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Xcel Energy

Colorado Lighting Efficiency Product Impact & Process Evaluation

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Executive Summary

Xcel Energy contracted with TRC Companies (TRC) to evaluate the 2022 Colorado Lighting Efficiency Product (Product). The Product is designed to encourage Xcel Energy electric business customers to install energy efficient lighting equipment in existing buildings. To achieve this objective, Xcel Energy offers rebates to lower the upfront costs of qualifying efficient lighting products. The Product offerings include prescriptive lighting rebates, LED instant rebates, and custom rebates. This evaluation covers the prescriptive and custom channels; LED instant rebates and New Construction are evaluated separately.

As part of the process evaluation, TRC and its subcontractor Apex Analytics, LLC (Apex) assessed customer and trade partner experience with the Product, customers' attitudes towards energy efficiency and capital improvements, and barriers and opportunities for increasing adoption of networked lighting controls (NLCs). TRC and Apex assessed the net-to-gross ratio (NTGR) for the Product. This summary includes the key findings and recommendations from our evaluation.

Methods

Participating Customer Surveys (n=70)

Non-Participating Customer Surveys (n=53)

Lighting Controls Interviews (n=3)

Trade Partner Interviews (n=42)

Peer Benchmarking Interviews (n=9)

Summary of Findings

The evaluation team estimated a **retrospective NTGR of 0.81 and recommended a prospective NTGR of 0.81.** Prior to the Covid-19 pandemic, market saturation was increasing and LED equipment prices were decreasing. However, the pandemic impacts that are still ongoing have stalled market transformation as customers are reluctant to invest on their own with economic uncertainty and as equipment prices are rising. Analysis of the influence data indicated that Product influence did not vary significantly by type of equipment, rebate type, or number of measures installed.

Nearly half of peer utilities do not calculate a NTGR, and those that did used data several years old or included non-lighting measures. One peer utility jurisdiction only recently decided to drop NTGR research, citing that NTGR estimates are less reliable because long-running utility programs are part of the "normal" market for equipment and program activities are less visible to customers, making it less feasible for customers to identify what influenced their decisions.

High-level program design among peer utilities is similar to the Xcel Energy program design; however, a wider variation in specifics occurs. Differences include variations in incentive design, with some utilities listing only $/kWh or $/kW and others listing individual technologies or different sizes and configurations; overlap between midstream and downstream technologies, combining lighting with other business technologies into one program; and trade partner incentives to encourage comprehensiveness or specific technologies, such as NLCs.

Trade partners would like more communication and training from Xcel Energy. Although customers and trade partners expressed satisfaction with their experiences with the Product, many would like more communication from Xcel Energy staff, more training and networking opportunities, and more functionality from the online application system. Some trade partners were unaware of Product tools such as online applications and pre-approval reservations for custom rebates.

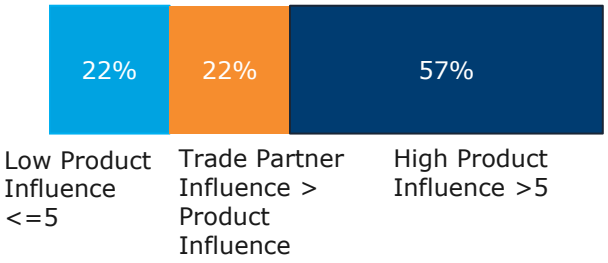
Both customers and trade partners expressed a desire for a broader array of eligible products. While customers were not specific about the products they were looking for, other than smaller wattage fixtures, trade partners suggested the addition of some niche-type technologies such as flexible flat panel LEDs, mesh lighting, germicidal UV fixtures, solar LEDs, fixtures for high temperature setting, LED tape light, selectable wattage and color temperature fixtures, replacement of first-generation LEDs, and RGB LEDs.

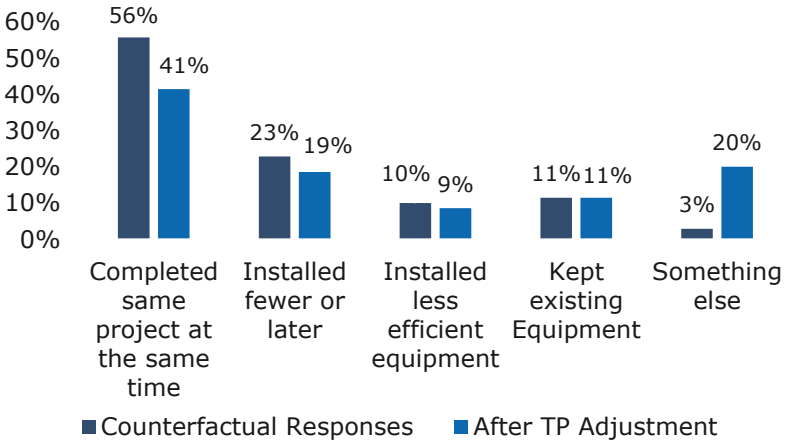
Both customers and trade partners expressed concern about the complexity of applications (particularly custom). A significant share of trade partners avoid using the custom application because of the complexity. Some non-participating customers reportedly did not participate because of the confusing forms.

NLCs have experienced slow uptake due knowledge gaps for both customers and trade partners. Most customers are unfamiliar with the technology and are not aware that Xcel Energy offers incentives. Many trade partners are uncomfortable with the technology and perceive customers as having numerous concerns. Peer utilities with the highest success rates in achieving participation with NLCs have employed prescriptive rebates, trade partner education, training, and sometimes trade partner incentives.

PRODUCT INFLUENCE – FREE-RIDERSHIP=0.29

The Product and the trade partners are influential in customer's decision to install energy efficient lighting.





SPILLOVER AND MARKET EFFECTS

4 of 42 Trade Partners Reported Spillover

Trade partners reported sales that did not receive a rebate, totaling 5%, some of these noted that they do not apply for rebates on items too specialized or small that do not fit the prescriptive program.

Evidence of Market Effects

- Very few trade partners sell any linear fluorescents
- Some trade partners started up because of the Product
- Trade partners say the Product "legitimized LEDs"
- Evidence of market effects is strong, 5% adder

PEER BENCHMARKING

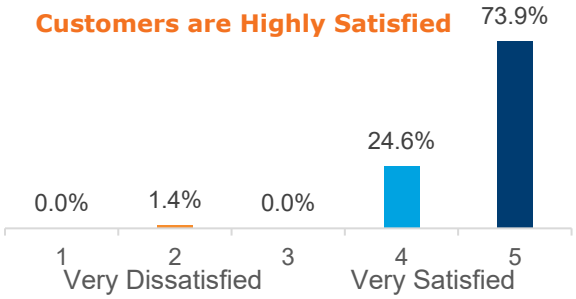
NTGR benchmarking was inconclusive due to small number of utilities that calculate NTGR, variations among study timing, measures included, and distribution channels.

	Peer A	Peer B	Peer C	Peer D	Peer E	Peer F	Peer G	Peer H	Peer I
NTG	0.27-0.96	0.82-0.87	0.80	NA	0.87	NA	NA	0.84	NA
Caveats	2016-2019 data	More than lighting	2018 data	Deemed 100%	2019 data	Not Reported	Deemed 100%	2018 data	Deemed 100%

Recommended NTGR=0.81 Retrospective and Prospective

PRODUCT EXPERIENCE AND OPPORTUNITIES TO ENCOURAGE MORE COMPREHENSIVE RETROFITS

Customers are Highly Satisfied



Trade Partners Compare the Product Favorably

Trade partners compared Xcel Energy's Product favorably to that of other utilities: almost universally, Xcel Energy's Product rates higher than the smaller utilities around Colorado. Trade partners rated the Xcel Energy Product as good overall, with 11% (3 of 27) declaring it "great" and 59% (16 of 27) rating it as "good".

PRODUCT EXPERIENCE AND OPPORTUNITIES TO ENCOURAGE MORE COMPREHENSIVE RETROFITS (CONTINUED)

Opportunities Noted By Customers

While most customers were satisfied with the Product overall, some respondents provided feedback concerning areas where Xcel Energy could improve the program, including through more communication, simpler forms, and more types of equipment offerings.

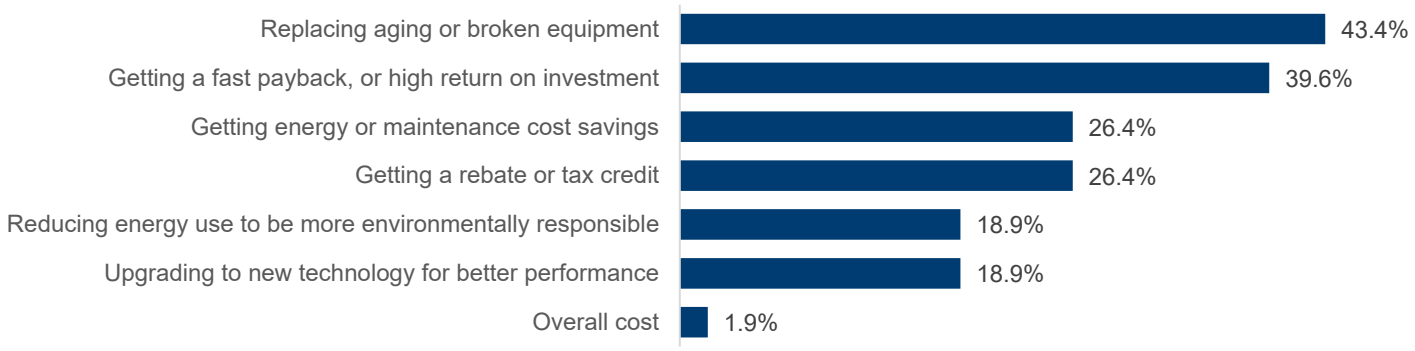
Opportunities Noted By Trade Partners

- Many trade partners avoid the custom path due to its complexity; 71% did not know about change for quick "pre-approval".
- 70% would like more training, networking, and more communication.
- 9 of 42 complained about slow turnaround times and responses.

Mentioned new requested measures: smaller wattage fixtures, LED tape lights, selectable wattage and color temperature fixtures, RGB LEDs, and germicidal UV fixtures.

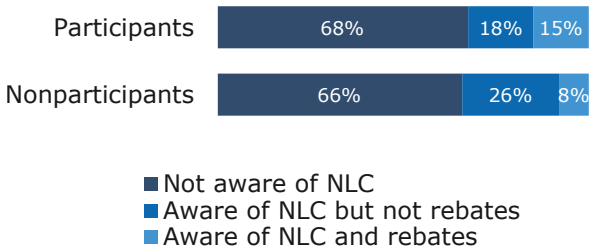
ATTITUDES TOWARD CAPITAL IMPROVEMENTS AND ENERGY EFFICIENCY

Nonparticipant Motivating Factors to Make Efficient Upgrades



BARRIERS AND OPPORTUNITIES TO INCREASE NLCs

The largest NLC barrier for customers is technology awareness.



Trade Partners report numerous customer concerns with NLCs for training to address

- Complexity
- Return on Investment
- Reliability/Troubleshooting
- Cost
- Ongoing Maintenance
- Security
- Old System Integration
- Too New
- Older users
- Installation

Conclusions & Recommendations

The Product is influential in encouraging customers to adopt LED technologies. However, the pandemic impacts that are still ongoing have stalled market transformation as customers are reluctant to invest on their own with economic uncertainty and as equipment prices are rising.

The evaluation team recommends a prospective NTGR equal to the retrospective value of 0.81 if Xcel Energy continues monitoring incremental costs and maintains rebates that are, in aggregate, at a similar proportion of incremental cost; develops an enhanced understanding of which business segments are lagging in LED installation for Product targeting; and promotes and increases participation in lighting controls measures.

Nearly half of peer utilities do not calculate a NTGR and those that did used data several years old or included non-lighting measures.

Discuss the value of continuing to calculate and apply NTGR to savings estimates in future strategic issues conversations with stakeholders. Modifying NTGR approach or adjusting to be focused around improving program design would reduce complexity of impact evaluation and realign with outcomes.

Trade partners would like more communication and training from Xcel Energy. Many would like more communication from Xcel Energy staff, more training and networking opportunities, and more functionality from the online application system. Some trade partners were unaware of Product tools such as online applications and pre-approval reservations for custom rebates.

Provide additional trade partner training and regular opportunities for engaging with Xcel Energy staff. Many trade partners have experienced staff turnover and need comprehensive education:

- Offer training classes online or in-person to inform trade partners on program processes.
- Promote and possibly increase staff resources for a direct line for trade partners or customers to call or email with specific questions.
- Make improvements to the online application portal to allow Product eligibility lookups, the ability to save and come back to a partially completed application and provide status updates on rebate progress.

Both customers and trade partners expressed a desire for a broader array of eligible products. While customers were not specific about products they were looking for, other than smaller wattage fixtures, trade partners suggested the addition of some niche type technologies including flexible flat panel LEDs, mesh lighting, germicidal UV fixtures, solar LEDs, fixtures for high temperature setting, LED tape light, selectable wattage and color temperature fixtures, replacement of first-generation LEDs, and RGB LEDs.

- Assess the feasibility of measures suggested by trade partners for inclusion in prescriptive rebates.
- Communicate and promote any updates to customers and trade partners.

Both customers and trade partners expressed concern about the complexity of applications (particularly custom).

Look for ways to simplify the application process for customers and trade partners.

High-level program design among peer utilities is similar to the Xcel Energy program design, however, a wider variation in specifics such as incentive design, midstream/downstream overlap, non-lighting technologies included, and trade partner incentive offerings occurs.

Assess the pros and cons of the program design specifics that differ from the Xcel Energy design to determine whether changes could be beneficial to the Product.

NLCs have experienced slow uptake due knowledge gaps for both customers and trade partners.

Increase marketing emphasis on NLCs, including offering training classes to trade partners and marketing videos or case studies to customers, dedicating trained Xcel Energy staff to answer trade partner and customers questions, and including NLCs in fixture incentives pricing.

Market actors all noted significant impacts on projects, their business, and the program from the Covid-19 pandemic.

1 Introduction

Xcel Energy offers a comprehensive array of energy services and products to its customers, including demand side management (DSM). For its 2022 product evaluations, Xcel Energy sought to understand the role each evaluated product plays in changing the marketplace, to analyze that influence on customer choices, and to use the findings to improve customer experience and ensure industry-leading product performance. To accomplish this, Xcel Energy contracted with TRC to evaluate nine products offered in Colorado and Minnesota in 2022.[1] This included the Colorado Lighting Efficiency Product (Product), discussed in this report. This introduction includes an overview of the Product and the evaluation approach and describes the organization of the report.

1.1 Product Overview

The Colorado Lighting Efficiency Product is designed to encourage Xcel Energy electric business customers to install energy efficient lighting equipment in existing buildings. To achieve this objective, Xcel Energy offers rebates to lower the upfront costs of qualifying efficient lighting products. The Product offerings include prescriptive lighting rebates, LED instant rebates, and custom rebates. This evaluation covers the prescriptive and custom channels; LED instant rebates and New Construction are evaluated separately.

Most customer projects qualify for prescriptive rebates, which are offered for the most common fixtures and controls. Retrofits that include a lighting redesign or more complex controls may qualify for custom rebates. Each rebate type has its own application process and requirements. Customers in either channel may receive help from Xcel Energy account managers (managed account customers), Business Solutions Center (BSC) representatives (non-managed account customers), and/or a trade partner to identify rebate-eligible equipment and complete the rebate application.

For the prescriptive rebates, customers must install energy efficient lighting equipment from a list of pre-approved products. Custom projects are for efficient lighting products not included in the prescriptive channel or do not involve a one-to-one fixture replacement or use. The custom project rebate amount is determined by the on-peak kilowatt (kW) and off-peak kW savings delivered by the project. For custom projects, customers must submit project information for pre-approval prior to making a purchase. Xcel Energy staff review pre-approval information to confirm the project qualifies and to calculate the rebate amount. Alternatively, customers can submit a signed blank application instead of pre-approval forms. This signals their expectation of a rebate (to avoid free-ridership), but the customer will not be guaranteed their project is eligible or know the exact rebate amount. Appendix A provides 2021 standard rebate amounts for prescriptive and custom projects.

In 2021, each channel contributed to the total gross savings from the Colorado Lighting Efficiency Product as shown in Table 1-1.

[1] The products selected for evaluation include: Lighting Efficiency (Colorado and Minnesota), Home Energy Insights (Minnesota and Colorado), Whole Home Efficiency (Colorado), Energy Management Systems (Colorado), Energy Savings Kits (Colorado), Low Income Segment (Minnesota), and Home Energy Squad (Minnesota).

Table 1-1: Gross Savings from Evaluated Channels of the Product[a]

Channel	Participants[b]	Gross Savings (kWh)	% of Total kWh
Prescriptive	695	36,008,353	54%
Custom	94	30,828,259	46%
Lighting Efficiency Product	**789**	**66,836,612**	**100%**

[a] This table shows only the savings from the components of the Lighting Efficiency Product that are subject to this evaluation. Savings from LED instant rebates and New Construction are not included.

[b] Participants are measured as the number of unique account numbers in the participant tracking database. Some Custom participants also participated in the Prescriptive channel but are included in this table only as Custom participants to avoid double-counting.

1.2 Evaluation Overview

The evaluation team designed a comprehensive evaluation of the Product to provide information on four key research objectives:

1. Estimate Product influence on customer decisions (net-to-gross ratio, or NTGR), including major drivers for NTGR, market effects, and peer utility NTGRs.
2. Assess Product experience and opportunities for more comprehensive retrofits.
3. Understand customer attitudes towards capital improvements and energy efficiency.
4. Identify barriers and opportunities to increase adoption of networked lighting controls (NLCs).

1.3 Report Organization

The following chapters organize the evaluation findings into two components: impact and process evaluation results. Further detail on the evaluation approach is presented in the following chapters.

- Chapter 2 presents an overview of the net impact and process evaluation, as well as characteristics of respondents from our data collection efforts.
- Chapter 3 reviews the approach and results of the net impact evaluation and the attribution of Product impacts using a standard NTGR analysis.
- Chapter 4 discusses the process evaluation components, including customer and trade partner experiences, attitudes, and barriers, and peer utility comparisons.
- Chapter 5 presents conclusions and recommendations.

Supporting documents, such as the evaluation plan, data collection instruments, and task-specific findings, can be accessed in this report's appendices.

2 Evaluation Overview & Respondent Characteristics

To accomplish the objectives for the Product evaluation, the evaluation team completed a suite of intersecting and complementary research activities in 2022. Detailed information on the sampling approach used for the research can be accessed in the evaluation plan, found in Appendix A.

The following sections discuss each of the evaluation's research activities: staff interviews, participating customer surveys and follow-up interviews, trade partner interviews, non-participating customer surveys, and peer utility interviews. Within each research activity description, the evaluation team also includes a description of respondent characteristics to help frame the results presented in Chapters 3 and 4. Table 2-1 presents an overview of how each of these research activities relate to each research objective of the Product evaluation.

Table 2-1: Evaluation Summary Table

Primary Research Objectives	Staff Interviews (n=6)	Participant Surveys (n=70)	Participant Interviews (n=11)	NLC In-Depth Interviews (n=3)	Non-Participant Surveys (n=53)	Trade Partner Interviews (n=42)	Peer Utility Benchmarking Interviews (n=9)
Understand Product influence, major drivers, market effects, and peer utility NTGR		x	x		x	x	x
Assess Product experience and opportunities for more comprehensive retrofits	x	x	x		x	x	x
Understand customer attitudes towards capital improvements and energy efficiency	x	x			x	x	
Identify barriers and opportunities to increase NLCs		x		x	x	x	x

2.1 Staff Interviews

The evaluation team conducted telephone interviews with key staff managing and implementing the Product. The overall objectives of the staff interviews were to understand their experiences with the Product, feedback they've received from market actors on the Product, and feedback on priority research topics for the evaluation. To conduct this research, the evaluation team completed six telephone interviews. Those interviewed included the Product Manager, Xcel Energy Evaluation Manager, Key Account Manager, Trade Partner Relations Manager, and BSC Staff Member. These interviews were conducted over Microsoft Teams and took between 30 minutes and one hour to complete.

Appendix B.1 presents the interview guide used for these discussions and Appendix C.1 provides results specific to this research activity.

2.2 Participating Customer Surveys

The evaluation team conducted telephone surveys with participating customers. This section presents the survey objectives, the participant sample, and key characteristics of the survey respondents. The participating customer survey was designed to address the following research objectives:

- **Understand Product influence, major drivers, market effects, and peer utility NTGR.** The evaluation team collected feedback from participating customers on the major drivers of free-ridership and whether the Product influenced any spillover.
- **Assess Product experience and opportunities for more comprehensive retrofits.**
  - **Feedback on design:** The evaluation team assessed customer satisfaction with the trade partners, eligible measures, available rebates, and requirements and process to apply for rebates (including the option of the online application and the alternative to pre-approval, as appropriate).
  - **Role of trade partners and Xcel Energy staff:** The evaluation team worked to understand the customer's reliance on their installer, general contractor, or Xcel Energy staff in general and at various stages of their project, to compare with non-participant responses.
- **Understand customer attitudes towards capital improvements and energy efficiency.** The evaluation team worked to understand major factors influencing customer decisions to upgrade their lighting and their capital expenditures generally, including factors such as available budget, equipment retrofit cycles, payback period, project timing, and the impacts of Covid-19. The objectives also included understanding how customers interacted with installers and Xcel Energy support staff, including at what point in their project development process and for what tasks/services.
- **Identify barriers and opportunities to increase adoption of NLCs.** The evaluation team identified barriers to lighting controls by asking if customers who did not install or commission controls have considered lighting controls, what resources (such as internal

or corporate expertise, trade partners, Xcel Energy account managers, etc.) they used to evaluate these items, and for what reasons they did or did not install controls.

The evaluation team spoke to 70 respondents, which provided a 90% level of confidence with a minimum of +/- 10% relative precision. For the purposes of this evaluation, and in order to have a large enough sample to achieve the desired completes, the evaluation team defined a participating customer as any customer who participated in the Colorado Lighting Efficiency Product between January 1, 2020, and September 21, 2022. Due to the limited number of participants, the team did not stratify the sample.

The evaluation team spoke with 11 survey respondents in follow-up interviews to fill in responses to a missed question in the survey. The team had also planned to interview survey respondents with conflicting responses or where or additional information needed about spillover responses, however further research on these topics was not needed.

Survey respondents represented a wide variety of business types as shown in Figure 2-1. Of all the facilities surveyed, the most common business activities were 1) manufacturing, 2) real estate, and 3) warehousing and transportation. The “other” category includes business types that make up less than 5% of participants and includes non-food consumer retail, government, mixed-use, nonprofit organizations, recreation, lodging, cannabis, construction, contracting, horse boarding, and offices. The average reported square footage was approximately 130,000 square feet.

Figure 2-1: Facility Business Types (n=70)

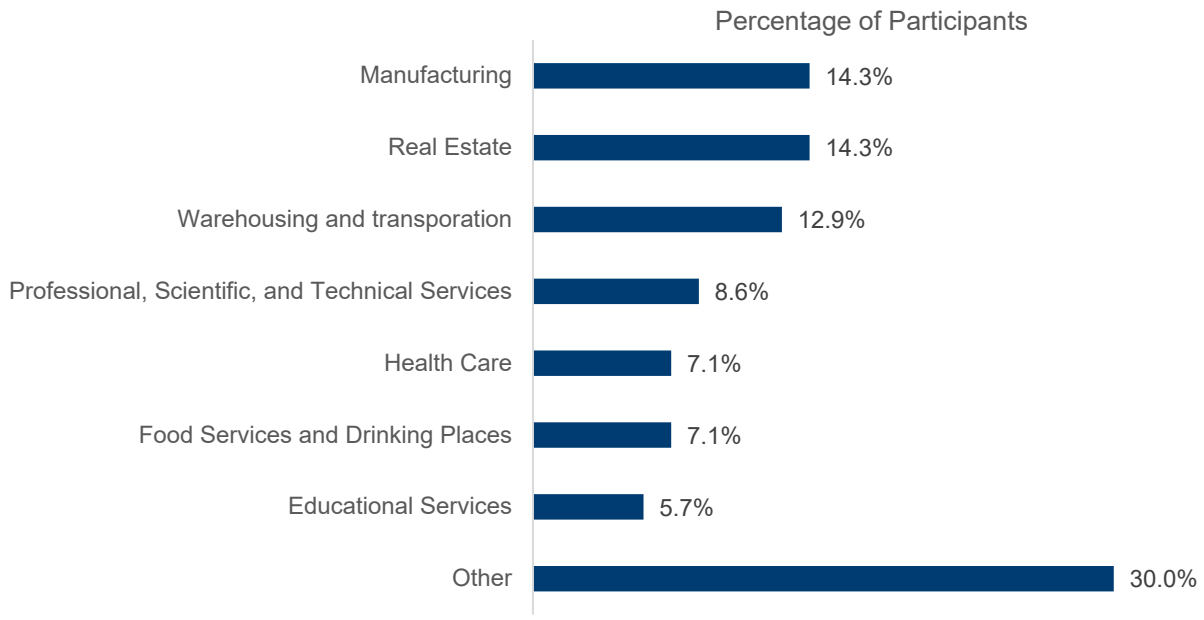
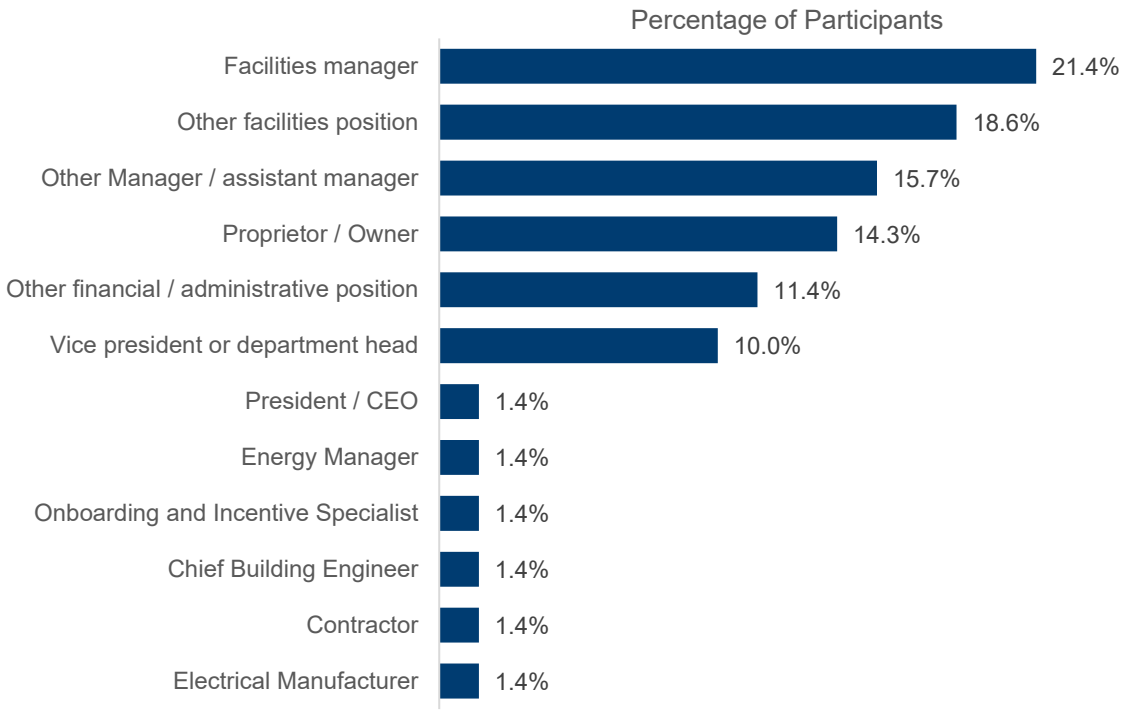


Figure 2-2 reports the proportion of respondents with different occupational titles. The majority of the respondents (57.1%) were some type of manager within the facility. Another 15.7% were proprietors or owners of the facility or the CEO/head of the company.

Figure 2-2: Occupational Title of Survey Respondents (n=70)



The team found that most of the participants surveyed (67.1%) owned the facility in which the rebated lighting equipment was installed, while another 22.9% either leased or rented the facility, and the rest had other various management agreements.

Appendix B.2 contains the survey instrument used for the participating customer survey, and Appendix C.2 provides results specific to this research activity.

2.3 Networked Lighting Controls In-Depth Interviews

The evaluation team conducted telephone interviews with three customers participating in the Product and receiving NLC rebates. This section presents the interview objectives, the interview sample, and key characteristics of the interview respondents. The interviews were designed to address the research objective of understanding barriers and opportunities to increase adoption of NLCs and included the following topics:

- **Motivation and Awareness:** What participants viewed as benefits of the system, and motivations for installing NLCs.
- **Decision-Making Process:** Key roles and resources needed in project planning.
- **Program Impact:** The impact of the Xcel Energy rebates, or other aspects of the Product, on the decision to install NLCs.
- **Resources:** Who was involved in the decision-making and what information resources were most helpful.

- **Installation Experience:** Details of the installation experience, including Product availability, availability of knowledgeable lighting professionals, and impact on project schedule, if any.
- **User Experience:** Details of the participants' experience using the controls to date, and whether the system has met expectations.

The evaluation team contacted a census of lighting customers installing NLCs in 2020, 2021, or 2022. Of the 14 unique contacts, 5 customers were no longer in business and 6 did not respond to outreach. Three customers completed interviews. One was a distribution center, one a manufacturer, and one a property manager for an office building.

Appendix B.6 contains the interview guide used for the lighting controls interviews and Appendix C.6 provides results related to this research activity.

2.4 Non-Participating Customer Surveys

The evaluation team also conducted telephone surveys with non-participating customers. This section presents the survey's objectives, the non-participant customer sample, and key characteristics of survey respondents. The non-participating customer survey was designed to address the following research objectives:

- **Understand Product influence, major drivers, market effects, and peer utility NTGR.** The evaluation team then assessed whether non-participating customers completed any lighting efficiency projects in the past year and to what degree the customer was influenced by the Product (even though they did not receive a rebate).
- **Assess Product experience and opportunities for more comprehensive retrofits:**
  - **Feedback on product design:** The evaluation team assessed the extent to which non-participant customers were aware of the Product, whether they have participated before, and satisfaction with aspects of the Product that the customer was aware of, such as rebate levels and eligible products.
  - **Roles of trade partners and Xcel Energy staff:** The evaluation team also assessed the degree to which non-participating customers rely on Xcel Energy or trade partners as resources when planning energy-related projects.
- **Understand customer attitudes towards capital improvements and energy efficiency.**
  - **Attitudes Toward Efficiency Improvements:** The evaluation team assessed non-participants' current levels of lighting efficiency and explored factors that influence decisions about capital improvement projects, including general budget availability for capital improvements and attitudes toward rebates. The objectives also included assessing any changes in capital improvement spending over the past two years or going forward.
  - **Decision Drivers:** The evaluation team worked to understand customer awareness of energy efficiency opportunities and rebates, especially for lighting, and assess

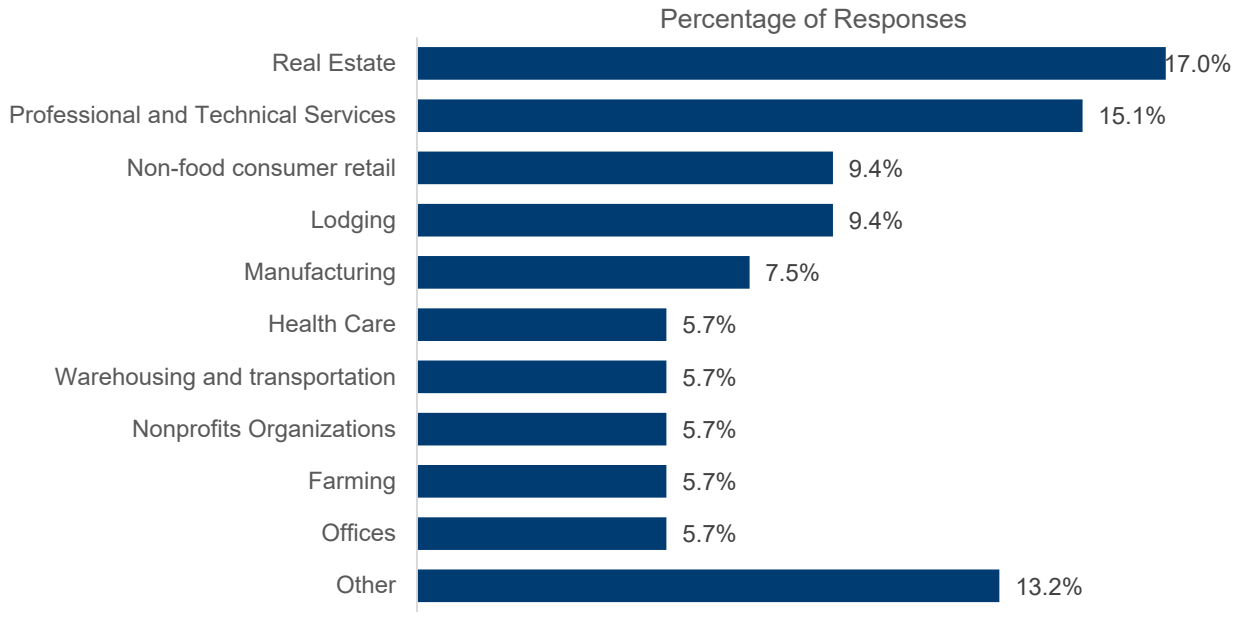
major factors influencing their capital expenditure decisions generally, including the impacts of Covid-19. The objectives also included identifying any obstacles faced if the respondent tried to participate in the past, such as insufficient information, difficulty navigating renter-landlord situation, lack of trade partner knowledge, or other issues.

