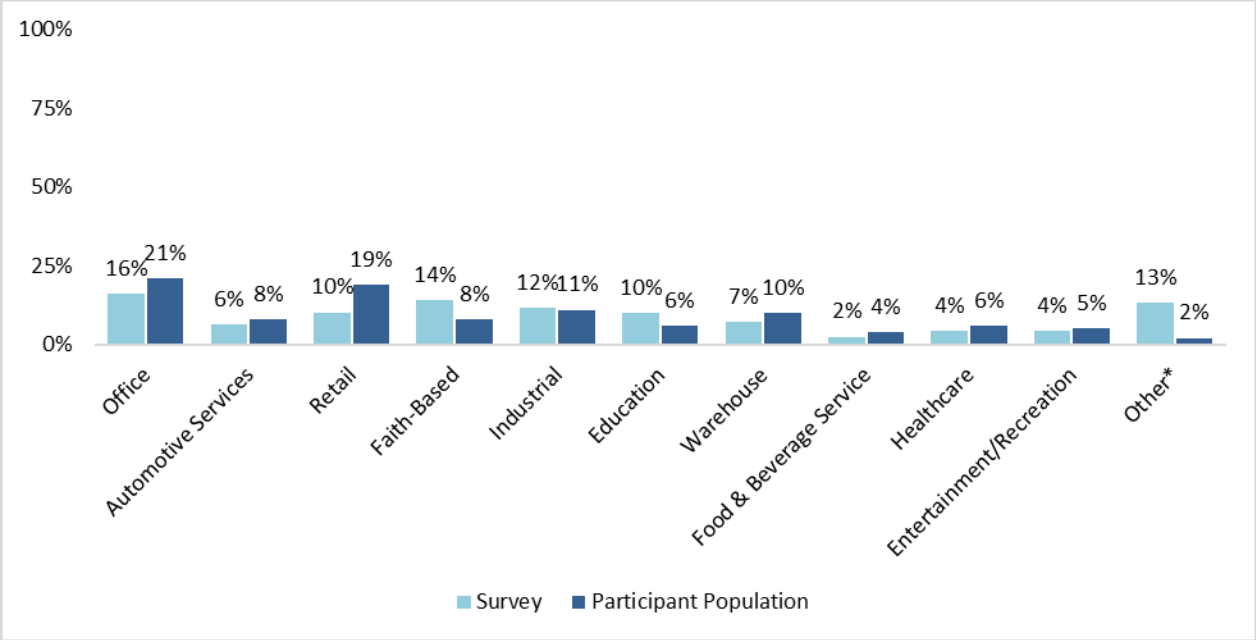
A total of 568 program participants completed the online participant survey, representing a 21% response rate. Of those, 421 had completed a Standard project, 125 had completed a Custom project, 100 completed an SBDI project, eight completed a New Construction project, four completed a project in the EMS pilot program, and three completed a Retro-commissioning project. Ninety survey respondents had completed projects in two or more programs (mostly Standard and Custom).

Respondents were the project contact identified in the program records. About two-thirds were the company owner, a top officer or director, or someone with facility management or maintenance responsibilities. Most others reported some management or administrative title.

Respondents represented a variety of building end-uses (Figure 5-1). The survey sample generally reflected the distribution of building uses in the participant population.

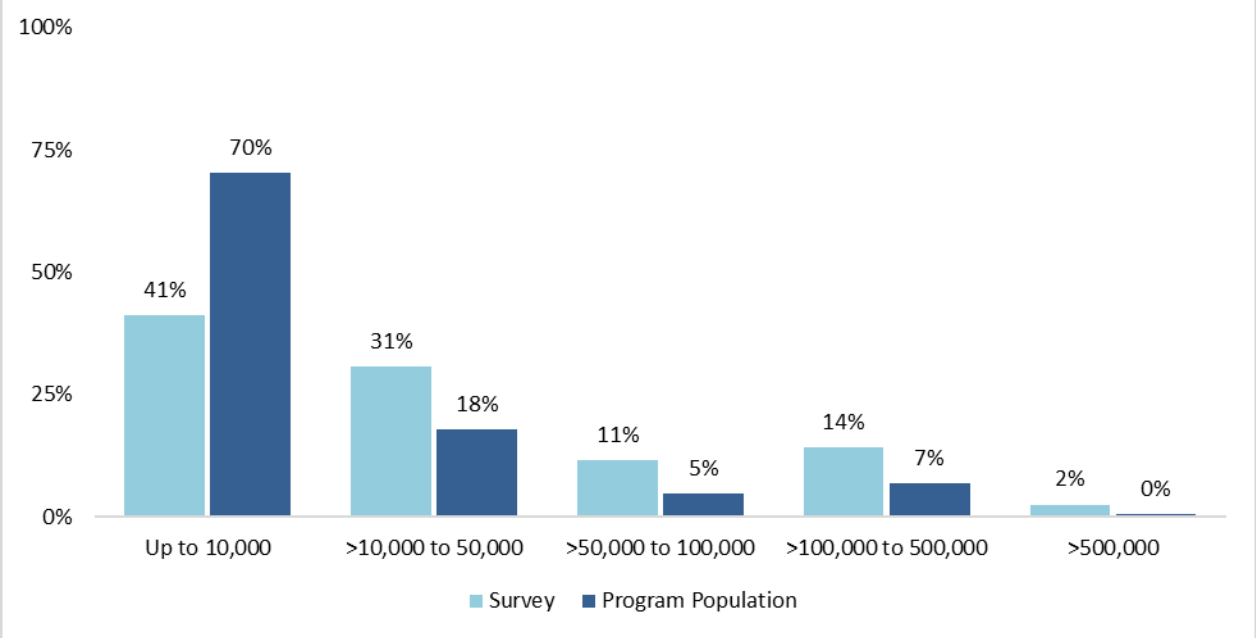
About three-quarters (76%) of respondents reported owning their buildings, most of whom (68% of the sample) also occupy it while the others lease it out; just less than one-fifth (18%) lease their space; the remaining respondents did not describe their building ownership.

Figure 5-1 Type of Building – Survey Sample Compared to Program Population



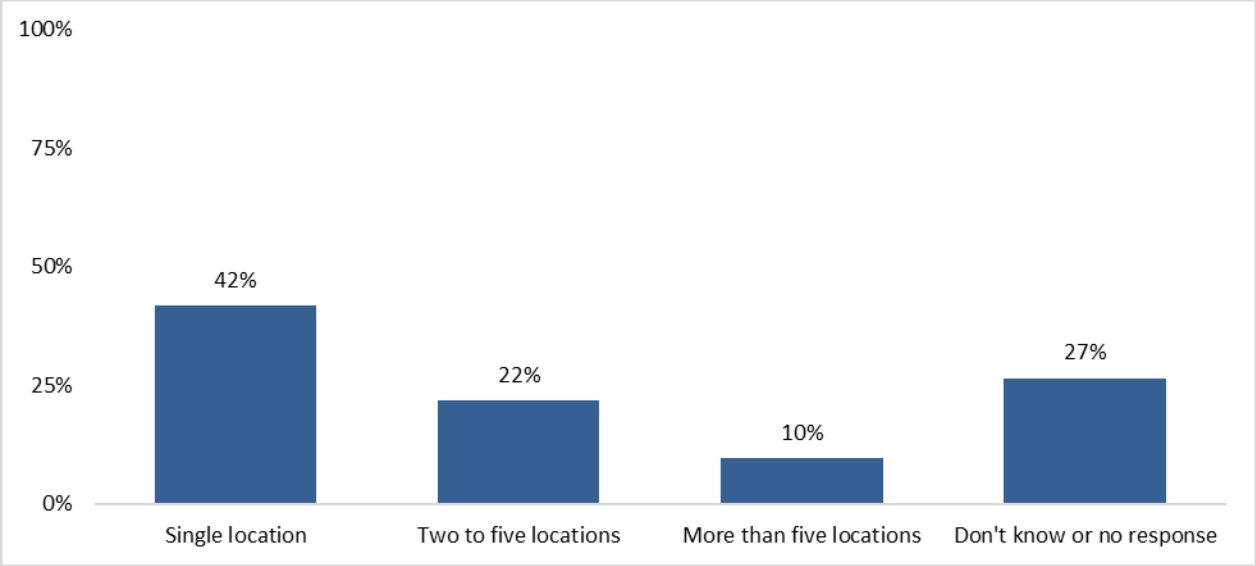
The distribution of facility sizes in the survey sample is less skewed than in the population of project sites (Figure 5-2).

Figure 5-2 Building Size- Sample Compared to Program Population



Nearly one-quarter of respondents – disproportionately representing office and warehouse building types – did not report the number of locations, making it difficult to gauge the skew of the distribution. However, among those who did report the number of locations, the degree of skew is comparable to that of building size (Figure 5-3).

Figure 5-3 Number of Locations



5.1.1 Nonparticipant Online and Telephone Survey Method and Response

The evaluation team carried out a primarily online survey of program non-participants, with some additional telephone calls. From the Ameren Missouri customer database, the team identified 67,460 unique customers (based on business name) that had not participated in the BizSavers program.

The team sent the survey to 29,020 customers with email addresses. The team email address came from the customer database for 27,028 of those and came from InfoUSA for the other 1,992.[5] The team sent up to two email invitations to each of the nonparticipant customers with email addresses.

The web survey produced 1,465 responses (Table 5-2), 5% of the invitations sent to valid emails. Of those, 1,131 customers started the survey but either were screened out because they were not involved in energy-using equipment decisions or completed only the first few questions. A total of 334 valid responses remained.

[5] The team sent InfoUSA a list of companies and addresses, requesting names and email addresses for any employees with the title facilities manager, operations manager, president, or CEO.

Table 5-2 Disposition Summary

Disposition	*Count*	*Percent of Total Sent*	*Percent of Valid Email*
Nonparticipants sent email	29,020	100%	n/a
Email was undeliverable	2,383	8%	n/a
Valid email	26,637	92%	100%
Responses	1,465	5%	5%
Screened-out, ineligible, or partial response	1,131	4%	4%
Valid responses	334	1%	1%

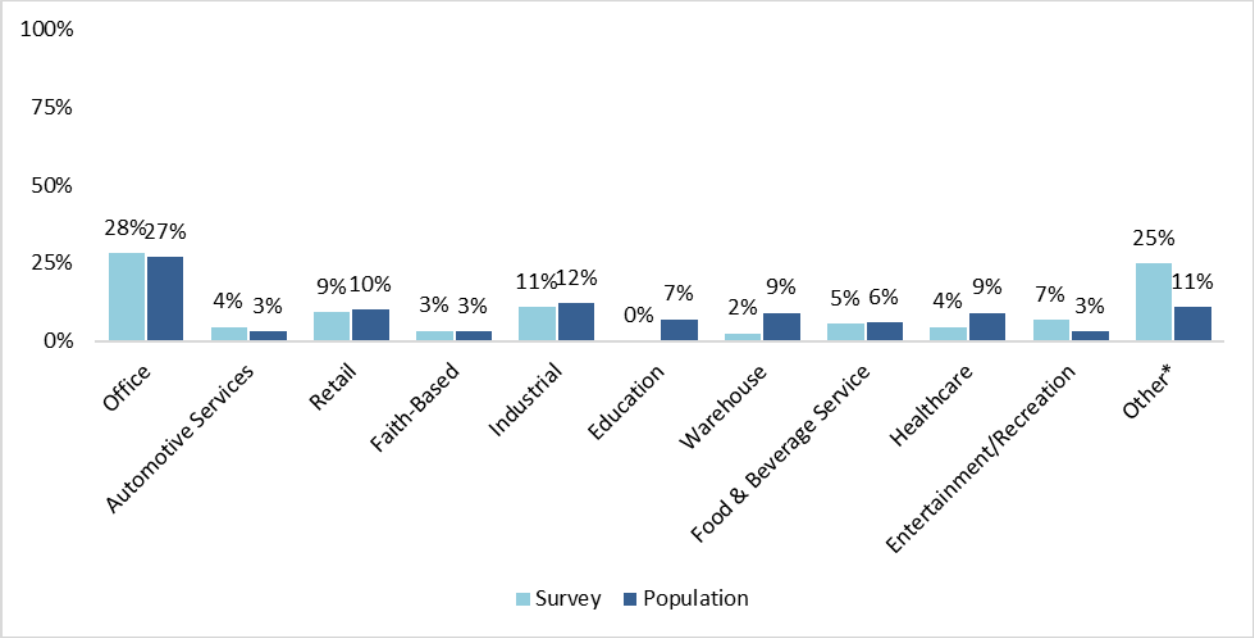
The nonparticipant survey sample provided a good representation of the overall customer population in terms of rate class (2M, representing small-to-medium-sized businesses, versus other rate classes), although the 2M rate class accounted for a smaller percentage of the total usage of survey respondents than of the customer population (Table 5-3).

Table 5-3 Surveyed Participants Compared to Customer Population

Rate class	*Businesses*		*Electric Reportable Usage*	
	Survey	*Accounts*	*Survey*	*Accounts*
2M	95%	93%	5%	17%
3M/4M/11M	5%	7%	95%	83%
Total	100%	100%	100%	100%

Survey respondents also generally represented the distribution of business types across the population at large (Figure 5-4), although the sample somewhat under-represented warehouse and healthcare types, while over-representing entertainment/recreation and “other” business types, which included government, transportation, construction, agriculture, information technology, and other miscellaneous categories. Note that the question asking the business type was open-ended, and several responses that were not clear also were coded as “other.”

Figure 5-4 Distribution of Business Types, Population vs. Sample



Note: "Other" includes government, transportation, construction, agriculture, information technology, and other miscellaneous categories.

The majority of survey respondents reported having a leadership role at their company. Two-thirds (68%) of those identifying their title were the company owner, a top officer or director, or someone with facility management or maintenance responsibilities. Most others reported some management or administrative title.

Just more than half (57%) of survey respondents reported owning their work facility, most of whom also reported occupying that facility; 36% reported leasing their work space.

Work facilities ranged in size, but the reported sizes were skewed toward smaller buildings (Table 5-4). Well more than half of nonparticipants (59%) reported having no more than one work location within Ameren Missouri territory, another fifth (21%) reported two to five locations, and very few (5%) reported more than five locations.

Table 5-4 Total Square Footage of Workplace Locations (n = 334)

Range	*Percent*
Up to 1,000	8%
>1,000 to 5,000	40%
>5,000 to 25,000	24%
>25,000 to 50,000	4%
>50,000	5%
Don't know, no response	19%

A large majority of nonparticipants (92%) reported their company or organization was responsible for maintenance or replacement decisions of at least one type of equipment (Table 5-5).

Table 5-5 Equipment Responsibilities Among Nonparticipants (n = 334)

Equipment Type	*Percent*
Any equipment responsibility	92%
Lighting	86%
Any non-lighting	89%
Heating	75%
Cooling	76%
Computer	70%
Refrigeration	44%
Motors	32%
Other	0%
Both lighting and non-lighting	82%

5.1.2 Trade Ally Online Survey

The evaluation team conducted an online survey of trade allies who were active in Ameren Missouri's service territory. The team sent up to three email invitations to take the survey to a total of 442 individual trade allies, representing 287 companies, who had completed at least one BizSavers project during program year 2018. The email offered a $50 gift card for completing the survey.

A total of 102 trade allies, representing 72 companies, completed the survey. Those 102 survey respondents were responsible for 56% of the BizSavers projects, 48% of the ex ante kW savings, and 47% of the ex ante kWh savings in PY2018.

The 102 surveyed trade allies represented a range of business types that were representative of the Ameren Missouri Trade Ally Network: 48 reported they sold equipment to contractors (i.e., they were distributors), of whom 43 also reported selling directly to end-users and 10 reported installing equipment; 44 were contractors or installers; and the other respondents were a range of other things, including design lighting professionals, ESCO, design build construction firm, consulting firms, and rebate processing companies.

Surveyed trade allies reported working with a range of equipment types (Table 5-6). A large majority had experience with lighting equipment and about two-fifths (39%) had non-lighting experience, with one-third (33%) reporting experience with both.

Table 5-6 Types of Equipment Installed or Sold by Surveyed Trade Allies (n=102; Multiple Responses Allowed)

Equipment Type	*Count*	*Percent*
Lighting	93	91%
Any non-lighting	40	39%
Energy management systems	17	17%
Building management systems	12	12%
Motors	21	21%
Heating	16	16%
Cooling	16	16%
Water heating	11	11%
Industrial process	8	8%
Refrigeration	8	8%
Air compression	7	7%
Building shell	5	5%
Cooking	4	4%
Other	3	3%

5.2 Key High-Level Findings

The following sections provide details of evaluation findings. This section summarizes key high-level findings by topic.

Program progress:

- While the Lockheed staff has undergone several changes recently, the BizSavers met all goals for this program cycle.
- The general profile of program activity remains as in previous years: program activity well represents the distribution of customers geographically and by rate class as well as the end uses in the population.
- Analyses of project tracking data suggests that the EMS pilot program may have increased the number of EMS projects completed and slowed the downward trend in kWh savings achieved from such projects, compared to what would have occurred without the pilot program.
- Project comprehensiveness is low, with the great majority of projects in existing buildings involving a single system.

Changes to incentives:

- The change in the cooling incentive levels appeared to have stimulated more cooling projects and savings. This appears to conflict with trade ally reports that the incentive changes did not influence their sales of cooling equipment.

- Trade allies generally were in favor of allowing lighting fixture replacements with Standard incentives and did not object to calculating lighting incentives on a per-watt-saved basis.
- Half of trade allies said that decreasing the lighting incentive to 30 cents per watt made it more difficult to sell high-efficiency lighting. Their observation is supported by analysis of project tracking data.

Marketing and outreach:

- Lockheed is working on several industry-specific efforts, including development of infographics for the website and distribution to customers, industry-specific outreach events, and video testimonials.
- Lockheed has conducted outreach to trade allies and developed collateral to encourage customers to install lighting as soon as they purchase it; this is partly because some customers continue to apply for lighting incentives without having installed the lighting.
- Lockheed worked on developing marketing videos for the BizSavers website but was unable to post one of them, completed in April, because a general renovation of the Ameren Missouri website took longer than expected.

Trade ally concerns:

- Trade allies reported that the BizSavers program motivates businesses to invest in energy efficiency and helps them get work, and that the program communicates well with them and has a consistent approach to managing the trade ally network.
- Awareness of the new Trade Ally Advisory Board is low among trade allies and about one-third to nearly one-half of those aware of it are unsure of its benefits.
- The BizSavers cooling business development representative provides value to cooling trade allies, but awareness of the availability of this assistance among trade allies is not yet high.
- Most SBDI Service Providers do not clearly understand that, when using third-party installation contractors, they must provide the customer with a single invoice for the work done by the Service Provider and any subcontractors.

Awareness of programs and incentives:

- Awareness of New Construction incentives was low among nonparticipants, even among those who had recently completed or were planning to complete a new construction project.

- Equipment vendors and contractors continue to be the main sources of BizSavers program awareness and to have the greatest influence on equipment selection.
- BizSavers participants had low awareness of incentive types that they had not used, as well as low awareness of recent changes to the incentive structure.
- A substantial percentage of surveyed trade allies appear to believe that there are no incentives for exterior lighting or do not know how to access those incentives.

Customer decision-making:

- Vendors and contractors continue to be the most important source of influence on customers' decisions about equipment upgrades to existing buildings.
- In new construction projects that received BizSavers incentives, decisions were most likely to be highly influenced by the project designer or architect, the design team process, or an Ameren Missouri staff member.

Customer experience:

- Participant satisfaction was high across most indices for all programs, but Custom, New Construction, and Retro-commissioning applications often require resubmission or additional documentation.
- Customers have difficulty finding information about energy efficiency and saving energy on the Ameren Missouri website – more than one-third could not find all the information they were looking for.
- While a substantial portion (about one-third) of customers who visited the Ameren Missouri website recalled seeing the *Customer Tools & Resources* page, very few followed any given link on that page to other content.

Other:

- The number of projects that included lighting controls was much lower for PY2018 than previously, possibly because the efficiency of LED lighting had reduced the perceived benefit of occupancy sensors or daylight controls.

5.3 Program Staff Feedback

The interviewed program staff provided feedback on program organization and staffing, program progress, marketing and outreach activities, communication, and tracking and reporting. Key findings are:

- While the Lockheed Martin staff has undergone several changes recently, staff reported that the BizSavers program was still on track to meet all goals for this

program cycle – as documented in Chapter 4, the program did meet and exceed overall goals.

- The change in the Custom incentive structure reportedly is having the intended effect, a view that is supported by the evaluation team's analysis of project savings.
- Lockheed Martin leveraged a St. Louis benchmarking ordinance to steer customers to the program.
- Some customers continue to apply for lighting incentives without having installed the lighting, which Lockheed Martin has addressed through outreach to trade allies and development of a graphic to illustrate the cost of waiting to install lighting.
- Lockheed Martin is working on several industry-focused marketing and outreach efforts, including development of infographics for the website and distribution to customers, industry-specific outreach events, and video testimonials.
- Lockheed Martin established a Trade Ally Advisory Board to provide feedback to help enhance the program.
- Lockheed Martin has removed and replaced at least 10 underperforming Service Providers (SPs) for the Small Business Direct Install (SBDI) program. Project tracking data indicate the new SPs are performing better than the removed ones.

Additional details are summarized below, by interview topic.

5.3.1 Program Staffing

Lockheed Martin's program management has maintained continuity over the past several program years, although several staffing changes have occurred, starting late in the previous program year and continuing into the current one. Those changes consisted of the addition – and subsequent expansion of duties – of an Associate Program Manager; the replacement of the previous Operations Manager with a new staff with a more limited data management portfolio; the loss and partial replacement of two business development (BD) analysts; and the replacement of a marketing coordinator.

Lockheed Martin hired the Associate Program Manager last program year to lead the implementation specialist group. He is 100% dedicated to BizSavers and now is also taking over the engineering group and handling day-to-day tasks of the current cycle while the Program Manager prepares for the launch of the next cycle. The Operations Manager who served for several years left and was replaced by a new hire to do data management, with the Operations Manager's other duties taken up by the Associate Program Manager.

The two BD Analysts left late in the previous program year, after having worked for Lockheed Martin for about one year. Lockheed Martin replaced them with an Implementation Specialist (IS) from another program. The Associate Program Manager reported that the new BD has "been a great addition." In addition to reporting on these changes, the Associate Program Manager reported that the addition in the previous program year of a BD who specializes in cooling technologies has helped provide accurate savings estimates.

The Associate Program Manager reported that current staffing levels are sufficient, but that Lockheed Martin might expand the engineering and IS groups to help meet the anticipated goals of the next program cycle.

Beyond staff additions and replacements, Lockheed Martin made other changes in program operations. Lockheed Martin switched from a structure in which individuals acting as the "lead" for specific programs had responsibility for the various functional areas (e.g., engineering, implementation, business development) within those programs, to one in which individuals act as lead for the functional groups, which work across programs. It is still the case that some individuals within the various functional areas have greater knowledge of one program than another.

The only other change of note is in the trade ally coordinator role, which may be partly related to changes in staffing and to changes in operational structure. Initially, that function was handled by a BD Analyst. For the previous program year, that role was transferred to one of the program leads. That staff member left last program year, and the trade ally coordinator role was returned to a BD Analyst.

5.3.2 Program Progress

When interviewed in November 2018, about three-quarters of the way through PY2018, program staff reported that the program was doing "great," expected to hit every goal for the cycle.

In particular, staff reported that the program was seeing the intended effects from the change in the Custom incentive structure. One part of the change was an increase in incentives for cooling measures (from $.07/kWh in MEEIA 1 to $.15/kWh in MEEIA 2). Analysis of savings associated with completed MEEIA 1 and MEEIA 2 projects confirms that view (see Section 5.4.6). A staff informant noted a concern that some customers may not be able to take advantage of the higher incentives because of the challenge in separating out the cooling savings from other savings associated with certain measures and projects. This is one reason for the addition of a cooling specialist to the BD team (see Section 5.3.1), and the addition of that specialist appears to have helped.

Staff also clarified the reason that the EMS pilot ended during the current program year. When the EMS pilot began, Lockheed Martin capped the number of projects that could

be completed. Late in the previous program year, the cap on number of projects in the EMS pilot was removed, which led to an increase in applications and projects. As a result, the pilot's budget was used up early in the current program year.

5.3.3 Marketing and Business Development

Interviewed staff described several marketing and business development focuses.

Staff reported that the program is making a "major push" on benchmarking to capitalize on a new St. Louis ordinance that requires all buildings above a certain size to benchmark. The BD team identified owners of buildings above the threshold, helped them benchmark the buildings, and then steered them to the incentive program. As discussed in Section 5.4.6, project tracking data show 14 companies that have had benchmarking assistance, with those 14 companies starting 38 projects on or after the start of the benchmarking assistance.

Ameren Missouri and Lockheed Martin reportedly had not made any "significant" changes to marketing materials in PY2018. Staff reported they "overhauled" the branding and design last year and that Ameren Missouri was happy with it. Nevertheless, staff reported on the development of marketing collateral and other tools over the course of the year.

The marketing team developed the following new collateral in PY2018:

- A graphic illustrating the cost of waiting to install energy efficient measures.
- Infographics for industry-focused marketing campaigns.
- SBDI brochures and a banner for an Earth Day event.
- A light bulb "cheat sheet" to help participants identify incentive-eligible bulbs.

Staff elaborated on the development of the "Cost of Waiting" graphic and the industry-focused infographics. The purpose of the former is partly to educate trade allies themselves on the costs, so that they will take measures to get their customers to install the lighting they sell, and partly to pass on to customers.

The industry-specific infographics are part of a planned effort for the coming program cycle to target several specific industries: office buildings, convenience stores, education, congregational, food service and restaurants, health care, industrial and warehouse, information technology and data centers, lodging, retail, supermarket, and agriculture. Lockheed Martin saw "strong participation" from schools in PY2018 in response to a school-focused outreach event that occurred in the previous program year, targeting trade allies who do work in schools and key school contacts like superintendents, and hopes to repeat that next year.

The infographics will be presented on the website and given to trade allies and BD staff to distribute to customers. They will show how certain business types use energy, how much BizSavers is helping them save, how much incentive dollars they have committed, and how energy savings relate to greenhouse gasses. They will mention three or four industry-specific ways to save energy. At the bottom of the web page with each graphic is contact information for a BizSavers BD representative.

In addition to the above, marketing staff also revised the Standard and SBDI incentives lists to reflect changes and, very near the end of the program year, redesigned the Ameren Missouri business development territory map, tri-fold brochure, and Standard incentive brochure.

Implementer staff also reported on efforts to develop marketing videos to be posted on the BizSavers website. Most of those were in the form of customer testimonials, including one from a school that Lockheed Martin intends to use to support its planned schools-focused outreach event for the coming program year. One video, completed in April, was focused on commercial lighting. Staff also reported efforts to get testimonials from small business owners to develop a video. As of the end of the program year, the videos were at various stages of readiness, but none, including the one completed in April, had been posted to the website because of pending website changes. Specifically, Ameren Missouri was in the process of transitioning to a mobile responsive website – that is, a website that detects when a user is on a mobile device and presents the device-appropriate interface. Staff reported that, when they had completed the lighting video in April, they were asked to hold off posting the video during the website transition, which was scheduled to be completed in August. However, at the time of the interview (November 2018), the website transition had not yet been completed, which had prevented the marketing team from implementing the completed video.

5.3.4 Measures and Incentives

Staff commented on the change from incenting lighting on a per-unit basis to a per-watt basis, noting that this change now allows replacement of a whole lighting fixture to be done through Standard incentives. Previously, whole fixture replacements required use of Custom incentives.

Staff also reported that the program had reduced the incentive level for lighting measures in August of this program year to free up budget to meet goals for other measure types. After determining that the existing level (about 40 cents per watt saved, depending on the specific lighting measure) was not needed to “get lighting done,” the program reduced the lighting incentive to a flat 30 cents per watt saved.

On a related topic, staff also commented on the decrease in the number of project starts that involved lighting controls, which at the time of the interview were about half what they had been the previous year at that time. The interviewed staff member suggested

that the benefit of occupancy sensors or daylight controls had diminished because of the efficiency of LED lighting. Program staff have had discussions about how to drive ethernet-controlled lights and more integration with building controls.

5.3.5 Trade Allies

Staff reported that Lockheed Martin had added 30 to 40 trade allies to the Trade Ally Network (TAN) and had a total of 319 approved trade allies in the TAN. As of April 2019, the project tracking database shows 328 approved trade ally companies.

Program staff also reported that Lockheed Martin removed at least 10 underperforming Service Providers (SPs) for the Small Business Direct Install (SBDI) program to make room for other contractors on the waiting list to become SPs. The program now has 29 SPs.

Marketing summaries that staff provided document the following trade ally outreach activities carried out this program year: a trade ally awards dinner held in April 2018; a trade ally happy hour, in December 2018; and a luncheon for HVAC trade allies. In addition, Lockheed Martin sent a newsletter to trade allies in June 2018 and a re-enrollment survey in January 2019.

The key reported trade-ally-related activity was the development of a Trade Ally Advisory Board, consisting of 52 high-activity trade allies to provide feedback to help enhance the program. Lockheed selected the 52 trade allies who comprised the Board from 65 who signed up. Lockheed Martin held a 3-hour meeting with members of the Advisory Board in November 2018, which generated feedback on several topics. Board members would like to limit direct interactions between BizSavers and customers, instead having the trade allies serve as the go-between. Another topic was how to encourage cross-selling among trade allies – one suggested approach was the development of a “job board” on the TAN web page, where trade allies or possibly customers could post work they need done. Board members also commented on the strong potential remaining for additional savings from schools, on streamlining incentive processing and inspections processes, and on adding measures, such as VFDs, to the Standard measures list.

In addition to the above, staff reported that they solicited feedback from the Advisory Board on program rules and processes, including the change to a per-watt basis for lighting incentives. Staff reported that members of the Advisory Board were “overwhelmingly” in favor of the change.

Staff commented on two findings from previous years’ process evaluation. The first was the finding that “New Construction participants continue to be unsure about the requirement to apply for incentives before incorporating equipment into a project’s plan, and thus they and the program may lose out on energy-saving opportunities.” Staff

noted that this happens in both the New Construction and Custom programs and suggested that it is more likely to occur if the customer uses a contractor that is not a member of the TAN and so had not received training on program incentives. Another issue specifically with new construction projects is that they often bring multiple contractors together. There is one point of contact for a project, but that contractor may not know how well the other contractors understand program rules.

The second previous finding related to customers' continuing to apply for lighting incentives without having installed the purchased lighting. Staff reported that some customers continue to do so, possibly because their vendor did not properly explain the program rules or because they are waiting for their existing lighting to burn out. Staff reported that Lockheed Martin is trying to address this issue through outreach to trade allies and development of the "Cost of Waiting" graphic, described above, to show that lighting does not produce savings if it is not installed.

5.3.6 Communication

All interviewees reported good, effective communication within Lockheed Martin and between Lockheed Martin and Ameren Missouri. One respondent described Ameren Missouri staff as "pleasant, interactive, talkative, helpful in getting the resources they need." However, one respondent pointed out that Lockheed Martin staff often must follow up with Ameren Missouri staff on issues they have discussed "because they [Ameren Missouri staff] are busy on their end."

5.3.7 Tracking and Reporting

All interviewees said that tracking and reporting are effective.

5.4 Cross-Cutting Database Analysis

In PY2018, the majority of completed projects continued to be in the Standard and SBDI programs. The evaluation team carried out an analysis of the program database to identify characteristics of participants, the projects they have done, and the service providers associated with them. In addition, the team carried out special analyses to examine the effects of changes made in MEEIA 2 to Custom incentives and to the introduction of the EMS pilot program.

Key findings are:

- Customers with multiple projects made up one-quarter of the participants, more than half of the projects, and at least two-thirds of the energy and demand savings.

- Projects with Standard incentives were about eight times as common as those with Custom incentives and nearly four times as common as those with SBDI incentives.
- The great majority of projects with Standard or Custom incentives involved a single system.
- The distribution of participant building end-uses matches relatively well with the distribution in the general population, with some exceptions noted below.
- The distribution of energy savings across geographic areas is consistent with the distribution of customers.
- The share of total program savings in the 2M rate class is slightly high relative to total electric reportable usage in that class.
- The program delivered the incentive within the contractually mandated 45 days for 95% of projects.
- Demand (kW) savings for Custom measures with cooling end uses showed a drastic increase in MEEIA 2, compared to decreases for most other end use types, suggesting that the change in the Custom incentive structure had the desired effect.
- Lighting project starts fell sharply at about the same time that the program reduced lighting incentives from an average of about 40 cents per watt saved to a flat 30 cents per watt saved.
- The introduction of the EMS pilot program may have increased the number of EMS projects completed and slowed the downward trend in kWh savings achieved from such projects.
- Members of the BizSavers Trade Ally Network accounted for 82% of kW and 83% of kWh savings.
- SBDI Service Providers new in PY2018 did many more projects, on average, than those removed this program year.

5.4.1 Overall Analysis of Projects and Participants

The analysis identified 4,390 unique participants with completed BizSavers projects, who collectively had completed 7,430 projects.[6] While those who did multiple projects

[6] Based on the Parent Company field in the project tracking database. Only projects with kWh savings are counted.

were a minority of all participants, they accounted for more than half of projects and at least two-thirds of kWh and kW savings (Table 5-7).

Table 5-7 Participants with Single and Multiple Projects

Number of Projects	*Participants (n = 4,390)*	*Projects (n = 7,430)*	*kWh Savings*	*kW Savings*
One project	74%	44%	33%	29%
Multiple projects	26%	56%	67%	71%
Total	100%	100%	100%	100%

Standard incentives were by far the most common types, followed by SBDI incentives, about one-quarter as common as Standard (Table 5-8). However, SBDI incentives account for a small fraction of the savings of either Standard or Custom.

*Table 5-8 Incentive Types of Participants and Completed Projects**

Incentive Type	*Percentage of…*			
	Participants (n = 4,390)	*Projects (n = 7,430)*	*kWh Savings*	*kW Savings*
Standard only (n = 3,334)	61%	65%	56%	48%
SBDI (n = 976)	26%	18%	5%	5%
Custom only (n = 282)	3%	5%	13%	23%
Custom and Standard (n = 176)	7%	4%	11%	10%
NC (n = 36)	1%	1%	5%	7%
RCX (n = 9)	0%	0%	2%	4%
EMS (n = 17)	0%	0%	1%	3%

*A project may be counted in more than one row, so percentages may sum to greater than 100%.

The great majority of projects with Standard or Custom incentives involved a single system (Table 5-9). Of Standard or Custom projects with lighting incentives, fewer than 1% also had non-lighting incentives. Of those with non-lighting incentives, 10% also had lighting measures but 98% involved a single non-lighting system.

Table 5-9 Project Comprehensiveness

Measure Type	*Total*	*With Any other Measure Type*		*With Any (Other) Non-lighting Type*		*With Any Lighting Type*	
		Count	*%*	*Count*	*%*	*Count*	*%*
Lighting	5,816	18	0%	18	0%	n/a	n/a
Any non-lighting	184	21	11%	4	2%	18	10%
HVAC*	132	11	8%	3	2%	9	7%
Air compression	23	1	4%	1	4%	0	0%
Refrigeration	13	8	62%	0	0%	8	62%
Motors	12	2	17%	2	17%	0	0%
Process	5	1	20%	1	20%	0	0%

Measure Type	*Total*	*With Any other Measure Type*		*With Any (Other) Non-lighting Type*		*With Any Lighting Type*	
		Count	*%*	*Count*	*%*	*Count*	*%*
Shell	2	2	100%	1	50%	2	100%
Water heating	1	0	0%	0	0%	0	0%

*HVAC includes measures categorized as HVAC, cooling, or heating in the project tracking database.

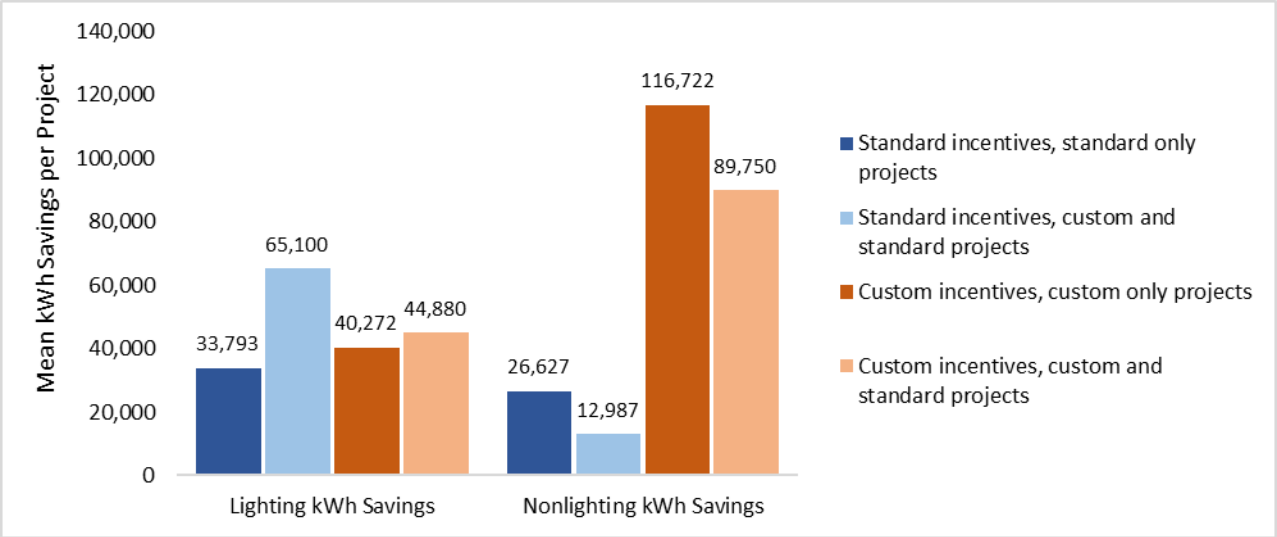
As seen in Table 5-10, above, a relatively small percentage of participants did projects that combined Standard and Custom incentives, but such projects accounted for a disproportionate amount of both kWh and kW savings. Interestingly, it appears that increased savings from Standard incentives was the main cause for the greater overall per-project savings from those projects – the mean savings from Custom incentives for those projects were less than half of the mean savings from Custom-only projects (Table 5-10).

Table 5-10 Mean per Project kW and kWh Savings of Standard-Only, Custom-Only, and Custom-and-Standard Projects

Incentive Type	*Mean kWh Savings per Project*			*Mean kW Savings per Project*		
	Standard	*Custom*	*Total*	*Standard*	*Custom*	*Total*
Standard only	35,242	0	35,242	6.7	0.0	6.7
Custom only	0	112,037	112,037	0.0	41.2	41.2
Custom and Standard	62,212	55,995	118,206	11.8	12.7	24.4

Further investigation showed different patterns for lighting and non-lighting savings (Figure 5-5). For lighting savings, the mean per-project savings increased for *both* Standard and Custom incentives, but *particularly* for Standard incentives, when Standard and Custom incentives were combined in one project. The opposite was seen for per-project non-lighting savings – those decreased, on average, when Standard and Custom incentives were combined.

Figure 5-5 Mean kWh Savings for Standard-Only, Custom-Only, and Custom-and-Standard Projects

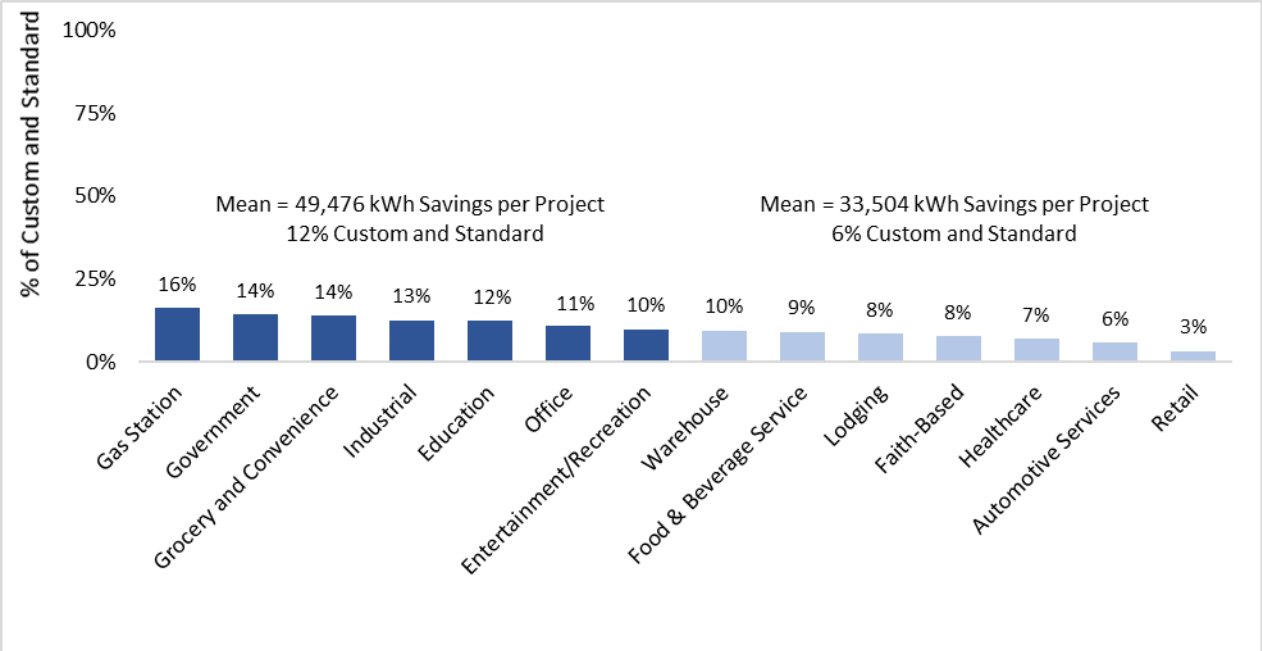


**Excludes IT/data center and parking garage building types, which had fewer than 65 projects each and so may not provide reliable data on the percentage of Custom-and-Standard projects.*

Table 5-11 helps clarify the pattern for non-lighting savings. Relatively higher-savings measures accounted for disproportionately high proportions of the Custom-only (process, air compression, motors) and Standard-only (water heating) savings, relative to the Custom-and-Standard savings. Thus, it appears that Custom-only and Standard-only projects tend to have higher non-lighting savings because they involve higher-saving non-lighting measures. Further, non-lighting projects almost always were related to a single system: HVAC, process, air compression, motors, or refrigeration.

The evaluation team did not find a comparable explanation for why kWh lighting savings from Standard incentives are so much higher in Custom-and-Standard projects than in Standard-only projects. It appears to have more to do with where the projects occurred. Those building types where Custom-and-Standard projects with lighting savings were more common tended also to be the ones with the greatest overall kWh savings per project (Figure 5-6). So, it appears that Custom-and-Standard projects tend to have higher lighting savings at least partly because they tend to occur in building types where larger projects often occur.

*Figure 5-6 Distribution of Standard-Only and Custom-and-Standard Projects with Lighting Savings Across Building End Use Types**



*Excludes IT/data center and parking garage building types, which had fewer than 65 projects each and so may not provide reliable data on the percentage of Custom-and-Standard projects.

Table 5-11 Distribution of Standard and Custom Non-lighting kWh Savings Across Measure End Uses, for Standard-Only, Custom-Only, and Custom-and-Standard Projects

Measure End Use	*Number of Projects*	*Standard kWh Measure-Specific Savings*				*Custom kWh Measure-Specific Savings*			
		Standard-Only Projects		*Custom-and-Standard Projects*		*Custom-Only Projects*		*Custom-and-Standard Projects*	
		Mean kWh Saved per Project	*% of Non-lighting kWh Saved*	*Mean kWh Saved per Project*	*% of Non-lighting kWh Saved*	*Mean kWh Saved per Project*	*% of Non-lighting kWh Saved*	*Mean kWh Saved per Project*	*% of Non-lighting kWh Saved*
Process	5	0	0%	0	0%	739,295	12%	0	0%
Air Comp	23	0	0%	0	0%	300,671	22%	0	0%
Motors	12	2,511	2%	0	0%	279,552	10%	0	0%
Refrigeration	13	1,230	3%	12,987	100%	296,927	4%	40,984	17%
All HVAC	132	0	0%	0	0%	128,770	52%	149,494	81%
Water Heating	1	126,936	95%	0	0%	0	0%	0	0%
Building Shell	2	0	0%	0	0%	0	0%	13,654	2%

5.4.2 Building End-Use Type

At the participant, building, and project levels, the most common building end uses were retail, office, and industrial (Table 5-12). Together, those three end-use types made up nearly half of all projects, participants, and savings. Industrial customers accounted for nearly twice the share of savings as they did of projects or participants, while retail and office customers accounted for a lower share of savings than of projects or participants.

Table 5-12 Building End-Use Types

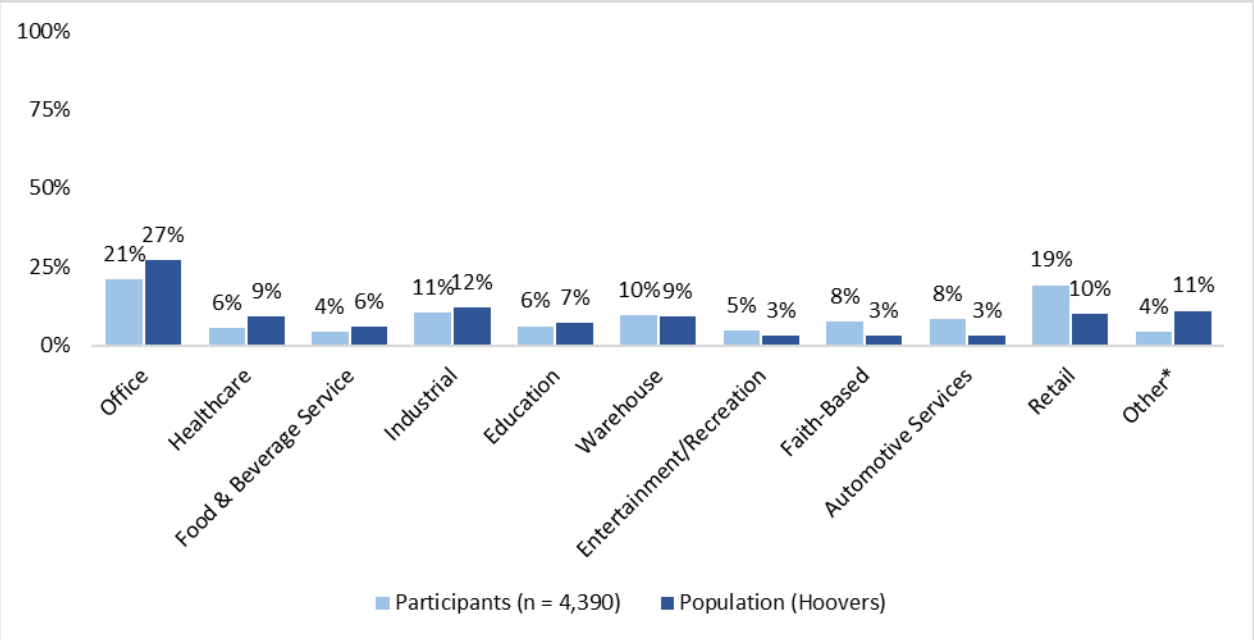
Building End-Use Type	*Percentage of…*			
	Participants (n = 4,390)	*Projects (n = 7,430)*	*Total kWh Savings*	*Total kW Savings*
Retail	19%	18%	14%	11%
Office	21%	19%	15%	20%
Industrial	11%	9%	19%	16%
Warehouse	10%	7%	9%	7%
Education	6%	10%	13%	16%
Automotive Services	8%	7%	4%	3%
Faith-Based	8%	8%	4%	4%
Healthcare	6%	6%	5%	7%
Entertainment/Recreation	5%	4%	3%	4%
Food & Beverage Service	4%	4%	2%	2%
Other*	8%	9%	11%	12%

*Other = Government, Automotive Services, Grocery and Convenience, Gas Station, IT/Data Center, and Parking Garage, all of which make up less than 5% of participants, buildings, projects, and savings.