- **Identify barriers and opportunities to increase adoption of NLCs:** The evaluation team identified barriers to lighting controls by asking if customers were familiar with controls, whether the customer has considered lighting controls, and, if so, reasons for installing or not installing controls. The objectives also included assessing what resources the customer used to evaluate controls.

The evaluation team defined a non-participating customer as any electric or combination customer who has not participated in the Product since 2016 (approximate date of LED emergence in the market). The number of completed interviews (53) provided a 90% confidence level with +/- 11.5% precision.

Survey respondents represented a wide variety of business types as shown in Figure 2-3. Of all the facilities surveyed, the most common business activities were 1) real estate, 2) professional and technical services, and 3) non-food consumer retail. The “other” category includes business types that make up less than 5% of participants, including wholesalers, tourism, irrigation wells, air hangers, and commissary kitchens. The average reported square footage was about 30,000 square feet.

Figure 2-3: Facility Business Types (n=53)



Most of the participants surveyed (60.4%) owned the facility, while another 32.1% either leased or rented the facility. Another 3.8% were managed by a property management company and 3.8% did not know.

Appendix B.3 contains the survey instrument used for the non-participating customer interviews and Appendix C.3 provides results related specifically to this research activity.

2.5 Trade Partner Interviews

In addition to customer data collection efforts, the evaluation team also conducted interviews with participating trade partners. This section presents the interview objectives, the participating trade partner sample, and key interviewee characteristics. These interviews addressed the following research objectives:

- **Understand Product influence, major drivers, market effects, and peer utility NTGR.** The team used trade partner responses to inform the NTGR based on feedback about the Product influence in their decision to recommend and stock high efficiency lighting and potential non-program measures installed because of the Product (spillover). The evaluation team worked to understand how the Product impacts their Product recommendations and anticipated future trends in customers installing energy efficient lighting with and without the Product.
- **Assess Product experience and opportunities for more comprehensive retrofits.**
  - **Trade partner level of engagement and barriers:** The team gathered feedback about trade partner staff understanding of the Product, perceived need for training, how staff stay informed, and opportunities for improving the Product's integration with trade partner business (including ideas from other utility programs), and for trade partners suggestions to help them use the program more (especially for medium and low performers, and trade partners whose activity level has dropped in recent years).
  - **Market outlook and feedback on design:** The evaluation team explored trade partners views about how customer interest in lighting is changing as Covid-19 restrictions ease and the impact of other potential economic issues, such as inflation and supply chain delays. The objectives also included assessing the appropriateness and effectiveness of eligible measures, available rebates, and requirements and process to apply for rebates (including the option of the online application and the alternative to pre-approval, as appropriate).
  - **Application process and tools:** The team worked to understand how trade partners participates in the application process, including their role in pre-approval for custom projects, selecting qualifying equipment, completing the application (using online portal or PDF forms), and whether the trade partner receives the incentive check directly.
- **Understand customer attitudes towards capital improvements and energy efficiency.** The evaluation team worked to understand how trade partners solicit

customers, how they structure sales conversations, and the role of the Product in their sales process.

- **Identify barriers and opportunities to increase adoption of NLCs.** The evaluation team assessed trade partner perspectives on barriers to lighting controls other than cost, and potential ways to overcome these barriers.

The evaluation team interviewed 42 of Xcel Energy's Colorado 200 trade partners. The breakdown of interview respondents by program performance is shown in Table 2-2. The evaluation team defines high performers as trade partners that return more than 1% of total Product rebate dollars, mid and low performers return less than 1% of rebate dollars. High-influence trade partners are those that are identified as influential by participants through the participant survey and therefore factor into the NTGR calculation. High-influence trade partners were pulled from all strata with four from high performers, four from mid/low performers, and two from inactive trade partners.[2]

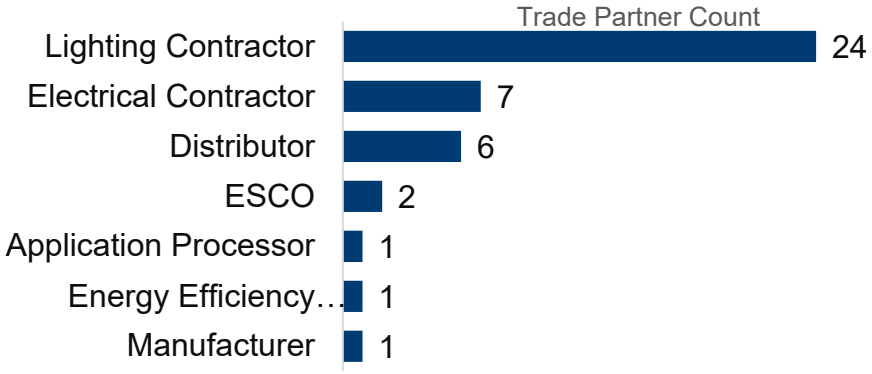
Table 2-2: Colorado Trade Partner Interviews Completed by Strata

Strata	Population	Completed Interviews
High Performers *(generating >1% of total Product savings)*	11	6
Mid/Low Performers *(active but generating <1% of total Product savings)*	95	18
High-influence *(determined by participant survey)*	11	8
Inactive	83	10
Total	**200**	**42**

Trade partner respondents represented electrical contractors, lighting contractors, and distributors, as shown in Figure 2-4. Twenty-four percent (10 of 41) respondents were project managers, and five respondents were sales managers. Some respondents did not have the expertise to respond to all interview questions.

[2] While inactive trade partners are defined as those not submitting applications in the past year, they may actually be active in the program if customers working with these partners submit the application directly.

Figure 2-4: Company Type (n=42)



Appendix B.4 presents the interview guide used for the participating trade partner research, and Appendix C.4 provides results specific to this research activity.

2.6 Peer Utility Benchmarking Interviews

Last, the evaluation team interviewed representatives from peer utilities. Interviews with peer utility program managers focused on the same discussion topics explored in the interviews with Xcel Energy customers and trade partners, but emphasized the following research objectives specific to peer benchmarking interviews:

- **Understand Product influence, major drivers, market effects, and peer utility NTGR.** The evaluation team collected feedback on NTGRs used among peers to compare NTG results with similar programs and understand possible opportunities to reduce free-ridership.
- **Assess Product experience and opportunities for more comprehensive retrofits.**
  - **Gauge peer utility's experiences:** The evaluation team explored peer utility program strengths, challenges, implementation strategies, approaches to working with trade partners, rebate levels, and recent or planned program changes.
  - **Identify new strategies or design ideas:** The evaluation team assessed peer utilities recent program changes and where they look to for new ideas.
  - **Identify opportunities:** The team assessed how other utilities are encouraging more or deeper lighting retrofits, including new approaches to program design or marketing.
  - **Comparison of program characteristics:** The evaluation team compared general information about peer utilities programs to the Product, including the measures offered, and incentive amounts, and program characteristics that may be beneficial to Xcel Energy.
- **Identify barriers and opportunities to increase NLCs.** The evaluation team assessed how peer utilities are promoting NLCs and how successful it has been.

The evaluation team collaborated with the Xcel Energy Product Manager to identify nine peer utilities to include in its sample, of which the evaluation team spoke to five. The evaluation team combined the results with additional peer utilities identified as part of the Minnesota Lighting Efficiency Product evaluation for a total of nine.

Appendix B.5 presents the interview guide used for these discussions and Appendix C.5 provides results specific to this research activity.

General characteristics of peer utility programs regarding the structures of their programs within their portfolio, along with whether they use an implementer, require ENERGY STAR® and/or DLC certification, or allow rebates for customers replacing existing LEDs. Summary findings can be found in the bullets below and in Table 2-3:

- Three of the nine peer utilities have a program focused only on lighting, similar to Xcel Energy. The remaining six include incentives for lighting within a broader business incentives program.
- All nine peer utilities offer downstream program incentives, and eight of nine also offer a midstream program that provides discounts through distributors at a point of purchase. Six offer direct install and incentives for small businesses, and four offer a separate new construction program. Two offer programs specific to horticulture, and one has a program focused on public buildings.
- Most utilities do not offer any of the same products in their midstream program that are offered in the downstream program. However, one program only offers fixtures in midstream, while lamps and fixtures are offered in the downstream programs. This utility indicated they started the midstream program not to focus on lowest cost measures, but rather to change the availability of more expensive fixtures in the market. The other two utilities offer lamps in both midstream and downstream, but they require that the customer is not able to receive incentives through both programs.
- Six of the peer utilities use a third-party implementer to manage the program, while three manage the program directly.
- The peer utilities varied in terms of requiring DLC or ENERGY STAR certification for products incentivized. Like Xcel Energy, two of the nine utilities do not require certification, while three have certification requirements across all products. The four remaining peer utilities allow exceptions or grandfathering. One utility stated that they received feedback that the testing requirements were a barrier to otherwise eligible products and are considering alternatives for the future.
- Five of the nine peer utilities allow incentives for customers replacing LEDs with LEDs. All peer utilities require there to be savings to earn the rebate. One utility bases all of its rebates on the energy saved against the existing lighting as a baseline, regardless of code requirements.

Appendix B.5 presents the interview guide used for the peer utility research, and Appendix C.5 provides results related specifically to this research activity.

Table 2-3: Summary Program Characteristics by Utility[b]

Characteristic	Xcel Energy CO	A	B	C	D	E	F	G	H	I
Program Specific to Lighting	Yes	No	No	No	Yes	No	Yes	Yes	No	No
	Lighting Program Offerings									
Midstream	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Downstream	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Small Business	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes
New Construction	Yes	Yes	Yes	Yes	No	No	Yes	No	No	No
Other	No	No	No	Yes	Yes	No	No	Yes	No	No
Downstream Implementer?	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes
DLC Certification Required?	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No
LED to LED Allowed?	Yes[a]	No	No	No	Yes	Yes	Yes	No	Yes	Yes
Products Overlap with Midstream?	No	Yes	N/A	No	Yes	Yes	Yes	No	No	No

[a] LED-to-LED replacements allowed in custom track only.

[b] Utility names and locations are not included to protect confidentiality.

3 Impact Findings

A central component of this evaluation was the estimation of the NTGR for the Xcel Energy Colorado Lighting Efficiency Product. For DSM products, the NTGR is a metric that estimates the influence of the product on the target market. It is used both as a benchmarking indicator of effectiveness and to adjust reported gross energy savings to account for energy efficiency that would occur in the absence of a program. NTGR results can indicate opportunities for Xcel Energy to adjust the design and implementation of its products to increase the cost-effectiveness of both individual products and the entire portfolio. The NTGR includes several factors that create differences between gross and net savings, such as free-ridership and spillover. In prior years, Xcel Energy relied on a NTGR value of 0.74 for the Product.[3]

The evaluation team estimated a NTGR based on data provided by customers and trade partners, while also considering the status of the efficient lighting market and the effects of the Covid-19 pandemic. The NTGR value relies primarily on free-ridership which is estimated as a value between 0 and 1, where 0 means the program had absolutely no influence and 1 means the program was 100% responsible for the customer's decision to install the measure. Note that, while a NTGR of 1.0 or greater is often seen as desirable, it may not be appropriate for all product designs depending on a variety of factors (including the maturity of the product and the technologies it promotes, product intervention strategies, and cross-product coordination strategies). The evaluation team has taken care to present its NTGR results with this context in mind.

This chapter presents:

- **Key Impact Findings:** This section presents the recommended NTGR based on the evaluation team's synthesis of findings from market actors.
- **Retrospective Net-to-Gross Approach and Findings:** This section presents an overview of the evaluation team's methods to calculating the recommended NTGR.
- **Prospective Net-to-Gross Considerations:** This section presents findings the evaluation team considered when recommending its prospective NTGR.
- **Peer Utility Net-to-Gross Comparisons :** This section presents NTGR ratios across peer utilities included in this evaluation.

3.1 Key Impact Findings

This section presents a summary of the key findings from the impact evaluation for the Colorado Lighting Efficiency Product, including retrospective and prospective NTGR recommendations. The evaluation team provides its estimated retrospective NTGRs, based on the quantitative results of customer and trade partner research. The evaluation team then provides its recommended prospective NTGR, based on potential changes to the business lighting market while considering potential program changes.

[3] EMI Consulting and Apex Analytics, *Xcel Energy Lighting Efficiency Product 2018 Evaluation Final Report*, January 29, 2019.

3.1.1 Retrospective Net-to-Gross Ratio

The evaluation team calculated a retrospective NTGR of 0.81 for the Colorado Lighting Efficiency Product, based on participant surveys and follow-up interviews, non-participant surveys, and participating trade partner interviews. To estimate this NTGR, the evaluation team took the following steps:

- The evaluation team first estimated savings-weighted free-ridership ratios to be 0.29 for the Product. The team based these values on participating customer surveys and included any adjustments based on follow-up interviews with customers that it conducted to clarify survey results. The evaluation team found trade partners to be highly influential, as 14 participating customer respondents rated their trade partners as more influential than the program. Additionally, trade partners rated the influence of the Product very highly on their decisions to stock and promote efficient lighting equipment.
- The evaluation team also analyzed participant spillover to determine if any customer survey respondents installed additional energy efficiency equipment as a result of participating in the Product and without participating in an Xcel Energy rebate offering. The evaluation team found no evidence of quantifiable spillover associated with the Product.
- The evaluation team also analyzed trade partner interview data to assess nonparticipant spillover (when trade partners sold efficient lighting equipment that did not receive Product rebates, although the Product was influential in the sale). The evaluation team calculated spillover of 5% from these responses. Additionally, non-participant customers qualitatively corroborated that spillover is occurring with several indicating some program influence on their decision to install efficient lighting products without a rebate.
- The evaluation team included a 5% adder to account for market effects the Product generated that are not addressed through the free-ridership and spillover results. Trade partners felt the Product increased the availability of LEDs and legitimized the technology. Very few trade partners sell linear fluorescent lamps or fixtures any longer and some are in business only as a result of the Product.
- To calculate the overall NTGR, the evaluation team subtracted the free-ridership ratio from 1.00, then added the spillover and market effect results. This brings the overall Product NTGR to 0.81.
- The evaluation team did not find any statistically significant results when comparing free-ridership by different metrics such as receiving bonus incentives, number of measures installed, or rebate type, however, trade partners reported that the bonus rebates allowed them to make sales that otherwise wouldn't have occurred and addressed the increasing supply prices.

Detailed methodology for the NTGR calculation can be found in Section 3.2.

3.1.2 Prospective Net-to-Gross Ratio

LEDs are considered to be a market transforming technology. Previous evaluations assumed a continued decline in NTGR because prices had dropped, saturation increased, and many lighting product dealers only offer LED products. All else being equal, these conditions would likely result in decreasing NTGRs over time. The Covid-19 pandemic has led to numerous disruptions in the market—increasing prices, supply constraints, and customer's economic outlook—that appear to have interrupted the normal evolution of market transformation. Further, customers that might normally decide on an early replacement retrofit project, may be more sensitive to the uncertainties and price increases since it is easy for them to delay upgrade decisions. As a result of these market disruptions the evaluation team recommends the prospective NTGR equal to the researched retrospective value (0.81).

3.2 Retrospective Net-to-Gross Approach

The NTGR assessment aims to estimate the percentage of savings achieved that can be attributed to Product actions. The NTGR value includes multiple metrics, which are described in the sections below. To determine the NTGR, the evaluation team primarily used participating and non-participating customer self-report surveys and trade partner interviews to assess Product attribution, including free-ridership, spillover, and market effects metrics. The evaluation team based its methodology on an approach tested during 2021 in Illinois that incorporates improvements made to the documented approach in the Illinois Technical Reference Manual, Version 11 (Illinois TRM).[4]

The remainder of this section presents the evaluation team's methodology for estimating the retrospective TNTGRs.

The data inputs to the NTGR analysis included:

- **Participating Customer Surveys:** Focused on project-level effects, including free-ridership and participating customer spillover.
- **Follow-Up Interviews with Participating Customers:** Sought to clarify any conflicting information in the participating customer surveys.
- **Trade Partner Interviews:** Focused on determining overall market effects and whether trade partners were influenced by Xcel Energy.
- **Non-Participating Customer Surveys:** Focused on understanding non-participating customer spillover and whether it corroborates spillover identified by trade partners.

The evaluation team used self-reported data from participating customer respondents to develop an initial free-ridership score. Data from the additional sources listed above were then used in constructing a logical narrative of Product attribution and in finalizing the retrospective and prospective NTGRs for the Product. The NTGR relies on three key components: a free-ridership score, a spillover score, and a market effects adder. The following sections define each of these key components and explain how they are combined to estimate the NTGR.

[4] Illinois Energy Efficiency Stakeholder Advisory Group. Illinois Statewide Technical Reference Manual, Version 10.0, Volume 4, Attachment A: IL-NET-TO-GROSS Methodologies, Volume 4. September 24, 2021.

3.2.1 Free-Ridership Score

The Free-Ridership Score is an average of the Product Influence Score and the Counterfactual Score and then multiplied by the Quantity and Timing (Q&T) Adjustment.

- **Product Influence Score:** a measure of how influential the overall Product was in a participant's decision-making process (1-(n/10), where n=the raw score from the customer survey.
- **Counterfactual Score:** a measure of what the participant would have done if the Product had never existed (n/10), where n=the raw score from the customer survey.
- **Q&T Adjustment:** a value calculated based on the percentage of measures that would have been installed over time in absence of the Product.

When scored, these components assess the likelihood of free-ridership on a scale of 0 to 10, with the two scores averaged and then the timing adjustment applied to create a final Free-Ridership Score, shown in Equation 3-1.

Equation 3-1: Free-Ridership Equation for the Net-to-Gross Ratio Calculation

$$Free\text{-}Ridership\ Score = \frac{Product\ Influence\ Score + Counterfactual\ Score}{2} x\ Q\&T\ Adjustment$$

Product Influence Score

To determine the Product Influence Score, the evaluation team asked each participating customer to identify factors involved in their decision to install rebated lighting equipment, including the following, and any additional factors the customer might volunteer.

- The rebate from Xcel Energy.
- The simple payback period, which is the amount of time until equipment has paid for itself.
- The total amount of money saved over lifetime of the equipment, otherwise known as the return on investment (ROI).
- Information about the benefits of upgrading to efficient lighting or rebates from an Xcel Energy mailing, email, or ad.
- A recommendation from an Xcel Energy representative.
- A recommendation or information from the contractor or vendor.
- A recommendation from a friend or peer.
- A recommendation from a trade organization.
- The age or condition of the old equipment.
- Your previous participation in an Xcel Energy program.
- Your previous experience with the type of equipment you installed.
- A corporate policy or guidelines related to energy efficiency.

- Your desire to minimize operating and maintenance cost.
- Your desire to improve ease of use, lighting quality, or other lighting features besides efficiency.
- A predetermined timeline or schedule for replacing equipment.
- State or Federal efficiency standards.

These questions were followed up with clarifying questions about whether the Product was influential in factors not obviously a program factor, such as corporate policies related to energy efficiency. Once program factors were identified, the survey asked customers to rate the importance of the Product using a 0 to 10 scale on the decision to install energy efficient equipment rather than less efficient equipment. If the customer also indicated the trade partner was influential, the survey asked the customer to separately rate the importance of the trade partner on the decision using the same 0 to 10 scale. If the Trade Partner Score was higher than the Product Influence Score, then the corresponding Trade Partner Score in response to a similar question about Product influence was substituted for that customer's Product Influence Score.[5]

The Product Influence Score was computed as 1 minus the quotient of the overall importance response divided by 10.

Counterfactual Score

The evaluation team assigned the Counterfactual Score based on responses to the following question:

Which of the following alternatives would you have been most likely to do if the Xcel Energy Lighting program and rebate had not been available?

1. Completed the exact same project, with the same equipment at the same time and paid the higher costs yourselves, and without the program information you received.
    a. Please rate the likelihood that you would have completed the exact same project, with the same equipment, at the same time. (Score = Rating)
2. Installed the same equipment, but fewer units or at a later time.
    a. (Score = 10 x Timing and Quantity Adjustment)
3. Installed other less efficient equipment than offered through the program that would not earn a rebate.
    a. Would the less efficient equipment most likely have been:
        i. The least expensive equipment that met the minimum efficiency required by code? (Score = 0)

[5] The customer survey asked customers to identify their trade partner if they rated it as more influential than the overall program in the customer's decision to participate. The evaluation team then looked up that trade partner's response to similar Product Influence Score questions and substituted the Trade Partner Response for the customer score (which was higher than the Product Influence Score as rated by the customer). If the specific trade partner was not interviewed by the evaluation team, the evaluation team applied the average score of those trade partners that were identified as more influential than the Product.

   ii. More efficient and more expensive than code, but less efficient than what you actually installed? (Score = 5)

4. Kept your existing equipment. (Score = 0)
5. Done something else. (Manually score after asking for clarification)

As with the Product Influence Score, the evaluation team adjusted the scores of those customers who had identified the trade partner as being more influential than the Product. The team substituted the inverse of the Product Influence Score (as substituted by the Trade Partner Score) for the Counterfactual Score.

Q&T Adjustment

The evaluation team calculated a Q&T Adjustment from responses to the following question:

If the rebate had not been available, about how much of the lighting equipment you installed do you think you would have installed at the around the same time, how much would you have installed at a later time, and how much would you have never installed?

1. Percent install at the same time, or within six months: _____
2. Percent install at a later time, but within 4 years: _____
3. Percent never installed: _____

The Q&T adjustment is calculated using this equation for each proportion of equipment delayed using Equation 3-2Equation 3-2Equation 3-2.

Equation 3-2: Q&T Adjustment

$$Q\&T\ Adjustment = \%\ 6\ mo\ or\ less\ x\ 1 + \%\ 6\ mo\ to\ 4\ years\ \left(1 - \frac{6}{42}\right) x\ months\ delayed$$[6]

3.2.2 Spillover Ratio

Spillover is a measure of the amount of energy savings that occur due to a product that are not captured in the product's claimed energy savings. To capture participating customer spillover, the evaluation team asked participating customers for information about any additional efficient equipment installed outside the Product and for which they did not receive a rebate. In its surveys, the evaluation team also probed for information on the importance of the Product in participating customer installation decisions and the likelihood that the measures would have been installed if they had not participated in the products. To be eligible for spillover, customers must have met the following criteria:

1. Installed additional energy efficiency equipment after participating in their respective product.
2. Not received rebates for this equipment (and not be in the process of applying for rebates).

[6] The 6/42 ratio is applied assuming that projects installed within 6 months are the same as installed at the same time, and beyond 42 months is assumed to be 100% not a free rider.

3. Been influenced to install this equipment by the Commercial or Process Efficiency Products.

The evaluation team computed savings estimates for all identified spillover equipment, then divided the total spillover savings by the Product's total energy savings to calculate the Product's Spillover Ratio.

To assess non-participating customer spillover, the evaluation team spoke with both trade partners and non-participating customers. The evaluation team quantified the savings from trade partners as it is identifying spillover from non-participating customers. It questioned non-participating customers to corroborate the general findings from trade partners that non-participant spillover exists. The team asked trade partners to quantify what percentage of eligible products they sold that did not receive a rebate and then to rate the importance of the product in achieving these sales. Trade partner spillover was included if the product importance was greater than 5 for sales that did not receive rebates.

3.2.3 Market Effects Adder

The final component to the NTGR was a Market Effects Adder. The Market Effects Adder estimated additional savings that could be attributed to the Product based on prolonged changes in the market due to the influence of the Product. Examples are stocking practices, trade partners knowledge about the technology and recommendation practices, and market acceptance of the technology. To understand market effects, the evaluation team asked trade partners about the impact of the Product on the overall energy-efficient lighting market for businesses in Xcel Energy's Colorado territory.

3.2.4 Determination of Retrospective Net-to-Gross Ratio

The evaluation team estimated the Product's initial NTGR by computing a Free-Ridership Score from a Program Influence Score, Counterfactual Score, and Q&T Adjustment (See Equation 3-1). Then it estimated spillover and market effects using customer and trade partner quantitative and qualitative information. Finally, the evaluation team utilized all the information collected about the Product (through participating customer surveys, non-participating customer surveys, and trade partner interviews) to construct a logical, internally consistent, and coherent narrative of Product attribution that attempted to identify all possible pathways of Xcel Energy influence. Based on these results, the team recommended a final summative NTGR that is consistent with this narrative. The evaluation team estimated the final NTGRs for the Product using the formula shown in Equation 3-3:

Equation 3-3: Generalized Net-to-Gross Ratio

$$NTGR = 1 - (Free\text{-}Ridership\ Score) + (Spillover\ Ratio) + (Market\ Effects\ Adder)$$

3.3 Retrospective Net-to-Gross Ratio Findings

As described in the approach section, the recommended retrospective NTGRs for the Product is based on three primary data inputs: the Free-Ridership Score, the Spillover Ratio, and the Market Effects Adder. This section explores each of these results in more detail, including qualitative data that support the results.

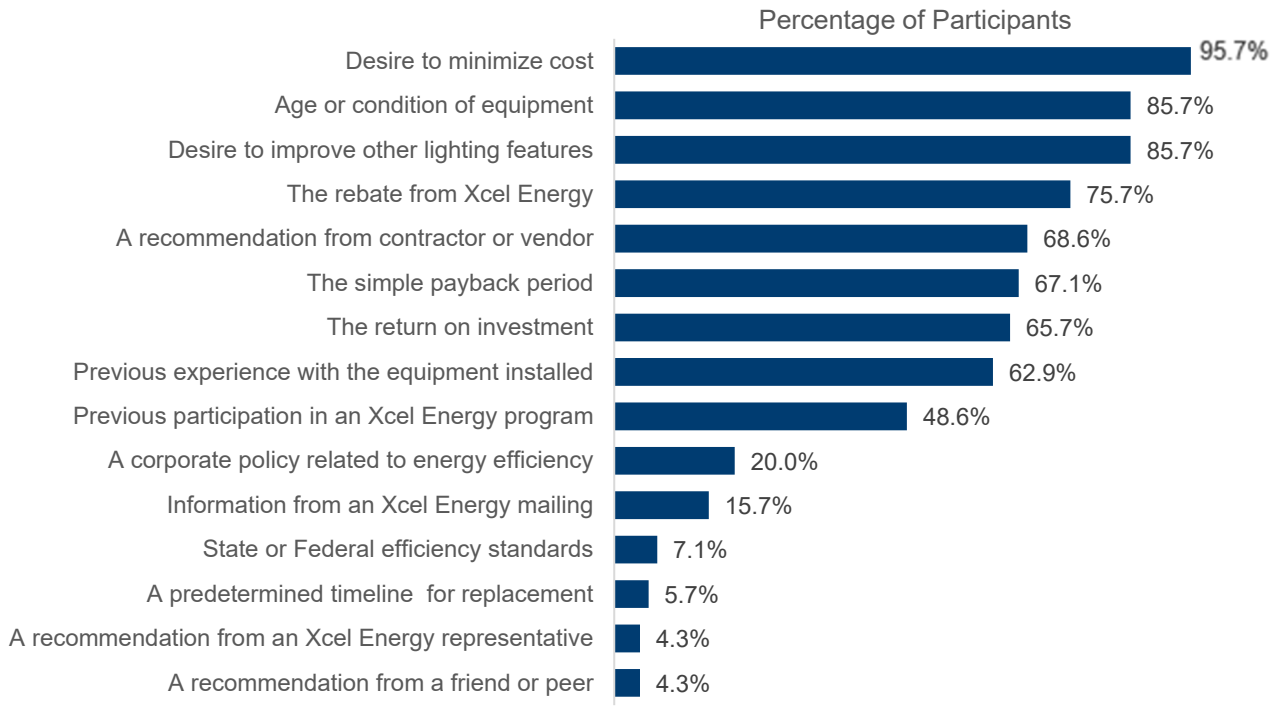
3.3.1 Free-Ridership Results

Free-ridership is a measure of the proportion of the Product's claimed energy efficiency savings that would have occurred in the absence of the Product. This section presents results related to the three metrics used to estimate the final weighted Free-Ridership Score of 0.29: the Product Influence Score, the Counterfactual Score, and the Q&T Adjustment.

Product Influence Score

As shown in Figure 3-1, participating customer respondents rated the following factors as being important to their decision to install high-efficiency equipment: desire to minimize cost, desire to improve other lighting features, the rebate, and age or condition of old equipment. This mixture of program and non-program factors reflect complex decision-making, with both types of factors playing important roles.

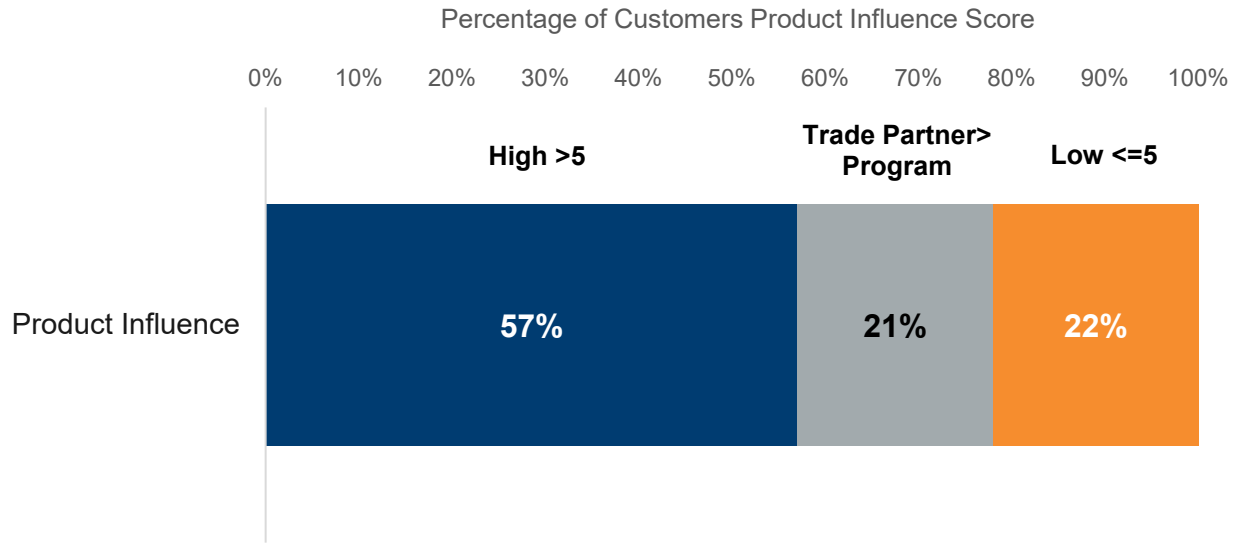
Figure 3-1: Influential Factors to Install Efficient Lighting Equipment, Rated by Participating Customers (n = 69)



Note: multiple responses were allowed

The distribution of the overall Product Influence Scores is shown in Figure 3-2. The majority (57%) rated the Product as highly influential, another 21% rated their trade partner as highly influential (who in turn rated the Product as highly influential), and then an additional 22% rated the program and trade partner influence as low (some of these with low scores referred to corporate or even state or local policies to reduce energy consumption as their reasoning).

Figure 3-2: Product Influence Score Distribution (n = 69)



To have matching scales with the Counterfactual Score, the evaluation team took the Product Influence Score, reversed the scale (making a "10" now a "0"), and divided by 10, so scores would fall between "0" and "1", and calculated an unweighted Product Influence Score of 0.29.

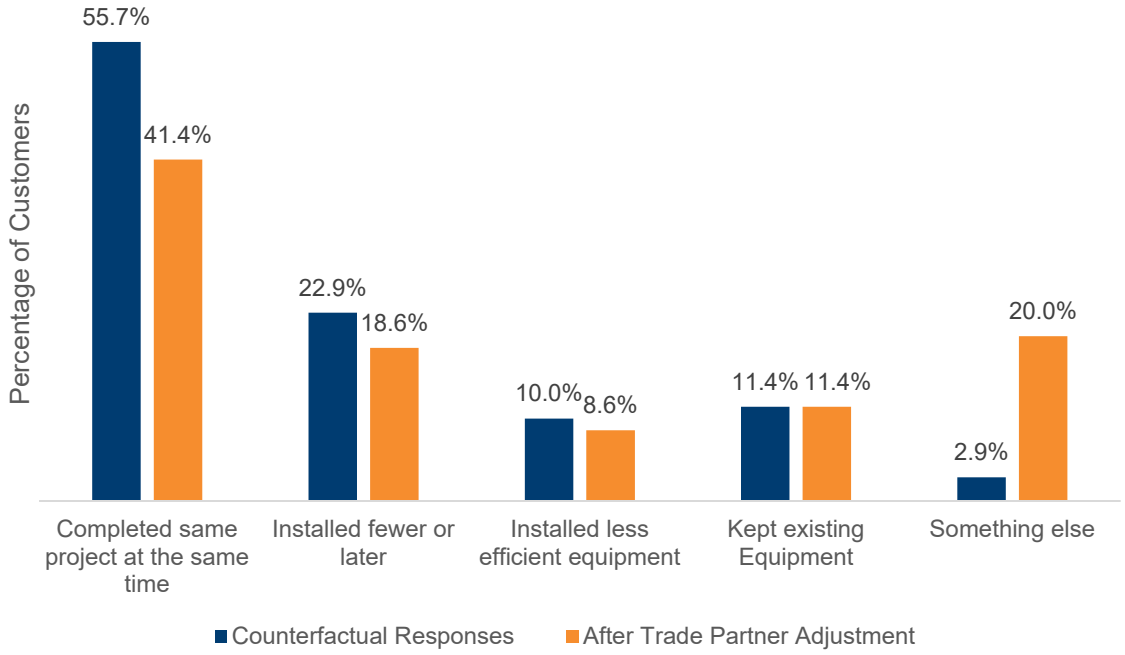
Counterfactual Score

As described in Section 3.2.1 the Counterfactual Score was based on scenarios offered to the respondent of what they are most likely to have done absent the Product. In contrast to the Program Influence Score, which asks how influential the Product was on a customer's decision to install equipment, the Counterfactual Score asks whether that decision would have been different absent the Product.