For most building end uses, the distribution of program participants matches relatively well with the distribution of buildings in the population (Figure 5-7). The appearance of over- or under-representation for some end uses could be at least partly a function of limitations of the data used to estimate the population proportions.[7]

[7] For the general population data, the evaluation team used data from the Hoover's database on entities doing business in the zip codes that make up the Ameren Missouri service territory (www.hoovers.com). A detailed explanation of the method, and the reason for using the Hoover's database, is found in the 2016 EOY report.

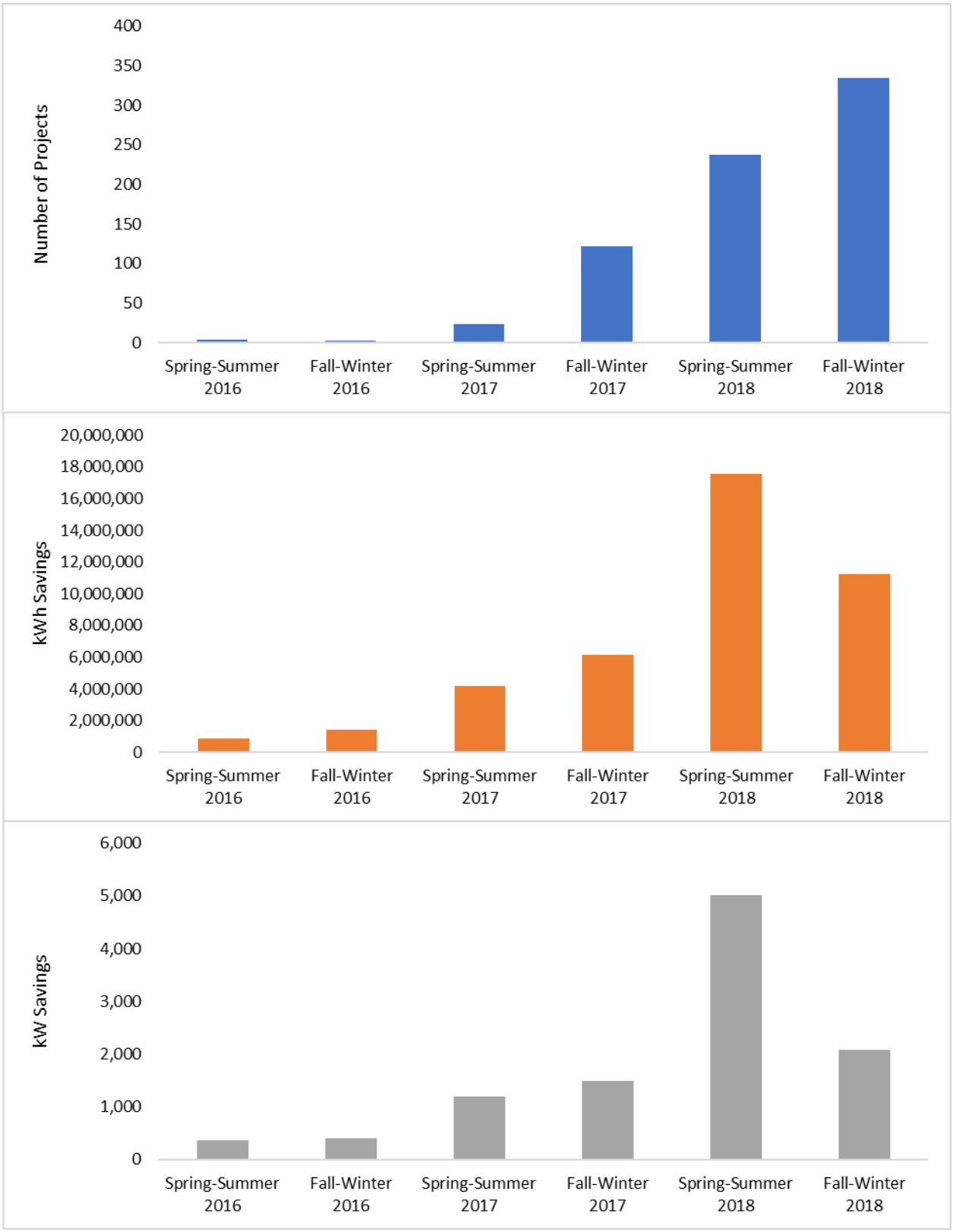
*Figure 5-7 Distribution of Participants by Building End-Use Types, Compared to Population Data**



*The population data are from the Hoover's database of commercial businesses. Other includes Lodging, Government, Grocery and Convenience, Parking Garage, Gas Station, and IT/Data Center.

As noted in Section 5.3.3, program staff reported "strong participation" from schools in PY2018 in response to a school-focused outreach event that occurred in the previous program year. Figure 5-8 substantiates that report, with PY2018 showing more projects, kWh savings, and kW savings in schools compared to the two previous program years.

Figure 5-8 School Projects in PY2016-PY2018



5.4.3 Geographic Area

The distribution of project savings by geographic area was fairly consistent with the distribution of Ameren Missouri customers' electric usage (Table 5-13). This was particularly the case for demand (kW) savings.

Table 5-13 Geographical Distribution of Participants, Buildings, and Projects

*Area**	*BizSavers Program Participation*				*Ameren Missouri Customers***	
	Participants (n = 4,390)	*Projects (n = 7,430)*	*kWh Savings*	*kW Savings*	*Customers*	*Usage*
St. Louis metro	34%	36%	36%	42%	33%	43%
Outer suburbs	43%	41%	43%	40%	32%	38%
All other areas	27%	23%	21%	18%	35%	20%
Total	100%	100%	100%	100%	100%	100%

* St. Louis metro encompasses zip codes 63101 through 63147 as well as about half of the zip codes in the range 63150 to 63199. Outer suburbs encompass zip codes 63001 through 63091 and 63301 through 63390. Other areas are all other Ameren Missouri service area zip codes.

**A given customer may have multiple locations, with some having locations in more than one geographic area, and so the percentages sum to more than 100%. The usage data are for 2016. The evaluation team will update this information for subsequent analyses.

5.4.4 Business Size

On average, customers in the 3M, 4M, and 11M rate classes produce higher savings per participant and project than do 2M customers as well as more projects per participant (Table 5-14). However, the share of total program kWh and kW savings for participants in the 2M rate class is higher than their share of total electric reportable usage (Table 5-15).

Table 5-14 Total and Average kWh Savings by Rate Class

Rate Class	*kWh Savings*			*kW Savings*			*Mean # Projects per Participant*
	Total	*Per Participant (n=4,390)*	*Per Project (n=7,430)*	*Total*	*Per Participant (n=4,390)*	*Per Project (n=7,430)*	
2M	74,244,340	18,307	17,131	12,707	3.6	2.9	1.34
3M	165,287,303	79,042	62,185	35,945	18.3	13.5	2.25
4M/11M	72,749,219	228,716	166,094	18,633	65.8	42.6	2.74
Total	312,280,862	71,135	42,030	67,285	15.3	9.1	1.69

Table 5-15 Participation, Savings, and Population by Rate Class

Rate class	Savings Compared to Usage			Participants and Projects Compared to Accounts		
	Total kWh Savings	Total kW Savings	Electric Reportable Usage	Participants (n = 4,390)	Projects (n = 7,430)	Accounts (n = ~160k)
2M	24%	19%	17%	74%	6%	93%
3M	53%	53%	42%	27%	75%	7%
4M/11M	23%	28%	41%	4%	19%	<1%
Total	100%	100%	100%	100%	100%	100%

Customers in the outer areas of the Ameren Missouri service territory appear to be using the SBDI program to a disproportionally great degree. As Table 5-16 shows, customers in those outer areas account for 20% of all energy usage and 25% of the usage in the 2M rate class, but they account for 36% of SBDI savings.

*Table 5-16 Geographical Distribution of Completed Energy Usage and SBDI Projects**

Area	Total Energy Usage	Energy Usage in 2M Rate Class	SBDI Savings
St. Louis metro	43%	35%	25%
Outer suburbs	38%	40%	39%
All other areas	20%	25%	36%
Total	100%	100%	100%

*Results were comparable when the distribution of customers instead of usage was examined.

5.4.5 Interval between Project Completion and Incentive Delivery

The program delivered the incentive within the contractually mandated 45 days for 95% of projects. The rate of achievement was highest for Fast Track projects. Achievement of the 45-day standard was somewhat lower for pre-approval projects and much lower for New Construction and Retro-commissioning projects (Table 5-17).

Table 5-17 Time from Project Installation to Incentive Delivery

Time Interval	Fast Track (n = 5,711)	Pre-Approval (n = 1,643)	New Construction (n = 62)	Retro-Commissioning (n = 14)	All Projects (n = 7,430)
> 45 days	2%	12%	82%	50%	5%
Within 45 days	98%	88%	18%	50%	95%
Within 30 days	91%	66%	6%	21%	85%
Within 15 days	42%	16%	2%	0%	36%

5.4.6 Benchmarking

The project tracking data showed 14 companies with projects identified as "benchmarking." Those 14 companies had a total of 48 projects, of which 38 were begun on or after the start date of the benchmarking project. While the mean kWh savings were somewhat lower for those 38 projects (48,963 kWh) compared to the 10 projects started by those 14 companies before the benchmarking (136,464 kWh), the mean kWh savings *per company* were higher after benchmarking (132,899 kWh) than before (97,475).

Without an appropriate control group, the findings above do not conclusively show that benchmarking leads to greater savings. Since the benchmarking effort focuses on owners of buildings above a certain size threshold, it would not be meaningful to compare the mean savings for companies with benchmarked buildings to all other companies. Unfortunately, the project tracking database does not have consistent data on building size to facilitate a comparison to buildings of similar size.

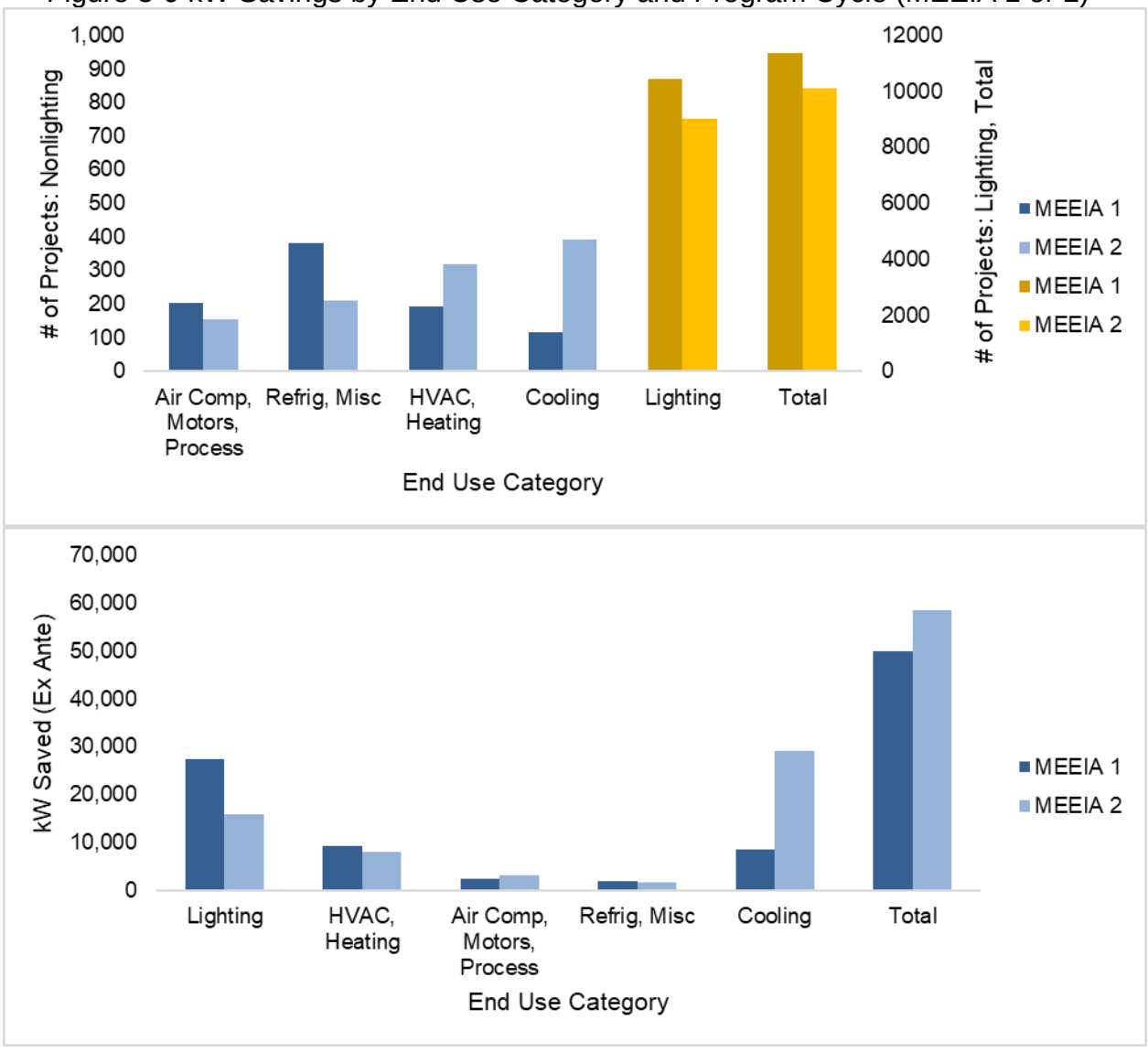
5.4.7 Effect of MEEIA 2 Changes to Custom Incentive Structure

For MEEIA 2 (starting PY2016), the implementer changed the incentive structure for Custom projects. Previously, incentives were paid per kWh saved at two levels: one for lighting measures ($.06/kWh) and one for non-lighting measures ($.07/kWh). In MEEIA 2, incentives were paid at five levels, depending on the end use or equipment type:

- Cooling – $.15/kWh.
- Building shell, HVAC, and cooking – $.08.
- Lighting and water heating – $.075.
- Air compression, motors, and process – $.07.
- Refrigeration and miscellaneous – $.06.

The program doubled the cooling incentive in an effort to achieve greater peak demand savings. For other measure types, incentives slightly increased, remained about the same, or slightly decreased. Analysis of number of projects completed and kW savings by end use shows the change in incentive structure appears to have had the desired effect. While for most end uses, the number of projects completed and kW savings decreased from MEEIA 1 to MEEIA 2, those for the cooling end use showed a large relative increase (Figure 5-9). Associated with this, the overall kW savings across all end uses increased substantively from MEEIA 1 to MEEIA 2.

Figure 5-9 kW Savings by End Use Category and Program Cycle (MEEIA 1 or 2)*



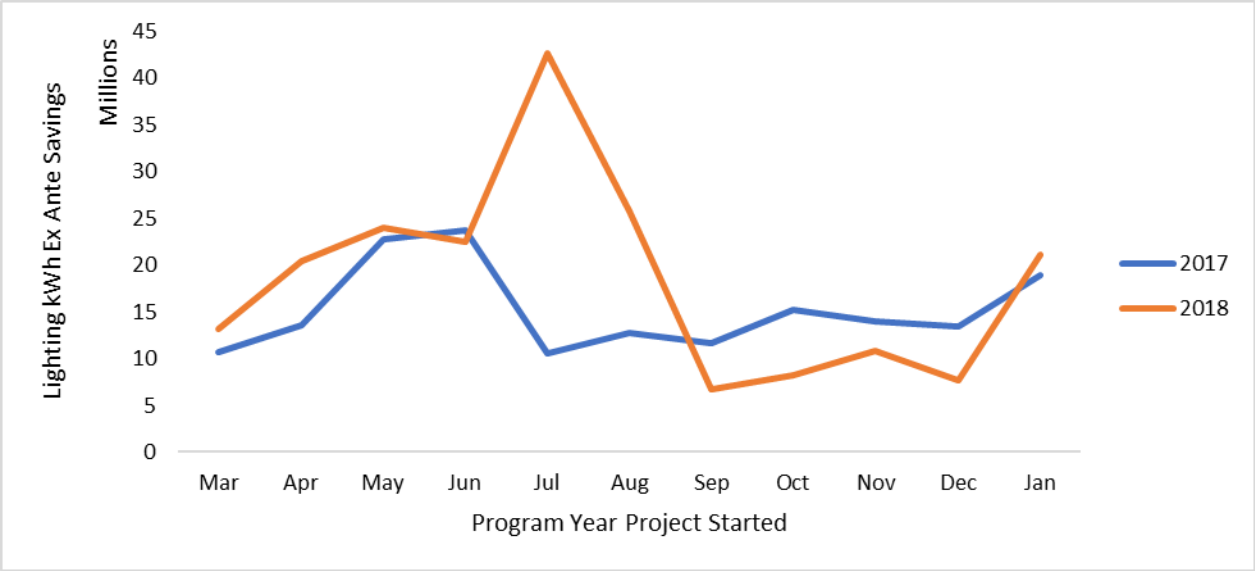
* The upper part of this figure has separate y-axes for non-lighting end uses (primary axis, on the left of the graph) and for lighting end uses and all end uses combined (secondary axis, on the right side of the chart. This is because the much larger number of lighting projects would produce very short columns for the non-lighting measures if they were all on the same scale. In the lower part of this figure, all end uses are on the same y-axis as the difference between lighting and other end uses in kW saved is not quite as extreme.

5.4.8 Effect of Mid-Year Decrease in the Lighting Incentive

The implementer reduced the lighting incentive levels in August of this program year from about 40 cents per watt saved (depending on the specific lighting measure) to a flat 30 cents per watt saved (see Section 5.3.4). The evaluation team analyzed project data to assess whether the incentive reduction had an adverse impact on lighting savings, as trade allies reported (see Section 5.5.4).

Analyses showed that total kWh ex ante savings in PY2018 were comparable to those in PY2017 for lighting projects started in March through June, both trends showing an increase over those four months (Figure 5-10). After that, the patterns diverged. While PY2017 savings dropped somewhat from June to July and then rose very gradually to January, PY2018 savings spiked in July and then dropped just as sharply between July and September to below-PY2017 levels, where they remained until December.

Figure 5-10 Lighting Starts by Month, PY2017 and PY2018



The PY2018 trend does suggest that the trade allies' observation may be correct, that the decrease in lighting incentives reduced lighting sales, at least for a while. Nevertheless, in January, lighting project starts increased again to above PY2017 levels. There were no lighting project starts in February, likely because the start of planned projects was postponed until after the new program cycle began in March.

5.4.9 Analysis of Contractors

Members of the BizSavers Trade Ally Network (TAN) comprised about one-third of contractor firms in the project tracking database but a large majority of kW and kWh savings (Table 5-18). Platinum-level trade allies generated nearly half of all program kW and kWh savings.

Table 5-18 Trade Ally Network Membership and Energy Savings

Trade Ally Network (TAN) Membership	*Count of TAs with Projects*	*Percent of TAs with Projects*	*Percent of Total kW*	*Mean kW Savings*	*Percent of Total kWh*	*Mean kWh Savings*
Members	149	32%	74%	327.4	73%	2,052,136
Platinum	27	6%	32%	789.5	32%	3,616,689
Gold	32	7%	22%	450.7	18%	1,682,829
Silver	61	13%	15%	166.8	19%	947,632
General	29	6%	4%	98.9	4%	445,963
Non-members	310	68%	26%	56.6	27%	269,447
TOTAL	459	100%	100%	144.5	100%	666,162

5.4.10 Analysis of SBDI Service Providers

As noted above in Section 5.3.5, Lockheed Martin removed 10 underperforming SBDI Service Providers (SPs) in and enrolled new ones PY2018. The evaluation team attempted to assess the effects of these changes by analyzing the counts of SBDI projects done in 2016 through 2018 by SPs that are or are not currently identified as approved SBDI SPs in the project tracking database. Using this data, the team was not able to identify all 10 SPs that were removed: four companies had completed projects in the time frame under study and were not currently approved SPs; possibly the other six companies that Lockheed Martin removed had not done any projects.

The team could not identify the date of approval as an SBDI SP, and therefore could not identify with certainty which SPs were added in the current program year. Table 5-19 shows the mean and median number of SBDI projects by year for four groups of SPs: 1) those identified as discontinued; 2) those that have done SBDI projects since 2016; 3) those that did their first SBDI project in 2017; and 4) those that did their first SBDI project in 2018. This shows that the four discontinued SPs had very few projects in any year. There is considerable variability in the number of projects completed by the other SPs, as seen by the difference between the means and medians for the three groups. However, both groups of continuing SPs showed considerable year-by-year increases in the number of SBDI projects completed, and the group of SPs with projects starting in 2018 showed many more projects, on average, than the discontinued SPs showed in any year.

Table 5-19 Mean and Median Number of SBDI Projects, 2016-2018, for Discontinued Service Providers (SPs) and Those with Projects Since 2016, 2017, and 2018

SP Group	Number of Projects by Program Year							
	Mean				Median			
	2016	2017	2018	Total	2016	2017	2018	Total
Discontinued (*n* = 4)	1.3	0.8	0	2.0	1	0	0	2
Projects since 2016 (*n* = 10)	16.9	27.2	56.7	100.8	1	13	20	43
Projects since 2017 (*n* = 9)		9.8	57.9	67.7		10	20	26
Projects since 2018 (*n* = 10)			26.6	26.6			12	12

Table 5-20 shows that the annual increase in number of SBDI projects is generally consistent across continuing SPs.

Table 5-20 Number of SBDI Projects by Year for Continuing Service Providers (SPs)

SP Company	Number of Projects			
	2016	2017	2018	Total
Continuing SPs – with Projects Since 2016 (n = 10)				
Company 1	249	261	291	801
Company 2	1	49	85	135
Company 3	3	35	93	131
Company 4	19	30	43	92
Company 5	34	15	2	51
Company 6	7	13	23	43
Company 7	3	13	4	20
Company 8	2	4	9	15
Company 9	2	7	4	13
Company 10	1	2	3	6
Continuing SPs – with Projects Starting in 2017 (n = 9)				
Company 11		17	289	306
Company 12		15	85	100
Company 13		24	43	67
Company 14		1	63	64
Company 15		10	16	26
Company 16		2	20	22
Company 17		15	3	18
Company 18		3	1	4
Company 19		1	1	2

5.5 Cross-Cutting Trade Ally Feedback

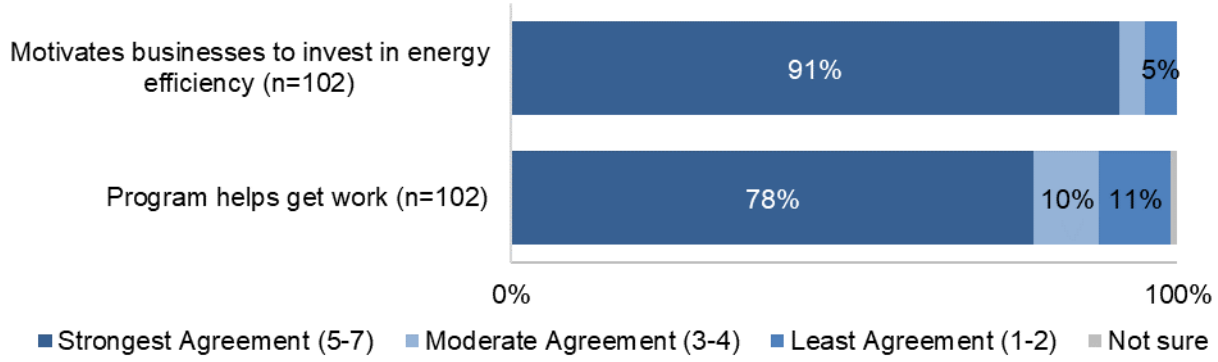
The 102 surveyed trade allies provided both program-specific and cross-cutting information. Program-specific information is presented in the program-specific sections of this chapter. This section discusses three topics that cut across programs: overall

program effectiveness, the effects of changes to the incentive structure, and suggestions for program improvements.

5.5.1 Program Effectiveness

Trade allies reported that Ameren Missouri's BizSavers program is effective in motivating businesses to invest in energy efficiency and that communication between the program and trade allies is acceptable. Nearly all trade allies reported strong agreement that the BizSavers program both helps in motivating businesses to invest in energy efficiency and about three-quarters indicated that the program helps them to get work (Figure 5-11).

*Figure 5-11 Trade Ally Agreement with Aspects of the Ameren Missouri BizSavers Program Effectiveness**

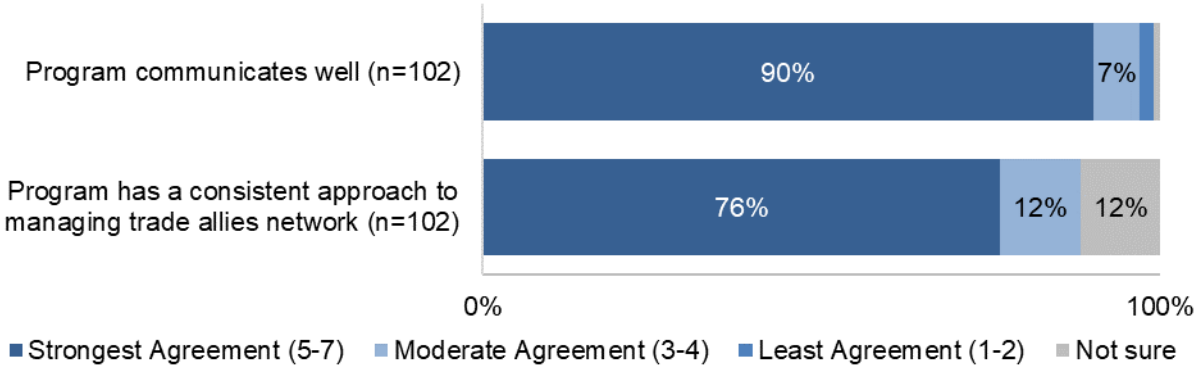


* The team asked respondents to provide their level of agreement with each statement using a scale from 1 (strongly disagree) to 7 (strongly agree).

5.5.2 Program Outreach

Trade allies also reported that the program communicates well with them and has a consistent approach to managing the trade ally network (Figure 5-12).

*Figure 5-12 Trade Ally Agreement with Aspects of the Ameren Missouri BizSavers Program Outreach**

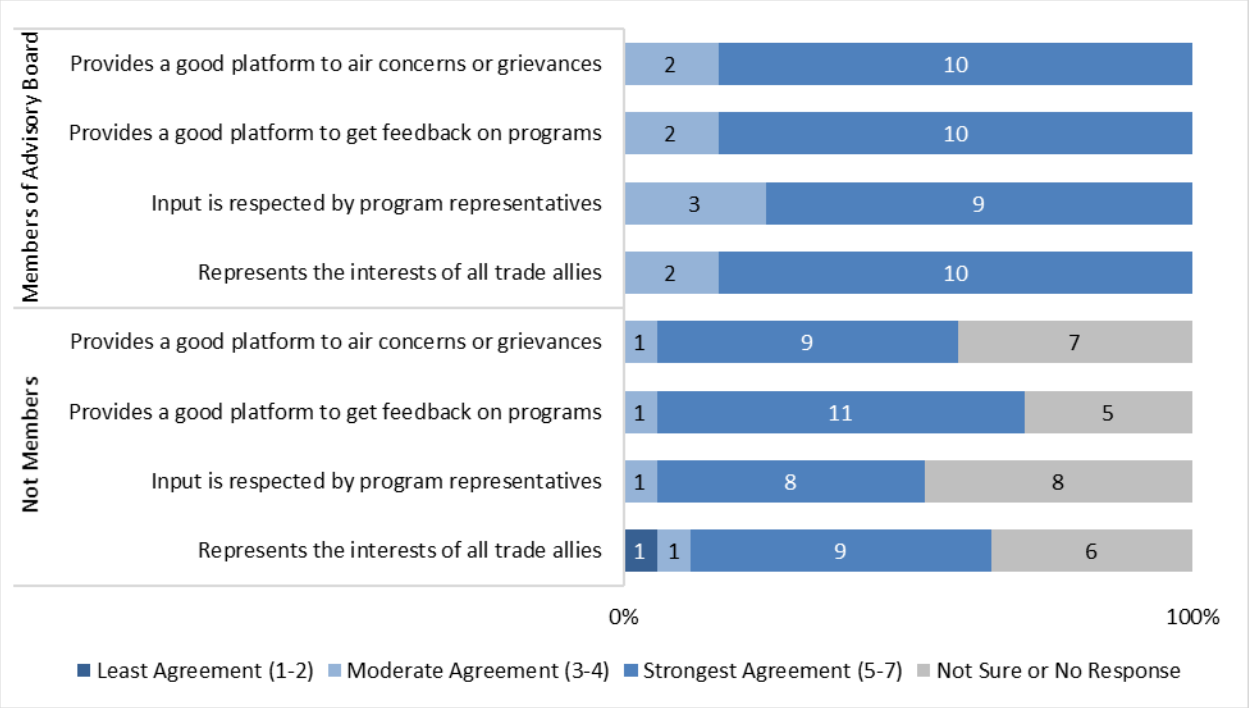


* The team asked respondents to provide their level of agreement with each statement using a scale from 1 (strongly disagree) to 7 (strongly agree).

Ameren Missouri recently established a Trade Ally Advisory Board consisting of 52 high-activity trade allies, to get feedback on program improvements and ways to increase energy savings (see Section 5.3.5). Of the 102 surveyed trade allies, 12 reported being a member of the Trade Ally Advisory Board.

The 12 trade allies who were members of the Trade Ally Advisory Board as well as 17 trade allies who were not members but reported they were aware of it provided feedback on the board's value. The board members reported strong agreement that the board represents all trade allies' interests, provides a good platform for program feedback, provides input that is respected by program representatives, and provides a good platform to air concerns or grievances (Figure 5-13). Non-board members who were aware of the board were less likely to have an opinion about the statements. Most who did have an opinion agreed with them.

*Figure 5-13 Trade Ally Agreement with Aspects Related to the Trade Ally Advisory Board (n = 29)**



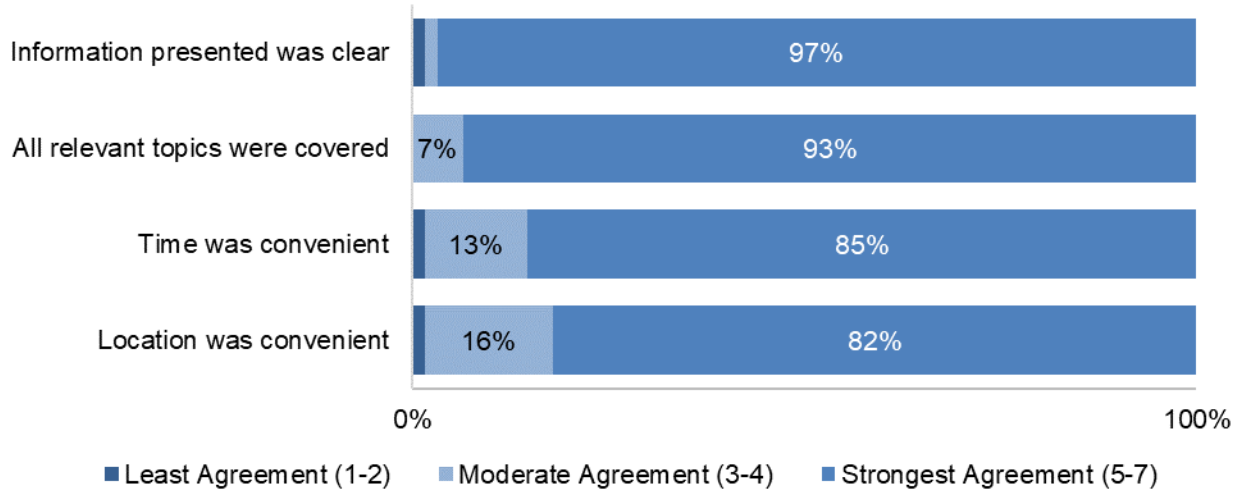
* The team asked respondents to provide their level of agreement with each statement using a scale from 1 (strongly disagree) to 7 (strongly agree).

Of the 102 surveyed trade allies, 61 (60%) reported attending at least one BizSavers informational or training event during the past program year.[8] Of those 61, 56 (92%) indicated they attended three or fewer events during the program year, while the other five reported attending four or more events.

Surveyed trade allies who attended at least one event generally agreed that information at the event they attended was clear and all relevant topics were covered (Figure 5-14). Trade allies reported moderate to high agreement that event locations and times were convenient for them.

[8] The team asked surveyed trade allies to exclude check presentations and purely social events like trade ally happy hours.

*Figure 5-14 Trade Ally Agreement with Aspects Related to the BizSavers Events Attended (n = 61)**

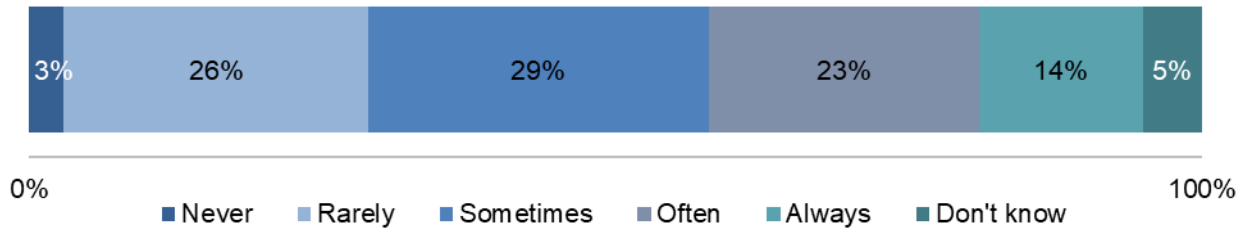


* The team asked respondents to provide their level of agreement with each statement using a scale from 1 (strongly disagree) to 7 (strongly agree).

5.5.3 Promotion of Advanced Lighting Controls

About two-thirds (66%) of surveyed lighting trade allies reported at least sometimes discussing integration of advanced lighting controls (e.g., networked controls, luminaire-level lighting controls, or integration of lighting controls with other building control systems) when discussing non-residential lighting projects with customers (Figure-5-15).

Figure-5-15 Frequency of Trade Allies Discussing Integration of Advanced Lighting Controls with Lighting Customers (n = 94)

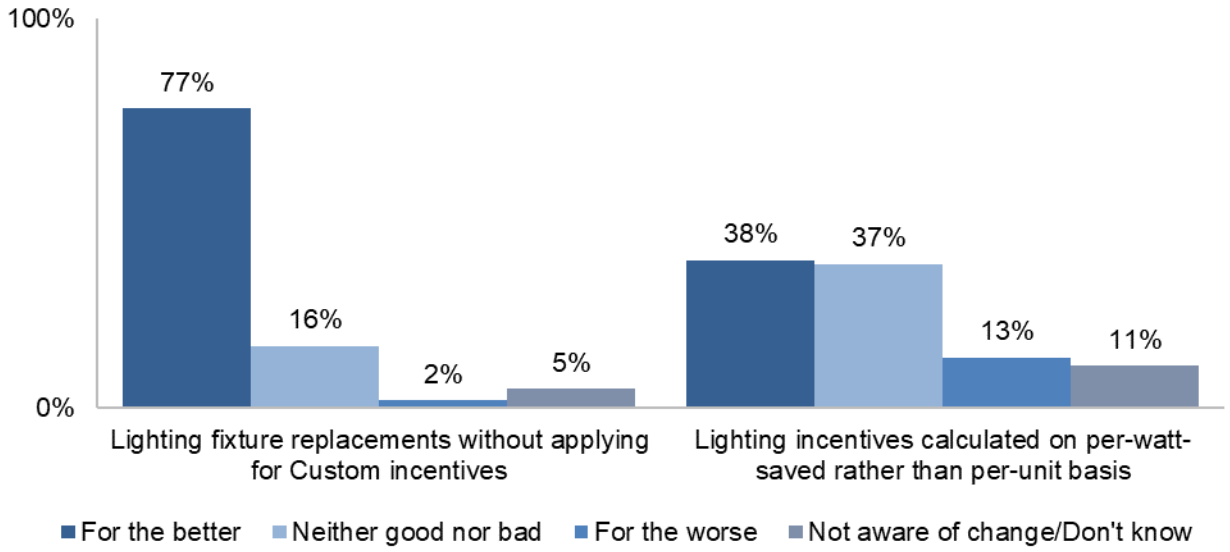


5.5.4 Effect of Changes to Incentives

Surveyed lighting trade allies provided mixed responses on three recent changes to lighting incentives: decreasing lighting incentive levels in August 2018 from 40 cents to 30 cents per-watt saved; allowing fixture replacements to be done with Standard

incentives; and calculating incentives on a per-watt-saved rather than per-unit basis. About half (53%) of lighting trade allies reported the decrease in incentive levels has made it harder to sell high-efficiency lighting. About three quarters (77%) of the 94 surveyed lighting trade allies reported that allowing fixture replacements without having to apply for Custom incentives was a change for the better (Figure 5-16). However, fewer than two-fifths (38%) of lighting trade allies reported the move from calculating incentives on a per-unit to a per-watt-saved basis was for the better.

Figure 5-16 Trade Ally Opinion of Effect of Changes to Lighting Incentives (n = 94)



Of the 72 surveyed lighting trade allies who were in favor of allowing fixture replacements to be done with Standard incentives, 53 gave a reason. All comments related to making the process faster (31 mentions) or less complicated (21 mentions). The two objections to this change (mentioned by one trade ally each) were that requiring pre-approval helped eliminate poor performing trade allies, and that the change had reduced incentive levels for Type B lamps, making the equipment unaffordable for small-to-medium-sized businesses.

Of the 36 surveyed lighting trade allies who were in favor of the change to a per-watt-saved basis, 32 gave a reason why they were in favor. Fourteen said that either the calculations were easier for them (10 mentions) or that it was now easier to explain to customers (six mentions). Other comments (16 mentions) focused on effects the change had on customers – specifically that it encouraged purchasing of more efficient equipment (six mentions), increased incentive amounts, providing customers with more options (three mentions each), encouraging the purchase of quality equipment, and being fairer and more reasonable (two mentions each).

Nearly all objections to the change to per-watt-saved basis were that changes have made the application process more complicated or confusing (nine mentions). One respondent noted that the change discouraged de-lamping.

5.5.5 Suggestions for Improvements

The survey offered several opportunities for trade allies to suggest improvements to the program in general or to the program's interactions with trade allies in general. A total of 55 respondents offered suggestions, which spanned a range of topics (Table 5-21; details follow).

Table 5-21 Trade Ally Suggestions for Program Improvements
(n = 45; Multiple Responses Allowed)

Topic/Suggestion	*Count*
Incentives	26
Incent exterior lighting	17
Miscellaneous	8
Improving trade ally events	14
More measure-related information	5
More information on the application procedure	3
Training on sales techniques	2
Improving remote access or providing more events with remote access	2
Miscellaneous	5
Communication with trade allies	8
Marketing and outreach	5
Online application	3
Minimize changes to the program	3
Other	6

The most common topic area was incentives, which was dominated by calls for reintroducing or expanding incentives for exterior lighting. Most of the comments seemed to suggest a belief that there were no incentives at all for exterior lighting. Representative comments were: "add exterior lighting," "would like to see incentives for outdoor lighting," and "bring back the exterior incentives." Four of the comments specifically referenced dusk-to-dawn applications.

Eight respondents offered a variety of other suggestions regarding incentives: two suggested moving as many incentives as possible to the Standard list and one each suggested: increasing the incentive for the retro-commissioning reports, making sure to

incent emerging technology, expanding incentives for building management systems, incenting de-lamping, increasing incentives for smart controlled lighting fixtures relative to “plug n play” LEDs, and generally increasing incentives for low-income multifamily, small business, and heavy industrial.

The second most common topic was improvements for trade ally events. Five respondents suggested adding or increasing measure-specific information: of those, two suggested adding events focused on emerging technologies or “the future of energy efficiency” and one each suggested a lighting-focused event, providing more information on risks associated with poor lighting solutions, and providing information on T8 to LED replacements (no details were provided with this latter suggestion).

Respondents offered a variety of other suggestions for improving events: three suggested providing more information on the application procedure; two suggested offering training on sales techniques; and one each suggested having more knowledgeable presenters, more information on the rationale for the incentive structure, more explanation of the vetting process for trade ally network membership, more time to answer trade ally questions, and providing follow up information to those who did not attend the event or posting it on the trade ally website.

The third most common topic, representing eight trade ally respondents, was increasing or improving communication with trade allies through more newsletters, updates on informational videos or seminars, in-person meetings between program staff and trade allies, more promotion of or assistance with co-branding, increasing the number of seminars, and general calls for more communication.

Five trade allies suggested a need for more general program marketing and outreach to increase awareness of the program.

Three trade allies suggested “moving the application online,” having the online application store copies of cutsheets, and having a “template” for required information that can be reused in new applications.

Three trade allies indicated they would like to see less frequent changes in the program. Of those, two specifically mentioned the need to revise quotes to customers because of changes to program rules. One also suggested that frequent changes can lead to “loose interpretation by less knowledgeable business partners,” contributing to “over-promised incentives.”

5.6 Cross-Cutting Nonparticipant Feedback

The 334 surveyed program nonparticipants provided both program-specific and cross-cutting information. Program-specific information is presented in the program-specific

sections of this chapter. This section discusses two topics that cut across programs: use and experiences with the Ameren Missouri website and use of lighting controls.

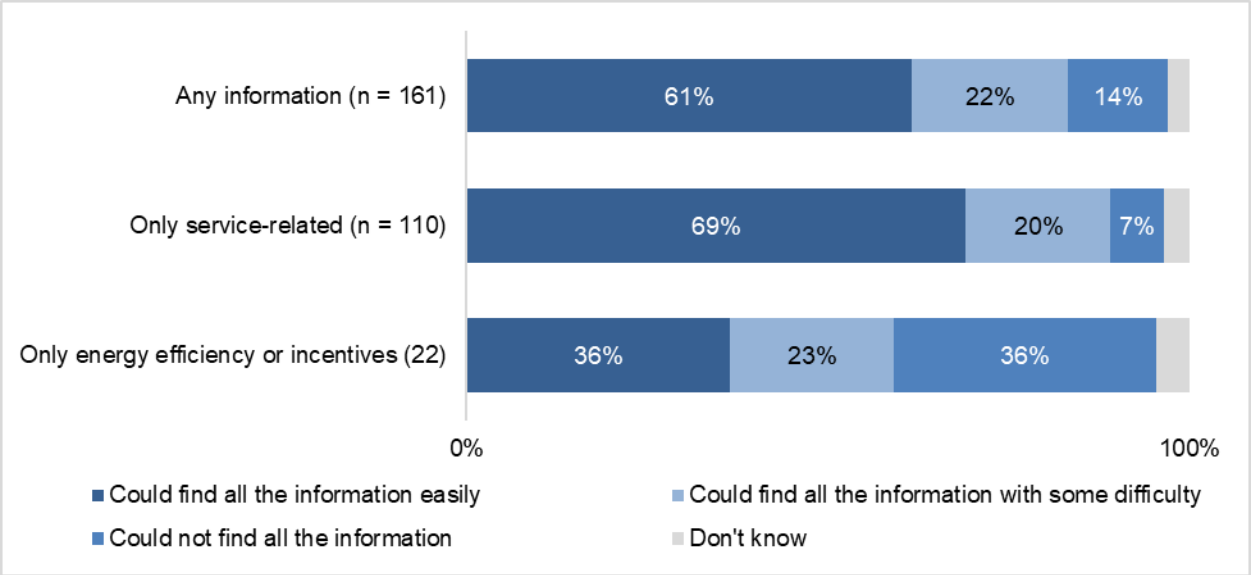
5.6.1 Use and Experience with the Ameren Missouri Website

Nonparticipants most frequently visit the Ameren Missouri website to find billing-related information, which was easier to find than information on energy efficiency incentives or on saving energy.

About half of the surveyed nonparticipants (48%) reported having visited the website in the past 12 months. Of those, a large majority (79%) said they were looking for information about their services (e.g., starting or stopping service, paying bills), about one-quarter (24%) were looking for information about energy efficiency incentives or saving energy, and a few (7%) were looking for other information (e.g., outages). Most (89%) reported having sought information on a single topic, while the rest reported two or more topics.

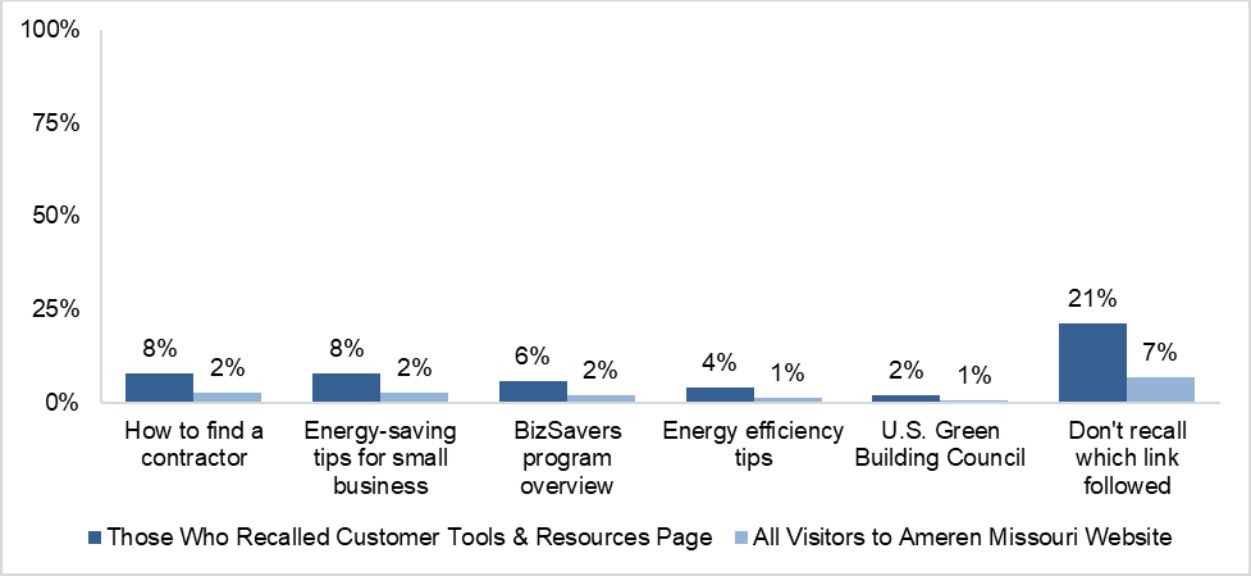
When asked about their experience in searching for information on the website, almost two-thirds reported they could find all the information they were seeking easily and about one in seven said they were unable to find all the information they wanted (Figure 5-17). However, the ease of finding information was related to the type of information sought. Of those who reported looking *only* for Ameren Missouri's energy efficiency incentives or information on how to save energy, 59% reported having had difficulties or not being able to find the information, compared to 27% of those looking only for information on rates or billing.

Figure 5-17 Nonparticipants' Experiences with Ameren Missouri Website by Information Sought (n = 161)



The Ameren Missouri website included a new page called *Customer Tools & Resources*, which shows links to energy efficiency related program information useful for non-residential customers. Of the 161 nonparticipants who had visited Ameren Missouri's website in the past 12 months, two-thirds (68%) reported they and not seen this page. Of the remaining one-third, 28 (17%) reported remembering seeing this page and another 24 (15%) said they did not recall whether or not they had seen it. Of those 52 who did or might have seen that page, nearly two-fifths (38%, or 12% of all visitors to the website) indicated they followed one or more of the page's links to other content. The most visited contents were *Energy-saving tips for small business*, *How to find a contractor*, and *BizSavers program overview*, but none of which accounted for more than 8% of those who recalled visiting the page or 4% of all visitors to the website (Figure 5-18).