When asked what customers would have likely done if the Product did not exist, many customers reported they would have installed the same measure without the Product, as shown in Figure 3-3. A significant portion of those that indicated they would have installed the same measure had also indicated high trade-partner influence, and the scores were adjusted to the Trade Partner Score to account for these. Those customers indicating, they would have installed the same measure were also asked to rate the likelihood on a scale of 0 to 10 of doing the same. The average rating of these customers was 9.5. By applying the scores for each Counterfactual scenario as described in Section 3.2.1, the team calculated the average unweighted Counterfactual Score as 0.63.[7]

[7] Note that customers choosing the counterfactual scenario "I would have installed fewer measures or delayed" get a counterfactual score of 10, which gets adjusted during the Q&T adjustment stage.

Figure 3-3: Counterfactual Distribution (n = 69)



Q&T Adjustment

The evaluation team developed a Q&T Adjustment to overall free-ridership using survey responses. Unlike the Product Influence and Counterfactual Scores, which measure Product influence on equipment installation overall, the Q&T Adjustment measures whether the Product influenced the *quantity and timing* of equipment installation. To determine whether a Q&T Adjustment should be attributed to a participating customer, the evaluation team asked respondents whether they installed their equipment earlier than they otherwise would have due to the Product's influence.

When asked, 14 of 69 respondents reported installing either a larger quantity than planned or installing it earlier because of the Product. The evaluation team applied a Q&T Adjustment to all participating customers who chose the counterfactual scenario that they would have installed any portion of the equipment 6 months or later than when they actually installed it. The degree of their adjustment was determined by dividing the number of months installation was expedited by 3.5 years (42 months), as set by the Illinois TRM.[8]

The adjustment reduced the overall free-ridership scores of the 23 respondents indicating they installed more equipment or the same equipment earlier, by an average of 24%.

Free-Ridership Adjustments due to Follow-Up Participant Interviews

The evaluation team conducted follow-up interviews with participants to gather further insight into responses that were inconsistent or missing or to gather detailed information about potential

[8] The evaluation team applied this equation with the maximum amount expedited (42 months), reflecting 0% free-ridership for that portion of the project for which customers reportedly installed a larger quantity of the measure due to the Product.

spillover.[9] Eighteen customers did not respond to the follow-up question asking them to rate the likelihood on a scale of 0 to 10 that they would have installed the same measures at the same time absent the program. The team was able to reach eleven of these customers to obtain this additional information and then applied the average to the remaining seven.

Final Free-Ridership

To calculate the final Free-Ridership Score of 0.29, the evaluation team weighted each score by the total savings for each participant so that the score is representative of population-level savings. In other words, measures with a larger share of total kWh are weighted more heavily, as they have more influence on the total Product savings. In general, larger projects had lower free-ridership than smaller savings projects. Overall, the free-ridership on a weighted basis was lower than the unweighted result (0.43 vs. 0.29, respectively).

The evaluation team examined whether these final free-ridership scores varied based on different factors, such as rebate type, measure type, and number of measures, and whether the project received bonus incentives. No significant differences were found; however, our sample size was small to conduct stratified analysis.

3.4 Prospective Net-to-Gross Considerations

The evaluation team also examined market conditions and considered possible Product changes to recommend a prospective NTGR. Previous evaluations assumed a continued decline in NTGR because prices had dropped, saturation increased, and many lighting product dealers only offer LED products. All else being equal, these conditions would likely result in decreasing NTGRs over time. The Covid-19 pandemic has led to numerous disruptions in the market—increasing prices, supply constraints, and customer's economic outlook—that appear to have interrupted the normal evolution of market transformation. Trade partners suggested that the bonus rebates allowed them to make sales that otherwise wouldn't have occurred and addressed the increasing supply prices. Similarly, peer utilities also found that bonuses or higher rebates were necessary to meet their program goals. The evaluation team recommends the prospective NTGR equal retrospective of 0.81 due to the ongoing market disruptions of customer uncertainty, higher prices, and supply chain concerns.

3.5 Peer Utility Net-to-Gross Comparisons

The evaluation team reviewed peer utility NTGR's to better understand the context of the NTGR results. Nearly half of peer utilities do not calculate a NTGR and those that did used data several years old or included non-lighting measures. Given the evolving lighting market and pandemic disruptions, it is challenging to compare results from research conducted in different years. Only one utility conducted research using more recent 2021 data, and the NTGR included non-lighting measures (Table 3-1). Further, four of the nine peer utilities either deem NTGR at 1.0 or do not apply it for savings impacts.

[9] The initial survey had a problem with a skip pattern that was fixed after the first set of completions.

Table 3-1: Peer Utility NTGR

Program Administrator	NTGR	Methodology	Type	Year Applied/Year Data	Notes
Xcel CO	0.73	Participant surveys and trade partner interviews	Prospective	2021/2017	2018 evaluation
Xcel CO	0.81	Participant surveys and trade partner interviews	Prospective	Retrospective/2021	Current evaluation
A	0.27–0.96	Participant surveys, trade partner interviews	Prospective	2021/2016-2019	Midstream and downstream, varies by measure type and channel
B	0.82–0.87	Participant surveys	Retrospective	2022/2021	Lighting and HVAC
C	0.80	Participant, non-participant, and trade partner surveys	Prospective	2019/2018	--
D	1.0	Deemed	Prospective	NA	No NTG Research
E	0.87	Participant surveys	Retrospective	2020/2019	--
F	NR	Not reported (NR)	Upcoming	NA	Used for program design purposes only
G	1.0	Deemed	Prospective	NA	No NTG Research
H	0.84	Participant and non-participant surveys	Prospective	2019/2018	--
I	1.0	Deemed	Prospective	NA	No NTG Research

4 Process Evaluation

The evaluation team conducted a process evaluation to determine how Xcel Energy can optimize the design and delivery of the Product to its customers. Specific research objectives of the process evaluation are listed in the bullets below:

- Assess Product experience and opportunities for more comprehensive retrofits.
- Understand customer attitudes towards capital improvements and energy efficiency.
- Identify barriers and opportunities to increase adoption of NLCs.

To accomplish these objectives, the evaluation team elicited feedback from Product staff, customers, trade partners in the Xcel Energy Colorado territory, and peer utilities. This chapter presents key findings from the process evaluation, the evaluation team's approach to conducting the process evaluation, and specific findings relating to each evaluation objective. Within the sub-section for each objective, the evaluation team included data from all relevant data collection efforts. The synthesis of findings places an emphasis on helping Xcel Energy to interpret research findings and identify actionable opportunities for improving Product operations. These findings, along with findings from the impact evaluation, inform the conclusions and recommendations presented in the final chapter.

4.1 Key Findings

The evaluation team found that, overall, the Colorado Lighting Efficiency Product is well established, with strong trade partner and customer participation year-over-year. Challenges from the Covid-19 pandemic such as customer uncertainty, supply disruptions, inflation, have resulted in difficulties meeting overall Product goals. Despite these challenges, customers and trade partners both noted high satisfaction with the Product. Additional key findings associated with each objective from the process evaluation research included:

- **Assess Product experience and opportunities for more comprehensive retrofits:** Customers (including non-participant customers who had previously participated) are highly satisfied with the Product. Trade partners are also very satisfied with the Product and especially appreciated the bonus rebates to offset increased costs and challenges due to supply chain disruptions and inflation. Both customers and trade partners expressed a desire for a broader array of products available through the program and more communication from Xcel Energy. Trade partners would like to "catch up" from the pandemic with more trainings about the Product.
- **Understand customer attitudes towards capital improvements and energy efficiency:** Both participating and non-participating customers are primarily motivated to improve lighting energy efficiency when equipment needs replacement (rather than before), although with enough economic value they can be convinced to replace systems early. The Covid-19 pandemic significantly affected the willingness of some customers to invest in any upgrade. Trade partners and peer utilities also found it challenging to sell energy efficiency investments during this period.

- **Identify barriers and opportunities to increase adoption of NLCs:** The largest barrier to customers around NLCs is awareness of both the technology and available rebates. However, trade partners are typically aware of the technology and reported numerous customer concerns such as complexity, cost, reliability, and maintenance. Many peer utilities are also trying to promote this technology and find that high incentives and continued education are key factors in the acceptance.

The remainder of this chapter presents detailed findings related to each objective.

4.2 Product Experience and Opportunities for More Comprehensive Retrofits

Both customers and trade partners reported positive experiences with the Product, which were primarily driven by assistance from trade partners, who most often work directly with customers to identify and obtain the incentives. Both customers and trade partners also offered suggestions on how the Product could be improved. This section presents results relating to Product experience, comprehensiveness, Product awareness, and motivations and benefits of Product participation.

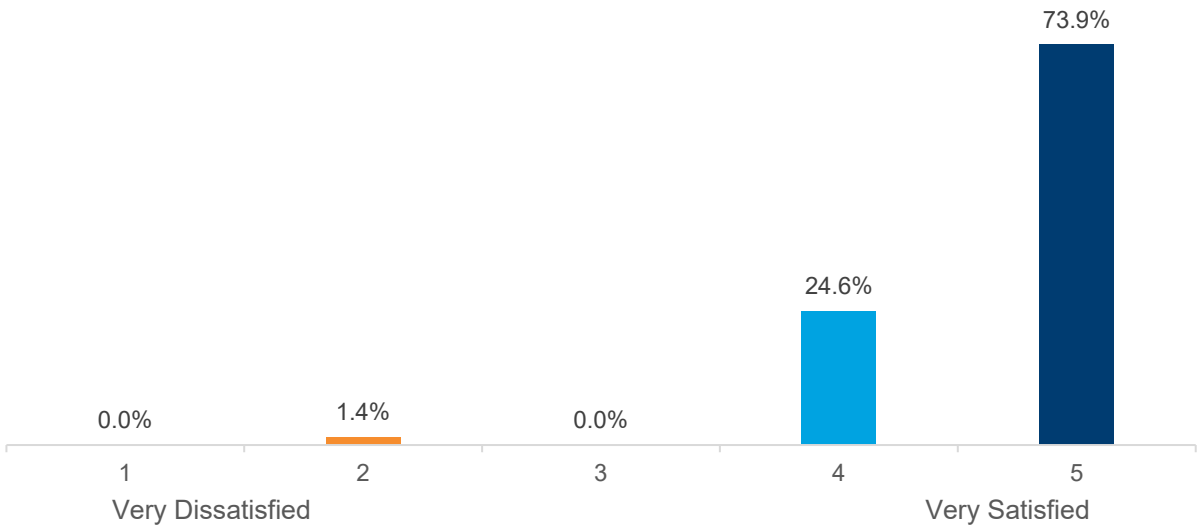
4.2.1 Product Experience

Customers and trade partners report high levels of satisfaction with the Product. Some customers and trade partners would like more communication from Xcel Energy, and trade partners specifically asked for more training around the Product. Both customers and trade partners would like to see a broader array of options eligible for rebates. The next sections provide more detailed findings from participating customer survey respondents, trade partners, non-participants, and peer utility experiences with similar programs.

Participating Customer Satisfaction

Participating customer survey respondents are very satisfied with the Product overall, providing an average rating of 4.7 out of 5, where 1 meant “very dissatisfied” and 5 meant “very satisfied (Figure 4-1). The majority of respondents (73.9%) reported being very satisfied with the Product overall, and only one customer considered themselves “dissatisfied”. This respondent mentioned issues with finding consistent Xcel Energy staff to help them through the application process.

Figure 4-1: Overall Participating Customer Respondent Product Satisfaction



When asked about various aspects of the Product, respondents provided similarly high satisfaction average rates to each component, including rebate amounts, the range of available equipment, and the ease of understanding product requirements, with a minimum satisfaction score of 4.5. (Figure 4-2).

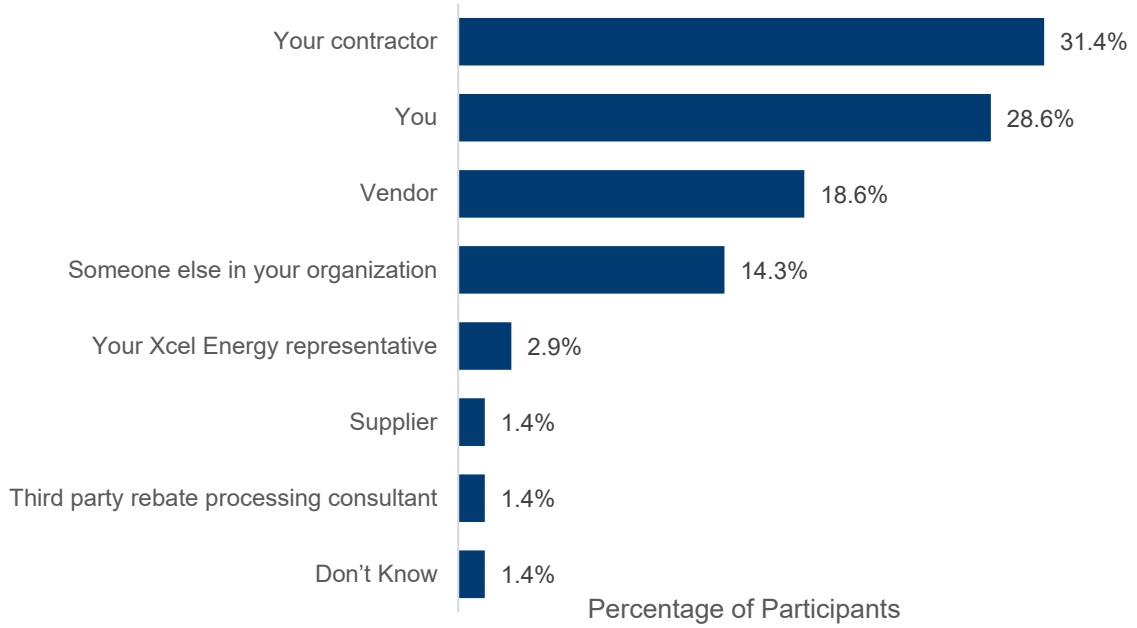
While most customers were satisfied with the Product overall it's respective components, some respondents provided feedback concerning areas where Xcel Energy could improve the program, including through more communication, simpler forms, and more types of equipment offerings. Some examples of comments included the following:

- *"Making it easier to understand, so we don't have to rely on the contractor to interpret it* for us."
- "If they could send some guidance or a rep out and communicate with me directly, I probably *could take advantage of more of their incentives."*

Figure 4-2: Average Participating Customer Satisfaction with Product Elements (n=70)

As shown in Figure 4-3, about one-third (31.4%) of survey respondents had the trade partner fill out the rebate application, while approximately another third (28.6%) of survey respondents filled out the majority of the rebate application themselves. Comparatively fewer respondents indicated that they had a vendor complete the application (18.6%), that the application was completed by someone else in the organization (14.3%), or that they had someone else fill out the application (5.7%).

Figure 4-3: Who Completed Rebate Application (n=70)



As Xcel Energy had recently added an online option for rebate application, the evaluation team asked for related customer feedback. Of the participants who had a rebate that was not a part of a new construction project, 72.5% submitted their rebate application using a preprinted form. The other 27.5% used the online portal. Of those who used a preprinted form, about a third (35.7%) were aware of the online rebate application portal, and the other 64.2% were unaware of the portal. When asked why participants chose the preprinted form over the online portal, responses included:

- *"Because the fixtures I purchased did not match that as on their form."*
- *"Because they were given to me by the contractor."*
- *"I didn't want to get timed out."*
- *"I read it is easier that way."*
- *"It's what I did before."*

The median amount of time to fill out the application forms fell between 16 to 30 minutes. The average satisfaction with the application process on a scale of 1 to 5 was 4.6.

Xcel Energy offers custom rebate participants the option to submit a pre-approval form to document the intent to submit for a rebate without having to wait for the full review of the project and approval of savings. Of the three surveyed custom participants, not one was aware that there was an option to submit either a pre-approval form to calculate their rebate or a signed application form to record their intent to apply for a rebate.

Trade Partner Experience

Through the evaluation team's interviews with both active and inactive trade partners, the team learned that most trade partners are happy with the program and are actively engaged with it.

- On average, 92% of fixtures and kits reportedly sold by trade partners are eligible for rebates.
- Trade partners compared Xcel Energy's Product favorably to that of other utilities: almost universally, Xcel Energy's Product rates higher than the smaller utilities around Colorado. Trade partners rated the Xcel Energy Product as good overall, with 11% (3 of 27) declaring it "great", and 59% (16 of 27) rating it as "good".
- Trade partners reported bonus rebates helped motivate customers and secure more business. Trade partners would like to see bonuses continue, especially in the wake of substantial lighting equipment price increases. Six (6) of 32 trade partners in Colorado reported increased business from the bonus rebates, while 4 did not know about them.
- Many trade partners avoid the custom path due to its complexity and 71% did not know about the changes to allow for a quick "pre-approval" process.
- The majority (70%) felt they could benefit from training, networking, and more communication.
- Nine (9) of 42 trade partners noted difficulties communicating with Xcel Energy, complaining of slow turnaround times and responses.
- Several trade partners suggested Xcel Energy establish a single point of contact who can get back to them in a timely manner.

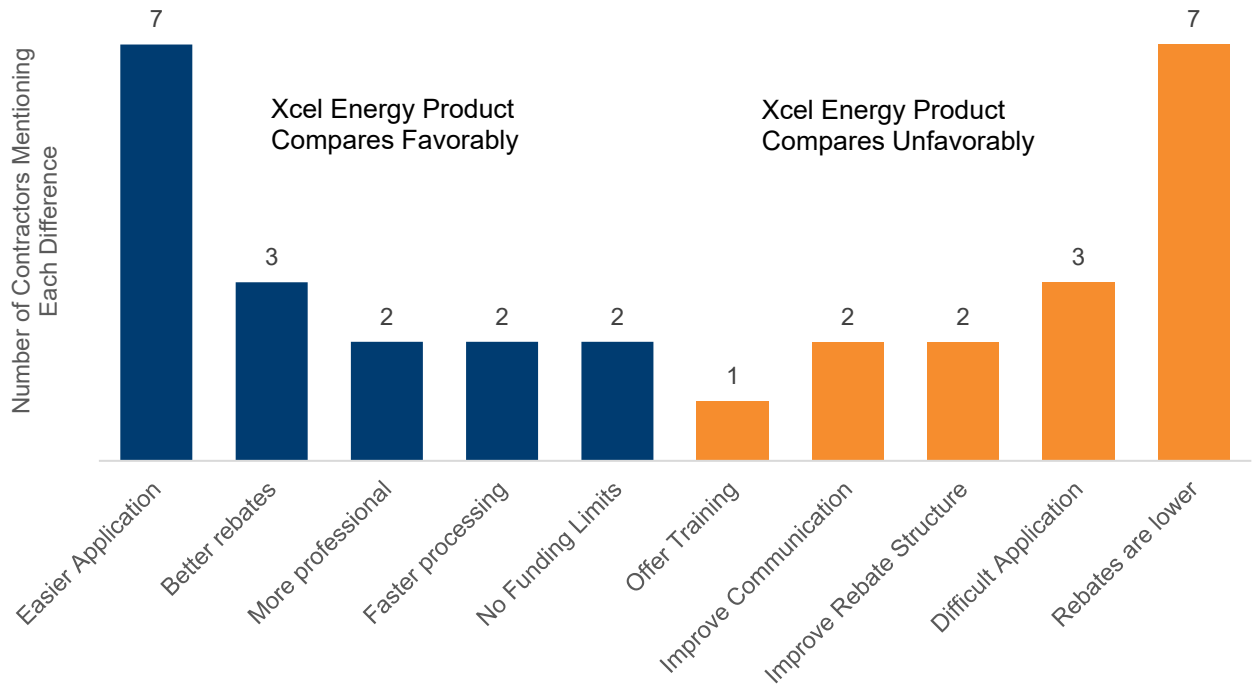
Specific comments relating to these findings are:

- *"[It would be] nice to have 2x a year refresher ... the tech is changing all the time, rapidly, and our sales staff don't always understand the change."*
- *"[the custom application] is lots of paperwork, time and cost prohibitive."*
- *"Covid really stopped a lot of our projects that were in the works… Even in 2021 some jobs didn't continue."*

Figure 4-4 presents trade partners open-ended comments comparing Xcel Energy's Product to others with which they are familiar, along with the number of trade partners who volunteered each comparison point. (Blue bars on the left are areas where Xcel Energy compared favorably to others, while orange bars on the right are areas where Xcel Energy did not compare favorably.) Trade partners complimented many aspects of Xcel Energy's Product. Several felt the application was easier and the requirements were less stringent than other utilities. Others felt the application was difficult, with one saying that inputting a 34-page invoice, including

splitting out costs and providing part numbers per product and per location, is tedious and time consuming. A couple of trade partners noted faster processing times than other utilities, with one saying an Xcel Energy rebate takes 4 to 6 weeks, while other utilities can take 9 months. Trade partners felt that Colorado municipal utilities were better with communication but appreciated that Xcel Energy does not have the annual rebate funding limits most the municipal utilities maintain.

Figure 4-4: Points of Comparison, Xcel Energy Product v. Other Utilities (n=27)



Note: Multiple responses allowed.

Some specific comments by contractors include the following:

- *"If Texas gives me a $5k incentive, I don't submit because they are a pain. If Xcel gives me $1k - $3k I'll submit it. It always works."*
- *"Other utilities make rebates based on watts saved, in some ways that is much easier...There are reverse incentives with the minimum wattage, a 30w fixture has no rebate, so people will sell the 35w fixture that has a rebate."*

Most trade partners (78%) say they always fill out and submit rebate applications on customers' behalf (slightly less than half of customers state they submit the applications themselves, so it may be that customers and trade partners are both involved). Almost half of trade partners submit their applications online, with some reporting it is straightforward and pretty simple. Others indicated they would like the online applications to be more user friendly, provide status

updates, save their work-in-progress, and allow for DocuSign and a contact option for Xcel Energy.

Peer Utility Experiences

Xcel Energy's Product compares similarly to peer utility programs in that most offer separate downstream and midstream channels. Beyond this structure the program designs can vary widely in terms of whether measures overlap between the two channels. Most programs do not overlap measures; however, some list the same measure in both channels, but do not allow customers to collect rebates in both channels. Another structure difference is whether the lighting program is embedded in an overall business program or separate by technology (most are combined into one business program however some are lighting only). Peer utilities differ in rebate structure with some offering simply $/kW or $/kWh rebates and others consider a more nuanced design by technology, considering cost-effectiveness, incremental cost, and customer uptake in addition to savings. In comparing a sample of specific technologies, the evaluation team found that Xcel Energy's rebates were neither the highest nor lowest in comparison to peers, with the exception of occupancy sensors, in which Xcel Energy's incentives were the lowest.

4.2.2 Comprehensiveness

To assess opportunities to encourage customers to install more measures and achieve greater savings, the evaluation team noted whether customers were satisfied with the range of measures offered. In the follow-up to satisfaction questions of participating customers, a few customers noted they would like to see more types of equipment offered.

- *"I think the ranges were too narrow and the options were too few."*
- *"[Would like to see] offering for smaller fixtures."*

The evaluation team also noted where nonparticipating customers mentioned equipment eligibility. Some nonparticipants who had considered and then chose not to participate mentioned limited equipment eligibility as a reason they did not participate.

While customer feedback was general about wanting a broader selection of rebate-eligible equipment, trade partners identified specific technologies they would like to see included. Several trade partners responding to the question identified NLCs as a growth opportunity. Other suggestions were smaller wattage fixtures, LED tape lights, selectable wattage and color temperature fixtures, RGB LEDs, and germicidal UV fixtures. As noted in 4.2.1, trade partners would like more communication, and any updates to available equipment list should be communicated to make customers and trade partners aware.

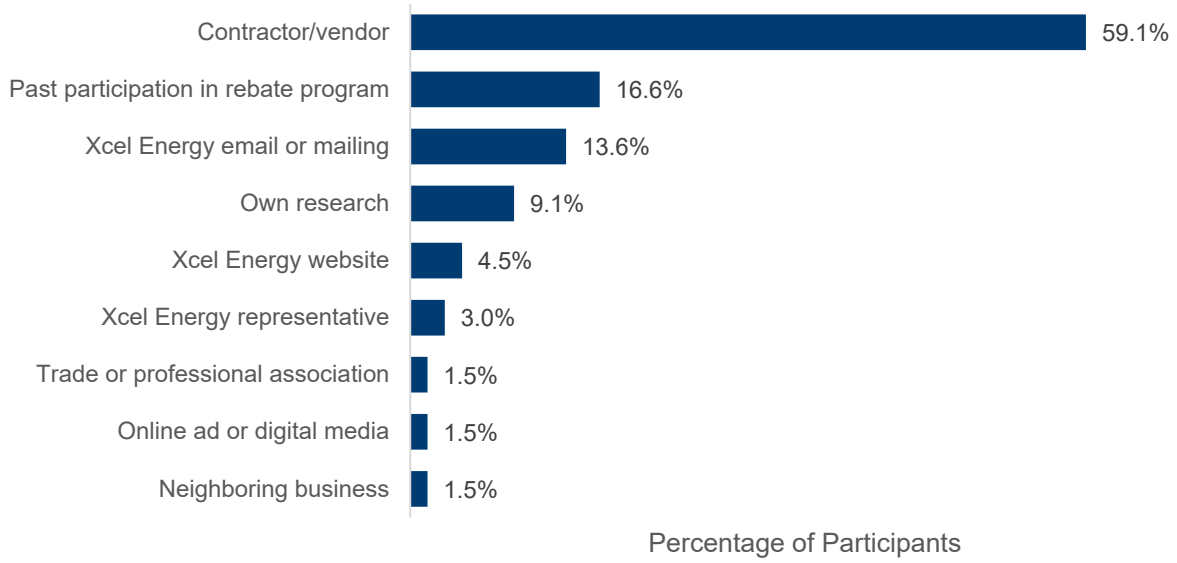
4.2.3 Product Awareness

The following section describes customer and trade partner awareness of knowledge of the Product. Participating customers commonly reported learning about the Product through trade partners, and most trade partners report always or usually mentioning the Product to customers.

Participating Customer Awareness

As shown in Figure 4-5, more than half of the participants (59.1%) learned about the lighting rebates from their contractor or vendor. Another 16.6% knew about the rebates from past participation in the Product, and 13.6% indicated that they learned about the product from an Xcel Energy email or mailing.

Figure 4-5: How Participants Learned About Available Rebates (n=66)



Note: Multiple responses allowed.

Participants were also asked about their awareness of other lighting products offered by Xcel Energy. Most of the participants (62.9%) were not aware that Xcel Energy also offered discounted replacement lamps through partner distributors. Of those who were aware, only 15.4% had purchased or considered purchasing lamps using the discounts available. Of the four participants in the lamp discount product, only one had any challenges in participating, which was due to cost.

Similarly, of the participants who had a prescriptive rebate, most (69.2%) were also not aware that Xcel Energy offered custom rebates on a per-kWh-saved basis for energy efficient lighting projects that do not fit into the prescriptive rebate structure.

Finally, 60% of the participants who had a custom rebate were not aware that Xcel Energy offered fast and easy prescriptive rebates for certain common high-efficiency fixtures that do not require preapproval.

Non-Participating Customer Awareness

Most non-participants (69.8%) had heard of Xcel Energy's Product. While non-participating customers were defined as those not completing a project since 2016, 28.3% (15 of 53) reported previously participating in the Colorado Lighting Efficiency Product (presumably prior to

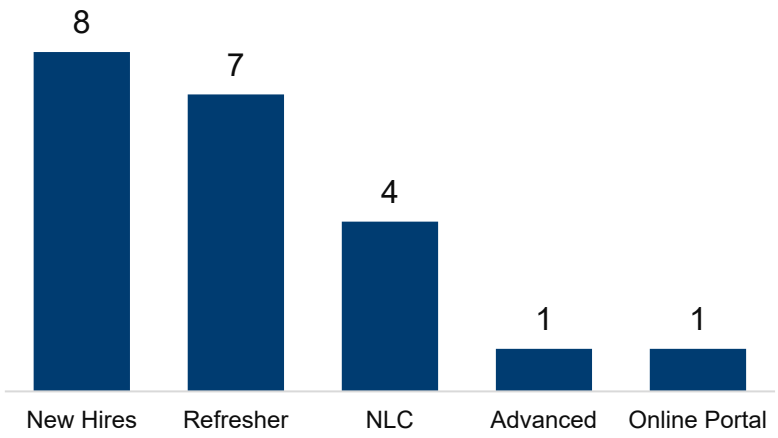
2017). These customers report being largely satisfied (4.3 rating out of 5.0). Of those who had not previously participated, 9.6% had considered participating but did not. Reasons cited by some who had considered and then chose not to participate included limited equipment eligibility and insufficient rebate amounts.

Trade Partner Awareness and Understanding

Trade partners are highly engaged with the Product, as active trade partners reported an average of 92% of fixtures and retrofit kits sold are eligible for rebates. Seventy-six percent of all trade partners interviewed said they always mention the Product to customers. Trade partners indicated a strong understanding of the Product, with over 70% indicating they know the Product well or very well; however, most trade partners also requested more training from Xcel Energy on the Product. Trade partners stay up to date on program changes via email or contact with an Xcel Energy representative.

Sixty-two percent (23 of 37) of trade partners felt they or their staff could benefit from training. Of those expressing an interest in training, 4 of 23 (17%) preferred online training, and another 4 preferred in-person trainings. The training topics of interest to trade partners are included in Figure 4-6 with a general class for new hires and a general "refresher" class identified as the top topics of interest.

Figure 4-6: Topics of Interest for Trade Partner Training (n=23)



Note: Multiple responses allowed

Even some trade partners uninterested in training said they would like to join a lunch and learn in their community or a larger, more central event. They feel disconnected from the Product after two pandemic years and have an interest in stronger connections to the Product and opportunities to network with Xcel Energy and other trade partners.

4.2.4 Motivation and Benefits of Product Participation

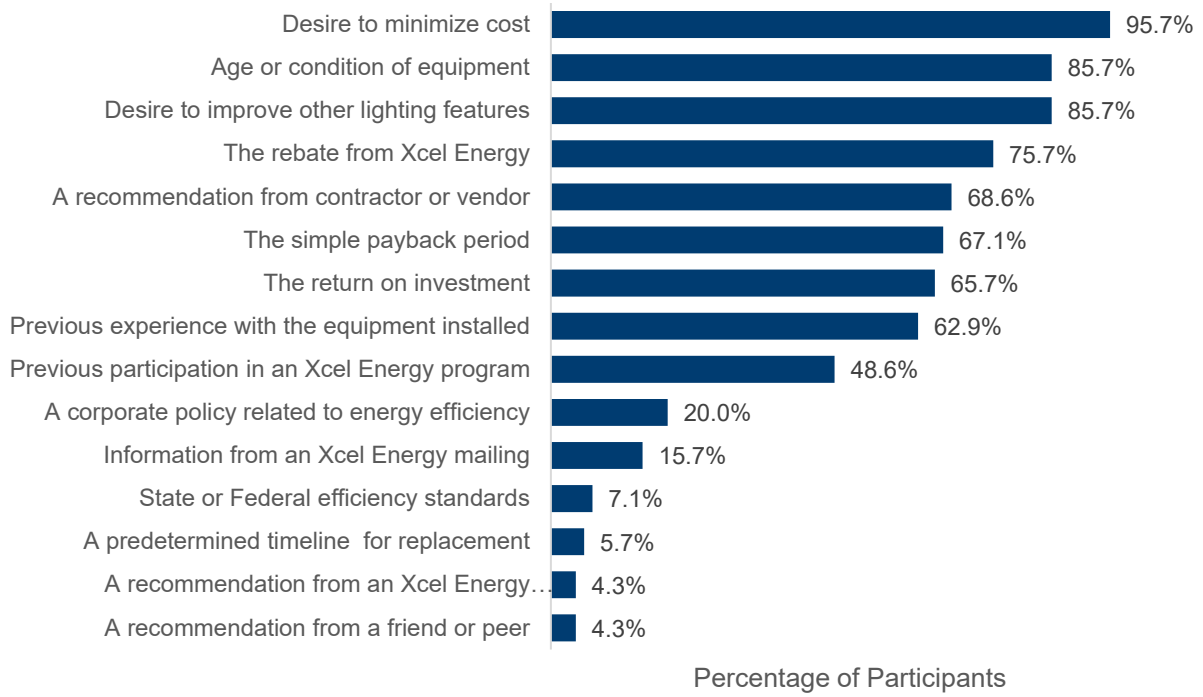
The evaluation team collected feedback on what motivates customers to install energy-efficient lighting through participating and non-participating customer surveys and trade partner interviews. A better understanding of customers' motivation to participate in the Product helps

pinpoint where there may be opportunities to target additional marketing or support to grow the Product over time. These results highlight how participating customers were primarily motivated by a need to replace their current equipment and the economics around upgrading to energy efficient lighting. Trade partners report being motivated by opportunities to help their customers with better equipment and increase their lighting sales. Responses from each market actor are summarized in the following sections.