Figure 5-18 Links Followed in Customer Tools & Resources Page

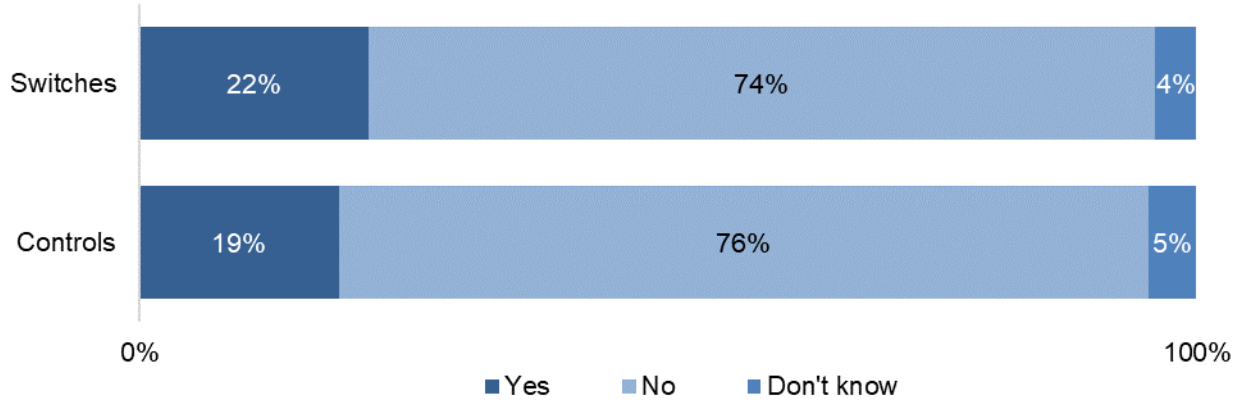


5.6.2 Use of Lighting Controls

In response to a concern raised (see Section 5.3.4) that the benefit of occupancy sensors or daylight controls had diminished because of the efficiency of LED lighting, the evaluation team investigated the use and potential for expansion of such sensors through the nonparticipant survey.

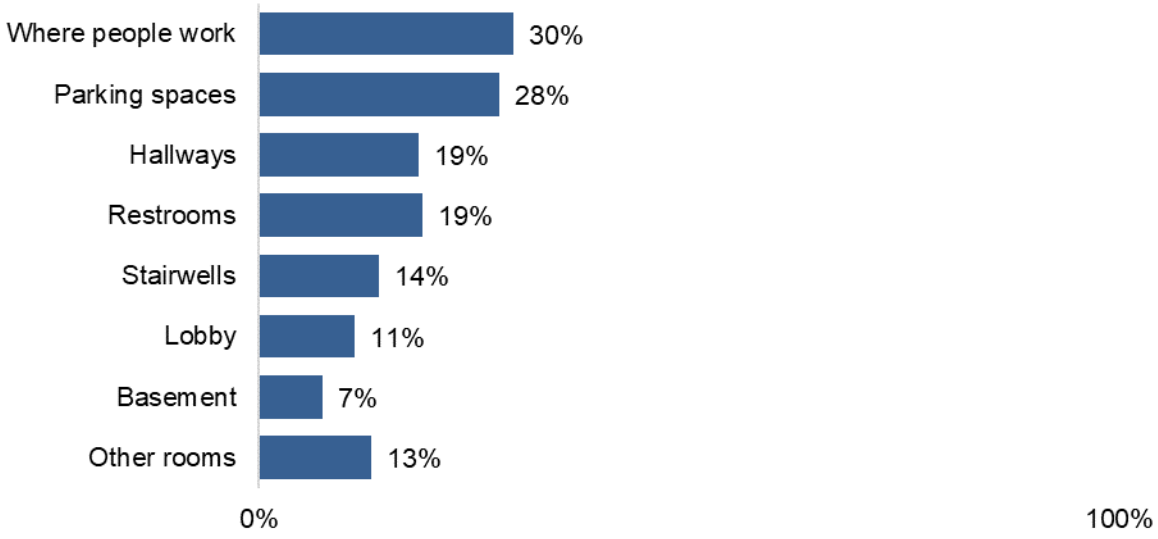
Among the 125 nonparticipants who reported replacing or upgrading lighting during the past two years, 72% reported installing LEDs, 29% reported installing fluorescent tubes and 2% reported installing other types of lighting. About one-fifth of nonparticipants have switches that allow them to adjust the lighting level (22%) or controls that turn the lights on or off or adjust the lighting levels automatically (19%).

Figure 5-19 Presence of Switches and Controls to Adjust Lighting Level Among Nonparticipants (n = 334)



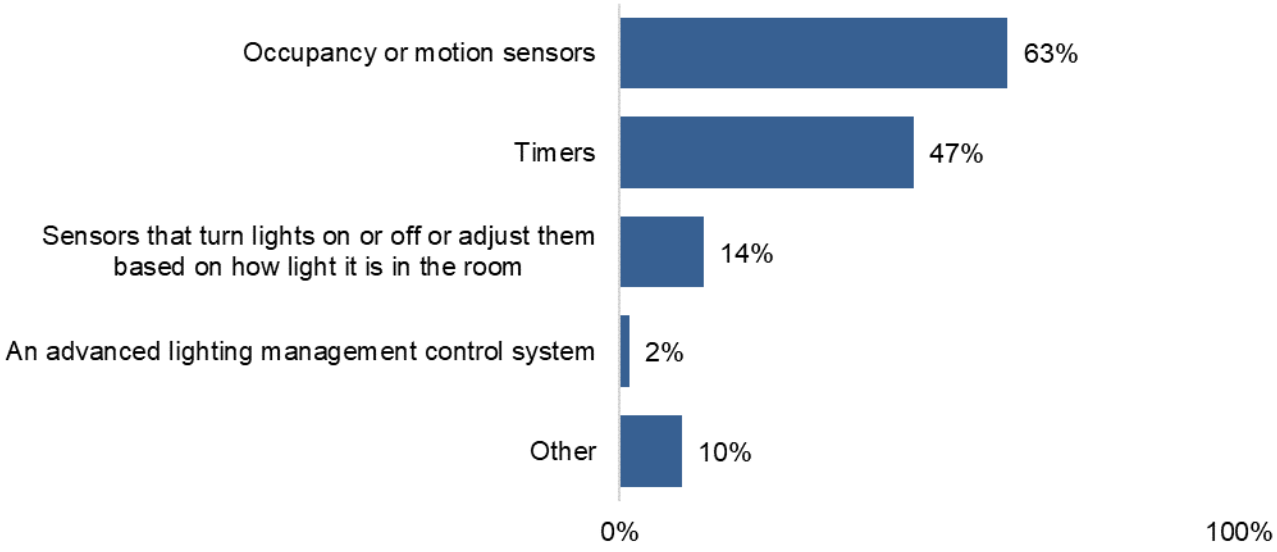
The most common locations at which such lighting switches and controls are installed in these nonparticipants' buildings were where people work – such as offices or retail spaces – (30%) and parking spaces (28%), followed by hallways (19%), restrooms (19%), stairwells (14%), lobby (11%), and basement (7%) (Figure-5-20). Other rooms included warehouse, conference room, garage, break room, and other main rooms such as living room or dining room, etc.

Figure-5-20 Locations of Lighting Switches and Controls (n = 108)



Occupancy or motion sensors (63%) and timers (47%) are the most common types of controls installed (Figure-5-21). Dusk-to-dawn type sensors that automatically adjust lights based on the light in the area are also reported installed at 14% of these nonparticipants' buildings.

Figure-5-21 Types of Controls (n = 59)



Of the surveyed nonparticipants who reported already having such lighting switches or controls, about one-third (30%) have considered introducing more controls in their buildings. By contrast, 12% of the nonparticipants who reporting having no lighting switches or controls yet have considered having them installed. The most common challenges reported to install lighting sensors and controls are upfront cost (59%) and unfamiliarity with the technology (33%).

5.7 Feedback on the Custom and Standard Programs

Feedback on the Custom and Standard Programs came from the nonparticipant survey, from the 468 Custom and Standard Program participants who completed the online participant survey, and from the trade ally survey. Together, these sources provided information on program awareness, customer decision-making, experiences with the Custom and Standard Programs, and nonparticipant interest in participation.

5.7.1 Program Awareness

The evaluation team obtained information about the level and sources of program awareness from program nonparticipants and participants as well as from surveyed trade allies. These nonparticipant and trade ally findings converge to suggest that fewer than half of Ameren Missouri commercial customers who have not yet participated in the BizSavers program are aware of it.

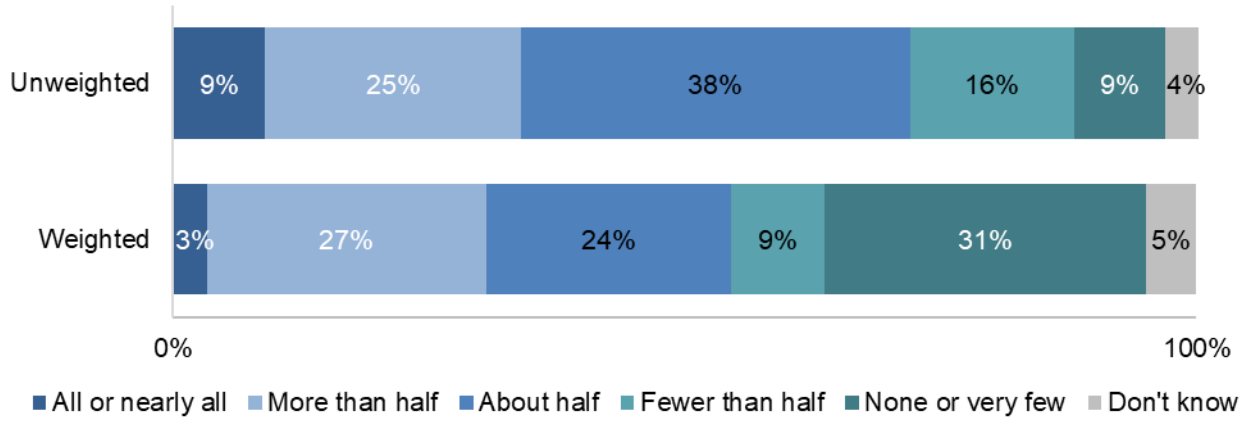
Both participants and nonparticipants learn about the BizSavers programs in a variety of ways, but participants learning about the program via contractors and equipment vendors is strongly associated with program participation. Among nonparticipants, level

of awareness and source of awareness also are associated with organizational characteristics, such as building size and energy usage.

Awareness of the BizSavers program is moderate among nonparticipants. Fewer than half (41%) reported awareness of Ameren Missouri's cash incentives for energy efficient equipment purchases. Awareness was somewhat higher among respondents whose companies owned their buildings, had greater total square footage, and had more work locations, but none of those differences was statistically significant. Sample sizes for most building end-use types were too small to offer reliable estimates of awareness for specific building types.

Feedback on customer awareness from surveyed trade allies was consistent with the nonparticipant self-reports. When asked what proportion of their customers already knew about Ameren Missouri's BizSavers incentives before they mentioned the program, trade ally responses were skewed slightly in the direction of more than half. However, when responses are weighted to account for the fact that respondents who reported lower prior customer awareness did more projects than those who reported greater customer awareness, the results suggest that the overall awareness is somewhat less than half (Figure 5-22). Vendors (distributors and retailers) reported higher customer awareness than did contractors (73% vs. 52% reporting at least half of customers are aware, respectively).

Figure 5-22 Proportion of Customers Aware of Ameren Missouri BizSavers Incentives Prior to Trade Ally Mentioning Them: Trade Ally Survey (n = 102)



Trade-ally-driven awareness is associated with program participation. Participants and nonparticipants both reported various sources of program awareness, but participants most frequently mentioned becoming aware of the program via a contractor

or vendor, while nonparticipants most commonly reported Ameren Missouri outreach or marketing as the source of awareness (Table 5-22).[9]

Table 5-22 Sources of Program Awareness (multiple responses allowed)

Source	*Non-participants (n = 140)*	*Participants (n = 468)*
Your contractor or vendor	11%	58%
Ameren Missouri or BizSavers*	22%	20%
Another contractor or vendor	-	18%
Word of mouth	10%	16%
Ameren Missouri Website	7%	7%
Mass or direct marketing	6%	8%
Web search	6%	2%
Event or tradeshow	0%	2%
Other	9%	3%
Don't know	33%	2%

* Representatives, past experience with the BizSavers Program, program webinars.

Consistent with the above, most nonparticipants who reported recent purchase or upgrade of equipment or building features said that the vendor or contractor they dealt with did not mention BizSavers incentives. Lighting vendors were more often reported as mentioning the incentives (11%) than were non-lighting vendors (5%), but still a small minority of lighting vendors reportedly mentioned the incentives.

Awareness of Ameren Missouri's Custom incentive offerings is moderate among Standard-only Program participants. Of the 336 respondents who had not completed a custom project, about one-quarter (24%) reported awareness of the custom incentives. Awareness of Custom incentives was highest among those with technical responsibilities (e.g., facilities or maintenance; 31%) and lowest among those who were part of upper management (e.g., business owners or CEOs; 11%). Those with large buildings (>100,000 square feet) were more likely to report awareness of Custom incentives (55%) than those with smaller buildings (13%).

[9] Many respondents to the nonparticipant survey reported their source only as "Ameren," without further specifying the medium.

5.7.2 Awareness and Feedback on Changes to Cooling Incentives

The evaluation team obtained information about the awareness and feedback on changes to the Custom program cooling incentive from surveyed trade allies and program participants.

Awareness of the increase in Custom cooling incentives is low. Of 203 surveyed participants who had used or were aware of Custom incentives, about one-fifth (20%) reported being aware that incentives had increased from $0.07/kWh to $0.15/kWh for cooling equipment. A minority of participants – 4% of all 203 respondents – were aware *both* that the cooling incentives had increased *and* that they were higher than for other equipment types.

Awareness of the cooling incentive increase varied depending on the type of incentive the participant had received. It was highest (26%) among those who had done Custom non-lighting projects (*n* =16). Interestingly, awareness of the cooling incentive increase was higher among those who had *not done* Custom projects but knew about Custom incentives (22%; *n* = 52) than among those who had done Custom lighting projects (8%; *n* = 76). It is not surprising that those who reported awareness of the Custom incentives even though they did not receive them, knew about the cooling incentive increase. It is possible that some or all of them were aware of Custom incentives because they were contemplating installing measures other than those for which they received Standard incentives and so had investigated the Custom incentives.

What requires explanation is why such a low percentage of those who did Custom lighting projects knew about the cooling incentive change. Two possibilities are that: 1) they were less likely than other participants to be considering installing non-lighting equipment that would require Custom incentives; or 2) they were more likely to rely on their contractors for estimating the incentive they would receive for Custom non-lighting projects. There is no obvious reason why either of these scenarios might be the case, and without any evidence for either, they must remain conjectures.

Fewer than half (42%) of surveyed trade allies reported being aware of changes to Custom program incentives, which included higher incentives for cooling, HVAC, building shell, lighting, and water heating measures and lower incentive levels for refrigeration measures. That percentage was much higher, however, for the 16 surveyed trade allies who reported their company deals in cooling equipment (63%) than for the 86 trade allies who did not report dealing in cooling equipment (38%).

The BizSavers cooling business development representative provides value to cooling trade allies, but awareness of the availability of this assistance is not yet high. Of the 16 surveyed trade allies involved with cooling equipment, six reported having received assistance from the BizSavers business development representative who specializes in cooling measures. All six of those trade allies reported finding the

assistance at least moderately valuable, three of whom indicated it was extremely valuable.[10] One measure of the value of the assistance is that five of the six surveyed trade allies who received the assistance reported awareness of the increase in the cooling incentives.

Among the 10 surveyed cooling trade allies who did not receive assistance, all but one reported they were *not* aware that the representative was available to help with savings calculations and modeling for custom cooling incentives.

Trade allies report that changes to the cooling incentive levels do not influence their sales of non-residential cooling equipment. Of the 16 surveyed trade allies whose companies dealt with non-residential cooling equipment, four reported that sales goals for cooling equipment had increased since PY2017. Three of those four said that the BizSavers incentives had little to no influence on their goals and the other reported being unsure of the program influence on those goals. Increased sales goals instead reportedly resulted from general year-over-year increases in sales (two mentions) and increasing equipment costs (one mention).

Of the remaining 12 surveyed cooling trade allies, three said their goals in PY2018 were about the same as in PY2017, two reported being unsure of any changes, and seven reported that their company did not have specific sales goals set for cooling equipment.

This report from trade allies appears to conflict with findings reported above (Section 5.4.7), that the change in the cooling incentive levels appeared to have stimulated more cooling projects and savings.

Trade allies reported varied challenges to promoting BizSavers cooling incentives. Seven of the 16 surveyed trade allies involved with cooling equipment mentioned specific challenges they have encountered with getting customers to apply for BizSavers cooling incentives. Challenges mentioned included having to get pre-approval, the trade ally's unfamiliarity with the cooling incentive process, incentive levels' not being adequate to offset higher equipment costs (two mentions each) and gathering required information in time to apply for incentives (one mention).

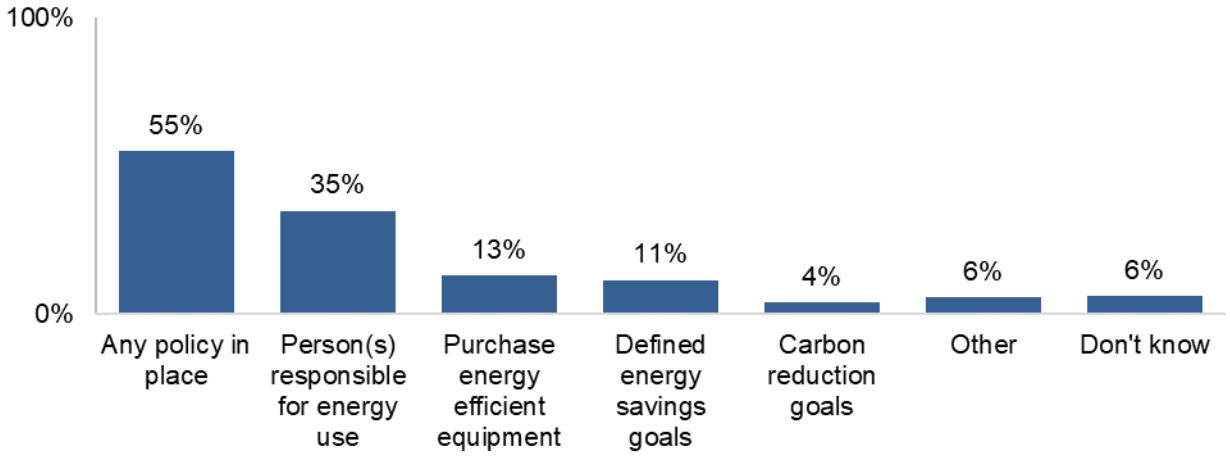
5.7.3 Customer Decision-Making

Program participants are moderately proactive in saving energy. About half of respondents reported that their company had one or more energy management policies, the most common of which was having at least one employee responsible for

[10] "Extremely valuable" is defined here as a rating of six or seven on a scale from 1 ("not at all valuable") to 7 ("extremely valuable"), and "moderately valuable" is defined as a rating of four or five.

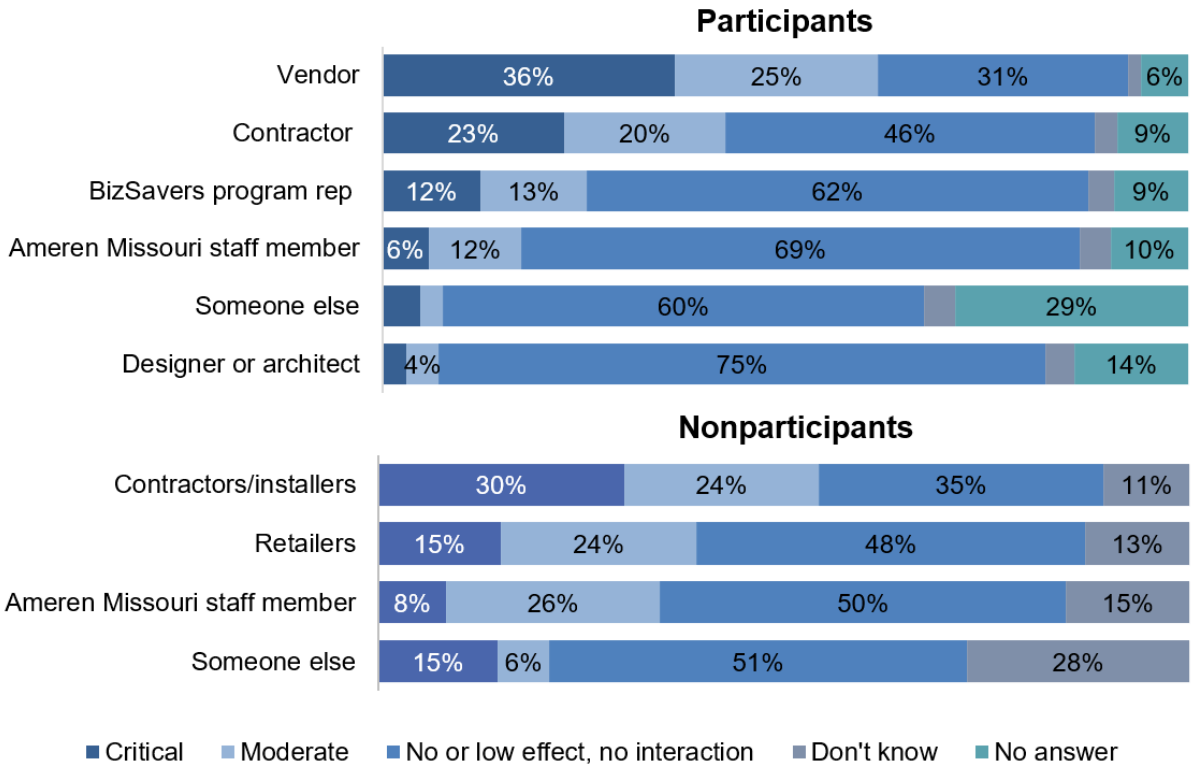
monitoring or managing energy use. Considerably fewer respondents reported a policy to consider energy efficient purchases (13%), defined energy saving goals (11%), or carbon reduction goals (4%; Figure 5-23).

Figure 5-23 Participants' Energy-Related Policies (n = 468; multiple responses allowed)



Vendors and contractors have the most influence on customers' equipment decisions. Participants were more likely to identify vendors than contractors, designers, or architects as influencers (Figure 5-24). By contrast, for nonparticipants, contractors were more commonly identified as influencers than were vendors (distributors and retailers).