Participating Customer Motivations

Findings related to participating customers' motivations to install energy-efficient lighting included both economics and other benefits. As shown in Figure 4-7, the four most important factors that influenced a participant's decision to install a measure were 1) minimizing operating costs (95.7%), 2) age or condition of equipment (85.7%), 3) the desire to improve other lighting features (85.7%), and 4) the rebate from Xcel Energy (75.7%).

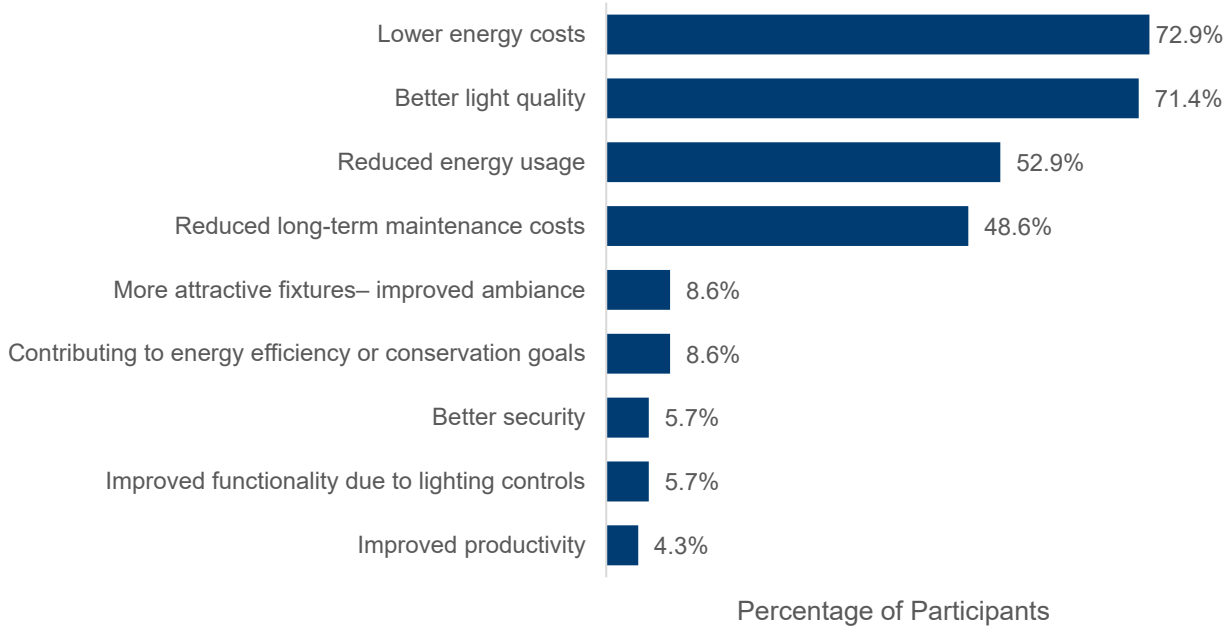
Figure 4-7: Factors in Deciding to Install Rebate Eligible Lighting Equipment (n=70)



Note: Multiple responses allowed

Participants were asked about what benefits they expected in pursuing their projects. Of all the benefits from the new equipment installed in their project, the participants were mostly expecting 1) lower energy costs, 2) better light quality, and 3) reduced energy usage. The expected benefits are listed in Figure 4-8.

Figure 4-8: Expected Benefits from New Lighting Equipment (n=70)



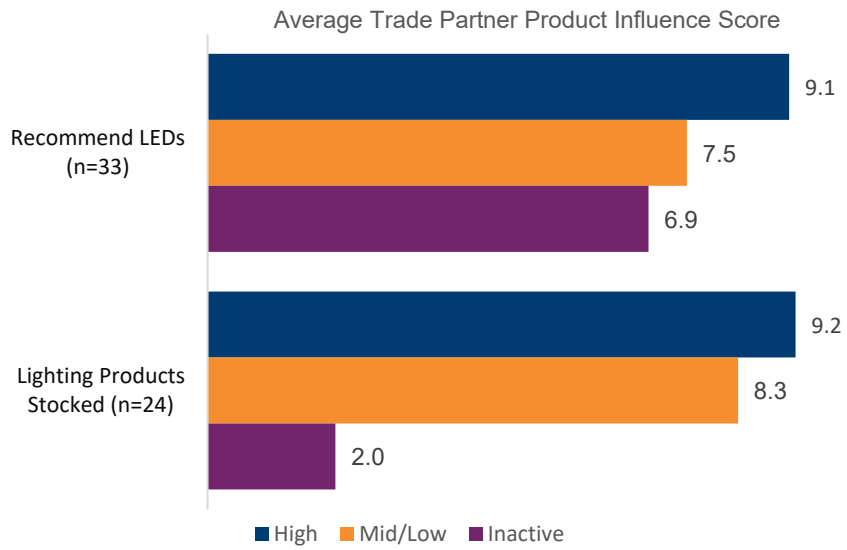
Participating Trade Partner Motivations

Most trade partners have built their businesses or a portion thereof around Xcel Energy's Product, and tailor their lighting recommendations and lighting designs to maximize customer rebate opportunities. The evaluation team investigated the impact of the Product on the decisions of trade partners to recommend and stock LED lighting. Trade partners answered on a scale of 0 (not at all important) to 10 (extremely important) the importance of the Product on:

- Trade partners decision to recommend eligible LED lighting to customers.
- Deciding which lighting products trade partners stock as a whole.

Overall, the Product had a strong impact on trade partners, especially in their choice to recommend LED lighting to customers. Figure 4-9 displays product influences for high performing, mid/low performing, and inactive trade partners (See Section 2.5 for definitions).

Figure 4-9: Product Influences on Trade Partners



The team also asked trade partners to rate the importance of past participation in the Product on their recommendations to customers. Highly active trade partners averaged a rating of 9.6; mid/low trade partners, 7.2; and inactive trade partners, 6.8.

The impact of the Product on trade partners was high overall, with high performers being most influenced by the Product in each area. This is unsurprising, given their level of participation and their reported high levels of satisfaction. The Product influence over mid/low performers was slightly less than high performers, in part due to two electrical contractors and one distributor who rated the influence of the program lower. Those trade partners working mostly as lighting contractors stated higher levels of influence from the Product. Inactive trade partners report being influenced by the Product, especially on their decision to recommend rebate-eligible lighting to customers. Four inactive trade partners are electrical contractors and manufacturers who do not normally stock products.

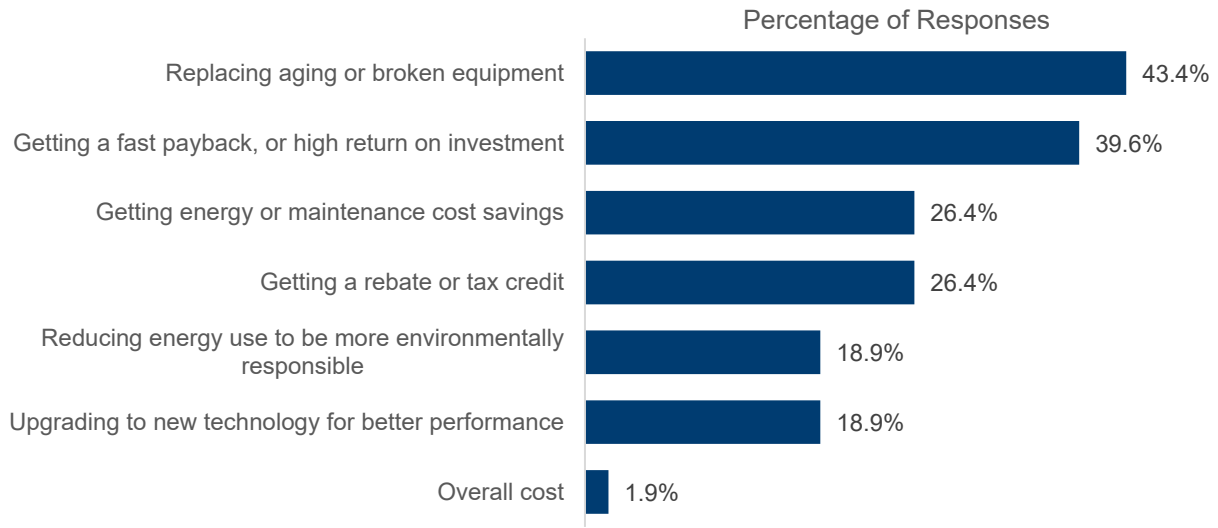
4.3 Attitudes and Barriers Towards Capital Improvements and Energy Efficiency

The previous section about Product experience discussed influences and benefits to participation in the Product. This section describes barriers to participation as noted by non-participating customers and the recent impacts on both customers and trade partners from the Covid-19 pandemic. The most common general barrier noted by non-participant customers is that existing equipment is still working and does not need replacement. These customers did note that a fast-payback project could motivate them to replace equipment early. Otherwise, non-participating customers reported being more reluctant to invest in upgrades during the Covid-19 pandemic (39.6%) than participating customers (11.4%). Further, trade partners confirmed that issues associated with the pandemic have greatly affected their business due to customer uncertainty, supply disruptions, and inflation.

4.3.1 Non-Participating Customer Attitudes and Barriers

The evaluation team wanted insights into what motivates non-participating customers to make an energy efficient upgrade and whether they experienced significant barriers. Non-participating customers indicate they are most likely to install energy efficient equipment if they are 1) replacing aging or broken equipment, 2) getting a fast payback or high ROI, or 3) getting energy or maintenance cost savings. These results are shown in Figure 4-10.

Figure 4-10: Motivating Factors to Make an Efficient Upgrade (n=53)



Note: Multiple responses allowed

These non-participating customers were also asked if their organization had a specific energy efficiency or conservation goal to reduce energy use. About a quarter (22.6%) responded that they did have a goal or policy in place, while 75.5% did not (the rest were unsure).

When asked to rate common barriers on the accuracy of how well they apply to a respondent's facility (on a scale of 1 to 5 with 1 being "not at all accurate" and 5 being "very accurate"), none of the barriers were scored above 3. As seen in Figure 4-11, non-participants rated the barrier "facilities have already made all the energy improvements that they could" as the most accurate (2.6 out of 5).

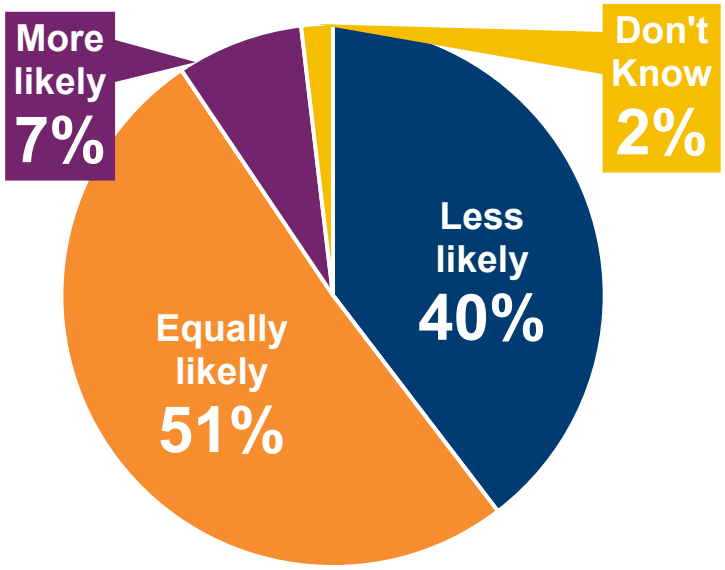
Figure 4-11: Non-Participant Barriers to Energy Efficient Improvements

Note: "Not applicable" responses were removed from the counts

4.3.2 Impacts of Covid-19 Pandemic

The evaluation team asked several questions about the Covid-19 pandemic and found that it presented significant barriers to nonparticipants in recent years. As shown in Figure 4-12, 39.6% responded that the organization was less likely to invest in improvement projects, and 7.5% responded that they were more likely to invest in improvement projects. As a comparison, 11.4% of participating customers responded to the same question that they were less likely to invest in business upgrades in 2020 and 2021.

Figure 4-12: Non-Participating Customer Impacts of Covid-19 (n=53)



Trade partners also reported significant impacts from the Covid-19 pandemic. Most trade partners had their business interrupted. While some saw their businesses come back in the fall of 2020 and make up for initial losses, 62% saw an overall decline in business for 2020. Trade partners were also plagued by several issues affecting all businesses starting in late 2020 and continuing into 2022, including supply chain delays, multiple and continued increases in equipment prices, and labor shortages. Equipment shipping delays were particularly disruptive to trade partners during the pandemic, as they reported shipping delays ranging from 4 weeks to 6 months. Staff time had to be spent locating shipments, identifying alternative lighting equipment, and finding new suppliers; several trade partners even closed their businesses.[10]

Some of these issues continue today, and combined with inflation and potential economic recession, are still affecting some trade partners and their customers. Trade partners suffering losses in 2020 indicated their customers felt uncertain about their future and were hesitant to invest in anything non-essential. Comments from trade partners indicated uneven impacts from the pandemic:

- *"Initially, huge impact… Late August 2020, all the holds turned to green lights. September through December made up all the earlier losses."*
- *"Covid really stopped a lot of our projects that were in the works… Even in 2021 some jobs didn't continue."*

Looking forward, trade partners voiced concern about on-going supply chain challenges (63%, 19 of 30) and labor shortages (43%, 13 of 30), with inflation as the concern most impacting customer interest in lighting upgrades. Three trade partners indicated they are still waiting on stock for jobs that are up to 4 months overdue. Some are moving customers to different fixtures that can be secured faster, while others are ordering more stock to have on hand—both to help with shipping delays and to stay ahead of price increases. Trade partners responded to

[10] The evaluation team found 5% of trade partners listed with Xcel Energy were closed as of September 2022.

increased lighting equipment prices by 1) switching manufacturers for some items, 2) including expiration dates on bids, and 3) proposing and selling more LED lamps instead of the more costly fixture replacement. Four trade partners pivoted their business to different market segments to keep busy, two moved from serving private industry to government and school buildings, and two pivoted a portion of their business to new construction.

Peer utilities also faced similar challenges in meeting their program goals during the pandemic. Most responded by raising incentives, either through bonuses or raising incentives or adding trade partner-specific incentives. Several peer utilities fell short of 2021 savings goals and most also set lower goals for 2022.

4.4 Barriers and Opportunities to Increased Adoption of Networked Lighting Controls

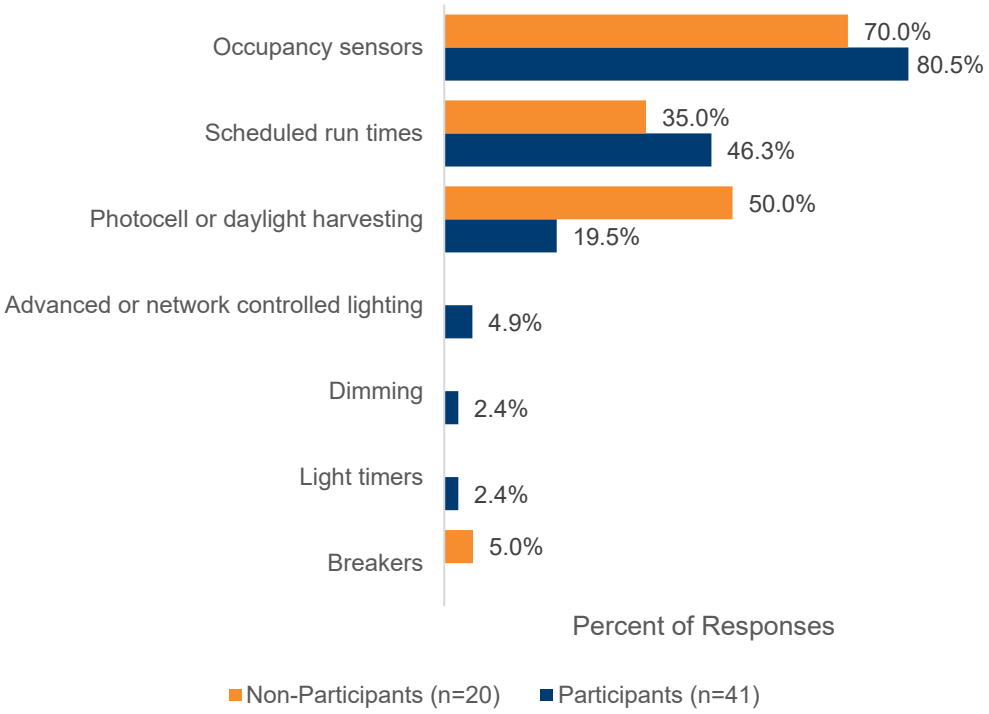
Lighting Efficiency Product staff were interested in understanding how to increase participation in NLCs. Overall, customers, trade partners, and peer utilities indicated that education and higher incentives were needed to increase adoption. Trade partners requested more training on how customers can use controls and how the program can help. Peer utilities that have found success have focused on having prescriptive incentives that differentiate fixtures with and without controls and educating trade partners and customers as much as possible. The customers installing controls through the Product were satisfied, felt that rebates were important to their decision, and were mostly educated on the systems before purchasing.

This section describes feedback from customers participating in the Product, non-participating customers, in-depth interviews with customers who have installed NLCs through the Produce, trade partners, and peer utilities.

4.4.1 Participating and Nonparticipating Customer Perspectives on Networked Lighting Controls

The evaluation team asked customers about current usage of controls, awareness of NLCs and Xcel Energy's incentives, and reasons for not using controls. A majority (59.3%, 41 of 69) of participants and 38.5% of nonparticipants have some type of lighting controls installed on the interior of their facility. As shown in Figure 4-13, of the facilities that used lighting controls, 80.5% of participants and 70% of nonparticipants used occupancy sensors, 46.3% of participants and 35.0% of nonparticipants had scheduled run-times implemented, and 19.5% of participants and 50.0 % of nonparticipants used photocell or daylight harvesting.

Figure 4-13: Type of Lighting Controls Installed (n=20, 41)



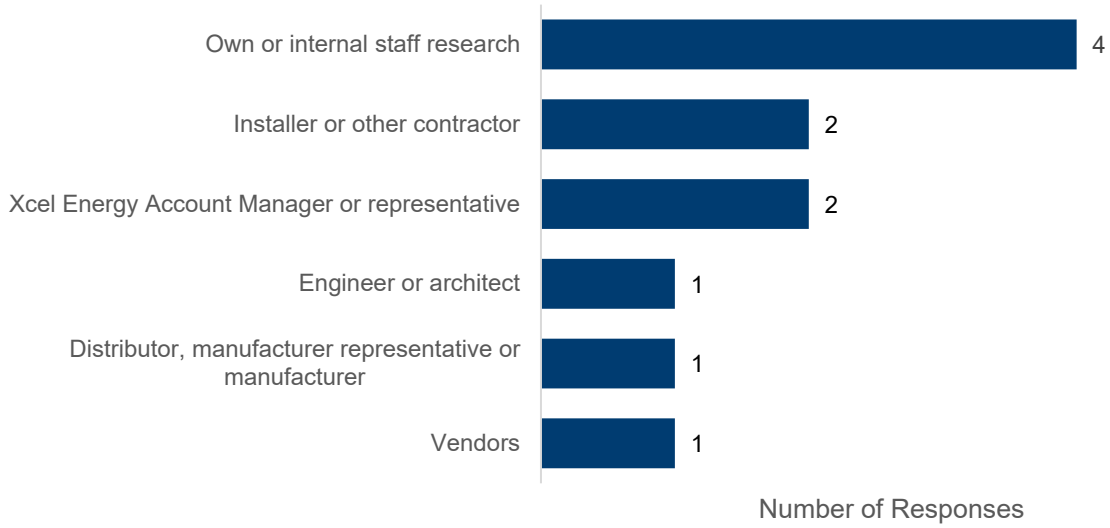
Note: Multiple responses allowed

More than two-thirds of participants (67.6%) and nonparticipants (66%) had not heard of NLC systems. Of the respondents who were familiar with these systems, 54.2% of participants and 76.5% of nonparticipants did not know that Xcel Energy offered rebates for them. Additionally, 81.3% of the participant respondents who knew about NLCs claimed that their contractor did not suggest a NLC system, while 18.7% reported that their contractor did suggest this.

Of those participant respondents aware of the systems, when asked why they did not install NLCs, the top three responses were: 1) no need for occupancy sensors or dimming, or centralized remote control, 2) cost, and 3) facility running constantly so lighting controls would not be feasible.

The nonparticipant customers who had heard of networked controls were asked if they had ever researched or considered installing them. Most (70.6%) said they had not. Those who had considered installing NLCs were then asked a series of questions. First, they were questioned about what resources they found most helpful when considering the installation. The most helpful resource to the customers was the research they did themselves and the help of their contractor or an Xcel Energy representative (Figure 4-14).

Figure 4-14: Helpful Resources when Considering NLCs (n=7)



The evaluation team next asked the nonparticipant customers who had researched NLCs if they had faced any challenges during their research. Of the seven customers responding, five indicated that determining the cost was an issue, three were concerned about understanding different equipment and programming options, two were concerned about compatibility with existing fixtures, and two were concerned whether staff could operate the system. The team also asked why these customers decided against controls and the reasons noted were 1) cost, 2) no need, 3) haven't gotten to it yet, and 4) not a priority.

Finally, the evaluation team asked what might motivate their organization to install these controls in the future. The top three motivations would be 1) lower cost of equipment, 2) greater energy savings, and 3) easier operation by in-house staff.

4.4.2 Customers Participating with Network Lighting Controls Incentives through the Lighting Efficiency Product Perspectives

The evaluation team conducted three in-depth interviews with NLC participants to explore topics related to their installation including the following:

- Benefits, obstacles, and how they overcame obstacles.
- Importance of rebates for their decision.
- Who was involved in the decision and what resources were helpful.
- Details around installation and operations experience.

The three respondents included a manufacturing facility and distribution center, both with 24-hour operation, and a property managed multi-tenant building with office and retail space.

The three participants all considered upfront cost as the primary obstacle and energy cost savings to be the primary benefit. One of the three also noted having data about their electricity use and flexibility of system programming to be of major benefit.

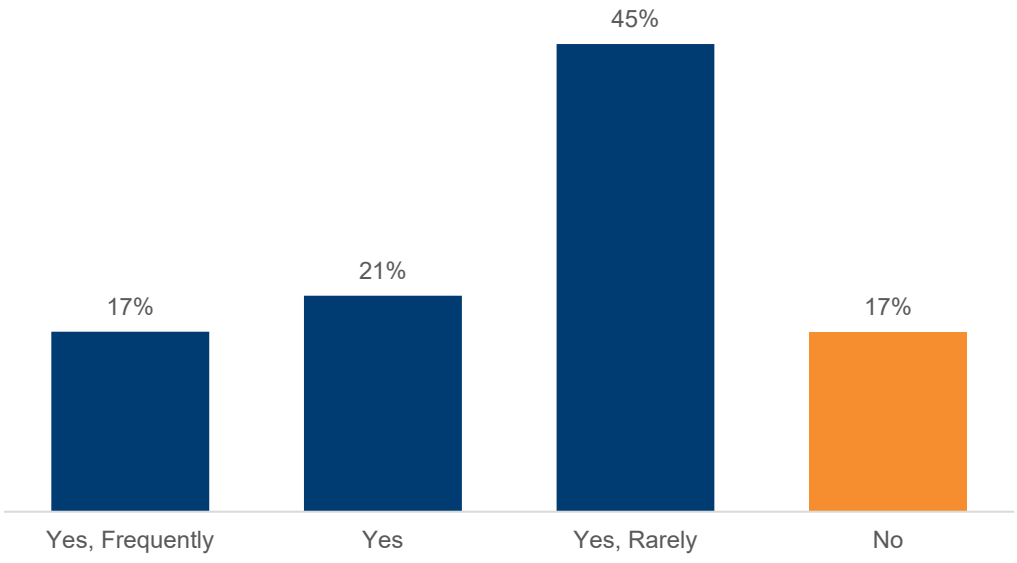
Two of the three indicated the rebate was very important to their decision, and the third was motivated by a city mandate that required the pursuit. Of the two where the rebate was important, the rebate covered 25% and 18% of the upfront costs, respectively. One of the respondents became aware of the rebate through direct outreach from an Xcel Energy representative.

The three respondents all had different experiences with their system, although all three are satisfied. The manufacturing facility had at least three staff attend a manufacturers training course on how to program the system using an app and are pleased by both the lighting quality and the energy savings. The distribution center relies on occupancy sensors and task tuning; employees have not reached out about any concerns, but the facility manager has noticed significant energy savings. This customer regrets not purchasing a control panel to be able to program the system more actively. The multi-use building had the most difficulties, as 20 different tenants had to adjust from having control switches to motion and occupancy sensors. The tenants were offered the option of getting a specific phone with the app to allow more direct control; however, they have not done that.

4.4.3 Trade Partner Perspectives on Networked Lighting Controls

Through the trade partner interviews, the evaluation team was able to collect information about trade partner perspectives on NLCs. Seventy-eight percent of trade partners had experience selling and installing the NLC systems, though only five trade partners sell NLCs “frequently”. Most trade partners do not bring up NLC, but just respond to customer requests (75% on customer request or customer need). Figure 4-15 shows the frequency to which trade partners reported selling NLC systems.

Figure 4-15: Frequency of Trade Partners Selling NLCs (n=29)



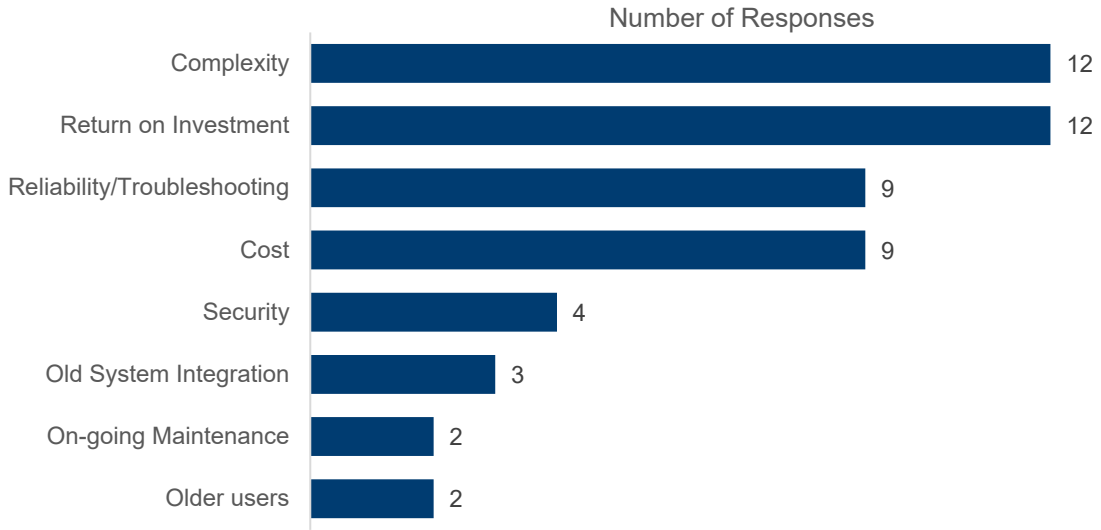
Examples of the wide view of experience in these systems are illustrated through the comments below.

- *"We put it on every package - it is code now."*
- *"I don't anymore. It takes so much work to design a system and the customers aren't interested."*

Trade partners have success selling NLCs to larger businesses, especially those with multiple buildings and government buildings. In addition, schools and churches are investing in Red-Green-Blue LEDs for color and dimming capabilities. Trade partners report that the customer types with more reticence and less interest in NLCs include industrial, agricultural, and 24/7 warehouses, as well as customers with older staff. Trade partners additionally identified Denver and Boulder as municipalities now requiring NLCs for some businesses. One distributor trade partner said they have a flow chart to illustrate to customers and contractors when local code requires NLCs be included in a project.

Trade partners report that customers hesitant about NLCs express several reservations, foremost being return on investment/cost, followed by the complexity of the system, and concerns about its reliability and the prospect of needing to troubleshoot issues in the future (Figure 4-16). Many of these concerns were also noted in customer survey responses.

Figure 4-16: NLC Customer Concerns (n=22)

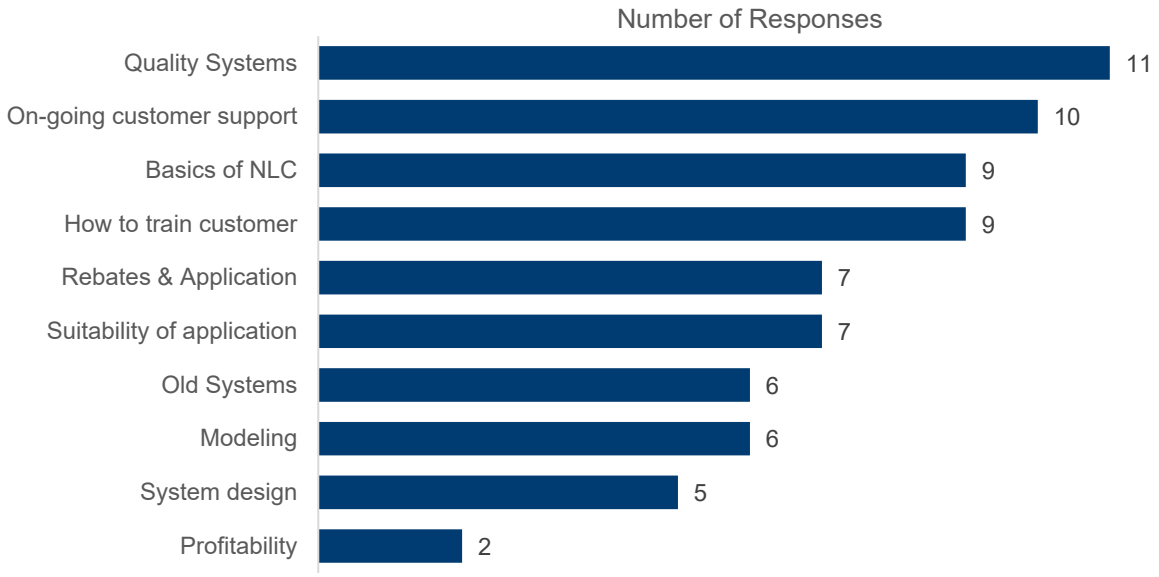


Example comments highlighting the concerns were:

- *"Some of it looks really slick in videos - customers purchase, and then it doesn't work for the application. We end up getting called in and have to sell them something different."*
- "*If they are older [staff]- they are less inclined - think of it as the old systems. Worried about security, worried about employees messing with it."*

Trade partner challenges in selling and implementing NLCs include: 1) being "on the hook" for ongoing system maintenance and troubleshooting, 2) having an adequate understanding of different suppliers and system types, and 3) negative experience with integration or replacement of older systems. One trade partner who had investigated several different NLC systems expressed a great deal of concern about several systems manufactured in China and the required customer data sharing agreements. Trade partners identified trade partner training as the top way to assist NLC sales. Trade partners identified topics they would like to see for training as shown in Figure 4-17.

Figure 4-17: Trade Partners Suggestions for NLC Training (n=24)



Note: Multiple responses allowed

Comments regarding these suggestions include the following:

- *"We are putting together a kind of 10-15-year maintenance contract. But it's very hard to estimate."*
- *"Overview of different systems out there. Most people offering trainings are the companies trying to push their product. Xcel could provide a non-biased overview."*

In addition to training, trade partners would like higher and better structured rebates, and more education and marketing targeted towards end-use customers. One trade partner with more NLC experience also suggested Xcel Energy provide mentoring to contractors who were newer to the technology.

4.4.4 Peer Utility Perspectives on Networked Lighting Controls

Peer utilities emphasized the importance of attractive incentives and education. Most utilities apply an incremental amount to fixture incentives if controls are added. One utility has five different levels of fixture rebates depending on the type of controls, with the highest level for fixtures tied to NLCs. Two utilities are offering trade partner incentives to encourage more

NLCs. Peer utilities seeking to increase NLC adoption work to educate both customers and trade partners. One utility discussed bringing in manufacturing representatives to trade partner meetings where they demonstrate the products and uses. Another has created targeted marketing videos to share with customers or trade partners. One utility reported having the most success with the warehouse sector.

5 Conclusions & Recommendations

This chapter presents the evaluation team's key findings and associated recommendations regarding the Xcel Energy Lighting Efficiency Product in Colorado. All recommendations are based on key findings from the evaluation team's research and are designed to reflect the context of future Product years, acknowledging expected changes in the market and planned Product changes.

Overall, the evaluation team found that the Product operated smoothly, and both customers and trade partners were satisfied with their experiences with the Product. The evaluation team also found that the Product continued to influence customers to install efficient lighting within the Xcel Energy Colorado service area. Despite high satisfaction, the evaluation team identified several recommendations to improve satisfaction and sustain Product influence. The remainder of this chapter presents key findings and recommendations.

- **Key Finding 1:** The Product is influential in encouraging customers to adopt LED technologies. Prior to the Covid-19 pandemic, market saturation was increasing, and LED equipment prices were decreasing. However, the pandemic impacts that are still ongoing have stalled this market transformation as customers are reluctant to invest on their own with economic uncertainty and equipment prices are rising. Analysis of the influence data indicated that Product influence did not vary significantly by type of equipment, rebate type, or number of measures installed.

  Recommendation 1: The evaluation team recommends a prospective NTGR equal to the retrospective value of 0.81 if several conditions are met:

  - Xcel Energy continues monitoring incremental costs and maintains rebates that are, in aggregate, at a similar proportion of incremental cost (or higher) as offered during 2021.
  - Xcel Energy develops an enhanced understanding of which business segments are lagging in LED installation and targets the program to encourage participation by customers who have less evidence of naturally occurring adoption.
  - Xcel Energy promotes and increases participation in lighting controls measures.

  By continuing to offer competitive rebates and seeking to encourage businesses that are not likely to install LEDs on their own, Xcel Energy can maintain its Product influence. Nonparticipant survey results indicated that many nonparticipants wait until their equipment reaches end-of-life to upgrade. One targeting strategy would be to develop and promote case studies highlighting the paybacks for early replacement.

- **Key Finding 2: Nearly half of peer utilities do not calculate a NTGR and those that did used data several years old or included non-lighting measures.** One peer utility jurisdiction only recently decided to drop NTGR research, citing that NTGR estimates are less reliable because long-running utility programs are part of the "normal" market for equipment and program activities are less visible to customers, making it less feasible for customers to identify what influenced their decisions.

Recommendation 2: Discuss the value of continuing to calculate and apply NTGR to savings estimates in future strategic issues conversations with stakeholders. Modifying NTGR approach or adjusting to be focused around improving program design would reduce complexity of impact evaluation and realign with outcomes (i.e. how to modify program to increase influence).

- **Key Finding 3: Trade partners would like more communication and training from Xcel Energy.** Although customers and trade partners expressed satisfaction with their experiences with the Product, many would like more communication from Xcel Energy Staff, more training and networking opportunities, and more functionality from the online application system. Some trade partners were unaware of Product tools such as online applications and pre-approval reservations for custom rebates. Trade partners would like Xcel Energy to resume trainings, trade shows, breakfast and lunch meetings, and quarterly meetings from before the pandemic.

  Recommendation 3: Provide additional trade partner training and regular opportunities for engaging with Xcel Energy staff. Many trade partners have experienced staff turnover and need comprehensive education. This additional support can help trade partners better engage customers in the Product and achieve more comprehensive upgrades. Recommended strategies include:

  - Offer training classes online or in-person or both to inform trade partners on program processes.
  - Promote, and possibly increase staff resources and a direct line for trade partners or customers to call or email with specific questions.
  - Make improvements to the online application portal to allow Product eligibility lookups, the ability to save and come back to a partially completed application and provide status updates on rebate progress. Xcel Energy has indicated it is working on increasing the functionality of the online portal and may already be addressing these requests.

- **Key Finding 4: Both customers and trade partners expressed a desire for a broader array of eligible products.** While customers were not specific about products they were looking for, other than smaller wattage fixtures, trade partners suggested the addition of some niche type technologies including NLCs, flexible flat panel LEDs, mesh lighting, germicidal UV fixtures, solar LEDs, fixtures for high temperature setting, LED tape light, selectable wattage and color temperature fixtures, replacement of first-generation LEDs, and RGB LEDs.

  Recommendation 4a: Assess the feasibility of measures suggested by trade partners for inclusion in prescriptive rebates. More measure types will increase the ability for more comprehensive efficiency upgrades.

  Recommendation 4b: Communicate and promote any new additions or changes to customers and trade partners. Some customers and trade partners were unaware of previous Product improvements and also unaware that some of these equipment types are already eligible (NLCs, selectable wattage and color temperature fixtures), so this outreach could improve satisfaction and usability of new features or products.

- **Key Finding 5: Both customers and trade partners expressed concern about the complexity of applications (particularly custom).** A significant share of trade partners avoid using the custom application because of the complexity. Some non-participating customers reportedly did not participate because of the confusing forms.

  Recommendation 5: Look for ways to simplify the application process for customers and trade partners. While Xcel Energy has made strides in the past by implementing the midstream channel, creating the online portal and the custom pre-approval reservation process, customers and trade partners still identify the application forms as a barrier. Recommended strategies include the following although applicability and outcomes will likely differ between custom and prescriptive:

  - Offer a short online training video for either customers or trade partners about filling out the application.
  - Increase staff resources and a direct line for customers or trade partners to call or email with specific questions.
  - Incorporate focus groups or customer testing to identify trouble spots within the forms to improve their ease of use.
  - Assess whether some of the information requested could be based on historical data or assumptions rather than information specific to the customer without losing significant accuracy.

- **Key Finding 6: High-level program design among peer utilities is similar to the Xcel Energy program design, however, a wider variation in specifics occurs.** Differences include:

  - Variations in incentive design, with some utilities listing only $/kWh or $/kW and others listing individual technologies for different sizes and configurations.
  - Overlap between midstream and downstream technologies.
  - Combining lighting with other business technologies into one program.
  - Trade partner incentives to encourage comprehensiveness or specific technologies (such as NLCs).

  Recommendation 6: Assess the pros and cons of the program design specifics that differ from the Xcel Energy design to determine whether changes could be beneficial to the Product. This could entail follow-up discussions with peer utilities to understand their choices. Considering the changes could result in more efficient or effective program design.

- **Key Finding 7: NLCs have experienced slow uptake due knowledge gaps for both customers and trade partners.** Most customers are unfamiliar with the technology and are not aware that Xcel Energy offers incentives. Many trade partners are uncomfortable with the technology and perceive customers as having numerous concerns. Peer utilities with the highest success rates in achieving participation with NLCs have employed prescriptive rebates, trade partner education, training, and sometimes trade partner incentives.

Recommendation 7: Increase marketing emphasis on NLCs. As customers become more aware of the benefits and trade partners become more comfortable, participation should increase. Recommended strategies include:

- Offer training classes to trade partners about NLCs. Involve manufacturer's representatives to demonstrate their systems and the benefits to customers.
- Offer marketing videos or case studies for customers that address likely customer concerns about best applications, complexity, cost, and maintenance in the materials.
- Dedicate trained Xcel Energy staff to answer customer and trade partner questions about the technology.
- Include prescriptive rebates for fixtures with and without controls to bring more visibility on the rebate applications.

Key Finding 8: Market actors all noted significant impacts on projects, their business, and the program, respectively from the Covid-19 pandemic. Xcel Energy's recent challenges meeting program goals can be largely attributed to the Covid-19 pandemic as it created barriers for customers and trade partners alike. The recommendations noted above to maintain incentives levels, simplify the Product, and have greater education and communication will also help address the pandemic barriers faced by customers and trade partners.

Appendices

Appendix A: Evaluation Plan

A.1 Evaluation Plan

Introduction

To support the 2022 process and impact evaluation of Xcel Energy efficiency products, the TRC evaluation team conducted a process and impact evaluation of the Xcel Energy Colorado Lighting Efficiency Product (Product). This memo provides the plan for the 2022 Light Efficiency Product evaluation based on staff feedback during the evaluation kickoff meeting, staff interview findings, and a review of the Product website and current Colorado DSM Plan. This evaluation plan included the following sections:

- Product Overview
- Evaluation Overview
- Data Collection Activities and Sampling Plans
- Net-to-Gross (NTG) Approach

Product Overview

The Colorado Lighting Efficiency Product is designed to encourage Xcel Energy electric business customers to install energy efficient lighting equipment in existing buildings. To achieve this objective, Xcel Energy offers rebates to lower the upfront costs of qualifying efficient lighting products. The Product offerings include prescriptive lighting rebates, LED instant rebates, and custom rebates. This evaluation covers the prescriptive and custom channels; LED instant rebates are evaluated separately.

Most customer projects qualify for prescriptive rebates, which are offered for the most common fixtures and controls. Retrofits that include a lighting redesign or more complex controls may qualify for custom rebates. Each rebate type has its own application process and requirements. Customers in either channel may receive help from Xcel Energy account managers (managed account customers) or Business Solutions Center (BSC) representatives (non-managed account customers) or a trade partner to identify rebate eligible equipment and complete the rebate application.

For the prescriptive rebates (LED retrofit), customers must install energy efficient lighting equipment from a list of pre-approved products. For custom projects (such as projects that do not involve a one-to-one fixture replacement or use efficient lighting products not included in the eligible prescriptive equipment), the rebate amount is determined by the on-peak kW and off-peak kW savings the project delivers. For custom projects, customers must submit project information for pre-approval prior to making a purchase. Xcel Energy staff will review pre-approval information to confirm the project will qualify, and to calculate the rebate amount. Alternatively, customers can submit a signed blank application instead of pre-approval forms. This signals their expectation of a rebate (to avoid free-ridership), but the customer will not be guaranteed their project is eligible or know the exact rebate amount.

In 2021, each channel contributed to the total gross savings from the Lighting Efficiency Product as shown in Table A.1-1.

Table A.1-1. 2021 Gross Savings from Evaluated Channels of the Lighting Efficiency Product[a]

Channel	Participants[b]	Gross Savings (kWh)	% of Total kWh
Prescriptive	695	36,008,353	54%
Custom	94	30,828,259	46%
Lighting Efficiency Product	**789**	**66,836,612**	**100%**

[a] This table shows only the savings from the components of the Lighting Efficiency Product that are subject to this evaluation. Savings from instant incentives are not included.

[b] Participants are measured as the number of unique account numbers in the participant tracking database. Some Custom participants also participated in the Prescriptive channel but are included in this table only as Custom participants to avoid double-counting.

Evaluation Overview

The 2022 evaluation focused on the custom and prescriptive rebate channels within the Product and consisted of a process evaluation and an impact evaluation. The process evaluation assessed customer and market actor experiences with the product and trends across similar programs at peer utilities; the impact evaluation offered a recommended net-to-gross ratio (NTGR).

Process Evaluation

The evaluation team discussed process evaluation priorities during the kickoff meeting and staff interviews.[1] During those conversations, several process-related themes emerged.

- The Product is well established, with strong trade partner and customer participation year-over-year. Despite recent declines in total savings, the Product continues to be a principal contributor to overall portfolio savings.
- LEDs are becoming more mainstream, and larger customers may be approaching saturation. This erodes savings opportunities and may also result in increasing free ridership. Long-term, it is not likely the Product will continue to be a major contributor to portfolio saving, but it is not clear how quickly the Product savings will decrease.
- The Covid-19 pandemic resulted in numerous challenges for the product staff, trade partners, and customers. These included supply-chain issues (contractors had difficulties keeping products in stock), price increases, loss of in-person sales and trade partner recruitment opportunities (i.e., trade shows), labor shortages and staff turnover for all parties, and stalled projects. It is not clear to what degree market constraints have eased, or to what extent customer priorities have changed.
- The Covid-19 pandemic impacts were uneven. Lighting projects in some segments, such as healthcare and federal government facilities, were relatively unaffected, while others, such as commercial real estate, were severely affected.
- Advanced lighting controls offer savings beyond LEDs. However, the market uptake has been slow because the savings and available rebates are not enough relative to the high

[1] Staff interviews took place in February and March 2022. The kickoff meeting was held on January 13, 2022.

equipment costs, in addition to other barriers. Xcel Energy is currently engaged in a study to reassess incremental costs for controls, to potentially offer higher incentives.

These themes drove the development of the following **process evaluation objectives**:

- Understand **key drivers of participant decisions to implement lighting retrofits**, and the role of Lighting Efficiency Product in decision-making.
- Understand current customer **attitudes toward capital improvements and energy efficiency retrofits**, given easing of COVID-19 restrictions and potential new economic challenges; assess awareness of Xcel Energy programs including demand response
- Understand what **barriers impede greater adoption of lighting controls,** including cost and other cost constraints.
- Understand the **roles of trade partners and Xcel Energy customer support staff** in motivating customers, identifying products, and completing applications.
- Get **feedback on the product design and application process**, including overall customer satisfaction, and perspectives on changes since the past evaluation such as the streamlined pre-approval process for custom projects and the digital application user experience; understand impacts (if any) of shifting products to midstream channel or back to downstream.
- **Assess whether trade partners are optimally engaged in the Product,** or whether there are opportunities to increase their engagement or effectiveness through more or different outreach, training, or other means, and whether Xcel Energy has sufficient resources available to meet trade partner needs.
- Identify opportunities to **encourage more comprehensive lighting retrofits,** including new approaches to program design or marketing.

Impact Evaluation

The objective of the impact evaluation of the Lighting Efficiency Product was to develop a NTGR documenting the extent to which program activities influenced customer lighting purchasing decisions. The evaluation team proposes to use participant self-report surveys and trade partner interviews to estimate both a retrospective and prospective Lighting Efficiency Product NTGR, and to review the prospective NTGR against additional information from staff interviews, nonparticipant surveys and peer benchmarking to create a final prospective NTGR. To summarize, objectives of the impact evaluation included:

- Develop retrospective and prospective NTGRs documenting the program's influence on customer's decisions.
- Assess market effects of the Colorado Lighting Efficiency Program.

The team excluded approximately 29 projects from the participant survey sample and the NTGR analysis, including 8 networked lighting controls projects and 21 indoor agriculture projects. As an emerging technology, Xcel Energy has previously assigned an NTGR of 100% to networked lighting controls. Because networked lighting controls projects remain relatively rare in the program (accounting for less than 1% of savings), the team considers them to continue to be an emerging technology and excluded them from the NTG analysis (these projects were evaluated for the process evaluation through in-depth interviews). The team excluded indoor agriculture projects from the survey and the NTGR analysis because these projects have been shifted to a

separate program as of 2022. The full NTGR approach is detailed in a later section of this document.

Data Collection Activities and Sampling Plans

To meet the above objectives, the evaluation team conducted a variety of data collection activities. These activities are listed in Table A.1-2 and explored more in this section. As a first step in the evaluation, the team interviewed six Xcel Energy staff to understand the program design, performance, and surrounding context over the past year. Based in part on these interviews, the evaluation team developed this research plan to complete the 2022 evaluation.

The evaluation team conducted surveys with participating customers, nonparticipating customers, and trade partners. These surveys addressed the research questions identified for the process evaluation (described previously) and informed prospective and retrospective NTG estimates.

Finally, the evaluation team benchmarked the program against nine peer utilities, assessing plans for future program designs and NTG estimates.

Table A.1-2 outlines each research task and the associated research objectives; details on each data collection activity are provided in the sections that follow. Note that because this program is a large contributor to Xcel Energy savings goals, several of the proposed data collection activities have larger sample sizes than those used for other product evaluations. Differing size or scope are included as outside the original scope in the table below.

Table A.1-2. Lighting Efficiency Product Research Summary

Task Ref.	Research Task	Included in Original Scope?	Sample Size	Research Objectives
1	Staff Interviews	✓	6	Inform evaluation plan
2	Participant Survey	✓	70	Decision-making factors; attitude toward capital investments; attitudes toward lighting controls; role of trade partners/Xcel Energy support staff; feedback on design and application process; NTGR (quantify free-ridership and spillover)
2a	Participant Follow-up Interviews	✓	Up to 10	Allows for clarification on any specific survey responses.
2b	Networked Controls In-depth Interviews		Up to 4	Understand decision-making process (perceived benefits, perceived obstacles and how obstacles overcome), identify key decision resources (sources of information), understand experience to date with controls system
3	Nonparticipant surveys	✓	70	Understand barriers to participation and existing efficiency levels; quantify nonparticipant spillover savings.
4	Trade Partner Interviews	✓	20	TP role in driving participation; perspectives on general market outlook; barriers to lighting controls; TP training needs; feedback on digital application and other design features; NTG
4a	Trade Partner Interviews		Additional 20	Allows for higher precision on NTG as well as segmentation among active and less active trade partners
5	Peer Utility Benchmarking Interviews	✓	4-6 utilities	Identify new approaches for more/deeper savings, and NTG

1. Staff Interviews

In February and March 2022, the evaluation team conducted six interviews with Xcel Energy staff to inform this evaluation plan, discuss product goals, and review product processes, challenges, and successes. Those interviewed included the Product Manager, the Xcel Energy Evaluation Manager, Key Account Manager, Trade Partner Relations Manager, and a Business Solutions Center Staff Member. These interviews were conducted over Microsoft Teams and took between 30 minutes and one hour to complete. These meetings, combined with the kickoff meeting, allowed the evaluation team to create a focused evaluation plan with defined data-collection activities.

2. Participating Customer Surveys

The evaluation team utilized participant surveys to meet both process and impact objectives. These surveys focused on the following five topics: decision drivers by project channel, attitudes toward lighting controls, feedback on product design, role of trade partners/Xcel Energy support staff, and the NTGR.

- **Decision Drivers:** The evaluation team asked customers about major factors influencing their decision to upgrade their lighting, and their capital expenditures generally, including factors such as available budget, equipment retrofit cycles, payback period, project timing, and the impacts of Covid-19. The team also asked how they interacted with installers and Xcel Energy support staff, including at what point in their project development process, and for what tasks/services.
- **Attitudes Toward Lighting Controls:** The survey asked if participants who did not install advanced lighting controls have considered advanced lighting controls, what resources (such as internal or corporate expertise, trade partners, Xcel Energy account managers, etc.) they used to evaluate these items, and for what reasons they did not install controls.
- **Feedback on Design:** The evaluation team asked about customer satisfaction with the trade partners, eligible measures, available rebates, and requirements and process to apply for rebates (including the option of the online application, and the alternative to pre-approval, as appropriate). The team also asked questions to understand if shifting products to a midstream channel has impacted accessibility or resulted in other impacts to participants. Finally, the team asked what additional services Xcel Energy could offer that may encourage participation.
- **Role of Trade Partners and Xcel Energy Staff:** The team asked about customer's reliance on their installer or Xcel Energy staff in general and at various stages of their project, to compare with nonparticipant responses. These questions investigated whether participants received information or support to identify more or deeper retrofits, including information on custom lighting incentives.
- **NTGR:** The team asked questions on program attribution (the impact the program had on their decision to purchase high efficiency lighting), and potential non-program energy efficient measures installed because of the Xcel Energy Lighting Efficiency program (spillover).

The evaluation team targeted a sufficient sample size for results to be statistically significant (at 90% confidence and 10% precision) for the Product. The target sample is shown in Table A.1-3. Participant surveys were conducted via telephone, and respondents received an incentive of $25.

Table A.1-3. Lighting Efficiency Participant Population

Strata	Population[a]	Target Surveys	Response Rate
Participants	771	70	9%

[a] The population did not include 8 networked lighting controls projects or 21 indoor agriculture projects.

2a. Participant Follow-Up Interviews

Since project decision-making can be complex, the team conducted follow-up interviews with eleven ten survey respondents to clarify their responses related to free-ridership and spillover.

2b. Networked Lighting Controls In-Depth Interviews

The evaluation team conducted in-depth interviews with 3 of a total of 8 participants that installed a networked lighting controls system in 2021[2]. These interviews explored how and why these participants made the decision to install networked controls. The research topics included:

- What participants viewed as benefits of the system, what participants viewed as potential obstacles, and how they overcame those obstacles
- The impact of the Xcel Energy rebates, or other aspects of the Xcel Energy program, on the decision
- Who was involved in the decision, and what information resources were most helpful
- Details of the experience completing their project such as product availability, availability of knowledgeable lighting professionals, impact on project design phase if any, and impact on implementation or commissioning timeline if any, details of the participants' experience using the controls to date, and whether the system has met expectations

The interviews were conducted by phone. Interviews lasted between 30-60 minutes, and respondents received a $50 incentive.

3. Nonparticipating Customer Surveys

The evaluation team conducted a survey of nonparticipating customers. These surveys addressed key decision drivers for the Lighting Efficiency Product, opportunities for future participation, and possible spillover savings. Specific survey topics included:

- **Decision Drivers**: The evaluation team asked about customer awareness of energy efficiency opportunities and rebates, especially for lighting. The evaluation team also asked customers about major factors influencing their capital expenditure decisions generally, including the impacts of COVID-19. In addition, the team asked about any obstacles faced if the respondent tried to participate in the past such as insufficient information, difficulty navigating renter-landlord situation, lack of trade partner knowledge, or other issues.
- **Attitudes toward Efficiency Improvements**: The survey asked about current levels of lighting efficiency, and exploration of factors that influence decisions about capital improvement projects, including general budget availability for capital improvements and attitudes toward rebates. The team asked about any changes in capital improvement spending over the past two years or going forward.
- **Barriers to Lighting Controls:** The evaluation team asked about the customers' familiarity with lighting control options, whether the customer had considered lighting controls, and if so, reasons for not either installing or not installing controls. The survey asked about what resources the customer used to evaluate controls (such as internal or corporate expertise, trade partners, Xcel Energy account managers, etc.).

[2] These 8 participants were excluded from the survey sample.

- **Feedback on Product Design:** The survey asked about satisfaction with aspects of the Foduct that the customer is aware of, such as rebate levels and eligible products.
- **Roles of Trade Partners and Xcel Energy Staff:** The evaluation team explored to what degree the customer relies on installers, account managers, or the Business Solutions Center team as resources when planning energy-related projects.
- **NTGR:** The evaluation team asked questions about any lighting efficiency projects the customer had completed in the past year, and to what degree the customer was influenced by the Lighting Efficiency Product (even though they did not receive a rebate).

The sample was randomly selected from the customer database, after excluding any customers that have participated in the Lighting Efficiency Product or other rebated lighting projects since 2016 (approximate date of LED emergence in the market). Table A.1-4 shows the target sample size. The survey was conducted via telephone, and respondents received an incentive of $25.

Table A.1-4. Nonparticipant Customer Survey Target Sample

Population	Target Sample
7,000	70

4. Trade Partner Interviews

The evaluation team utilized trade partner interviews to meet both process and impact objectives. These interviews captured trade partner perspectives to inform several research objectives related to the process evaluation and the impact evaluation, including the following:

- **Key decision drivers:** The team asked questions about how trade partners solicit customers, how they structure sales conversations, and the role of the Lighting Efficiency Product in their sales process. The team also asked about how shifting lamps to the midstream channel affected trade partners sales approach, if at all.
- **Market outlook and feedback on design**: Interviews included questions about how customer interest in lighting is changing as COVID-19 restrictions ease, and the impact of other potential economic issues such as inflation and supply chain delays on the lighting market in the near term. Questions were structured to break out market response by customer characteristics such as market segment or size where possible. Questions were asked about the appropriateness and effectiveness of eligible measures, available rebates, and requirements and process to apply for rebates (including the option of the online application, and the alternative to pre-approval, as appropriate).
- **Lighting controls**: The evaluation team asked trade partners about their experience with selling, installing, and programming lighting controls. The team asked how often and under what circumstances they discuss controls with customers. The team also sought trade partners perspective on barriers to lighting controls other than cost, and potential ways to overcome these barriers.
- **Application process and tools**: The team asked questions about how the trade partner participates in the application process, including their role in pre-approval for custom

projects, selecting qualifying equipment, completing the application (using online portal or PDF forms), whether the trade partner receives the incentive check directly (and what application assistance they provide the customer when they do not receive the check directly). The team asked if trade partners have experience with other utility rebate programs, and how Xcel Energy's programs compare.

- **Trade partner level of engagement and barriers**: The team asked about staff understanding of the Product (and perceived need for training), how staff stay informed, and opportunities for improving the Product's integration with trade partner business (including ideas from other utility programs), and for trade partners suggestions to help them use the product more (especially for medium and low performers, and trade partners whose activity level has dropped in recent years). For trade partners with lower participation in 2021 than previous years, the team asked for the reason for the decrease.
- **NTGR**: Finally, the team asked questions about program attribution, or the impact the program had on their decision to recommend and stock high-efficient lighting and potential non-program measures installed because of the Xcel Energy Lighting Efficiency program. The evaluation team discussed how the program impacts their product recommendations as well as anticipated future trends in customers installing energy efficient lighting with and without the product.

The evaluation team interviewed a minimum of 40 trade partners as part of this effort. To ensure a representative sample, the evaluation team separated the sample into four strata: high performers, mid/low performers, high influence, and inactive trade partners. The evaluation team defined high performers as trade partners that returned more than 1% of total product rebate dollars, and mid/low performers less than 1% of rebate dollars. (In assigning trade partners to performance categories, the team also reviewed each trade partners' total number of projects. Trade partners that achieved very high savings but only a very low number of projects were shifted to the mid/low performance category.) High influence trade partners were those that were identified as influential by participants through the participant survey, and therefore factored into the NTGR calculation. High influence trade partners included high or mid/low performers. Inactive trade partners were those that had participated in previous years but did not participate in 2021.

The population of 201 trade partners was sufficient to reach the targeted number of interviews (Table A.1-5). This number of target interviews was increased from the standard 20 interviews due to the active and central role trade partners play in the Lighting Efficiency program, the large percent of rebates the trade partners contribute to, their influence on customer decisions (contributing to NTG), and potential spillover attributable to the program. The evaluation team required sufficient interviews to confidently assess these metrics.

Table A.1-5. 2021 Lighting Efficiency Trade Partner Population, by Interview Strata

Strata	Population	Completed Interviews
High Performers *(generating >1% of total Product savings)*	11	6
Mid/Low Performers *(active but generating <1% of total Product savings)*	95	18
High-influence *(determined by participant survey)*	11	8
Inactive	83	10
Total	**200**	**42**

The evaluation team conducted the trade partner interviews by phone. Interviews lasted 30-60 minutes. The team offered an incentive of $50 per interview to encourage robust participation from a diverse cross-section of the trade partner pool.

5. Peer Utility Benchmarking Interviews

The objective of the peer utility benchmarking task was to understand how the Lighting Efficiency Product approached key issues by comparing it with four similar peer utility programs. The evaluation team selected a comparable cohort so that Xcel Energy has an “apples-to-apples” comparison and evaluated the set of circumstances (such as regulation, retail channels, demographics) that impacted program plans at the peer utilities. Through interviews with the peer program staff, the evaluation team explored the reasons behind design or implementation differences with the Xcel Energy Lighting Efficiency product, the factors necessary for success of these components, and whether they could be applicable or beneficial to Xcel Energy.

Based on its staff interviews, the evaluation team identified the utilities shown in Table A.1-6 as relevant peers to Xcel Energy. To complete the benchmarking study, the team contacted the utilities in random order to achieve four to six completed interviews. The team coordinated these interviews with the benchmarking interviews the team conducted for the Xcel Energy Minnesota Lighting Efficiency Product evaluation, which occurred concurrently, to avoid overlap and expand the total sample. This avoided fatigue by program managers interviewed and ensured Xcel Energy received as much information as possible about other similar commercial lighting programs.

Table A.1-6. Potential Peer Utilities for Benchmarking

Utility	State
Arizona Public Utility	Arizona
Rocky Mountain Power	Utah, Idaho and Wyoming
Pacific Power	California, Washington, Oregon
Tucson Electric	Arizona
Salt River Project	Arizona
Avista	Washington, Idaho
Eversource	Massachusetts
National Grid	New York
Puget Sound	Washington
Portland General Electric	Oregon
PG&E	California

The evaluation team developed a peer utility interview guide that was customized to the desired benchmarking components and provided to Xcel Energy for approval prior to beginning data collection. The interview guide addressed the following product components:

- **Gauge peer utility's experiences:** Successes or challenges peer utilities had with their program, including most active market segments and success of any segment-targeted marketing.
- **Identify new strategies or design ideas:** Asked peer utilities about recent program changes. Asked which other utilities/organizations do the peer utilities look to for new ideas.
- **Identified opportunities** to encourage more or deeper lighting retrofits, including new approaches to program design or marketing, especially about networked controls
- **Compared program characteristics:** The team compared general information about peer utilities programs to the Xcel Energy product, including the measures offered, and incentive amounts, and identified any peer utility program characteristics that may be beneficial to Xcel.
- **NTGR:** Inquired about their most recent NTGR value and details on their methodology.

Finally, the team summarized the results of our benchmarking analysis in a summary that can be distributed to interviewees to thank them for their time. The summary included a description of the comparability of each utility, based on the factors identified during the planning task.

Net-to-Gross Approach

The NTGR assessment estimated the percentage of savings achieved that was attributed to program actions. The team used an approach based on the methodology presented in the Illinois Technical Reference Manual (IL TRM) and applied in the 2018 Colorado Lighting

Efficiency evaluation to calculate the NTGR.[3] The type of approach referenced in the IL TRM is used extensively in other jurisdictions both by our team and outside industry experts for a broad array of program types. Revisions to the question structures were tested in Illinois in 2021 and updates are being discussed in the TRM working group. Based on our knowledge of the discussions and 2021 results, the TRC evaluation team modified the survey language and calculation method from the IL TRM to better reflect expected IL TRM updates as well as the lighting product design and customer decision-making for Xcel Energy. The team reviewed the past customized survey instruments and calculations from 2018 and the revised IL TRM recommended methodology and adapted them to fit the context of the 2021 Product implementation and evaluation research questions.

The evaluation team calculated two NTGRs for the Lighting Efficiency Product: one retrospective for 2021, and one prospective for 2022 and beyond. The IL TRM method relies on data from participant self-report surveys and trade partner interviews to assess retrospective product attribution. The evaluation team calculated a prospective NTGR by constructing a logical narrative of product attribution going forward, based on the retrospective NTGR, feedback from trade partners relating to the future of the lighting market, comparison to peer utility NTGRs, and consideration of potential changes to the product's design.

Retrospective NTG

The evaluation team estimated a retrospective NTGR by examining free ridership, participant spillover, and nonparticipant spillover from two data sources: participants and trade partners. The TRC evaluation team used Equation 1 to calculate the retrospective NTGR.

Equation 1. Net-to-Gross Algorithm

$$NTGR = 1 - Free\ ridership + Participant\ Spillover + Nonparticipant\ Spillover$$

The research team weighted individual respondent-level NTGRs by their project savings (kWh). Where respondents installed multiple projects, the survey asked if the decision process was the same for each project. If yes, the team applied the savings from all projects; if no, the team used the savings from the sampled project only.

Each of the NTGR components is discussed in greater detail in the following sections.

Free-ridership is a measure of the amount of a product's claimed savings that would have occurred in the absence of the product. The evaluation team estimated a free-ridership value as a percentage, calculated as an average of two scores that measure free ridership from different perspectives, and adjusted for possible product influence on the quantity or timing of the project. The free-ridership score for each respondent is based on four components:

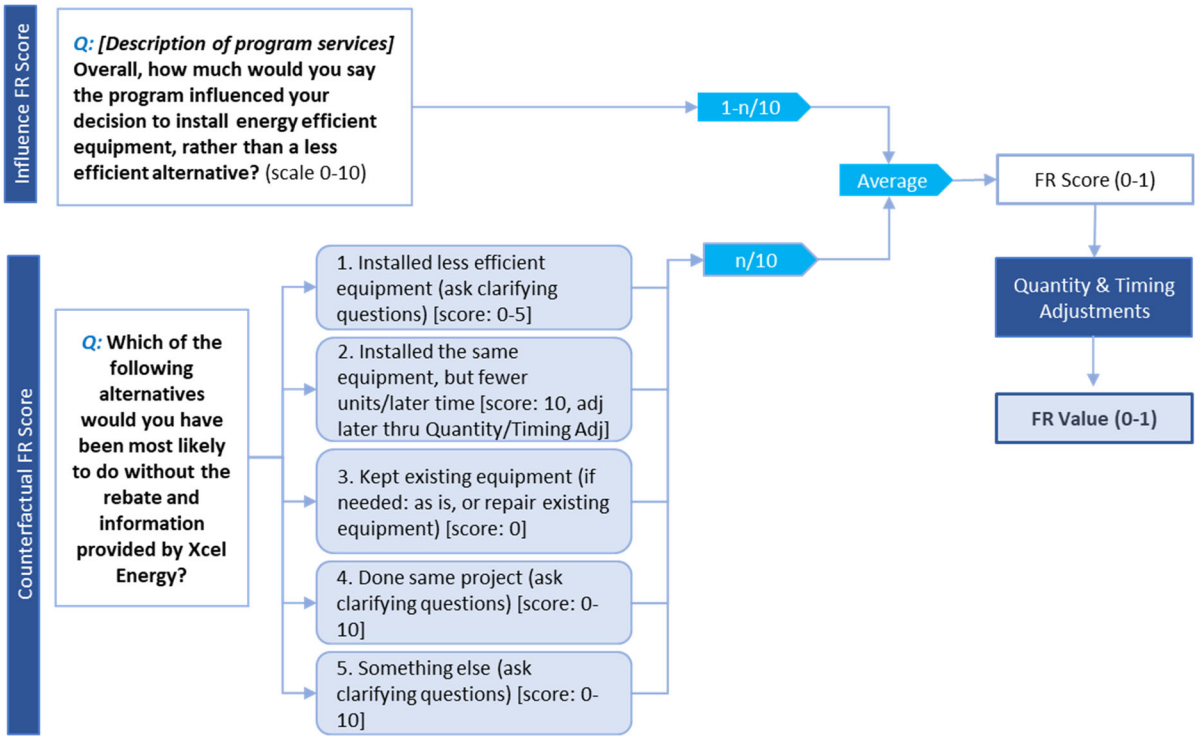
1. An *Influence Score* assessing the participant's perception of the importance of the product overall (including rebates, education and other support) in their decision to install *high-efficiency* equipment;

[3] Illinois Technical Reference Manual, Volume 4, "Cross-cutting Measures and Attachments". Version 9.0. Available online: https://ilsag.s3.amazonaws.com/IL-TRM_Effective_010121_v9.0_Vol_4_X-Cutting_Measures_and_Attach_09252020_Final.pdf

2. A *Counterfactual Score* that assesses the participant's intention to carry out the *energy-efficient* project without Product funds and support;
3. A *Timing Adjustment*, based on the participant's perception of when they would have carried out the *efficient* project in the absence of the Product.
4. A *Quantity Adjustment*, based on the participant's estimate of the quantity of items or level of efficiency they would have installed in the absence of the product.