Figure 5-24 Influencers on Participants' (n = 468) and Nonparticipants' (n = 192) Decisions to Install Efficient Equipment

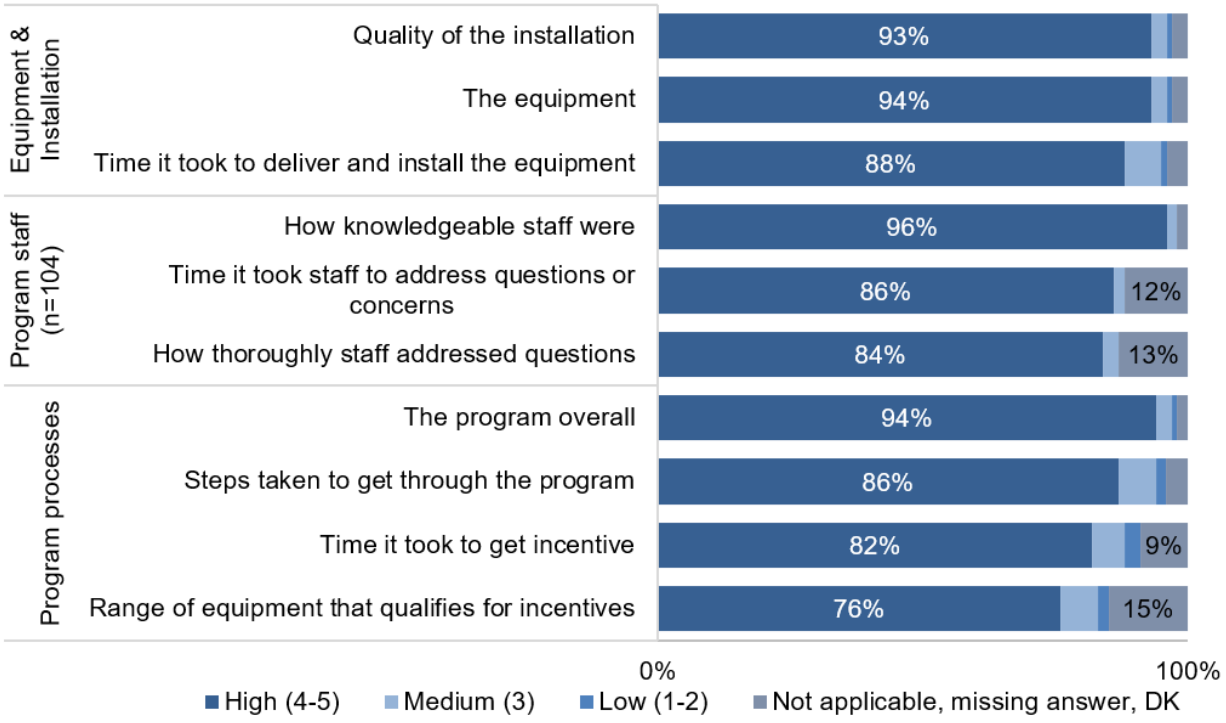


5.7.4 Participant Program Experience

Program participants reported generally positive experiences with the program processes. They rated the application instructions as clear and, with some exceptions, reported knowing where to get help when needed. They reported high satisfaction with all program elements and reported that the incentive met or exceeded expectations. Despite high satisfaction with most program elements, almost half of Custom Program participants need to resubmit applications with additional documentation or revised calculations, which may cause some dissatisfaction with the application process.

The Custom and Standard Programs have high customer satisfaction. Respondents gave high satisfaction ratings to all aspects of participation (Figure 5-25). Satisfaction was lowest regarding the range of incented equipment and time it took to get the incentive; however, when the respondents who said they were "not sure" about their satisfaction with these items (and, thus, may not have been directly involved in those aspects), or respondents who did not provide an answer are excluded, the satisfaction levels were nearly on a par with those for other program elements.

Figure 5-25 Satisfaction with Program Elements (n = 468)

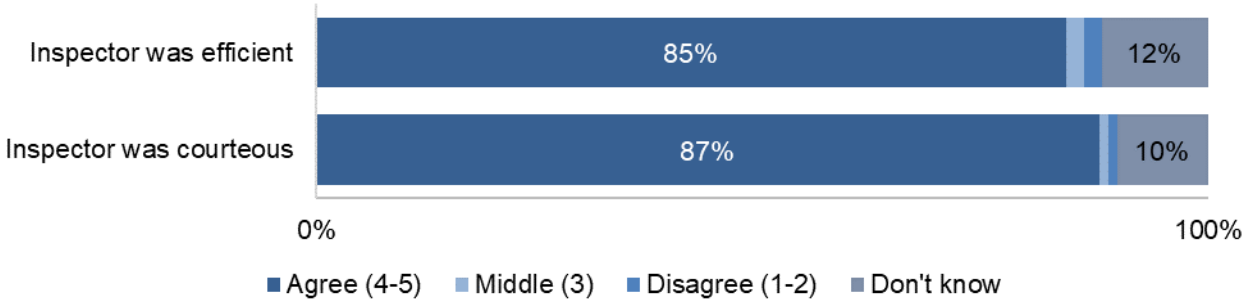


Note: The sample for the program staff items is the subset of respondents who reported interacting with program staff.

Verbatim comments by the 45 respondents who indicated low or medium satisfaction with program elements revealed they were dissatisfied with the project timeline; primarily the time it took to receive the incentive or to get approval for their application. Four respondents mentioned they felt that the incentive amount was too low, while three mentioned they have not seen the energy savings associated with the new equipment. Eleven of the 45 respondents elaborated that they were in fact satisfied with their experience despite having given a lower rating to a specific aspect.

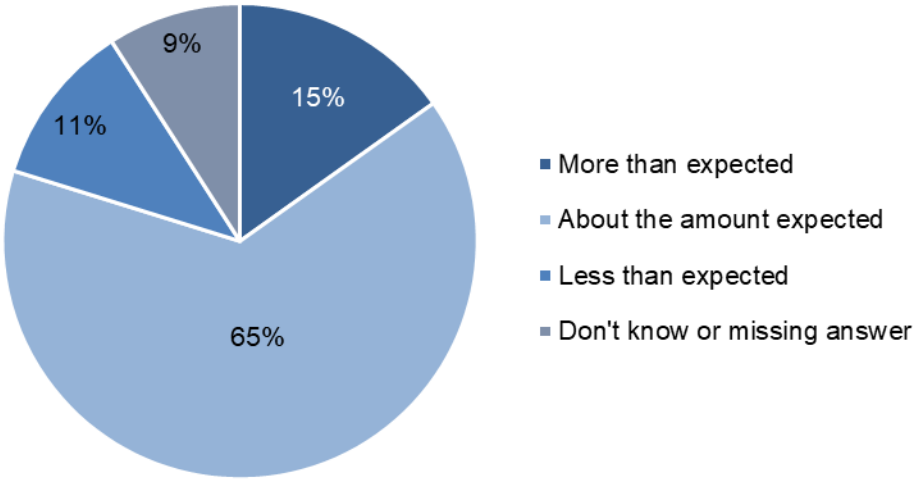
Of respondents who reported that a program representative had inspected the completed project (35% of the total), nearly all indicated high agreement (a 4 or 5 on a 5-point scale) that the inspector had been courteous and efficient (Figure 5-26).

Figure 5-26 Satisfaction with Project Inspection (n = 166)



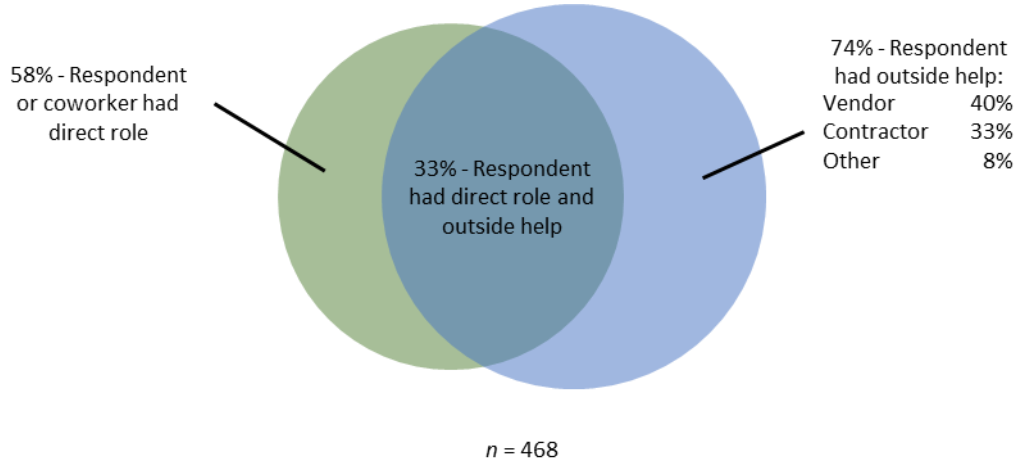
A large majority (65%) of respondents reported that the incentive was at least as much as they had expected (Figure 5-27), when asked how their incentive amount compared to what they had expected to receive.

Figure 5-27 How Incentive Compared with Expectations (n = 468)



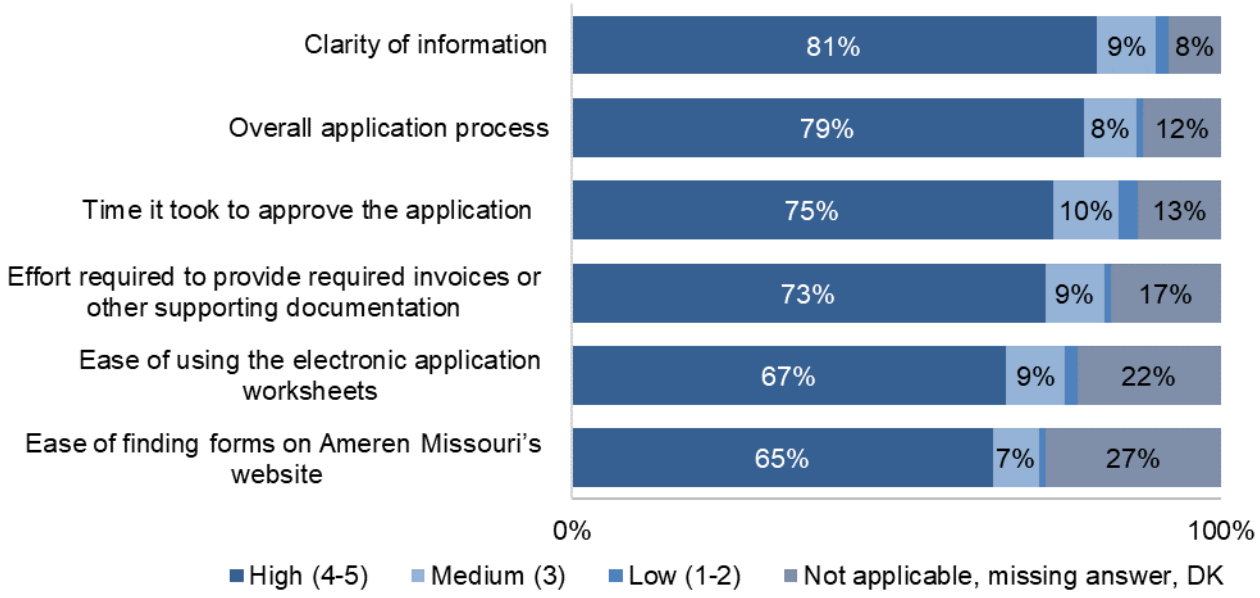
Participants perceive Ameren Missouri's application instructions as clear and the process as acceptable. More than half of respondents reported that they or a co-worker had a direct role in completing their application for incentives, and three-quarters said they had received outside help, most commonly from a vendor or contractor (Figure-5-28).

Figure-5-28 Who Had a Role in the Application?



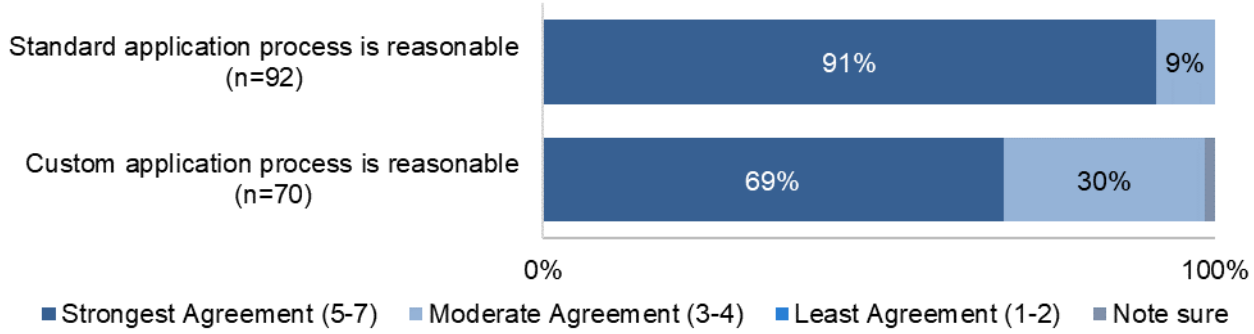
Standard and Custom survey respondents who personally had a role in completing the application (*n* = 230) gave high ratings to several aspects of their application experience, including the clarity of application instructions (Figure 5-29). Initially, it may appear that ease of using the electronic application was less acceptable than other items, but nearly one-fifth of respondents provided a "don't know" response, suggesting they had not used the electronic application. When those respondents are excluded, the acceptability rating is on a par with that of other aspects of the application.

Figure 5-29 Program Participants' Rated Clarity of Information and Acceptability of Application Process (n = 230)



Surveyed trade allies agreed that the application process for the Standard and Custom Programs is reasonable (Figure 5-30).

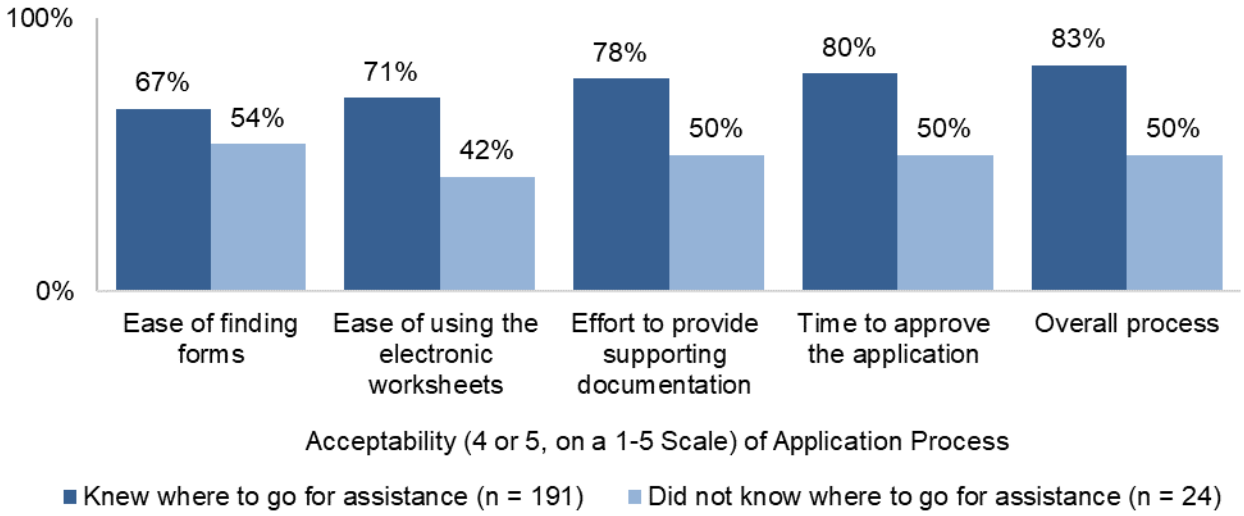
Figure 5-30 Trade Allies' Rating of Reasonableness of Application Process



Participants generally know how to get application assistance, which promotes satisfaction with the process. Of the 468 Custom and Standard program participants, 363 (80%) reported they knew who to go to for assistance with the application process.

Of the 230 respondents who reported a role in completing the application themselves, 191 (83%) knew where to go for help. Those 191 respondents reported the application process as more acceptable than did 24 respondents who had a role in the application but did not report knowing where to go for assistance (Figure 5-31). Thus, as in previous years, there is a small group of participants (about 5%) who found the process challenging and did not know where to get help with it.

Figure 5-31 Clarity of Application Instructions and Acceptability of Application Process

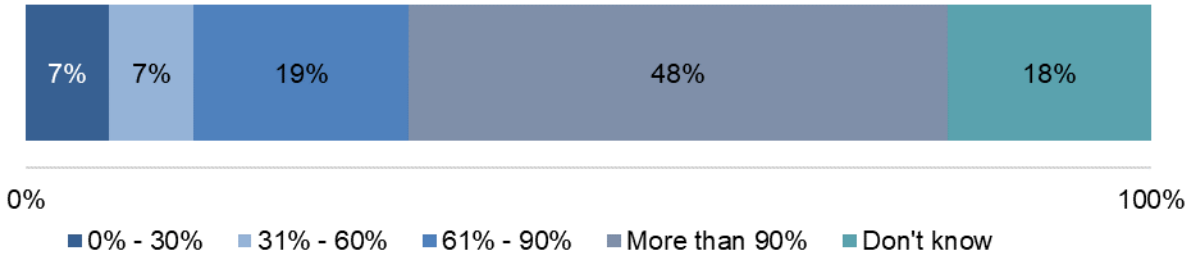


Despite overall satisfaction with the application process, many participants who received Custom incentives were required to resubmit additional documentation. Over two-fifths (45%) of the 115 participants who received Custom incentives reported they or someone acting on their behalf was required to resubmit or provide additional documentation before their application was approved.

5.7.5 Installation and Verification of Incented Lighting Equipment

The previous evaluation of the BizSavers Program found that about one-quarter of participants who use the Fast Track application misunderstand the procedure, about half of whom believe that it allows them to install purchased equipment after applying for the incentive. This could result in project disqualification and a reduced realization rate. To investigate the potential for such an outcome, the evaluation team asked lighting trade allies to report on the percentage of lighting products sold in PY2018 that they were able to verify were installed before the incentive application was submitted. About two-thirds of surveyed lighting trade allies reported that more than 60% of the lighting products they sold between March 1, 2018 through February 28, 2019 were installed and verified before submitting the application, with about half reporting that more than 90% were installed and verified (Figure 5-32).

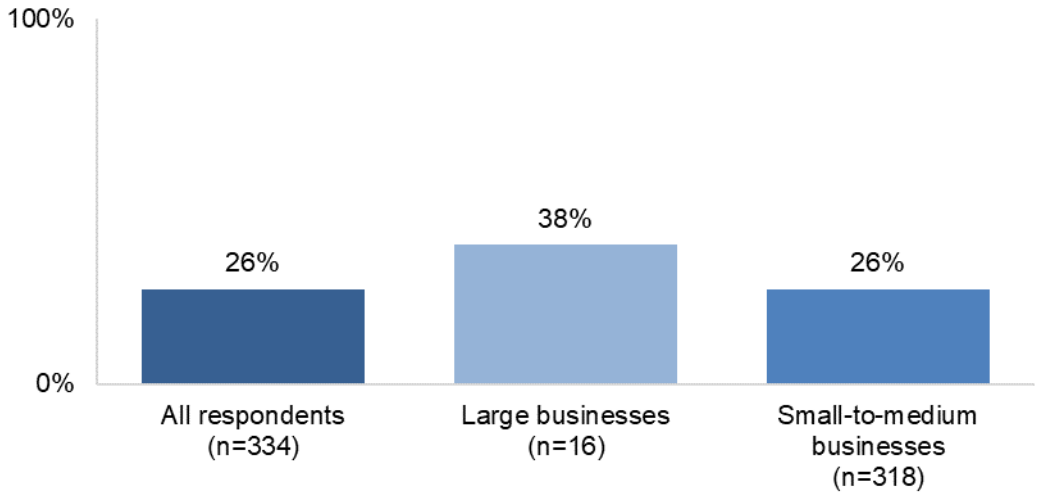
Figure 5-32 Reported Proportion of Lighting Products Sold During Program Year Installed and Verified by Trade Allies Before Submitting Application (n = 94)



5.7.6 Nonparticipant Program Interest

Nonparticipants are moderately interested in using Ameren Missouri incentives to increase the energy efficiency level of equipment replacements in the next two years. Overall, just over one-quarter of nonparticipants reported high likelihood of using Ameren Missouri incentives to increase the energy efficiency level of their equipment upgrades in the next two years. Interest in Ameren Missouri incentives was higher for large than small-to-medium customers (Figure-5-33).

Figure-5-33 Likelihood of Using Ameren Missouri Incentives



Note: Large business = rate class 3M, 4M, or 11M. Small-medium business = rate class 2M. Includes nonparticipant respondents who provided a “6” or “7” rating on a seven-point scale.

5.7.7 Benchmarking Ordinance

This year’s nonparticipant survey included questions about The St. Louis Energy Benchmarking Ordinance, which requires all buildings above a certain size to report energy usage on an annual basis. However, only four nonparticipants reported owning or managing targeted building sizes (50,000 square feet or greater) in St. Louis, and all of them reported having not enough experience with the ordinance to respond to these questions.

5.8 Feedback on the Small Business Indirect (SBDI) Program

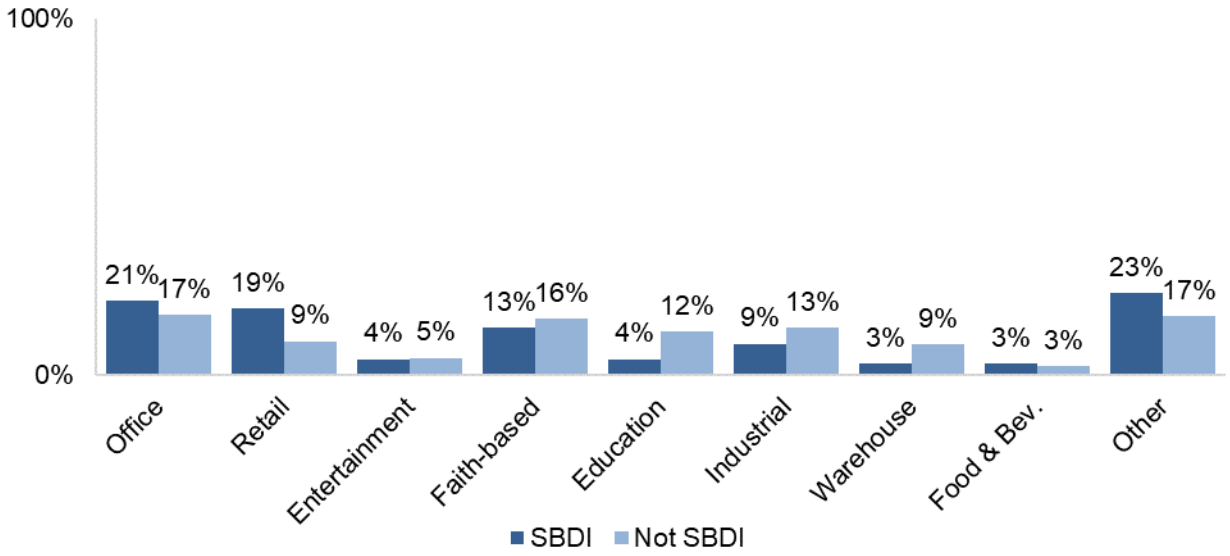
Feedback on the Small Business Direct Install (SBDI) program came from three main sources. The 100 SBDI participants who took the online participant survey and the 271 surveyed nonparticipants from the 2M rate class who reported their business was responsible for buying lighting equipment provided information on program awareness and potential for expanded savings. The participants also gave feedback on their participation experiences and satisfaction with the program. The 13 surveyed lighting trade allies who were SBDI Service Providers and had completed SBDI projects provided feedback on the application process.

5.8.1 Description of Surveyed SBDI Participants

More than half (59%) of respondents reported an upper management position, with most of the rest reporting facility, maintenance, other management responsibilities.

The 100 SBDI participants represented a variety of business types, though they were more likely to be office or retail organizations than were non-SBDI participants (Figure 5-34).

Figure 5-34 Distribution of SBDI Participants Across Customer Types, Compared to Distribution of Non-SBDI Participants



Just over half reported a single work location (53%) or reported they occupied buildings smaller than 10,000 square feet (57%). By contrast, 4% reported five or more locations and 4% reported buildings larger than 50,000 square feet. Two-thirds (69%) own their building, with most of those also occupying their building, and just under one-third (29%) lease their workspace.

A description of all participant survey respondents, along with a description of the nonparticipant and trade ally samples, can be found in Section 5.1.