Figure A.1-1 illustrates how these components come together to produce the final free ridership value.

Figure A.1-1. Participating Customer Free-ridership Algorithm for the Efficiency Lighting Product

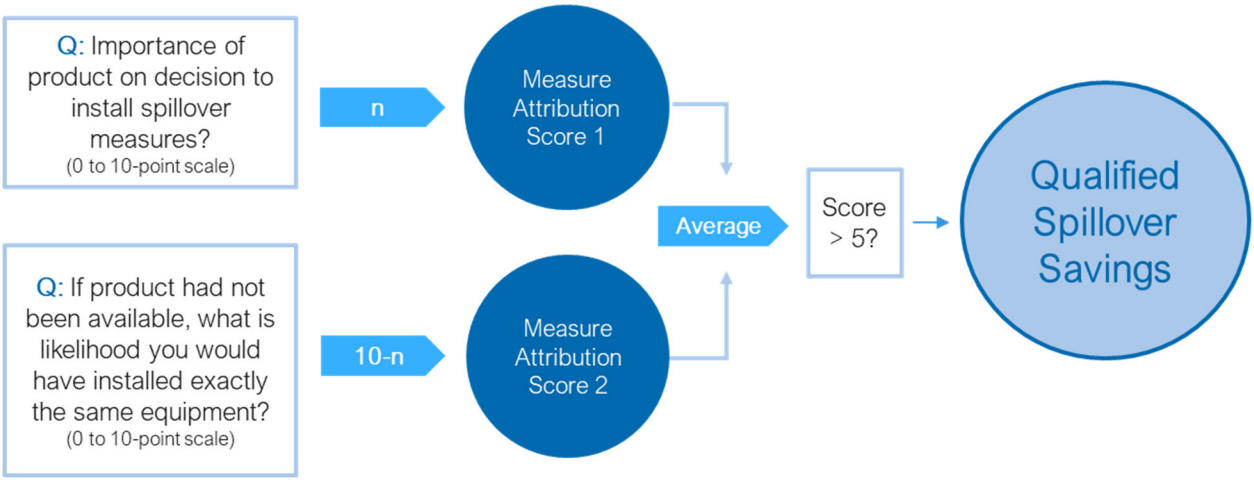


Prior to the questions about product influence, the survey reviewed with the respondent the various benefits provided by the product, as well as other factors that may have influenced their decision. For example, the survey cited product benefits such as the dollar amount and percent of total project cost covered by the rebate, the resulting reduction in payback period, information from Xcel Energy staff, and, where appropriate, information from the trade ally. Nonprogram factors included internal research or information from corporate headquarters, organization commitment to energy savings or conservation, desire to minimize operating cost or maintenance labor, state or federal policies, or other factors. This review helped respondents provide a more accurate rating of the overall product influence.

Participant Spillover is a measure of the amount of energy savings that occur due to the Product that are not captured in the Product's claimed energy savings. To capture 2021 participant spillover, the evaluation team asked participants for information about any additional energy efficient equipment installed outside of the product (for which they did not receive a rebate from Xcel Energy). The surveys also probed for information on the importance of the

Lighting Efficiency Product in participant installation decisions and the likelihood that the measures would have been installed if they had not participated in the Lighting Efficiency Product. The evaluation team computed savings estimates for all identified spillover equipment following the flowchart reported in Figure A.1-2. The Product's spillover ratio was the total spillover savings identified from the sample of respondents, divided by the total Product energy savings achieved from the sample.

Figure A.1-2. Lighting Efficiency Participant Spillover Protocol



Nonparticipant Spillover. Because the Product works closely with trade partners, the evaluation team also evaluated trade partner nonparticipant spillover. Trade Partner nonparticipant spillover, in this instance, is defined as savings from eligible equipment for which the purchaser did not receive rebates but was influenced by the Product through participant trade partners. This occurs when the trade partner recommends Product-eligible items because of the education and training from Xcel Energy, but the customer does not apply for the rebate for various reasons (e.g., too much paperwork, too busy).

The evaluation team calculated nonparticipant spillover as the total *potential* spillover savings from the trade partner sample, divided by the total gross Product savings achieved by the sample, for those trade partners rating the product importance as 5 or greater, as shown in Equation 2.

Equation 2. Calculation of Non-Participant Spillover

$$\%\ NP\ Spillover = (kWh_{potential}/kWh_{surveyed})$$

The evaluation team determined the potential spillover savings ($kWh_{potential}$) inputs through trade partner telephone surveys collecting two values: percent of products sold eligible for product incentives, and the percent of eligible products sold that do not receive a rebate. For each respondent, the calculation for this potential spillover savings is shown in Equation 3.

Equation 3. Trade Partner Reported Potential Spillover

$$\Delta kWh_{potential} = 2021\ rebated\ kWh\ /\%\ of\ products\ eligible * \%\ products\ eligible\ that\ did\ not\ recieve\ rebate$$

To determine the product score, the evaluation team asked trade partners to assess the extent the Lighting Efficiency Product influenced the sale of these non-rebated products. Specifically, trade partners rated the importance of the Product on the following three components, using a scale of 0-10:

- Sales of non-rebated equipment
- Efficient lighting equipment recommendations (past and current Product eligibility)
- Efficient lighting equipment stocking

The maximum Product importance rating from the above components, was the product importance rating.

Prospective NTG

Given the fast-changing conditions of the lighting market, the team reviewed and determined whether an adjustment of the retrospective NTG estimate was needed to provide a forward-looking, or prospective value. By design, our prospective NTG estimate incorporated data from mixed methods research (both quantitative data and qualitative data). The team relied on these data as well as their professional judgment to construct a logical, internally consistent, and coherent narrative of product attribution that attempted to identify all possible pathways of Xcel Energy influence. The prospective NTGR relied on the following inputs:

- Retrospective NTGR trend analysis
- Additional information from trade partners about market trends
- Logical Narrative (including review of staff interview and benchmarking results)

Retrospective NTGR Trend Analysis. The first step to calculating the prospective NTGR was identifying a potential trend between the participating customer 2019 retrospective NTGR estimate from the prior evaluation and the new, retrospective 2021 NTGR, then extending that trendline through 2022 and beyond. The team examined how each component of the retrospective NTGR (free-ridership, participant spillover and nonparticipant spillover) have contributed to the trend and used this information in constructing the logical narrative (described later in this section) to inform the prospective NTGR.

Trade Partner Prospective NTGR Incorporating Market Effects. The trade partner interviews offered important insights into market effects of the Lighting Efficiency Product. Such “market effects” are similar to spillover in that they result in savings beyond the savings quantified from rebated projects; however, while spillover savings are the result of individual project decisions, market effects signify a transformation in the underlying structure and functioning of the market. Market effects can take many forms and may result from product impacts in a market over time. Examples of market effects include trade partners permanently changing their business models based on the influence of the product, for instance: a distributor trade partner may be more likely to promote efficient lamps to take advantage of the customer incentives. Over time, the contractor builds this into their general approach to marketing and selling efficient lighting. The interviews included questions that allowed the team to estimate a prospective NTGR that

incorporated any market effects, as well as qualitative questions to identify any long-lasting changes to trade partner practices.

The evaluation team asked participant trade partners to predict both absolute sales volume and market share of LED fixtures, retrofit kits, and lighting controls in 2022 under two scenarios: (1) that the Product continues with "business as usual", and (2) that the Product had never existed and would not support LEDs in 2022. By asking about a scenario in which the Product would not only not be available in the future, but had never existed, the research team captured a more complete picture of the product's market effects over time.

The research team calculated the volume of 2022 sales attributable to the Product as the difference between trade partners' estimates of with- and without-Product sales. The initial prospective NTGR was the ratio of the volume of sales attributable to the Product to the projected volume of rebated sales in 2022. To predict rebated sales in 2022, the evaluation team applied the trade partner's $\%\ products\ eligible\ that\ did\ not\ recieve\ rebate$ value from the retrospective nonparticipant spillover calculation to the trade partner's reported expected sales with the Product for 2022. This calculation is summarized in Equation 4.

Equation 4. Prospective NTGR Adjustment Using Trade Partner Data

$$Prosepctive\ NTGR = \frac{LED\ sales\ volume\ with\ program\ - LED\ sales\ volume\ without\ program}{Rebated\ LED\ sales\ volume}$$

The research team weighted individual respondent-level NTGRs by their estimated sales volume, calculated by dividing their reported product sales by the proportion of sales they reported occurring outside the product, to arrive at a final trade partner projected NTGR value.

Logical Narrative. The team reviewed the retrospective NTGR value against market trend information from trade partners, such as their expectations for future efficient lighting measures in terms of availability, pricing, stocking, and customers purchasing practices. The team also reviewed information on customer attitudes toward lighting projects from nonparticipant customer surveys, and benchmarking of prospective NTGR values used in other states. The team also used input from the staff interviews about potential near-term future changes to the Product and considered the impact of those changes on the prospective NTGR estimate. For example, if the Product manager was planning to sunset a rebate on a particular item with a low NTG, the team removed that item from the prospective NTG estimate.

Based on these additional inputs, the team constructed a logical narrative to explain the likely NTGR going forward. The team adjusted the NTGR to create a final prospective NTGR that is consistent with this narrative that should be applied to the product after the completion of this report. The final prospective NTGR recommendation is based on the professional judgement of our team after considering all available quantitative and qualitative data.

Appendix B: Data Collection Documents

Appendix B contains materials related to data collection including the staff interview guide, participating customer survey instrument, nonparticipating customer survey instrument, trade partner interview guide, peer utility benchmarking guide, and networked lighting controls interview guide.

B.1 Staff Interview Guide

Introduction

This guide is to be used to interview staff associated with Xcel Energy's DSM products as part of the TRC Companies 2022 evaluation of the Xcel Energy DSM products. The interviews will be semi-structured, with these questions serving as a basic guide for experienced TRC Companies staff during one-on-one phone interviews.[1] As a guide for semi-structured interviews, these questions will not necessarily be asked verbatim, but will serve as a roadmap during the conversation.

Staff Interview Research Questions Or Objectives

List the research questions that this research task is designed to address.

- Assess the extent to which the product design supports product objectives and customer service/satisfaction objectives.
- Understand Xcel Energy's current Lighting Efficiency offerings in MN and CO.
- Assess the degree to which product resources are sufficient to conduct product activities with fidelity to the implementation plan.
- Collect staff feedback on implementation successes and challenges.
- Identify themes and issues for possible revisions to the standard evaluation plan.

Interview

Section A: Introduction

[If staff did not attend the kick-off meeting:] First we would like to give you some background about who we are and why we want to talk with you today. TRC Companies is an independent consulting firm that works with electric and gas utilities to review and improve product operations and delivery. Xcel Energy contracted with us to perform an evaluation of their portfolio of energy efficiency products, and we're currently in the process of conducting interviews with product managers and key staff involved in designing and delivering the Lighting Efficiency Product to improve our understanding of Xcel Energy's DSM products and their influence on customers. We also want to understand how our research can be useful for you as Xcel Energy product staff and incorporate your priorities into our study so that the results are as useful as possible.

[ALL] Thank you for taking the time to speak with us today. My objective for this meeting today is to gain a deeper understanding of the Lighting Efficiency Product, what Xcel Energy hopes to achieve through implementing this product, and a bit about your experiences with the Lighting Efficiency Product. I have a set of questions that should take approximately 60 minutes. We will combine the information you provide with information gathered from other interviews before reporting summarized information back to Xcel Energy.

Before I begin, is it alright if I record the conversation for note taking purposes? [RECORD IF ALLOWED AND CONFIRM YOU ARE RECORDING ONCE RECORDING BEGINS]. Thanks, we are recording now.

A1. [All] First, can you take a moment and explain your role and scope of responsibilities with respect to the Lighting Efficiency Product?

Probes:

- Approximately how long have you held this position?
- What previous positions did you hold?
- Whom do you report to in the overall org structure?

A2. [Colorado Product Manager] Can you confirm the Lighting Efficiency Product does not have a third-party implementer? And can you walk through how the Product is implemented? Please note that for this interview, we are considering the Colorado Efficient Lighting program exclusive of the Midstream program.

[Minnesota Product Manager] Can you describe the administrative structure for the Lighting Product? (Probe: Do you have a third-party implementer for any part of the Lighting program?) Please note that for this interview, we would like to know about the midstream channel if it operates as part of the Minnesota Lighting program, even though it will not be included in the Colorado evaluation.

Section B: Product Goals

I'd like to be sure I understand the goals of the Lighting Efficiency Product, both overall and specific.

B1. Can you take me through the key goals for the Lighting Efficiency Product?

[For staff outside of the Customer Solutions team] Can you take me through the key goals for the Lighting Efficiency Product, as it relates to your role?

B1a. **[Colorado]** According to the DSM Plan, the Lighting Efficiency Product savings goals, including prescriptive and custom components, are 15.7 MW and 100.1 GWh for both 2021 and 2022. Does that sound about right?

[Minnesota] According to the DSM Plan, the Lighting Efficiency Product savings goals, including prescriptive, custom, new construction and midstream, are 23 MW and 151 GWh for 2021, and slightly lower for 2022 and 2023 [21.5 MW and 143 GWh, then 21.3 MW and 142 GWh]. Does that sound about right?

[All]

B1a1. How did the program perform, in terms of participation and gross savings, in 2021? Did it meet your expectations? Did it meet, or do you expect it to meet, savings targets?

B1a2. How did that outcome compare to prior years? What factors do you think most influenced the program performance in 2021?

Probe:

- Active sectors and popular equipment types
- Shifts to midstream or other programs;
- Trade partner activity;
- Impact of COVID 19

B3. Any other, non-energy goals? For example, for participation, customer satisfaction, or customer awareness?

B3a. Did any of these other goals change significantly from 2020 to 2021?

B3a1. What was the rationale for changing them? Probe: COVID-related changes?

B3a2. In your opinion, how have these changes affected the product's operations or its outcomes?

B4. How has the market for LEDs and controls changed in your state in the past two years?

B5. What influences, if any, do you think the Lighting Efficiency Product has had on the market in the past two years?

Section C: Product Activities

I would like to make sure I have a solid understanding of how this product operates in your state and talk through the different components of the product.

[COLORADO]

C1. I understand that Colorado Lighting Efficiency offers two pathways, prescriptive and custom. The prescriptive pathway offers per-fixture rebates for lighting fixtures, and per-watt incentives for lighting controls, with higher amounts for DLC-qualified products. Custom rebates are based on peak and off-peak kilowatt savings. Is that right? Have I missed any key details or components of the Lighting Efficiency Product?

[MINNESOTA]

C1. I understand that Minnesota Lighting Efficiency offers four pathways: custom, prescriptive, new construction, and midstream. Is that right?

I also understand that the prescriptive path offers per-fixture rebates for lighting fixtures, and per-watt incentives for lighting controls, with higher amounts for DLC-qualified products. The new construction path is similar to prescriptive, except that rebate amounts are lower. Custom rebates are based on peak and off-peak kilowatt savings. Finally, Midstream is offered through participating distributors, and discounts bulbs instead of fixtures.

Is this information correct? Are there any major aspects to any of these components that I left out?

[Product Managers and Promotion Staff]

C2. My notes from the kick-off indicate you have offered bonus rebates and limited term offer incentives to adjust to changing market conditions. Following this interview, would it be possible to get a list of these offers, with the amounts, dates and eligible products? [YES / NO]

For now, can you briefly describe these campaigns?

C2b. For each, what was your objective (e.g., to increase customer participation, increase trade partner participation, increase website traffic, etc?)

C2c. How well do you think these campaigns worked to accomplish your objectives? Were you able to measure how these campaigns impacted savings or participation? If so, what have you observed?

C3. Besides the website, how are customers expected to learn about the Lighting Product? What are the most important channels of information?

C3a. What is the role of key account managers in the Product implementation? How would you characterize their influence on program outcomes?

C4. Who manages marketing activity? Have these staff made any significant changes to their approach in the past three years?

C4a. What was the rationale for changing them?

C4b. In your opinion, how have these changes affected the product's operations or its outcomes?

[Product Managers and Trade Partner Staff]

C5. What is the role of trade partners in the Efficient Lighting Product, excluding the midstream distributors?
Probe:

- Do trade partners have to be registered?
- Are there incentives for trade partners for lighting projects?

C5a. How does the program communicate with trade partners?

C5b. Are trade partners effective in their role? What aspects of the trade partner role are working well, and what challenges exist, if any?

C5c. [MN ONLY] Describe the role of distributors. What aspects of this role are working well, and what challenges exist, if any?

C6. What are the participation steps for the prescriptive path, and for the custom path, from a customer perspective?

C6a. Have these processes changed at all in the past two years?

C6b. At what points are customers most likely to drop out of the program, and what steps have staff taken to limit attrition?

Section D: Strengths And Challenges

Next, I'd like to get your feedback on how the product is running.

[All as applicable]

D1. What would you say is working well in terms of product design or implementation?

D1a. In 2018, you added an online application form. How is this form performing?

Probe:

- What percentage of customers use the online application?
- What feedback have you received if any? Does the form mitigate previous issues with the application process? Does the form present any obstacles to customers?
- How often do trade partners complete customers applications, whether online or via PDF?

D2. Do you expect to meet your savings target for 2022? What are the most significant challenges, or opportunities, for this product at this point?

Probe:

- Changing market for LEDs/NTG
- Shifts across custom, prescriptive, and midstream
- Increasing adoption of lighting controls, especially networked lighting controls
- Reduced avoided costs (other regulatory changes?)
- COVID 19
- Sharing lighting savings across Indoor Ag, Energy Management and other Products

D3. What feedback, if any, do you receive from customers on the Product? (PROBE FOR CUSTOMER ENGAGEMENT/ CUSTOMER SATISFACTION)

D4. What do you believe are the biggest barriers to getting customers to participate in this Product?

Probe:

- What are the barriers specifically for increasing adoption of networked lighting controls?

- Is market penetration an issue for this Product? If so, in which segments?

D5. Are there any specific opportunities for improvement in the design or implementation of the product? Please describe.

Section E: Resources

E2. Do you think you have sufficient Product staff, marketing support, and trade partner support to implement the product as designed? What are the most time-consuming tasks relative to your role?

E2a. [IF NO] What additional staff support is needed, or what administration changes could make the program operate more efficiently?

Section F: Product Tracking And Reporting

[All as applicable]

I understand that you are using Salesforce as your primary product tracking tool. I'd like to understand more about how product activities are tracked.

F1. Do you feel the Product is collecting any data that you don't need?

F2. Are there any additional data, or reporting or analysis capabilities, that you don't have but think would be helpful?

Probe:

- How would this information be helpful?
- What barriers prevent tracking this information?

F3. What data do you track outside of Salesforce? Are there any data/documentation that might be helpful for the evaluation?

F4. As part of our evaluation, we may want to speak to "near-participants," customers/trade partners that were eligible to participate in the product, showed some interested in product participation, but didn't participate for whatever reason. Would these customers/trade partners all be tracked in Salesforce?

F5. What kind of baseline does the product use to estimate energy savings? [PROBE FOR CODE VS. COMMON PRACTICE]

Section G: Closing

G1. Do you have any other comments, concerns or suggestions about the product that we didn't discuss that you would like to make sure I know about?

G2. We will be developing a detailed evaluation plan following the staff interviews. Do you have particular questions that you would like to see answered by the evaluation, or questions for customers, account managers, or trade partners?

G3. **[Product Managers, if not already determined]** We are planning to interview additional Xcel Energy staff. Who would you recommend we include in those interviews?

[If not mentioned, ask about:
Bob Macauly,
Jeff Kosak
Madison Curry]

G4. Do you have any peer utilities or programs that you'd like us to include in the peer utility benchmarking interviews?

G5. What performance indicators or program design questions are you interested in the evaluation benchmarking?

Thank you very much for taking the time in assisting us with this evaluation. If I come up with any additional questions that come from this interview, do you mind if I send you an email or give you a quick call?

B.2 Participating Customer Survey Instrument

Introduction

To support the process and impact evaluation of the 2021 Xcel Energy efficiency programs, the TRC evaluation team will conduct telephone surveys with participants. The evaluation team defined a participating customer as any customer that closed a project in 2021. The research will be conducted to assess key process and impact evaluation objectives, including Investment decision drivers, roles of trade partners and Xcel Energy representatives, feedback on the application process, attitudes and awareness of the program components and lighting controls, free-ridership, and spillover.

Evaluation Objectives

Specific research topics which this participant survey is designed to address are the following:

- **Decision Drivers:** What major factors influenced the decision to upgrade lighting? This could include capital expenditures, available budget, equipment retrofit cycles, new technology, high bills, payback period, project timing, and the impacts of COVID 19: staffing, training, supply chain. How did Xcel Energy Lighting rebates, Xcel Energy support staff, and trade partners influence the project decisions?
- **Attitudes toward Networked Lighting Controls**: Have participants considered advanced or networked lighting controls? What resources (such as internal or corporate expertise, trade partners, manufacturers, Xcel Energy account managers, etc.) did they use to evaluate these items, and why did they not install advanced lighting controls?
- **Feedback on Design:** How satisfied are customers with trade partners, the design of the programs the products (prescriptive, custom, new construction), eligible measures, available rebates, and requirements and process to apply for rebates (including the option of the online application, and the alternative to pre-approval, as appropriate)? The team will also ask questions to understand if shifting products to a midstream channel has impacted accessibility or resulted in other impacts to participants. Finally, the team will ask what additional services Xcel Energy could offer that may encourage participation.
- **Role of Trade Partners and Xcel Energy Staff:** How did customers engage with their trade partner or Xcel Energy representative at various stages of their project?
- **NTGR:** What impact did the program have on their decision to purchase high efficiency lighting (free-ridership), and what non-program energy efficient measures did they install because of the Xcel Energy Lighting Efficiency program (spillover)?

Table B.2-1 presents the link between each evaluation objective, research question, and survey question.

Table B.2-1. Evaluation Objective, Survey Research Themes & Survey Question Crosswalk

Evaluation Objective	Research Question	Survey Question Number(s)
Decision Drivers	What major factors influenced the decision to upgrade lighting? This could include capital expenditures, available budget, equipment retrofit cycles, new technology, high bills, payback period, project timing, and the impacts of COVID 19: staffing, training, supply chain. How did Xcel Energy Lighting rebates, Xcel Energy support staff, and trade partners influence the project decisions?	Sec B
Attitudes toward lighting controls	Have participants considered advanced, networked or stand-alone lighting controls? What type of controls were considered? What resources (such as internal or corporate expertise, trade partners, manufacturers, Xcel Energy account managers, etc.) did they use to evaluate these items, and why did they not install advanced lighting controls?	Sec G
Feedback on program design	How satisfied are customers and trade partners, eligible measures, available rebates, and requirements and process to apply for rebates (including the option of the online application, and the alternative to pre-approval, as appropriate)? Did shifting products to a midstream channel impacted accessibility or resulted in other impacts to participants. What additional services Xcel Energy could offer that may encourage participation.	Sec C Sec G Sec D (D17 – D20)
Role of trade partners and Xcel Energy staff	How did customers engage with their trade partner or Xcel Energy representative at various stages of their project? Did trade partners introduce the program? Did trade partners complete the application?	Sec B, Sec C, Sec E
NTGR	What impact did the program have on their decision to purchase high efficiency lighting (free-ridership), and what non-program energy efficient measures did they install because of the Xcel Energy Lighting Efficiency program (spillover)?	Sec E, Sec F

Sample & Target Completes

Table B.2-2 shows the target number of completes for each state. Once contact data is available for the sample, we will update the minimum number of interviews for each state.

Table B.2-2. Sample Population & Target Completes, by Strata

Stratum	MN		CO	
	Target # Projects	Minimum # Survey Interviewsa[a]	Target # Projects	Minimum # Survey Interviews[b]
Prescriptive	75	TBD	N/A	TBD
Custom	10	TBD	N/A	TBD
New Construction	15	TBD	N/A	N/A
TOTAL	**95**	**TBD**	**70**	**TBD**

[a] The "Minimum # Contacts Interviewed" quota will be determined once the number of unique contacts for the survey sample is known. The number of contacts may be less than the number of projects.

Sample Variables

Table B.2-3 includes the sample variables that will be used to conduct this survey, as well as descriptions of these variables and potential codes.

Table B.2-3. Sample Variables

Sample Variables	Variable Descriptions	Potential Codes
Interviewer Name	Name of interviewer from Ewald and Wasserman	e.g. Donna Whitsett
Organization	Organization name	e.g. Apex Analytics
Contact	Contact at organization	e.g. Laura James
Contact_Rev	Updated contact, based on Survey response	e.g. Sue Jones
Phone	Phone number for contact at organization	e.g. 555-555-5555
Phone_Rev	Revised phone, based on survey response	e.g. 555-555-6666
State	State where project facility is located	e.g., CO or MN
Month	Month customer completed project through program	e.g. May
Year	Year customer completed project through program	e.g. 2021
Dollar Amount	Dollar amount of rebate, from tracking data	e.g. "4,325"

Sample Variables	Variable Descriptions	Potential Codes
Dollar_Amt_Rev	Updated dollar amount, based on survey response	E.g. "2,325 "
Rebate Type	Type of rebate	E.g. "Pres", "New Const"
Location	Address or name of premise where lighting product was installed	E.g. "Baden Street"
Potential Projects	Number of projects associated with contact phone number, is >1 if multiple rebate projects in 2021, =1 if respondent had only 1 project in 2021	E.g, “1”

Fielding Instructions

- Attempt each record six times on different days of the week and at different times.
- Leave messages on the first and fourth attempt.
- Experienced interviewers should attempt to convert "soft" refusals (e.g., "I'm not interested", immediate hang-ups) at least once.
- The survey is considered complete when I1is answered.
- After completing 5 interviews, hold calling and output a preliminary SPSS dataset and recordings of the pretest interviews. Resume calling after Apex Analytics checks the data (usually with 1-2 working days).
- Monitor at least 10 percent of the interviews to ensure proper interview protocols (e.g., reading questions verbatim, proper probing, accurate data entry).
- Calling hours are 9 AM to 5 PM MDT.

Survey Sections

- **A. Introduction & Screening**
- **B. Decision Drivers**
- **C. Contractor/Representative Support**
- **E. Free-ridership**
- **F. Spillover**
- **G. Program and Lighting Controls Awareness and Attitudes**
- **D. Application Process**

- **H. Firmographics**
- **I. Closing**
- **Recruitment [baseline study – CO only]**

Survey Guide

[PROGRAMMER NOTES:

- Fields from sample to be piped into text are marked with **<>**
- Unless otherwise specified, interviewer should NOT read responses.
- DK and REF responses are always exclusive (meaning even if question allows multiple responses, DK and REF responses can't be selected in combination with any other responses)

A. Section Intro: Introduction & Screening

A1. Hello, this is **<INTERVIEWER NAME>** calling from Ewald and Wasserman, a national research firm working with Xcel Energy. I'm hoping to speak to someone at your organization who would be familiar with your participation in the Xcel Energy Lighting Rebate program in **<MONTH> <YEAR>.** Our records show that you received a rebate from this program for lighting installed at **<LOCATION>**. May I speak with **<CONTACT>?**

1. Yes, that would be me.
2. Yes, let me transfer you to the correct person [IF NAME GIVEN, ENTER AS **<CONTACT_REV>**; REPEAT QUESTION WITH NEW RESPONDENT]
3. No, they are not available right now.
4. No, they are no longer employed by this organization.
5. No, other reason (SPECIFY).
   DK [TERMINATE]
   REF [TERMINATE]

[IF A1=1, 4, OR 5]

A2. Are you the person at **<ORGANIZATION>** who worked to obtain the rebate from the Xcel Energy Lighting Rebate program in 2021, for the lighting project at **<LOCATION>**?

1. Yes.
2. No, they are not available right now.
3. No, that's someone else.
4. No, that person no longer works here.
5. Not applicable –organization did not participate in any such program. **[TERMINATE]**
   DK [TERMINATE]

   REF [TERMINATE]

[IF A2=4]

A3. Is there someone else that is knowledgeable about your participation in the Lighting Efficiency program?

1. Yes.
2. No [TERMINATE]
   DK [TERMINATE]
   REF [TERMINATE]

[IF A2=2-3 OR A3=1]

A4. What is this person's name?

1. [RECORD CORRECT PERSON'S NAME AS **<CONTACT_REV>]**
   DK [TERMINATE]
   REF [TERMINATE]

[IF A4=1]

A5. Would I reach that person by dialing the same number I used to connect with you: **<PHONE>**?

1. Yes
2. No, use a different number [RECORD AS **<PHONE_REV>**) [**TERMINATE**; REDIAL NEW SAMPLE CASE]
   DK [TERMINATE]
   REF [TERMINATE]

[PROGRAMMER NOTE: Only those for whom A1=1 or A2=1 should get to this screen; the rest would end at Intro5 as they will need to be made into new sample cases and called back at a later time.]

[ASK IF A1=1 OR A2=1]

A6. Great! (IF NEEDED: Again, we're Ewald and Wasserman, a national research firm calling on behalf of Xcel Energy). I invite you to participate in a short survey that will help Xcel Energy improve the Lighting Efficiency program to best suit the needs of businesses like yours. The survey takes about 15 minutes on average, and as a small token of appreciation, we are offering a $25 Amazon gift card that you will receive after completing the survey. Your responses will remain confidential, meaning that your name and company name will not be attributed to your answers.

Is now a good time or should we call you back?

1. No objection – fine to continue
2. Objection [RESOLVE/SCHEDULE A BETTER TIME AND RESCREEN AS NECESSARY]

REF [TERMINATE]

B. Decision Drivers

[SKIP IF **<REBATE TYPE>** = NEW CONST]

B1. As I mentioned, we are calling about the 2021 lighting project at **<LOCATION>.** Was this project part of a renovation or new construction project?

1. Yes
2. No

DK [SKIP TO B3]
REF [SKIP TO B3]

B2. Which of the following best describes how your organization makes decisions about funding projects like the one at **<LOCATION>**. Would you say [READ RESPONSES] [SINGLE RESPONSE]

1. you consider projects as they are identified, and decide based on need and cost,
2. you set an annual budget for building and equipment improvements, and then allocate funding to specific projects based on need and payback period,
3. you maintain a long-term capital improvement plan, and allocate sufficient budget for most planned projects each year, or
4. Or something else? [Specify] _____

DK
REF

B3. How was the need for this lighting project identified? Was it… [READ RESPONSES] [SELECT ALL THAT APPLY]

1. By facilities or maintenance staff,
2. By operations or planning staff,
3. By an outside contractor or installer,
4. Through a long-range (four year or more) facility or capital investment plan, or
5. Another person or method: [SPECIFY]_____

DK
REF

B4. How did your organization learn about the rebates available from Xcel Energy? [SELECT ALL THAT APPLY]

1. Contractor/vendor
2. Xcel Energy representative
3. Xcel Energy email or mailing
4. Trade or professional association
5. Brochure
6. Newspaper, radio or TV ad
7. Social media post
8. Online ad or digital media
9. Past participation in a rebate program
10. Own research
11. Xcel Energy website
12. Community event
13. Other [SPECIFY]: _____

DK

REF

B5. At what point in the project timeline did your organization learn about the rebates? Was it… [READ RESPONSES.]
1. Before the project need was identified,
2. After the project need was identified but before purchasing equipment,
3. After purchasing equipment but before completing the project,
4. After the project was completed, or
5. Another point [SPECIFY]: _____

DK
REF

B6. Which of the following sources of information were most helpful to your organization when planning your project? [READ RESPONSES] [SELECT UP TO TWO]
1. Experience/Knowledge of internal staff,
2. Online research by internal staff,
3. Information from contractor or installer,
4. Information from distributor or equipment vendor,
5. Information from Xcel Energy Account Manager or representatives, or
6. Another source: _____

DK
REF

B7. What benefits did your organization expect from new equipment installed through this project, relative to the previous lighting equipment? [SELECT ALL THAT APPLY]
1. Better light quality
2. More attractive fixtures– improved ambiance
3. Improved employee/customer satisfaction
4. Improved productivity
5. Reduced energy usage
6. Lower energy costs
7. Reduced long-term maintenance costs
8. Better security
9. Improved functionality due to lighting controls
10. Contributing to energy efficiency or conservation goals
11. Completing a necessary maintenance or building improvement
12. Other:_____
13. No benefits relative to previous lighting equipment [EXCLUSIVE]

DK
REF

B8. Would you say any aspect of the project at **<LOCATION>** was impacted by the COVID_19 pandemic?
1. Yes
2. No

DK
REF

B9. [IF B8=1] For each of the following statements, please tell me whether the statement applied to this project, as a result of COVID-19: [READ RESPONSES. RECORD YES/NO/DK/NOT APPLICABLE/REF for each]
1. Supply chain constraints, delays or difficulty in sourcing materials
2. Construction delay due to labor shortages
3. Construction delay because building was shut down
4. Faster construction because building was empty
5. Cost of materials higher than expected
6. Cost of labor higher than expected
7. Scope reduced due to more cautious budgeting or less available funding
8. Any other impacts?: _____

B10. How did the COVID-19 pandemic affect your organization's overall approach to building or equipment improvement projects, relative to 2019 or earlier? Would you say…[READ RESPONSES]
1. The organization was less likely to invest in improvement projects during 2020 and 2021,
2. The organization was equally likely to invest in improvements projects during 2020 and 2021, or
3. The organization was more likely to invest in improvements projects during 2020 and 2021?

DK
REF

C. Contractor/Representative Support

C1. During your project, did either your contractor or installer, or an Xcel Energy representative identify the equipment that was eligible for a rebate and the equipment that was not?

1. Yes, contractor or installer provided assistance
2. Yes, Xcel Energy representative provided assistance
3. Yes, both provided assistance
4. No, neither provided assistance

DK
REF

C2. Did an outside contractor install the lighting equipment that was rebated as part of the Xcel Energy Lighting Rebate program, or did you install the equipment using in-house staff?

1. Used a contractor
2. Installed equipment with in-house staff
3. Both

DK
REF

C3. MOVED

C4. MOVED

[IF B=1 OR 3 OR C2= 1 OR 3]

C5. How satisfied were you with your contractor's understanding of the Xcel Energy Lighting Rebate program, and ability to help you complete your rebate application? Please use a scale from 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied".

1. [NUMERIC OPEN END, 1 – 5]
96. Not applicable
DK
REF

[IF C5 < 4]

C6. Why weren't you satisfied with your contractor?

1. [OPEN END]
DK
REF

[SKIP IF B=2 OR 3]

C7. Did an Xcel Energy representative assist you to participate in the program?

1. Yes
2. No
DK
REF

[IF B=2 OR 3, or 0=1]

C8. How satisfied were you with your Xcel Energy representative's understanding of the Lighting Rebate program and ability to support your participation? (IF NEEDED: Please use the same scale from 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied")

1. [NUMERIC OPEN END, 1 – 5]
96. Not applicable
DK
REF

[IF C8 < 4]

C9. Why weren't you more satisfied with your Xcel Energy representative's understanding?

[OPEN END]

DK
REF

E. Free-ridership

[ASK C IF **<POTENTIAL PROJECTS>** >1]

E1. I understand you received rebates from Xcel Energy for lighting installation projects at several locations in 2021. I show **<POTENTIAL PROJECTS>** projects receiving Xcel Energy lighting rebates. Was there a single decision maker for all **<POTENTIAL PROJECTS>** projects or did projects other than **<LOCATION>** have different decision makers?

1. Single decision maker
2. Different decision makers
DK
REF

[IF E1=1]

E2. When making decisions about this project, did you make one decision that applied to all projects, or did each project require individual assessment?

1. Decision process was the same for all projects
2. Decision process varied from project to project
DK
REF

E3. Our records show that, for the lighting project at **<LOCATION>**, Xcel Energy provided you with a rebate of $**<DOLLAR_AMOUNT>**. Does that sound about right?

1. Yes
2. No
DK
REF

[IF E3= 2]

E4. About how much was the rebate you received from Xcel Energy for just the lighting project at **<LOCATION>**?

1. [NUMERIC]
DK
REF

[IF E4.1>0, SET **<DOLLAR AMT REV>** to E4.1; OTHERWISE SET **<DOLLAR AMT REV>** to **<DOLLAR AMOUNT>**]

E5. [MOVED TO C1]

E6. Please indicate whether any of the following were **factors** in your decision to install lighting equipment eligible for a rebate at **<LOCATION>**: [FOR EACH, RECORD Yes, No, or DK, REF]

1. The $**<DOLLAR AMT REV>** rebate from Xcel Energy
2. The simple payback period, which is the amount of time until equipment has paid for itself
3. The total amount of money saved over lifetime of the equipment, otherwise known as the return on investment or "ROI"
4. Information about the benefits of upgrading to efficient lighting or rebates from an Xcel Energy mailing, email, or ad
5. A recommendation from an Xcel Energy representative
6. A recommendation or information from your contractor or vendor
7. A recommendation from a friend or peer
8. A recommendation from a trade organization
9. The age or condition of the old equipment
10. Your previous participation in an Xcel Energy program
11. Your previous experience with the type of equipment you installed
12. A corporate policy or guidelines related to energy efficiency
13. Your desire to minimizing operating and maintenance cost
14. Your desire to improve ease of use, lighting quality, or other lighting features besides efficiency
15. A predetermined timeline or schedule for replacing equipment
16. State or Federal efficiency standards

E7. Are there any other factors that were important in your project decision-making, that I did not mention?

1. Yes
   1(a) Please describe these factors:_____
2. No
   DK
   REF

[IF E6=No, DK or REF FOR ALL, SKIP TO NEXT SECTION]

[IF E6.2=YES]

E8. Was the Xcel Energy rebate included in the calculation of the payback period, or when the equipment would pay for itself?

1. Yes
2. No
   DK
   REF

[IF E6.2=YES]

E9. Typically, what is the simple payback threshold that your company uses for such capital investments?

1. 1 year or less
2. More than 1 year up to 2 years
3. More than 2 years up to 3 years
4. More than 3 years up to 4 years
5. More than 4 years up to 5 years
6. More than 5 years up to 6 years
7. More than 6 years up to 7 years
8. More than 7 years up to 8 years
9. More than 8 years up to 9 years
10. More than 9 years up to 10 years
11. More than 10 years
    DK
    REF

[IF E6.3=YES]

E10. Did you factor the Xcel Energy rebate into your calculation of the return on investment, or the total financial return from implementing the project?

1. Yes
2. No
   DK
   REF

[IF E6.6=YES]

E11. Did your contractor or vendor mention the lighting rebate program from Xcel Energy during the process?

1. Yes
2. No
   DK
   REF

[IF E6.7=YES]

E12. Did your friend or peer mention the lighting rebate program from Xcel Energy?

1. Yes
2. No
   DK
   REF

[IF E6.8=YES]

E13. Did the information from the trade organization mention the lighting rebate program from Xcel Energy?

1. Yes
2. No
   DK
   REF

[IF E6.12=YES]

E14. What corporate policies related to energy efficiency impacted your project decisions?

1. [OPEN END]
   DK
   REF

[IF E6.12=YES]

E15. Did information from Xcel Energy influence these corporate policies related to energy efficiency?

1. Yes
2. No
   DK
   REF

[IF E6.14=YES]

E16. Did your contractor or an Xcel Energy representative introduce you to the features of the equipment besides efficiency that interested you?

1. Yes, my contractor/vendor/supplier
2. Yes, an Xcel Energy representative
3. Yes, both
4. No, neither
   DK
   REF

E17. Thank you. Based on your responses, it sounds like the Xcel Energy Lighting program helped your project through the following: [NO RESPONSE REQUIRED]

1. [IF E6.1=YES, OR E8=YES, OR E10=YES] A rebate of $**<DOLLAR AMT REV>**
2. [IF E6.4=YES OR E6.5=YES OR E16=2] Information about energy efficient equipment or available rebates
3. [IF B=2 OR 3] Assistance to select rebate-eligible equipment or design your project
4. [IF E11=1] Recommendation from contractor knowledgeable about the program
5. [IF E12=1] Recommendation from a peer knowledgeable about the program
6. [IF E13=1] Recommendation from a trade organization knowledgeable about the program
7. [IF E6.10=YES] Your previous participation in an Xcel Energy program
8. [IF E15=YES] Corporate policies that were influenced by information from Xcel Energy

E18. Using this information, please rate the overall importance of the Xcel Energy Lighting program and rebate on your decision to install energy efficient equipment for this project, rather than less efficient equipment. Use a scale from 0 to 10, with 0 being not at all important, and 10 being extremely important.

1. [NUMERIC 0-10]
   DK
   REF

[IF E5=1 OR 3, OR E6.6=YES]

E19. Thank you. Now, on the same 0-10 scale, please rate the overall importance of the information and recommendations from your contractor on your decision to install equipment that earned a rebate for this project, rather than a less efficient alternative. [IF NEEDED: Use the same scale from 0 to 10, with 0 being not at all important, and 10 being extremely important.]

1. [NUMERIC 0-10]
   DK
   REF

[IF E19 > E18 OR E19 > 5]

E19A. What was the name of the contractor/company?

[RECORD NAME]

DK
REF

[IF E19A = 1]

E19B. Who was your primary contact at the contractor/company?

[RECORD NAME]

DK
REF

E20. Now, which of the following alternatives would you have been most likely to do if the Xcel Energy Lighting program and rebate had not been available? Would you have… [READ OPTIONS]

1. Completed the exact same project, with the same equipment at the same time and paid the higher costs yourselves, [IF E17 >1] "and without the program information you received",
2. Installed the same equipment, but fewer units or at a later time
3. Installed other less efficient equipment than offered through the program that would not earn a rebate
4. Kept your existing equipment
5. Done something else [SPECIFY]: _____
   DK
   REF

[IF E20=1]

E21. Ok. Please rate the *likelihood* that you would have completed the exact same project, with the same equipment, at the same time. Use the scale of 0-10, with 0 being not at all likely and 10 being extremely likely.

1. [NUMERIC 0-10]
   DK
   REF

[IF E20=3]

E22. Would the less efficient equipment most likely have been…[READ RESPONSES]

1. The least expensive equipment that met the minimum efficiency required by code?
2. More efficient and more expensive than code, but less efficient than what you actually installed?
   DK
   REF

[IF E20=5]

E23. Ok. Please rate the likelihood that you would have done what you just described, if there were no rebate. Use the scale of 0-10, with 0 being not at all likely and 10 being extremely likely.

1. [NUMERIC 0-10]
   DK
   REF

[IF E20=2]

E24. If the rebate had not been available, about how much of the lighting equipment you installed do you think you would have installed at the around the same time, how much would you have installed at a later time, and how much would you have never installed? For this question, around the same time means within six months, and a later time means seven months to four years later. Please answer using percentages. [RECORD RESPONSE FOR EACH OPTION; RESPONSES SHOULD SUM TO 100%]

1. Percent install at the same time, or within six months: _____
2. Percent install at a later time, but within 4 years: _____
3. Percent never installed: _____

DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

E25. REMOVED.

E26. REMOVED.

[IF E24.1 + E24.2= 0]

E27. To confirm, without the program you would not have installed any rebate-eligible units at any point in the next four years?

1. Correct, no rebate-eligible units [SKIP TO NEXT SECTION]
2. Not correct

DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

[IF E27=2]

E28. In your own words, please explain what you would most likely have done without the Xcel Energy program or rebate.

1. [OPEN END] [SKIP TO NEXT SECTION]

DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

[IF E24.2>0]

E29. Without the rebate, when do you think you would have installed the [INSERT E24.2RESPONSE] of the equipment you would have installed at a later time? Would it probably have been…[READ RESPONSES]

1. 7 months to a year after you completed the project
2. 1 to 2 years after you completed the project
3. 2 to 3 years after you completed the project
4. 3 to 4 years after you completed the project

5. More than 4 years after you completed the project
   DK
   REF

[IF E24.3>0]

E30. Why would you have installed less rebate-eligible lighting equipment without the rebate?

1. [OPEN END]
   DK
   REF

[IF E24.2>0]

E31. Why would you have installed equipment at a later time without the program and rebate?

1. [OPEN END]
   DK
   REF

F. Spillover

[REVIEWER NOTE: Questions D through F11 measure 'like' spillover. Questions F12 through F19 measure 'unlike' spillover.]

F1. Thank you. Now I have a few questions about other improvement projects you might have completed in 2021 or 2022. Since your participation in the Lighting Efficiency program in **<MONTH> <YEAR>**, has your company installed any efficient lighting products at **<LOCATION>** ***without*** a rebate or discount from Xcel Energy? When I say "efficient lighting products", I mean any LED fixtures, lamps, retrofit kits, LED exit signs, or refrigerated case lighting, or any lighting controls.

1. Yes
2. No [SKIP TO F12]
   DK [SKIP TO F12]
   REF [SKIP TO F12]

F2. Did your experience with the efficient lighting products you installed through the Xcel Energy Efficient Lighting Rebate program help your decision to install some or all of the additional efficient lighting products that you installed without a rebate?

1. Yes
2. No [SKIP TO F12]
   DK [SKIP TO F12]
   REF [SKIP TO F12]

F3. Which of the following types of lighting did you install, based in part on your experience with the Xcel Energy program? [READ RESPONSES; SELECT ALL THAT APPLY]

1. LED indoor or outdoor fixtures,
2. LED lamps,
3. LED exit signs, [INCLUDE IN PRODUCT LIST]
4. LED refrigerated case lighting [INCLUDE IN PRODUCT LIST]
5. Lighting controls, or
6. None of these [SKIP TO F12]
   DK [SKIP TO F12]
   REF [SKIP TO F12]

[IF F3 = 1]

F4. What type of LED fixtures did you install: high bays, troffers, downlights, wall or stairwell fixtures, outdoor or parking lot fixtures, or none of these? [ALLOW MULTIPLE RESPOSE]

1. High bay fixtures [INCLUDE IN PRODUCT LIST]
2. Troffer fixtures [INCLUDE IN PRODUCT LIST]
3. Downlight fixtures [INCLUDE IN PRODUCT LIST]
4. Wall or stairwell fixtures [INCLUDE IN PRODUCT LIST]
5. Outdoor or parking lot fixtures [INCLUDE IN PRODUCT LIST]
6. None of these [EXCLUDE ALL FIXTURES FROM PRODUCT LIST SKIP TO F12]
   DK [EXCLUDE ALL FIXTURES FROM PRODUCT LIST SKIP TO F12]
   REF [EXCLUDE ALL FIXTURES FROM PRODUCT LIST SKIP TO F12]

[IF F3 = 2]

F5. What type of LED lamps did you install: linear tubes, screw-based, pin-based or mogul lamps, or none of these? [ALLOW MULTIPLE RESPOSE]

1. Linear tubes [INCLUDE IN PRODUCT LIST]
2. Screw-based [INCLUDE IN PRODUCT LIST]
3. Pin-based or mogul [INCLUDE IN PRODUCT LIST]
4. None of these [EXCLUDE ALL LAMPS FROM PRODUCT LIST SKIP TO F12]
   DK [EXCLUDE ALL LAMPS FROM PRODUCT LIST SKIP TO F12]
   REF [EXCLUDE ALL LAMPS FROM PRODUCT LIST SKIP TO F12]

[CREATE **PRODUCT LIST** INCLUDING EACH ITEM SELECTED IN F3-F5 AS INDICATED]

[IF F3 = 5]

F6. What type of controls did you install: stand-alone occupancy, daylight or motion sensors that must be operated at the switch, or networked controls that can be programmed and operated remotely? [ALLOW MULTIPLE RESPOSE]

1. Stand-alone occupancy, daylight or motion sensors [INCLUDE IN CONTROLS LIST]
2. Networked controls [INCLUDE IN CONTROLS LIST]
3. None of these [EXCLUDE ALL CONTROLS SKIP TO F12]
   DK [EXCLUDE ALL CONTROLS SKIP TO F12]
   REF [EXCLUDE ALL CONTROLS SKIP TO F12]

[CREATE **CONTROLS LIST** INCLUDING EACH ITEM SELECTED IN F6 AS INDICATED]

F7. Why did you not apply for an Xcel Energy rebate, or purchase a product discounted by Xcel Energy?

1. [OPEN END]
   DK
   REF

F8. Using a scale from 0 to 10, where 0 is "not at all important" and 10 is "extremely important", please rate how important your experience in the Xcel Energy Lighting Efficiency program was in your decision to install the [LIGHTING/CONTROLS TYPE X] even without a rebate. [RECORD FOR ALL ITEMS IN PRODUCT LIST AND ALL ITEMS IN CONTROL LIST.

1. Lighting type 1: _____ DK REF
2. Lighting type 2: _____ DK REF
3. Lighting type 3: _____ DK REF
4. Lighting type 4: _____ DK REF
5. Stand-alone controls: _____ DK REF
6. Networked controls: _____ DK REF

F9. Using a 0 to 10 scale, where 0 means you definitely would NOT have installed the product and 10 means you definitely WOULD have installed the product, how likely is it that your organization would have installed the [LIGHTING TYPE X] if you had not participated in the Lighting Efficiency program? [RECORD FOR ALL ITEMS IN PRODUCT LIST AND ALL ITEMS IN CONTROL LIST. AFTER FIRST ITEM, REDUCE QUESTION TO "And for the [LIGHTING/CONTROLS TYPE X]? [IF NEEDED: How likely is it that your organization would still have installed this product if you had not participated in the Lighting Efficiency program?]

1. Lighting type 1: _____ DK REF
2. Lighting type 2: _____ DK REF
3. Lighting type 3: _____ DK REF
4. Lighting type 4: _____ DK REF
5. Stand-alone controls: _____ DK REF
6. Networked controls: _____ DK REF

F10. [ASK FOR ALL ITEMS ON PRODUCT LIST FOR WHICH F8>4 AND F9<6] Approximately how many of the [LIGHTING TYPE X] did you install? [FOR EACH, RECORD QUANTITY INSTALLED, or DK, OR REF.]

1. Lighting type 1: _____ DK REF
2. Lighting type 2: _____ DK REF
3. Lighting type 3: _____ DK REF
4. Lighting type 4: _____ DK REF

F11. [ASK FOR ALL ITEMS ON CONTROL LIST FOR WHICH F8>4 AND F9<6] Approximately how many lamps and fixtures are connected to the [CONTROL TYPE X] you installed? First… [FOR EACH, RECORD QUANTITY OF LAMPS OR FIXTURES CONNECTED, OR DK, OR REF.]

1. Stand-alone controls: _____ DK REF
2. Networked controls: _____ DK REF

F12. Since your participation in the Lighting Efficiency Rebate program, have you installed any additional energy efficient equipment, other than lighting, at this or other facilities in Xcel Energy's territory, for which you ***did not receive*** an Xcel Energy rebate?

1. Yes
2. No [SKIP TO NEXT SECTION]
   DK [SKIP TO NEXT SECTION]
   REF [SKIP TO NEXT SECTION]

[ASK IF F12=1]

F13. Did your experience with Xcel Energy rebated lighting help your decision to install some or all of these efficient products?

1. Yes
2. No [SKIP TO NEXT SECTION]
   DK [SKIP TO NEXT SECTION]
   REF [SKIP TO NEXT SECTION]

F14. What equipment did you install?

1. Equipment 1:
2. Equipment 2:
3. Equipment 3:
4. Equipment 4:
5. Equipment 5:

DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

F15. Just to confirm, any of the item or items you just listed through Xcel Energy or any other energy efficiency program? If so, please indicate which item or items received a rebate. [SELECT MULTIPLE]

1. Equipment 1
2. Equipment 2
3. Equipment 3
4. Equipment 4
5. Equipment 5
6. Did not receive a rebate for any of these items
   DK [SKIP TO NEXT SECTION]
   REF [SKIP TO NEXT SECTION]

[ASK FOR ALL EQUIPMENT **NOT** SELECTED IN F15; IF F15=6, ASK FOR ALL EQUIPMENT]

F16. Using the scale from 0 to 10, where 0 is "not at all important" and 10 is "extremely important", how important was your experience in the Xcel Energy Lighting Efficiency Rebate program in your decision to install the [EQUIPMENT X]? [RECORD FOR EACH ITEM. AFTER FIRST ITEM, REDUCE QUESTION TO "And for [EQUIPMENT X]? [IF NEEDED: How important was your experience in the Xcel Energy Lighting Efficiency Rebate program in your decision to install this product?]

1. Equipment 1: _____ DK REF
2. Equipment 2: _____ DK REF
3. Equipment 3: _____ DK REF
4. Equipment 4: _____ DK REF
5. Equipment 5: _____ DK REF

[ASK FOR ALL EQUIPMENT NOT SELECTED IN F15; IF F15=6, ASK FOR ALL EQUIPMENT]

F17. Now, using a 0 to 10 scale where 0 means you definitely would NOT have installed this product and 10 means you definitely WOULD have installed this product, how likely is it that your organization would still have installed the [EQUIPMENTX] if you had NOT participated in the Xcel Energy rebate program? [RECORD FOR ALL ITEMS. AFTER FIRST ITEM, REDUCE QUESTION TO "And for the [EQUIPMENT X]? [IF NEEDED: How likely is it that your organization would still have installed this product if you had not participated in the Xcel Energy rebate program?]

1. Equipment 1: _____ DK REF
2. Equipment 2: _____ DK REF
3. Equipment 3: _____ DK REF
4. Equipment 4: _____ DK REF
5. Equipment 5: _____ DK REF

[ASK F18 AND F19 FOR ALL EQUIPMENT FOR WHICH F16>4 AND F17<6]

F18. In what city and state did you install the [EQUIPMENT X]?

1. Equipment 1: _____ DK REF
2. Equipment 2: _____ DK REF
3. Equipment 3: _____ DK REF
4. Equipment 4: _____ DK REF
5. Equipment 5: _____ DK REF

F19. If you can, please provide the type of equipment, number of units, size, and efficiency level of each type of equipment you installed. If one of these details is not applicable to the equipment, just say "Not applicable". First the… [EQUIPMENT X] (PROBE FOR NUMBER INSTALLED, EQUIPMENT TYPE, EFFICIENCY, SIZE)

1. Equipment 1: [NUMBER INSTALLED; TYPE OF EQUIPMENT; SIZE; EFFICIENCY]
2. Equipment 2: [NUMBER INSTALLED; TYPE OF EQUIPMENT; SIZE; EFFICIENCY]
3. Equipment 3: [NUMBER INSTALLED; TYPE OF EQUIPMENT; SIZE; EFFICIENCY]
4. Equipment 4: [NUMBER INSTALLED; TYPE OF EQUIPMENT; SIZE; EFFICIENCY]
5. Equipment 5: [NUMBER INSTALLED; TYPE OF EQUIPMENT; SIZE; EFFICIENCY]

DK ALL [SKIP TO NEXT SECTION]
REF ALL [SKIP TO NEXT SECTION]

G. Program and Lighting Controls Awareness and Attitudes

G1. [IF **<STATE>**=CO] Are you aware of Xcel Energy's program offering discounted replacement lamps through partner distributors?

1. Yes
2. No

DK
REF

[IF **<STATE>**=CO AND G1=1]

G2. Have you purchased, or considered purchasing, lamps for **<LOCATION>** or any other facility using the Xcel Energy lamp discounts from participating distributors?

1. Yes
2. No

DK
REF

[IF **<STATE>**=CO AND G2=1]

G3. What challenges, if any, did you experience when you participated in or attempted to participate in the lamp discount program?
1. None
2. [OPEN END]

77. Not applicable - did not participate or attempt to participate

DK
REF

G4. [IF REBATE_TYPE = PRES] At the time you completed your project, were you aware Xcel Energy also offers custom rebates on a per kilowatt hour saved basis for energy efficient lighting projects that do not fit into the prescriptive rebate structure?
1. Yes
2. No

DK
REF

G5. [IF REBATE_TYPE = CUSTOM] At the time you completed your project, were you aware Xcel Energy offers fast and easy prescriptive rebates for certain common high-efficiency fixtures, that do not require preapproval?
1. Yes
2. No

DK
REF

G6. How satisfied were you with the ease of understanding the different lighting rebate and discount programs offered by Xcel Energy, and identifying the best fit for your needs? Use a scale from 1 to 5, where 1 is “very dissatisfied” and 5 is “very satisfied”.
1. [NUMERIC OPEN END, 1 – 5]

96. Not applicable

DK
REF

G7. [IF REBATE TYPE = PRES or NEW CONST] How satisfied were you with the range of equipment options that were eligible for the Xcel Energy Lighting Efficiency rebate? (IF NEEDED: Please use the same scale from 1 to 5, where 1 is “very dissatisfied” and 5 is “very satisfied”)
1. [NUMERIC OPEN END, 1 – 5]

96. Not applicable

DK
REF

[IF G7.1<4]

G8. What would have increased your satisfaction with the range of available equipment?
1. [OPEN END]

DK
REF

G9. How satisfied were you with the rebate amounts available through the Lighting Efficiency program, using a scale from 1 to 5? (IF NEEDED: Please use a scale from 1 to 5, where 1 is “very dissatisfied” and 5 is “very satisfied”)
1. [NUMERIC OPEN END, 1 – 5]
2. Not applicable
DK
REF

[IF G9.1<4]

G10. What would have increased your satisfaction with the rebate amounts?
1. [OPEN END]
DK
REF

G11. Do you have lighting controls, such as photocell or occupancy sensors, or lighting timers, currently installed on the interior of your facility?
1. Yes
2. No [SKIP TO G16]
DK [SKIP TO G16]
REF [SKIP TO G16]

G12. What lighting control strategies are currently in use at your facility? [ACCEPT MULTIPLE]
1. Occupancy sensors
2. Photocell or daylight harvesting
3. Scheduled run times
4. High end trim
5. Task tuning
6. Advanced or network controlled lighting
7. OTHER [SPECIFY]
DK
REF

G13. Approximately what percent of the indoor lighting at your facility is controlled by lighting control strategies?
1. [NUMERIC 0 - 100]%
DK [SKIP TO G16]
REF [SKIP TO G16]

[IF G13 <90%]

G14. Why isn’t all of your indoor lighting managed through these lighting control strategies? [ACCEPT MULTIPLE ANSWERS]
1. Cost

2. Incompatibility with existing fixtures
3. Hassle of rewiring
4. No need for controls everywhere
5. Other: _____
   DK
   REF

[IF G14=4]

G15. What types of spaces do not need controls?
1. [OPEN END]
   DK
   REF

G16. Now I'd like to ask about a specific type of lighting controls called a networked lighting control system. Networked lighting control systems are usually installed for larger spaces or a section of a building. They generally include dimmable fixtures connected to occupancy and daylighting sensors, and are controlled remotely from a central location.
[NO RESPONSE NEEDED]

[IF G12≠4]

G17. Have you heard of networked lighting control systems, prior to today?

1. Yes

2. No [SKIP TO NEXT SECTION]
   DK [SKIP TO NEXT SECTION]
   REF [SKIP TO NEXT SECTION]

G18. Did you know Xcel Energy offers rebates for networked lighting controls through the Lighting Rebate program?
1. Yes
2. No
   DK
   REF

G19. At any point during the process to design your lighting project or select lighting equipment, did your contractor suggest or did your organization consider installing a networked lighting control system?
1. Yes
2. No
   DK
   REF

[IF G19=1]

G20. What challenges, if any, did you experience when deciding whether to install networked lighting controls? [ACCEPT MULTIPLE ANSWERS]
1. Determining the total cost
2. Understanding different equipment and programming options
3. Understanding potential energy savings
4. Ensuring compatibility with existing fixtures
5. Ensuring compatibility with future installations
6. Ensuring staff could operate system
7. Finding an experienced, knowledgeable vendor
8. Obtaining permission from building owner
9. Maintaining or verifying cybersecurity
10. Other [OPEN END]
11. [EXCLUSIVE] None, there were no challenges with this decision

DK
REF

[IF G12=4, SKIP TO NEXT SECTION]

G21. Why have you not installed networked lighting controls at your facility to date? [ACCEPT MULTIPLE ANSWERS]
1. Cost
2. Bad experience with lighting controls
3. Don't know enough about them
4. No need for occupancy sensors or dimming, or centralized remote control
5. Our facility runs constantly and lighting controls would not be feasible. [SKIP TO NEXT SECTION]
6. Other: _____

DK
REF

G22. What would motivate you to install networked lighting controls at your facility in the future? [ACCEPT MULTIPLE ANSWERS]
1. Higher rebates
2. Lower cost of equipment
3. Lower cost installation
4. Availability of knowledgeable contractors
5. Greater energy savings
6. Easier to operate by in-house staff
7. Need for more dimming or light variability
8. Added value for my business
9. Additional revenue opportunity such as utility demand response rebates
10. Other: _____
11. [EXCLUSIVE] Already plan to do this in the future
12. [EXCLUSIVE] Nothing would motivate us.
13. [EXCLUSIVE] Our facility runs constantly and lighting controls would not be feasible at this facility.

DK
REF

D. Application Process

[ASK D-D4 IF **<REBATE_TYPE>**= CUSTOM]

D1. For custom rebates like the one you received, Xcel Energy requires you submit one of two documents prior to purchasing your equipment. You can submit either a pre-approval form to calculate your rebate or a signed application form to record your intent to apply for a rebate. Were you aware of these two options at the time you completed your project?
1. Yes
2. No
DK
REF

D2. Which of these two options did you choose for your project?
1. Submit a pre-application with full equipment details and wait for approval and the exact rebate amount
2. Submit an application form to register intent, but not wait for approval or a rebate amount
DK [SKIP TO D5]
REF [SKIP TO D5]

D3. Why did you choose to [INSERT D2 RESPONSE]?
1. [OPEN END]
DK
REF

[IF D2 =2]

D4. How would you describe the rebate amount that you received after your project was complete? Would you say it was… [READ RESPONSES]
1. Significantly less than expected
2. Somewhat less than expected
3. About what you expected
4. Somewhat more than expected
5. Significantly more than expected
6. (Had no specific expectation)
(DK)
(REF)

[ASK D5 OF ALL]

D5. Who filled out the majority of the rebate application? Was it…
1. You
2. Someone else in your organization [SKIP TO D18

3. [IF B=3] Your distributor or vendor [SKIP TO D18]
4. [IF C2 = 1] Your contractor [SKIP TO D18]
5. [IF B=4 OR 0= 1] Your Xcel Energy representative [SKIP TO D18]
6. Someone else [SPECIFY]: _____ [SKIP TO D18]

DK [SKIP TO D18]
REF [SKIP TO D18]

[ASK D6- D10 IF **<REBATE_TYPE>** = CUSTOM OR PRES; SKIP TO D11 IF **<REBATE_TYPE>**= NEW CONST]

D6. Did you submit the rebate application using the online portal and uploading your documents, or, did you use the preprinted form and submit documents via email, mail or fax?

1. Submit application through online portal
2. Used preprinted form [SKIP TO D11]

DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

D7. About how long did it take you to fill out the online application? Would you say about

1. 15 minutes or less
2. 16-30 minutes
3. 31 minutes to 1 hour
4. Over 1 hour but less than 2 hours, or
5. More than 2 hours

DK
REF

D8. How would you rate your satisfaction with the online application process? (IF NEEDED: Please use the same scale from 1 to 5, where 1 is “very dissatisfied” and 5 is “very satisfied”)

1. [NUMERIC OPEN END, 1 – 5]

96. Not applicable

DK
REF

[IF D8< 4]

D9. What would have increased your satisfaction?

1. [OPEN END]

DK
REF

D10. Do you have any suggestions for Xcel Energy on how they could improve the online application?