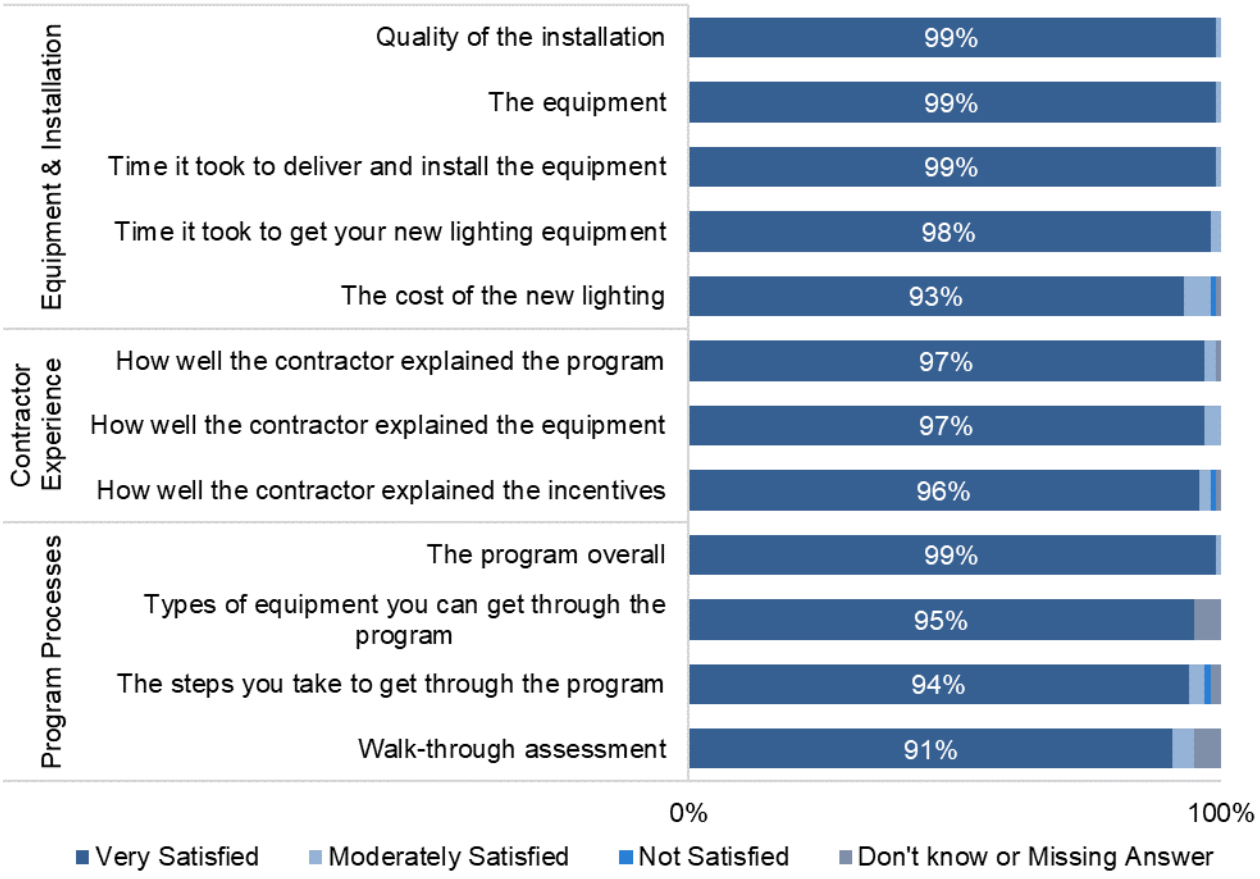
5.8.2 Customer Program Awareness and Interest

Consistent with the program delivery approach, SBDI Participants become aware of Ameren Missouri's incentives through contractors, vendors, or energy consultants. Almost two-thirds (62%) reported hearing about the program from a contractor or equipment vendor. About one-quarter (27%) reported becoming aware through friends or colleagues, while 13% reported an Ameren Missouri or BizSavers source, such as a representative, program-sponsored webinar, or other past experience with the program. Very few (3%) reported hearing about the SBDI program through a direct marketing channel, such as an informational brochure or other form of advertising.

5.8.3 Program Processes

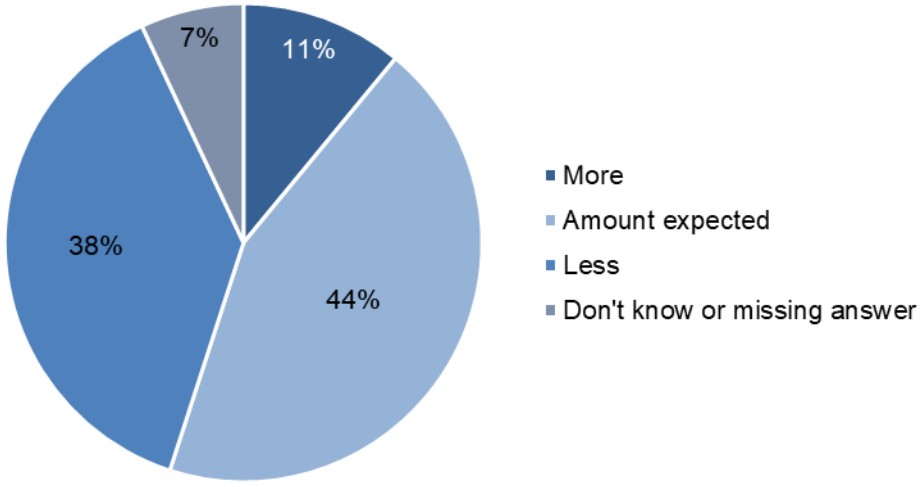
Participants in the SBDI program are highly satisfied with all aspects of the program. In particular, nearly all participants reported being completely satisfied with the installation experience, including the equipment and the time it took to deliver, receive, and install the equipment (Figure 5-35).

Figure 5-35 SBDI Participant Satisfaction with Program Participation (n = 100)



Over three-quarters of participants reported the project cost of their lighting upgrades was roughly the same as or less than their expectations (Figure 5-36).

Figure 5-36 How Project Cost Compared with Expectations (n = 100)



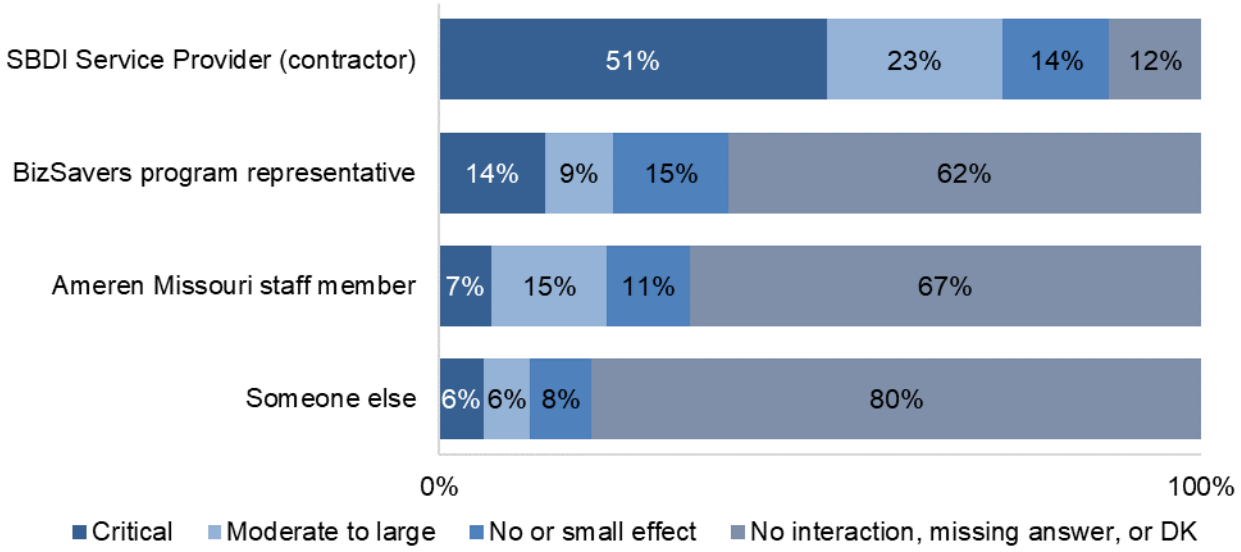
SBDI participants were highly satisfied with the project inspection they received after the lighting was installed. Of the 37 respondents who reported their project received inspection from an Ameren Missouri program representative (37% of the sample), all rated the inspector as courteous and efficient.

SBDI Service Providers believe the SBDI application process is reasonable. Surveyed trade allies reported moderate to high agreement that the application process for the SBDI Program is reasonable (Figure 5-37).

Figure 5-37 Trade Allies' Rating of Reasonableness of SBDI Application Process (n = 13)

SBDI service providers influence participants' decisions about lighting equipment. About three-quarters (74%) of respondents reported their service provider had at least a moderate effect on their decision-making, with most reporting a critical influence (Figure 5-38). The SBDI participants reported interacting with Ameren Missouri staff members and BizSavers program representatives infrequently.

Figure 5-38 Influence of Contractor and Utility Staff on SBDI Participants' Decision to Install Efficient Equipment (n = 100)



There is some confusion among SBDI service providers on guidelines for working with third-party installation contractors. The team asked the 13 surveyed SBDI Service Providers their understanding of rules for hiring a third-party contactor to install incented equipment. Four of the 13 reported the correct understanding, that third-party subcontractors can install incented equipment if the customer received a single invoice from the service provider. The remaining nine service providers reported either that the SBDI program does not allow service providers to hire subcontractors (five mentions), that the program allows subcontractors and that the invoice can come from either the subcontractor or the service provider (one mention), or that they did not know the rule (three mentions).

After being informed of the correct rule, 10 of the 13 SBDI Service Providers reported that the rule does not or would not cause any challenges for their company. Of the remaining three, only one reported any challenges directly related to the rule, specifically that it can be a challenge when a subcontractor lists both incented and non-incented work on a single invoice. Presumably, this makes it difficult for the Service Provider to produce an accurate invoice for the customer, which would not be an issue if the Service Provider and the subcontractor submitted their invoices separately to the customer.

Another Service Provider mentioned having encountered situations in which a subcontractor had installed equipment incorrectly, causing the service provider to have to go back out to the customer. This issue does not appear to be about the program rule *per se*, unless the idea is that the program should not allow Service Providers to use subcontractors.

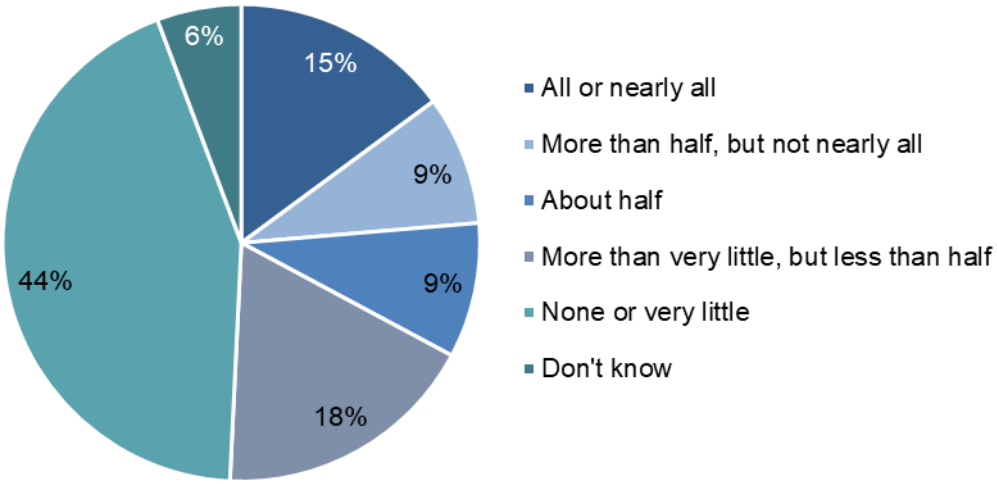
The remaining SBDI service provider was unsure whether the rule caused or would cause challenges for their company.

5.8.4 Program Potential for Expansion

Many small customers do not have LED lighting installed. The nonparticipant survey included questions to assess potential SBDI program participation among eligible customers. Of the 318 survey respondents in the 2M rate class, 271 (85%) reported responsibility for buying the lighting at their work location. These formed the overall sample of interest.

About two-thirds of the SBDI-eligible nonparticipants (62%) reported that LEDs make up less than half the lighting at their work location, with most of these reporting it constitutes “none or very little” of the lighting (Figure 5-39).

Figure 5-39 Proportion of LED Lighting at Work Location (n = 262)



Nonparticipants are interested in the SBDI Program. Few eligible nonparticipants (5%) reported SBDI program staff had contacted them to offer free walk-through energy assessments, but more than half of those who were offered a walk-through assessment (8 of 12) reported having taken advantage of it. Of the 159 eligible nonparticipants who were not offered a free walk-through, more than half (53%) reported at least some likelihood they would schedule a walk-through with an SBDI service provider if contacted (a rating of 4 or higher on a seven-point scale). The most prominent barrier reported by respondents who did not report likelihood of scheduling a free walk-through was lack of time to schedule an energy assessment.

Many participants of the SBDI program are not aware of, but are interested in, using Ameren Missouri incentives for other types of energy efficient equipment. Of 61 respondents who reported they were financially responsible for equipment repairs

or replacements at their workplace and had *not* participated in other BizSavers programs, over two-thirds (70%) were unaware they could qualify for other energy efficient equipment incentives. Of those 61 participants, 47 (77%) rated their interest as a “4” or “5” on a 5-point interest scale when asked if they would be interested in using Ameren Missouri’s incentives to upgrade to new, energy efficient equipment. Eight respondents reported they were not interested or only moderately interested and six were not sure.

5.9 Feedback on the New Construction Program

Sources for the evaluation of the New Construction Program were 334 surveyed nonparticipants, 8 surveyed participants who completed a new construction project, and 11 trade allies that completed BizSavers New Construction projects. These sources provided information on program awareness, processes, and potential for expansion.

Three-quarters of the surveyed nonparticipants and participants reported being an owner or executive or having facilities responsibilities at their workplace. The respondents represented a range of business types, with half of them representing the Office, Industrial, Retail or Food & Beverage types. Of those who reported building size, more than two-thirds (69%) reported they occupy a building less than 10,000 square feet. Of those reporting the number of work locations, 70% reported a single location and most of the rest reported no more than five.

5.9.1 Customer Awareness of the New Construction Incentives

New Construction participants learned about the Ameren Missouri’s New Construction incentives early in their project and from a variety of sources. Four respondents learned of New Construction incentives prior to any project discussion and two reported they became aware of incentives after they had started discussing their project, but before selecting major energy-using equipment. The other two respondents reported learning of Ameren Missouri New Construction incentives once they had started designing their project.

New Construction participants reported becoming aware of the program via a program representative (three mentions), a contractor or vendor (two mentions), brochure, email, online via the website or search engine, or word of mouth (one mention each). The source of awareness was unrelated to how early in the planning process they became aware.

Awareness of New Construction incentives is low among nonparticipants, regardless of whether they have done or were planning to do new construction projects. About one-quarter (28%) of the nonparticipants reported being aware of Ameren Missouri’s New Construction incentive offering. About one-quarter (26%) of

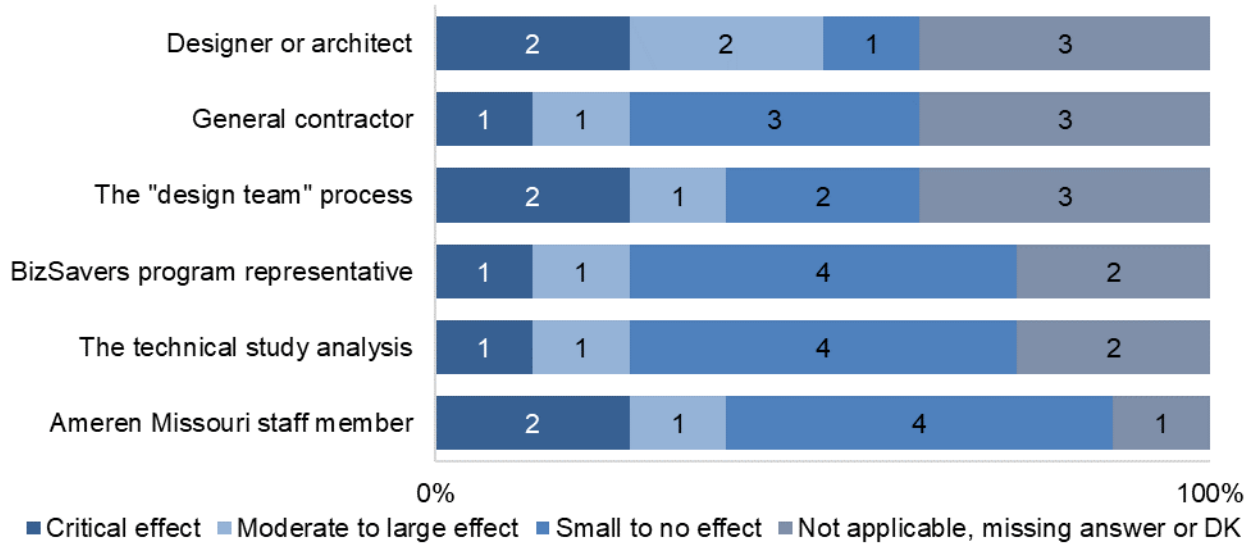
nonparticipants reported having undertaken new construction projects or major building renovation projects in the past five years, and about the same proportion (25%) reported any plans for undertaking new construction projects within the next five years (about half of nonparticipants with any plan for future new construction projects have also done new construction projects in the past five years). Awareness of BizSavers New Construction incentives did not differ based on of whether someone had done or was planning to do a new construction project.

Those nonparticipants who had completed new construction projects in the past five years indicated that their contractors or installers were the most influential source in their equipment selection for their projects (42% rated the influence of their contractors "critical").

5.9.2 Customer Decision Making

Factors influencing the decision to install energy efficient equipment in new construction projects varied. Participants rated the influence of various factors, including various elements of the New Construction program, on their decisions to install energy efficient equipment. No single factor stood out as being most important. The three factors that were most frequently identified as having a moderate to critical effect (three out of eight respondents each) were the designer or architect, the design team process, and an Ameren Missouri staff member (Figure 5-40).

Figure 5-40 Influencers on Decision to Install Energy Efficient Equipment (n = 8)

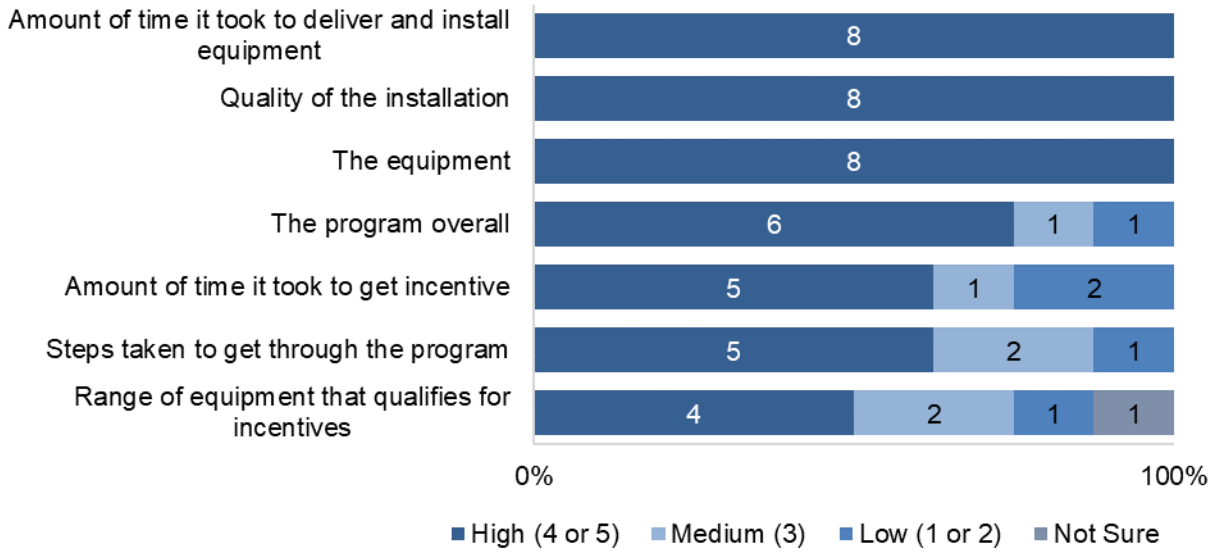


5.9.3 Satisfaction with the New Construction Program

Participants are highly satisfied with some, but not all, elements of the New Construction program. Most notably, 100% of participants reported they were highly

satisfied with the amount of time it took to deliver and install equipment, quality of the installation, and the equipment itself (Figure-5-41). One respondent was dissatisfied with all program related aspects.

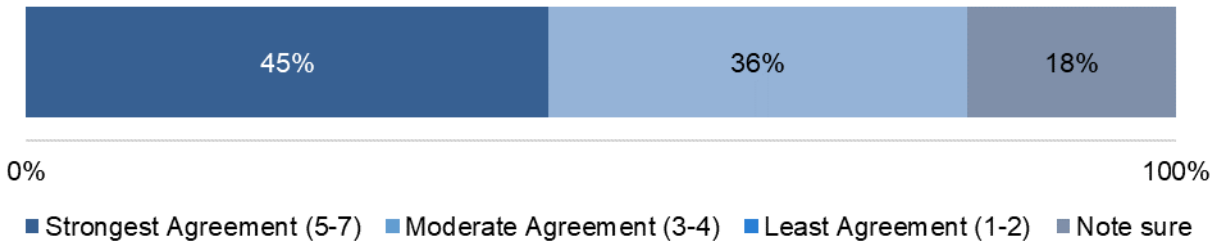
Figure-5-41 New Construction Participants' Satisfaction with Program Participation (n = 8)



Most New Construction projects are inspected by program representatives, who are rated as courteous and efficient by participants. Among the six New Construction participants who reported having an inspection, five reported the inspector was both courteous and efficient. The remaining participant reported not finding the inspector courteous or efficient.

The 11 surveyed trade allies who completed BizSavers New Construction projects reported moderate to high agreement that the application process for the New Construction Program is reasonable (Figure 5-42).

Figure 5-42 Trade Allies' Rating of Reasonableness of New Construction Application Process (n = 13)



The New Construction program's range of incentive options fits participants' needs and the incentive amount frequently matched or exceeded expectations. Six out of eight participants indicated the program's range of incentives fit their needs well.[11] One respondent reported the program's incentive did not fit their needs and further said that the incentive was inadequate, given the program requirements. The remaining respondent reported they were unsure. Five of the eight respondents reported the incentive payment was about the amount they expected to receive or more, while the remaining three respondents reported it was less.

Some New Construction participants are unsure of the guidelines for receiving incentives. Respondents reported whether they understood a key program requirement at the time they applied for New Construction incentives – specifically, that they could not receive incentives for equipment that already was part of their project design before they spoke with a program representative. Four of the eight surveyed participants reported they did not understand that requirement or were unsure.

5.10 Feedback on the Retro-Commissioning Program

Sources for the evaluation of the Retro-commissioning Program were three surveyed participants who completed retro-commissioning projects and one trade ally who completed two retro-commissioning projects.

Two of the three surveyed Retro-commissioning participants reported being past BizSavers program participants. Of the two past participants, one reported initially learning about the program through various sources, including their account representative, trade shows, newsletters, brochures, the Ameren Missouri website, and word of mouth. The other past participant reported learning about the program from a contractor or vendor. The one participant who was new to the BizSavers program reported learning about Retro-commissioning incentives through their Ameren Missouri account representative and a BizSavers program representative. All three surveyed retro-commissioning participants reported being aware of the Standard and Custom incentives and one knew about the New Construction incentives. All three retro-commissioning participants indicated the range of incentive options met their needs well.

Surveyed Retro-commissioning participants provided mixed responses when asked who was most influential in their decision to complete the retro-commissioning project. One respondent reported that their Ameren Missouri account representative and a BizSavers program representative both had a critical effect on their decision to participate and

[11] Defined as a 4 or 5 on a scale from 1 ("not at all well") to 5 ("extremely well").

another reported that their retro-commissioning service provider had a critical effect on their decision. The remaining respondent reported that outside input had no effect on their decision to participate.

The Retro-commissioning application process is working well. All three surveyed Retro-commissioning participants reported receiving outside help with the application process, with one mentioning that they were also personally involved in the process. The one respondent who indicated being personally involved, reported information on how to complete the application was clear. Additionally, the one surveyed trade ally who had completed a retro-commissioning project reported strong agreement that the application process was reasonable (providing a rating of 6 or higher on a 7-point scale from “strongly disagree” to “strongly agree”).

Surveyed Retro-commissioning participants reported high satisfaction with the program, including the length of time to get questions answered by program staff, the thoroughness of staff answers, and the steps they had to take to get through the program. One respondent reported slightly lower satisfaction with the incentive processing time.

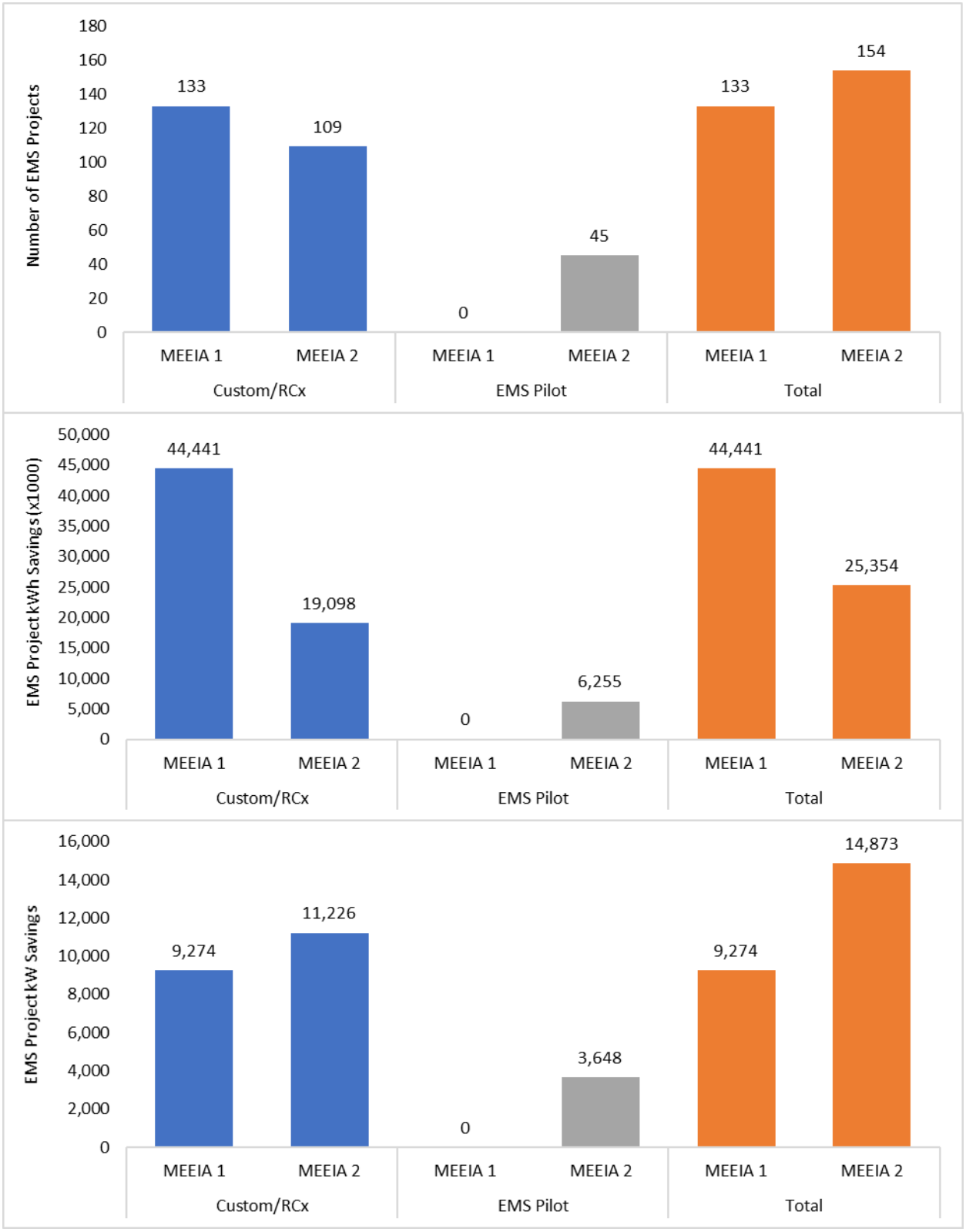
5.11 Effects of the Energy Management System (EMS) Pilot

A variety of analyses of project tracking data provide evidence that the EMS pilot program had a positive effect on EMS projects and savings. The evaluation team examined the number of projects and both kWh and kW savings from EMS projects completed in MEEIA 2 (2016-2019) compared to those completed in MEEIA 1 (2013-2015). EMS projects were defined as those that included direct digital controls, demand controlled ventilation, carbon dioxide monitors, or set-point controls; were identified as “centrally power managed” in the project tracking data; or were identified as EMS pilot projects (MEEIA 2 only).

Initial analyses do not show strong evidence for a positive impact of the EMS pilot program. Figure 5-43 shows that both the number of EMS projects and kWh savings from EMS projects done with Custom and RCx incentives decreased from MEEIA 1 to MEEIA 2. The addition of the EMS pilot resulted in somewhat more projects done in MEEIA 2 than MEEIA 1, but total MEEIA 2 kWh savings from EMS remained lower than in MEEIA 1.

Note that kW savings were higher in MEEIA 2 than MEEIA 1 for EMS, both for those projects done with Custom/RCx incentives as well as those done through the EMS pilot. The fact that kW savings increased drastically while kWh savings declined suggests the kW increase was related to a change in the peak factors applied to kWh rather than to a change in mean project size. For this reason, the remaining analyses (below) focus on number of projects and kWh saved rather than on kW saved.

Figure 5-43 Number of EMS Projects and EMS kWh / kW Savings, MEEIA 1 and 2

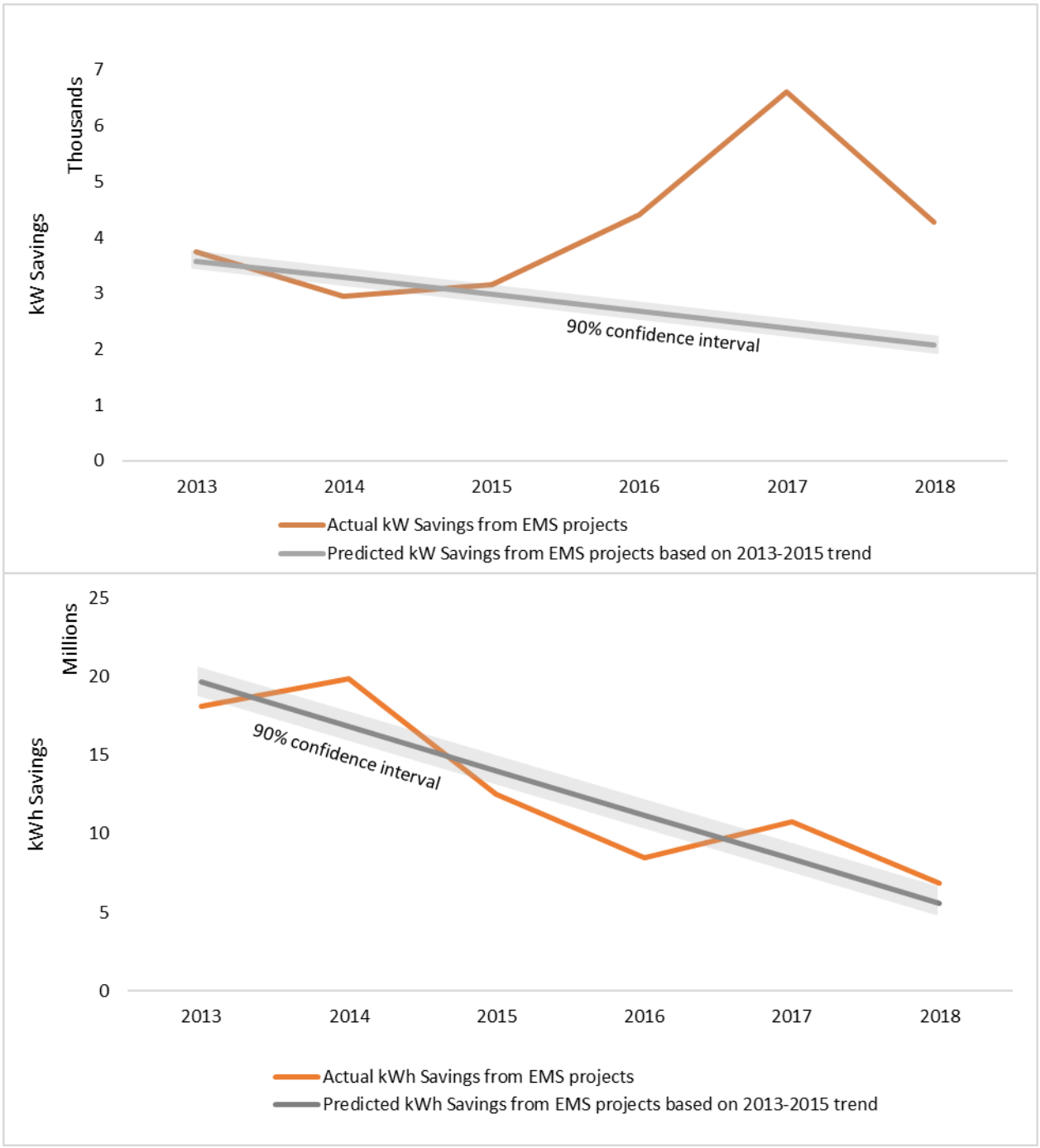


More detailed analyses suggest that the addition of the EMS pilot increased kW savings from EMS projects and reduced the decline in kWh savings in MEEIA 2, compared to what might have occurred without the pilot.

Figure 5-44 shows the actual kW and kWh savings from EMS projects each year, from 2013 through 2018 as well as the predicted year-by-year savings based on the 2013-2015 (MEEIA 1) data. The evaluation team recognizes that predicting future activity based on three years' worth of data may be risky. For that reason, the figure shows the 90% confidence intervals for both predicted trends.

For MEEIA 2, kW savings were greater than the predicted data in all three program years and kWh savings were greater than predicted in the last two program years of the cycle; the differences in all cases were outside the 90% confidence interval. Thus, although kWh savings from EMS projects were lower in MEEIA 2 than MEEIA 1, it appears that the savings from those projects were greater than they likely would have been had the MEEIA 1 trend continued. It is possible that some factor or factors other than the introduction of the EMS pilot may be responsible for the discontinuation of the MEEIA 1 trend. However, absent the identification of such factors, the most likely explanation is that the introduction of the EMS pilot program slowed the downward trend in kWh savings achieved from such projects and increased the kW savings.

Figure 5-44 EMS kW and kWh Savings by Year, Compared to 2013-2015 Trend



6. Cost Effectiveness Evaluation

This chapter summarizes the results of the cost effectiveness evaluation of the Ameren Missouri BizSavers Program. The PY2018 cost effectiveness analysis is premised on cost data received to date (end of March 2019).

For each program, the following cost effectiveness tests were performed: Total Resource Cost (TRC) test, Utility Cost test (UCT), Ratepayer Impact Measure test (RIM), Societal test and Participant test, as defined by the California Standard Practice Manual.

Cost effectiveness analysis was completed by Morgan Marketing Partners using DSMore software. Developed and licensed by Integral Analytics based in Cincinnati Ohio, the DSMore cost-effectiveness modeling tool takes hourly prices and hourly energy savings from the specific measures/technologies being used in the Ameren Missouri program, and correlates both price and savings to weather. The software references over 30 years of historic weather variability to appropriately model weather variances. In turn, this allows the model to account for low probability, high impact weather events and apply appropriate value to them. Thus, a more accurate view of the value of the efficiency measure can be captured in comparison to other alternative supply options. Volume II of this report provides additional information on the data sources test formulas, inputs, and methodology.

Table 6-1 shows the resulting cost benefit scores for each program and for the overall portfolio. Any score above 1.0 signifies cost effectiveness. The following table also summarizes the net present values of the UCT lifetime benefits. Nearly all programs pass the UCT, TRC, PTC and SCT cost effectiveness tests; the New Construction Program passed all cost effectiveness tests with the exception of the TRC test. The RIM test score was less than 1.0 for all programs.

Table 6-1 Results of Cost Effectiveness Evaluation

Variable	*Portfolio*	*Custom*	*Standard*	*New Construction*	*Retro-Commissioning*	*SBDI*	*EMS*
UCT	3.62	3.77	3.73	4.00	4.37	2.37	2.13
TRC	1.57	1.21	1.92	0.95	4.78	1.67	1.12
RIM	0.55	0.63	0.48	0.61	0.83	0.44	0.81
PCT	3.13	2.12	4.50	1.63	8.75	4.03	1.43
SCT	2.05	1.59	2.49	1.23	6.08	2.16	1.44
NPV of UCT Lifetime Benefits (2016 Dollars)	$162,477,237	$45,344,680	$89,136,901	$11,830,564	$4,615,618	$7,493,718	$4,055,756

7. Conclusions and Recommendations

The following section summarizes conclusions and recommendations that resulted from the evaluation activities. They are organized to present impact and process findings separately.

7.1 Impact Conclusions

Below is a summary of conclusions from the impact evaluation.

- With the exception of Retro-Commissioning, all BizSavers programs exceeded their energy savings goals, and in several instances by a large amount. On the high end, Standard ex post net kWh savings were equal to 508% of the goal. Retro-commissioning ex post net kWh savings were equal to 82% of the savings goal. The savings for the portfolio as a whole were equal to 229% of the savings goal.
- Ex ante kWh energy savings estimates were, on average, relatively accurate relative to ex post gross kWh savings, with program-level gross realization rates ranging from 89% for SBDI, to 99% for New Construction.
- High Impact measures within the Standard program have average ex post gross realization rates of 94% and 82% for HIM Measure 3025 and 3026 respectively. Of the input variables for the kWh savings algorithm, the hours-of-use input has the largest variation from the application hours to the measured ex post hours of use. The differences in hours occurs similarly in both the above expected hours and less than expected hours.
- Overall, goal attainment followed a similar pattern for kW savings as for kWh. One exception is that kW savings for Retro-Commissioning savings exceeded the program goal – kW savings equaled 169% of the savings goal, whereas kWh savings equaled 82% of the goal. The high kW reductions achieved are likely a function of the savings concentration in end-uses with high peak demand factors. More than one-half Retro-Commissioning savings resulted from cooling and HVAC end-uses.
- During PY2018, ADM recommended that the New Construction Program protocol for determining applicable baselines cease to reference ASHRAE 2001, and instead reference ASHRAE 2007 – this recommendation was implemented by the program.

7.2 Impact Recommendations

The evaluation team offers the following impact recommendations for consideration.

- Modify the New Construction application to require input of both a baseline equipment cost and the proposed efficient equipment cost, to calculate incremental cost.
- Modify the lighting tabs with the program application to encourage the disaggregation of unique usage areas within a measure. Add a method to permit applicants that have already created a lighting survey to transfer data to the application. The application currently uses two merged cells per field, which hinders the applicant's ability to cut/paste lighting data. Add an additional worksheet to permit transfer of applicant's data to the formatted lighting application.

7.3 Regulator Research Questions – Process Findings and Recommendations

The results of the process evaluation research are largely positive. Program participant satisfaction was high across all most program facets. This report provides an overview of program operations and suggests recommendations for consideration as the program evolves.

Below, conclusions and recommendations are organized according to the five regulatory research questions specified in 4 CSR 240-22.070(8) Evaluation of Demand-Side Program and Demand-Side Rates subsection of the Resource Acquisition Strategy Selection section. The conclusions address the first four questions; the fifth question speaks to recommendations.

Research Question 1: What are the primary market imperfections common to target market segment?

One factor that would prevent Ameren Missouri customers from taking advantage of the BizSavers programs is not being aware of the programs. This year's evaluation found that somewhat less than half (41%) of nonparticipants were aware of the BizSavers program. By contrast, most of the evaluations in the past several years had found that about half of surveyed nonparticipants were aware of the programs (47% in PY2017). It is possible that awareness has not actually decreased since PY2017: the 95% confidence intervals for the PY2018 and PY2017 awareness estimates overlap, with the former going as high as 46% and the former going as low as 43%.

Still, the best guess is that awareness has dipped at least slightly. Slightly decreased program awareness in the general customer population did not keep the program from achieving enough savings this program year to exceed most savings targets. However, starting the next program cycle with reduced awareness in the customer population may put the program at a disadvantage. Recall that the PY2016 evaluation found a very low program awareness rate (20%), assessed a few months after the end of the program's

three-month suspension, possibly suggesting that maintaining program awareness depends on continuous program marketing, outreach, and trade ally engagement.

High up-front costs continue to be commonly cited barriers to efficiency upgrades, and the continued high net-to-gross ratios for the BizSavers Program, together with feedback from participants about the value of the incentives, again emphasize the importance of incentives in driving the efficiency upgrades. In this context, it is worth noting that trade allies reported that the decreased lighting incentives made it more difficult to sell lighting projects.

Another potential barrier is time: in particular (for the current evaluation), small businesses reported that lack of time is the primary barrier to scheduling a free walk-through assessment through the SBDI Program. This did not prevent that program from achieving its target savings for the current cycle, but as the program achieves greater penetration, this factor may begin to come into play.

Findings from evaluations in an earlier program cycle indicated that smaller businesses and those in remote parts of the Ameren Missouri service territory were underrepresented in program participation, suggesting that business size and geography may have affected those customers' ability to take advantage of the BizSavers programs. Analyses of PY2018 program participation data as it compares to customer population data indicate that various business sizes and geographic areas are well represented in the program.

Research Question 2: Is target market segment appropriately defined, or does it need further subdivision or merging with other segments?

In general, the BizSavers Program does a good job of reaching all parts of the nonresidential market: for most building end uses, the distribution of program participants matches relatively well with the distribution of businesses in the population.

Evaluation findings continue to support the establishment of the SBDI Program to serve small businesses, with savings in the 2M rate class now at or above par with electric usage for several years in a row since the program's establishment. Surveyed nonparticipants indicated moderate-to-high likelihood of agreeing to schedule a walk-through assessment if approached by an SBDI Service Provider.

Research Question 3: Do program measures reflect the diversity of end-use needs and available technologies for target segment?

Participant surveys and interviews showed satisfaction with the range of program-eligible equipment, delivery time for ordered equipment, and the quality of the equipment and the installation. The evaluation identified several measure-specific findings.

A variety of analyses of project tracking data provide evidence that the Energy Management System (EMS) pilot program, introduced in PY2016 to help non-profit and other tax-exempt entities install EMS, has had a positive effect on EMS projects and savings in the current program year. Specifically, it appears to have reduced the decline in EMS projects and savings compared to what might have occurred without the pilot. This suggests the EMS pilot program has met certain end-use needs.

In the current program year, the implementer introduced some changes to incentive structures to promote certain measure types. One such change was a large increase in the incentive for cooling measures. Analysis of project tracking data suggests that this change may have stimulated more cooling projects and savings, increasing the overall amount of demand savings.

Another change was to allow lighting fixture replacements to be made with Standard incentives, whereas previously they could be made only with Custom incentives. Surveyed trade allies were largely in favor of this change because it increased the speed and reduced the complication of making such replacements.

A class of measure types that may warrant attention in the future are lighting controls. The number of projects with lighting control measures, such as occupancy sensors, daylight sensors, and other dimming controls, declined sharply in PY2018 from previous years, possibly because of a perceived decrease in the value of controlling lighting as highly efficient LEDs become more pervasive. A large opportunity exists for increased penetration of lighting controls. Four out of five surveyed nonparticipants reported no lighting controls in their buildings. Those who have controls were twice as likely to report plans for more controls than those without controls, which suggests high satisfaction with controls among those who have them. Program staff reportedly have had discussions about how to drive ethernet-controlled lights and more integration with building controls.

Finally, it should be noted that about one in five surveyed trade allies commented on the need for exterior lighting incentives – these were unsolicited open-ended comments, and so they may represent a higher percentage of all trade allies. Most of the comments seemed to suggest a belief that there were no incentives at all for exterior lighting, which may suggest a need for better communication of program rules with trade allies (see below), some explicitly called for reinstating incentives for dusk-to-dawn exterior lighting.

Research Question 4: Are communication and delivery channels/mechanisms appropriate for the target market segment?

The program implementer continued using a wide range of marketing outreach channels and methods to reach end-use customers and service providers (e.g.,

contractors, vendors, and distributors), including targeted outreach to decision makers representing customer account aggregates or “towers.”

Program staff reported continued efforts at targeting outreach to specific industries. This year’s targeted efforts involved development of website infographics with industry-focused information on energy use, energy-saving tips, program savings, and program contact information. This industry-focused effort is a follow-on to an effort targeting schools in PY2017, which produced results in the current program year.

Another newly reported outreach activity is an effort to capitalize on a new St. Louis ordinance requiring benchmarking on all buildings above a certain size. The business development team identified owners of buildings above the threshold, helped them benchmark the buildings, and then steered them to the incentive program. Project tracking data suggest this effort so far may have had some limited effect.

The importance of the program trade allies as a program marketing channel is clear. Equipment vendors and contractors continue to be the main sources of BizSavers program awareness and to have the greatest influence on equipment selection. For this reason, it is noteworthy that trade allies reported that the BizSavers program communicates well with them and has a consistent approach to managing the trade ally network.

Still, it appears that overall program awareness in the nonparticipant customer population has dipped somewhat – awareness of New Construction incentives was particularly low, even among those who had recently completed or were planning to complete a new construction project. Moreover, BizSavers participants had low awareness of incentive types that they had not used, as well as low awareness of recent changes to the incentive structure. As noted above, while the program met and exceeded most savings targets this program year, starting the next program cycle with reduced awareness in the customer population may put the program at a disadvantage.

One further evaluation finding that is pertinent to this research question is the fact that it was difficult for many surveyed program nonparticipants to find information on energy efficiency on the Ameren Missouri website. Just over one-third of those who visited the website to look for that information reported being able to find it easily, and the same proportion reported there was some information they were not able to find. This issue is important in light of the fact that one of the channels that staff mentioned for the planned industry-focused marketing and outreach is the use of web-based infographics, which may have limited impact if they are difficult to find.

Finally, some evidence suggests that communication of some program rules and incentive changes has not reached some trade allies and customers. Awareness of the change to the incentives for Custom cooling measures was low, including among Custom program participants. Even one-third of trade allies who deal with cooling

equipment were not aware of it. In addition, as noted above, many trade allies made comments that seemed to suggest a belief that the program provided no incentives at all for exterior lighting.

Research Question 5: Are there better ways to address market imperfections to increase adoption of each program measure?

As indicated above, the BizSavers program met or exceeded all savings targets and has done a good job of delivering the program to all segments of the nonresidential market. The following recommendations may help ensure continued effective program delivery and achievement of goals:

Process recommendation 1: Ameren Missouri and Lockheed Martin should assess how customers use the website, particularly to find information on energy efficiency and incentives to identify ways to make this information easier to find. Such an assessment could include web-use analytics as well as interviews or focus groups with customers.

Process recommendation 2: Lockheed Martin should continue efforts to educate trade allies and customers about the change in incentives for Custom cooling measures, such as through additional email blasts, webinars, and group events as well as tying information on the cooling incentives to industry-focused marketing and outreach activities.

Process recommendation 3: Lockheed Martin should put effort into increasing implementation of lighting controls such as by developing messaging that controls are valuable even with LED lighting and by working with trade allies that specialize in either lighting or building automation to encourage them to promote controls in their jobs.

Process recommendation 4: Lockheed Martin should consider developing and implementing training for SBDI Service Providers to help them overcome resistance by business owners to scheduling a free walk-through assessment, thereby increasing the value of the Service Providers' outreach efforts and the savings achieved.

Process recommendation 5: Lockheed Martin should ensure that trade allies accurately understand the incentives available for external lighting so that opportunities are not lost because trade allies believe there are no incentives, and should consider re-introducing incentives for dusk-to-dawn external lighting if doing so will help ensure that other lighting replacements get made.