1. [OPEN END]
   DK
   REF

[SKIP TO D18 IF D6=1 AND **<REBATE TYPE>** = PRES OR CUSTOM]

D11. About how long did it take you to fill out the application form? Would you say about
1. 15 minutes or less
2. 16-30 minutes
3. 31 minutes to 1 hour
4. Over 1 hour but less than 2 hours, or
5. More than 2 hours
   DK
   REF

[ASK D12 IF <REBATE_TYPE>= CUSTOM]

D12. About how long did it take you to complete the Custom Efficiency workbook?
1. 15 minutes or less
2. 16-30 minutes
3. 31 minutes to 1 hour
4. Over 1 hour but less than 2 hours, or
5. More than 2 hours
   DK
   REF

D13. How would you rate your satisfaction with the application and application process? (IF NEEDED: Please use the same scale from 1 to 5, where 1 is “very dissatisfied” and 5 is “very satisfied”)
1. [NUMERIC OPEN END, 1 – 5]

96. Not applicable

DK
REF

[ASK IF D13 < 4]

D14. What would have increased your satisfaction?
1. [OPEN END]
   DK
   REF

D15. Do you have any suggestions for Xcel Energy on how they could improve the application?
1. NONE
2. [OPEN END]

DK
REF

[SKIP IF **<REBATE_TYPE>**= NEW CONST]

D16. Were you aware that the Lighting Rebate program offers an online rebate application portal, as an alternative to the preprinted form?
1. Yes
2. No
DK
REF

[ASK IF D16 = 1]

D17. Why did you choose to use the preprinted form rather than the online version?
1. [OPEN END]
DK

D18. Thinking about your experience from start to finish, how would you rate your satisfaction with the Xcel Energy Lighting Rebate program as a whole? (IF NEEDED: Please use the same scale from 1 to 5, where 1 is “very dissatisfied” and 5 is “very satisfied”)
1. [NUMERIC OPEN END, 1 – 5]

96. Not applicable

DK
REF

[ASK IF D18 < 4]

D19. What would have increased your satisfaction?
1. [OPEN END]
DK
REF

D20. Do you have any suggestions for Xcel Energy on how they could improve the Lighting Rebate program to make it easier for customers to complete more lighting projects, or achieve better energy savings with each project?
1. NONE
2. [OPEN END]
DK
REF

H. Firmographics

H1. Finally, I’d like to gather some information about your organization. How would you describe the primary business activity in the facility at <LOCATION>?
1. Administrative and Support Services

2. Health Care
3. Educational Services
4. Manufacturing
5. Food and Beverage Stores
6. Food Services and Drinking Places
7. Wholesalers
8. Warehousing and transportation
9. Non-food consumer retail
10. Professional, Scientific, and Technical Services
11. Real Estate
12. Religious, Grantmaking, and Civic, and Nonprofits Organizations
13. Recreation and entertainment
14. Government
15. Lodging
16. Other (Specify: _____)

DK
REF

H2. What is the approximate total square footage of all the building space occupied by your organization at this address?

1. [NUMERIC]

DK
REF

H3. What is your occupational title within your company? (ASK OPEN END, PROBE FOR SPECIFICS / VERIFY SELECTION AS NEEDED)

1. President / CEO
2. Proprietor / Owner
3. Chief Financial Officer
4. Vice President / Director / Assistant Director / Department Head
5. Other financial / administrative position
6. Facilities Manager
7. Energy Manager
8. Other facilities management / maintenance position
9. Other Manager / assistant manager
10. Other ____

DK
REF

H4. Does your organization own, lease, or rent your facility at [LOCATION]?

1. Own
2. Lease / Rent
3. Other _____

DK
REF

[IF H4≠ 1]

H5. Does your organization pay your Xcel Energy bill, or does someone else (e.g., a landlord or building manager)?
1. Our organization pays the bill
2. Someone else pays the bill
DK
REF

Closing

I1. Those are all the questions I have. As a thank you for your input, we'd like to send your $25 Amazon gift card. We can send the gift card to you or someone of your choosing.

1. [COLLECT CONTACT INFORMATION]
2. [RESPONDENT DOES NOT ACCEPT GIFT CARD]

Recruitment for CO Baseline Study

[ASK THIS SECTION IF **<STATE>** = CO]

RECRUITMENT1. Xcel Energy is planning to conduct a separate study to gather information about the types of lighting currently installed in customer facilities. We are looking for facilities that are willing and able to allow a trained technician to walk through your facility and record the types of lighting products and equipment at your location. If you wish to participate, an Xcel Energy employee may review the data from your facility with you and suggest ways to reduce your energy usage. Would you be interested in being a part of this study?

1. Yes
2. No

DK

REF

[ASK IF RECRUITMENT1. = Yes]

RECRUITMENT2. Xcel Energy or their contractor may be reaching out to you by phone over the next few months to schedule the on-site visit at your facility.

Is this the best phone number to reach you to schedule the on-site visit at your facility?

1. Yes
2. No [Collect correct phone number]:

[IF NEEDED] Below are answers to some frequently asked questions:

How long will this take?

Visits should last approximately two hours, depending on the size of your facility.

What does the visit involve?

Technicians will walk around your location and record the various types of lighting products you have installed. They will also ask basic information regarding your facility's hours of use and building characteristics such as square footage. This representative will not request any personal information.

What is the purpose of this study?

The purpose of the study is to gather information that will be used by Xcel Energy as a guide and will help them improve their energy efficiency programs and help customers save money.

How do I know you are legitimate?

Xcel Energy is sponsoring this program and study. If you would like to contact Xcel Energy to confirm, the contact person is Paige Romero-Freeland at 303-294-2056.

What is the next step?

If you are selected for the study, we will contact you by phone and email to schedule a site visit and to answer any remaining questions you may have.

B.3 Non-Participating Customer Survey Instrument

Introduction

To support the process and impact evaluation of the 2021 Xcel Energy efficiency programs, the TRC evaluation team will conduct telephone surveys with nonparticipants. The evaluation team defined a nonparticipating customer as any customer that has not completed a project through the Lighting Efficiency Product or installed lighting upgrades through any other Xcel Energy Product since 2017.

Evaluation Objectives

The research will be conducted to assess key process and impact evaluation objectives. Specific research questions which this nonparticipant survey is designed to address are the following:

- **Decision Drivers**: The evaluation team will ask about customer awareness of energy efficiency opportunities and rebates, especially for lighting. The evaluation team will also ask customers about major factors influencing their capital expenditure decisions generally, including the impacts of COVID 19. In addition, the Team will ask about any obstacles faced if the respondent tried to participate in the past such as insufficient information, difficulty navigating renter-landlord situation, lack of trade partner knowledge, or other issues.
- **Attitudes toward Efficiency Improvements**: The survey will ask about current levels of lighting efficiency, and exploration of factors that influence decisions about capital improvement projects, including general budget availability for capital improvements and attitudes toward rebates. The team will also ask about any changes in capital improvement spending over the past two years or going forward.
- **Feedback on Product Design:** The survey will also ask about satisfaction with aspects of the Product that the customer is aware of, such as rebate levels and eligible products.
- **Roles of Trade Partners and Xcel Energy Staff:** The evaluation team will explore to what degree the customer relies on installers, account managers, or the Business Solutions Center team as resources when planning energy-related projects.
- **Barriers to Lighting Controls:** The evaluation team will ask about the customers familiarity with lighting control options, whether the customer has considered lighting controls, and if so, reasons for not either installing or not installing controls. The survey will ask about what resources the customer used to evaluate controls (such as internal or corporate expertise, trade partners, Xcel Energy account managers, etc.).
- **NTGR:** The evaluation team will ask questions about any lighting efficiency projects the customer has completed in the past year, and to what degree the customer was influenced by the Lighting Efficiency Product (even though they did not receive a rebate).

Table B.3-1 presents the link between each evaluation objective, research question, and survey question.

Table B.3-1. Evaluation Objective, Survey Research Themes & Survey Question Crosswalk

Evaluation Objective	Research Question	Survey Question Number(s)
Decision Drivers and Attitudes toward Efficiency	What are the major factors influencing capital expenditure decisions generally, including budget availability and the impacts of COVID 19? How does the organization judge the budget available for capital improvements, and prioritize projects? Have there been any changes in capital improvement spending over the past two years or going forward? Do customers view trade partners or Xcel Energy staff as useful resources for developing an energy efficiency project?	Sec B Sec C
	What are customer attitudes toward energy efficiency investments?	Sec D
	Are customers aware of energy efficiency opportunities and rebates, especially for lighting? What obstacles have customers faced when they tried to participate in a rebate program? Were trade partners and Xcel Energy representatives more likely to be involved where customers had a good experience with the program?	Sec G
	What type of lighting do customers currently have installed?	
Feedback on Product Design	What obstacles prevent customers from applying for rebates? How satisfied were customers with rebate amounts and eligible equipment?	Sec D
Roles of Trade Partners and Xcel Energy Staff	Are trade partners and/or Xcel Energy representatives primary channels of information about rebates? Have customers engaged with trade partners and/or Xcel Energy representatives about available rebates or filling out an application?	Sec D

Barriers to Lighting Controls	Are customers familiar with lighting control options? Have customers installed lighting controls, or has considered lighting controls? What are reasons for not installing controls? How familiar are customers with the concept of networked lighting controls, and what has their experience been?	Sec F
NTGR	What impact did the program have on customers' decisions to purchase high efficiency lighting and other efficient equipment without a rebate (spillover)?	Sec E

Sample & Target Completes

Table B.3-2 shows the target number of completes for each state. Once contact data is available for the sample, we will update the minimum number of surveys for each state.

Table B.3-2. Target Completes, by State

	Target Completes
Minnesota	70
Colorado	70
TOTAL	**140**

Sample Variables

Table B.3-3 includes the sample variables that will be used to conduct this survey, as well as descriptions of these variables and potential codes.

Table B.3-3. Sample Variables

Sample Variables	Variable Descriptions	Potential Codes
Interviewer Name	Name of interviewer from Ewald and Wasserman	e.g. Donna Whitsett
Organization	Organization name	e.g. Apex Analytics
Contact	Contact at organization	e.g. Laura James
Contact_Rev	Updated contact, based on Survey response	e.g. Sue Jones

Sample Variables	Variable Descriptions	Potential Codes
Phone	Phone number for contact at organization	e.g. 555-555-5555
Phone_Rev	Revised phone, based on survey response	e.g. 555-555-6666
State	State where project facility is located	e.g., CO or MN
Location	Address or name of premise where lighting product was installed	E.g. "Baden Street"

Fielding Instructions

- Attempt each record six times on different days of the week and at different times.
- Leave messages on the first and fourth attempt.
- Experienced interviewers should attempt to convert "soft" refusals (e.g., "I'm not interested", immediate hang-ups) at least once.
- The survey is considered complete when CLOSE1 is answered.
- After completing 5 interviews, hold calling and output a preliminary SPSS dataset and recordings of the pretest interviews. Resume calling after Apex Analytics checks the data (usually with 1-2 working days).
- Monitor at least 10 percent of the interviews to ensure proper interview protocols (e.g., reading questions verbatim, proper probing, accurate data entry).
- Calling hours are 9 AM to 5 PM MDT.

Survey Sections

- **A. Introduction & Screening**
- **B. Decision Drivers**
- **C. Attitudes toward Efficiency**
- **D. Program Awareness**
- **E. Spillover**
- **F. Barriers to Lighting Controls**
- **G. Firmographics**
- **I. Closing**

Survey Guide

[PROGRAMMER NOTES:

- Fields from sample to be piped into text are marked with **<>**
- Unless otherwise specified, interviewer should NOT read responses.
- DK and REF responses are always exclusive (meaning even if question is "ALL THAT APPLY", those responses can't be selected in combination with any other responses)

A. Introduction & Screening

A1. Hello, this is **<INTERVIEWER NAME>** calling from Ewald and Wasserman, a national research firm working with Xcel Energy. May I speak with **<CONTACT>?**

1. Yes
2. No, they are not available right now.
3. No, they are no longer employed by this organization.
4. No, other reason (SPECIFY).

DK [TERMINATE]
REF [TERMINATE]

[IF A1= 3, OR 4]

A2. Ok, may I speak to the person responsible for energy decisions at **<LOCATION>**?

1. Yes, that would be me.
2. Yes, let me transfer you to the correct person [IF NAME GIVEN, ENTER AS **<CONTACT_REV>**; REPEAT QUESTION WITH NEW RESPONDENT]
3. No, they are not available right now.
4. No, other reason (SPECIFY).

DK [TERMINATE]
REF [TERMINATE]

[IF A1= 1, OR A2=1 OR 2]

A3. Are you the person at **<ORGANIZATION>** responsible for making decisions about energy efficiency or facility improvements at **<LOCATION>**?

1. Yes.
2. No, that's someone else.

DK [TERMINATE]
REF [TERMINATE]

[IF A3=2]

A4. Would I reach that person by dialing the same number I used to connect with you: **<PHONE>**?

1. Yes [**TERMINATE**; REDIAL NEW SAMPLE CASE]
2. No, use a different number [RECORD AS **<PHONE_REV>**) [**TERMINATE**; REDIAL NEW SAMPLE CASE]

DK [TERMINATE]
REF [TERMINATE]

[PROGRAMMER NOTE: Only those for whom A3=1 should get to this screen; the rest would end at Intro5 as they will need to be made into new sample cases and called back at a later time.]

[ASK IF A3=1]
A5. Great! (IF NEEDED: Again, we're Ewald and Wasserman, a national research firm calling on behalf of Xcel Energy). We are conducting a short survey that will help Xcel Energy improve their programs to help organizations like your save energy and money. As a token of appreciation, we are offering a $25 Amazon gift card that you will receive after completing the survey. Your responses will remain confidential, meaning that your name and company name will not be attributed to your answers.
[IF NEEDED: The survey takes about 12 minutes, on average]

Is now a good time or should we call you back?
1. No objection – fine to continue
2. Objection [RESOLVE/SCHEDULE A BETTER TIME AND RESCREEN AS NECESSARY]

REF [TERMINATE]

A6. To make sure this survey is appropriate for you, can you tell me if your company completed an efficient lighting improvement projects at **<LOCATION>** in 2021 for which you received a rebate from Xcel Energy?
1. Yes, completed a project [This survey is only for customers that did not receive a lighting rebate in 2021, so I have no further questions for you. Thank you. TERMINATE]
2. No, did not complete a project

DK
REF

B. Decision Drivers

B1. Thank you. My first questions ask about how your organization makes decisions about building or equipment improvements. Which of the following statements best describes how your organization manages capital improvement decisions? [READ RESPONSES. SELECT ONE]
1. You consider improvement projects as they are identified, and decide based on need and cost,
2. You set an annual budget for building and equipment improvements, and then allocate funding to specific projects based on need and payback period,
3. You maintain a long-term capital improvement plan, and allocate sufficient budget for planned projects each year, or
4. Something else? [Specify] _____

DK
REF

B2. Does your organization typically consider reduced energy costs when calculating a payback period or return on investment for building or equipment upgrades?

1. Yes
2. No
3. We don't typically calculate a payback/return on investment

DK
REF

B3. When considering an energy efficient building or equipment improvement, which of the following sources of information do you typically rely on most? [READ RESPONSES; SELECT UP TO TWO]

1. Experience or knowledge of internal staff,
2. Online research by internal staff,
3. Information from a contractor or installer,
4. Information from a distributor or equipment vendor,
5. Information from Xcel Energy representatives, or
6. Another source? [Specify]: _____

DK
REF

B4. How did the COVID-19 pandemic affect your organization's overall approach to new building or equipment improvement projects, relative to 2019 or earlier? Would you say…[READ RESPONSES]

1. The organization was less likely to invest in improvement projects during 2020 and 2021,
2. The organization was equally likely to invest in improvement projects during 2020 and 2021, or
3. The organization was more likely to invest in improvement projects during 2020 and 2021?

DK
REF

B5. Thinking about 2023, how do you think your organization's approach to building and equipment improvements will compare to its approach right now? Would you say…[READ RESPONSES]

1. The organization will be less likely to invest in improvements,
2. The organization will be equally likely to invest in improvements, or
3. The organization will be more likely to invest in improvements?

DK
REF

C. Attitudes toward Efficiency

C1. In general, which of the following factors would be most likely to motivate your organization to make an energy efficient building or equipment upgrade? [READ RESPONSES; SELECT UP TO TWO]

1. Getting a fast payback, or high return on investment,
2. Replacing aging or broken equipment,

3. Reducing energy use to be more environmentally responsible,
4. Upgrading to new technology for better performance,
5. Getting energy or maintenance cost savings,
6. Getting a rebate or tax credit, or
7. Something else? [Specify: _____]

DK
REF

C2. I'm going to read you several statements describing barriers organizations often face when considering energy-efficient improvements. Please tell me to what extent each statement accurately describes your organization, on a scale of 1 to 5 with 1 being "not at all accurate" and 5 being "very accurate". If it doesn't apply to you, please let me know that. [READ LIST. IF NEEDED ASK: How accurately does this describe your organization?]
[RECORD FOR EACH: 1-5, 77=Not Applicable, DK, REF]

A. The first statement is: Making upgrades at this location is too much of a hassle.
B. We don't replace working equipment even if it uses a lot of energy.
C. We have already made all the energy efficiency improvements we can
D. Energy efficient upgrades are too expensive.
E. It's too hard to know what equipment is really energy efficient
F. We lease our space, we do not want to invest in upgrades.
G. Lastly: Decisions about building and equipment upgrades are made at a corporate office, and we don't have much input at this location.

C3. Does your organization have a specific energy efficiency or conservation goal or policy to reduce energy use?

1. Yes
2. No

- DK
- REF

D. Program Awareness

D1. Xcel Energy offers rebates and discounts for the installation of high efficiency lighting, heating and cooling, and other equipment and building improvements. Before today, were you aware Xcel Energy offered these programs?

1. Yes
2. No [SKIP TO NEXT SECTION]

DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

[IF D=1]

D2. How did you learn about the rebates or discounts? [SELECT MULTIPLE]

1. Contractor/vendor
2. Xcel Energy representative
3. Xcel Energy email or mailing
4. Trade or professional association
5. Brochure
6. Newspaper, radio or TV ad

7. Social media post
8. Online ad or digital media
9. Past participation in a rebate program
10. Own research
11. Xcel Energy website
12. Community event
13. Other[SPECIFY:_____]
    DK
    REF

[IF D=1]
D3. Have you ever received a rebate or discount from Xcel Energy in the past?
1. Yes
2. No [SKIP TO D6]
   DK [SKIP TO NEXT SECTION]
   REF [SKIP TO NEXT SECTION]

[IF D3=1]
D4. How satisfied were you with your overall experience participating in an energy efficiency program through Xcel Energy? Use a scale from 1 to 5, where 1 is “very dissatisfied” and 5 is “very satisfied”.
[NUMERIC OPEN END, 1 – 5]
Not applicable
DK
REF

[IF D4<4]
D5. Why do you say that?
[OPEN END]
DK
REF

[IF D3=1, SKIP TO NEXT SECTION]

[IF D3=2]
D6. Have you ever researched or considered applying for an Xcel Energy rebate in the past?
1. Yes
2. No [SKIP TO NEXT SECTION]
   DK [SKIP TO NEXT SECTION]
   REF [SKIP TO NEXT SECTION]

D7. Why did you not receive a rebate at that time? [SELECT ALL THAT APPLY]
1. Did not complete the project,
2. The equipment purchased was not eligible,
3. Application too confusing,
4. Did not have time to complete the application,
5. Applied, but application was not approved,
6. Rebate was too little money,

7. Forgot to apply,
8. We lease building, don't own it,
9. Expect to get rebate - application is in process, or
10. Something else [SPECIFY:_____]

DK
REF

[SKIP D8 IF D7=6]

D8. At the time you considered applying for a rebate, would you say the rebate amounts were [READ RESPONSES]
1. Very high,
2. High enough to be meaningful, or
3. Not high enough to be meaningful?

DK
REF

D9. At the time you considered applying for a rebate, would you say the list of eligible equipment [READ RESPONSES]
1. Included most equipment you wanted,
2. Was limited but included some equipment you wanted, or
3. Did not include any equipment you wanted?

DK
REF

D10. At the time you considered applying for a rebate, did you discuss the rebate requirements or application with your contractor or vendor?
1. Yes, discussed it
2. No, did not discuss it
3. No, did not have a contractor or vendor

DK
REF

D11. At the time you considered applying for a rebate, did you discuss the rebate requirements or application with an Xcel Energy representative?
1. Yes, discussed it
2. No, did not discuss it

DK
REF

D12. [SKIP D12 IF D7=1]Did you complete the project that you were considering at that time, even though you did not receive the rebate?
1. Yes
2. No

DK
REF

E. Spillover

[REVIEWER NOTE: We will consider these responses in developing the final prospective NTG, but may not include the **lighting** spillover portion in the quantitative analysis to avoid double counting the result with spillover measured from trade partner interviews.]

♦

E1. Thank you. Now I have a few questions about energy improvement projects you might have completed recently. In 2021 or 2022, has your organization installed any efficient lighting products at **<LOCATION>** or other facilities in Xcel Energy territory ***without*** a rebate or discount from Xcel Energy? When I say "efficient lighting products", I mean any LED fixtures, lamps, retrofit kits, LED exit signs, or refrigerated case lighting, or any lighting controls.

1. Yes
2. No [SKIP TO F12]
   DK [SKIP TO F12]
   REF [SKIP TO F12]

E2. Did information from Xcel Energy about energy efficiency or available rebates have some influence on your decision to install the efficient lighting or controls, even though you did not receive a rebate?

1. Yes
2. No [SKIP TO F12]
   DK [SKIP TO F12]
   REF [SKIP TO F12]

E3. Which of the following types of lighting did you install, based in part on information from Xcel Energy? [READ RESPONSES; SELECT ALL THAT APPLY]

1. LED indoor or outdoor fixtures,
2. LED lamps,
3. LED exit signs, [INCLUDE IN PRODUCT LIST]
4. LED refrigerated case lighting, or [INCLUDE IN PRODUCT LIST]
5. Lighting controls
6. None of these [SKIP TO F12]
   DK [SKIP TO F12]
   REF [SKIP TO F12]

[IF F3 = 1]

E4. What type of LED fixtures did you install: high bays, troffers, downlights, wall or stairwell fixtures, outdoor or parking lot fixtures, or another type?

1. High bay fixtures [INCLUDE IN PRODUCT LIST]
2. Troffer fixtures [INCLUDE IN PRODUCT LIST]
3. Downlight fixtures [INCLUDE IN PRODUCT LIST]
4. Wall or stairwell fixtures [INCLUDE IN PRODUCT LIST]
5. Outdoor or parking lot fixtures [INCLUDE IN PRODUCT LIST]
6. Another type, specify:
7. None of these [EXCLUDE ALL FIXTURES FROM PRODUCT LIST; SKIP TO]
   DK [EXCLUDE ALL FIXTURES FROM PRODUCT LIST]
   REF [EXCLUDE ALL FIXTURES FROM PRODUCT LIST]

[IF F3 = 2]

E5. What type of LED lamps did you install: linear tubes, screw-based, pin-based or mogul
1. Linear tubes [INCLUDE IN PRODUCT LIST]
2. Screw-based [INCLUDE IN PRODUCT LIST]
3. Pin-based or mogul [INCLUDE IN PRODUCT LIST]
4. None of these [EXCLUDE ALL LAMPS FROM PRODUCT LIST]
DK [EXCLUDE ALL LAMPS FROM PRODUCT LIST]
REF [EXCLUDE ALL LAMPS FROM PRODUCT LIST]

[CREATE **PRODUCT LIST** INCLUDING EACH ITEM SELECTED IN F3-F5 AS INDICATED]

[IF F3 = 5]

E6. What type of controls did you install: stand-alone occupancy, daylight or motion sensors that must be operated at the switch, or networked controls that can be programmed and operated remotely?
1. Stand-alone occupancy, daylight or motion sensors [INCLUDE IN CONTROLS LIST]
2. Networked controls [INCLUDE IN CONTROLS LIST]
3. None of these [EXCLUDE ALL CONTROLS]
DK [EXCLUDE ALL CONTROLS]
REF [EXCLUDE ALL CONTROLS]

[CREATE **CONTROLS LIST** INCLUDING EACH ITEM SELECTED IN F6 AS INDICATED]

[IF PRODUCT LIST =0 AND CONTROLS LIST=0, SKIP TO NEXT SECTION]

E7. Why did you not apply for an Xcel Energy rebate, or purchase a product discounted by Xcel Energy?
1. [OPEN END]
DK
REF

E8. Using a scale from 0 to 10, where 0 is “not at all important” and 10 is “extremely important”, please rate how important the information from Xcel Energy was in your decision to install the following product: [LIGHTING/CONTROLS TYPE X]. [RECORD FOR ALL ITEMS IN PRODUCT LIST AND ALL ITEMS IN CONTROL LIST.
1. Lighting type 1: _____ DK REF
2. Lighting type 2: _____ DK REF
3. Lighting type 3: _____ DK REF
4. Lighting type 4: _____ DK REF
5. Stand-alone controls: _____ DK REF
6. Networked controls: _____ DK REF
DK ALL
REF ALL

E9. Now, using a 0 to 10 scale, where 0 means you definitely would NOT have installed this product and 10 means you definitely WOULD have installed this product, how likely is it that your organization would still have installed the [Lighting Type/Controls X] if you had

not had the information from Xcel Energy? [RECORD FOR ALL ITEMS IN PRODUCT LIST AND ALL ITEMS IN CONTROL LIST.

1. Lighting type 1: _____ DK REF
2. Lighting type 2: _____ DK REF
3. Lighting type 3: _____ DK REF
4. Lighting type 4: _____ DK REF
5. Stand-alone controls: _____ DK REF
6. Networked controls: _____ DK REF

E10. [ASK FOR ALL ITEMS ON PRODUCTS LIST FOR WHICH E8 >4 AND E9<6] Approximately how many of the [LIGHTING TYPE X] did you install? [FOR EACH LED ON PRODUCT LIST, RECORD QUANTITY INSTALLED, or DK, OR REF.]

1. Lighting type 1: _____ DK REF
2. Lighting type 2: _____ DK REF
3. Lighting type 3: _____ DK REF
4. Lighting type 4: _____ DK REF

E11. [ASK FOR ALL ITEMS ON CONTROLS LIST FOR WHICH E8 >4 AND E9<6] Approximately how many lamps and fixtures are connected to the [CONTROL TYPE X] you installed? [FOR EACH ITEM ON CONTROLS LIST, RECORD QUANTITY OF LAMPS AND FIXTURES CONNECTED, OR DK, OR REF.]

1. Stand-alone controls: _____ DK REF
2. Networked controls: _____ DK REF

E12. In 2021 or 2022, have you installed any additional energy efficient equipment, other than lighting, at this or other facilities in Xcel Energy's territory, for which you ***did not receive*** an Xcel Energy rebate?

1. Yes
2. No [SKIP TO NEXT SECTION]
   DK [SKIP TO NEXT SECTION]
   REF [SKIP TO NEXT SECTION]

E13. Did information from Xcel Energy about energy efficiency or available rebates have some influence on your decision to install any of these efficient products, even if you did not receive a rebate?

1. Yes
2. No [SKIP TO NEXT SECTION]
   DK [SKIP TO NEXT SECTION]
   REF [SKIP TO NEXT SECTION]

E14. What equipment did you install?

1. Equipment 1:
2. Equipment 2:
3. Equipment 3:
4. Equipment 4:
5. Equipment 5:
   DK [SKIP TO NEXT SECTION]
   REF [SKIP TO NEXT SECTION]

E15. Just to confirm, did you receive a rebate for any of the item or items you just listed through Xcel Energy or any other energy efficiency program? If so, please indicate which item or items received a rebate. [SELECT MULTIPLE]
1. Equipment 1
2. Equipment 2
3. Equipment 3
4. Equipment 4
5. Equipment 5
6. Did not receive a rebate for any of these items
   DK [SKIP TO NEXT SECTION]
   REF [SKIP TO NEXT SECTION]

[ASK FOR ALL EQUIPMENT **NOT** SELECTED IN E15; IF E15=6, ASK FOR ALL EQUIPMENT]

E16. Using a scale from 0 to 10, where 0 is "not at all important" and 10 is "extremely important", how important was information from Xcel Energy on your decision to install the [EQUIPMENT X]? [RECORD FOR ALL ITEMS. AFTER FIRST ITEM, REDUCE QUESTION TO "And for [EQUIPMENT X]? [IF NEEDED: How important was the information from Xcel Energy in your decision to install this product?]
1. Equipment 1: _____ DK REF
2. Equipment 2: _____ DK REF
3. Equipment 3: _____ DK REF
4. Equipment 4: _____ DK REF
5. Equipment 5: _____ DK REF

[ASK FOR ALL EQUIPMENT **NOT** SELECTED IN E15; IF E15=6, ASK FOR ALL EQUIPMENT]

E17. Now, using a 0 to 10 scale where 0 means you definitely would NOT have installed this product and 10 means you definitely WOULD have installed this product, how likely is it that your organization would still have installed the [EQUIPMENTX] if you had NOT had the information from Xcel Energy? [RECORD FOR ALL ITEMS. AFTER FIRST ITEM, REDUCE QUESTION TO "And for the [EQUIPMENT X]? [IF NEEDED: How likely is it that your organization would still have installed this product if you had not had the information from Xcel Energy?]
1. Equipment 1: _____ DK REF
2. Equipment 2: _____ DK REF
3. Equipment 3: _____ DK REF
4. Equipment 4: _____ DK REF
5. Equipment 5: _____ DK REF

[ASK FOR ALL EQUIPMENT FOR WHICH E16>4 AND F17<6]

E18. If you can, please provide the number of units, type of equipment, size, and efficiency level installed for the [EQUIPMENT X]. If one of these details is not applicable to the equipment, just say "Not applicable". (PROBE FOR NUMBER INSTALLED, EQUIPMENT TYPE, EFFICIENCY, SIZE)
1. Equipment 1: [NUMBER INSTALLED; TYPE OF EQUIPMENT; SIZE; EFFICIENCY]
2. Equipment 2: [NUMBER INSTALLED; TYPE OF EQUIPMENT; SIZE; EFFICIENCY]
3. Equipment 3: [NUMBER INSTALLED; TYPE OF EQUIPMENT; SIZE; EFFICIENCY]
4. Equipment 4: [NUMBER INSTALLED; TYPE OF EQUIPMENT; SIZE; EFFICIENCY]
5. Equipment 5: [NUMBER INSTALLED; TYPE OF EQUIPMENT; SIZE; EFFICIENCY]

DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

F. Barriers to Lighting Controls

Thank you. The survey is almost done. Next I just have a few questions about lighting controls.

[IF E3=5, SKIP TO G12]

F1. Do you have lighting controls, such as photocell or occupancy sensors, or lighting timers, currently installed on the interior of your facility at [LOCATION]?
3. Yes
4. No [SKIP TO F7]
DK [SKIP TO F7]
REF [SKIP TO F7]

F2. What lighting controls or strategies are currently in use at [LOCATION]? [READ LIST; ACCEPT MULTIPLE]
8. Occupancy sensors
9. Photocell or daylight harvesting
10. Scheduled run times
11. High end trim
12. Task tuning
13. OTHER strategies [SPECIFY]
DK
REF

F3. Approximately what percent of the indoor lighting at your facility is controlled by lighting controls or strategies?
2. [NUMERIC 0 - 100]%
DK [SKIP TO F7]
REF [SKIP TO F7]

[IF G13 <90%]

F4. Why isn't all of your indoor lighting controlled? [ACCEPT MULTIPLE ANSWERS]
6. Cost
7. Need more information on payback
8. Don't know much about controls technology
9. Incompatibility with existing fixtures
10. Hassle of rewiring
11. Space isn't used frequently
12. No need for controls everywhere
13. Other: _____
DK
REF

[IF G14=7]

F5. What types of spaces do not need controls?
3. [OPEN END]
DK

REF

[IF F6=2, SKIP TO F10]

Now I'd like to ask about a specific type of lighting control strategy called a networked lighting control system. Networked lighting control systems are usually installed for an entire building or large section of a building. They generally include dimmable fixtures connected to occupancy and daylight sensors, all controlled remotely from a central location or online application, rather than within each room.
[NO RESPONSE NEEDED]

F6. Do you have any networked lighting controls installed in your facility?
1. Yes [SKIP TO F10]
2. No
DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

F7. Have you heard of networked lighting control systems, prior to today?
1. Yes
2. No [SKIP TO NEXT SECTION]
DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

F8. Did you know Xcel Energy offers rebates for networked lighting controls?
1. Yes
2. No
DK
REF

F9. Have you ever researched or considered installing a networked lighting control system?
1. Yes
2. No [SKIP TO NEXT SECTION]
DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

[IF F6=1 OR G19=1]

F10. Which of the following people or resources were useful to you when considering installing networked lighting controls? [READ RESPONSES; ACCEPT MULTIPLE ANSWERS]
1. Own or internal staff research,
2. Engineer or architect,
3. Installer or other contractor,
4. Distributor, manufacturer representative or manufacturer,
5. Xcel Energy Account Manager or representative, or
6. Another person or resource [SPECIFY:_____]
DK
REF

[IF F6=1 OR F9=1]

F11. What challenges, if any, did you experience when considering whether to install networked lighting controls? [ACCEPT MULTIPLE ANSWERS]
1. Determining the cost
2. Understanding different equipment and programming options
3. Understanding potential energy savings
4. Ensuring compatibility with existing fixtures
5. Ensuring compatibility with future installations
6. Ensuring staff could operate system
7. Finding an experienced, knowledgeable contractor or vendor
8. Obtaining permission from building owner
9. Other [OPEN END]
10. [EXCLUSIVE] None, there were no challenges with this decision

DK
REF

[IF F9=1]

F12. Why have you not installed networked lighting controls at your facility to date? [ACCEPT MULTIPLE ANSWERS]
1. Cost/too expensive
2. Bad experience with lighting controls
3. Don't know enough about them
4. No need for occupancy sensors or dimming, or centralized remote control
5. Our facility runs constantly and lighting controls would not be feasible. [SKIP TO NEXT SECTION]
6. Other: _____

DK
REF

[IF F9=1]

F13. Which of the following might motivate your organization to install networked lighting controls at your facility in the future? Select all that apply. Would you be motivated by … [Read responses; ACCEPT MULTIPLE ANSWERS]
1. Lower cost of equipment?
2. Lower cost installation?
3. Greater availability of knowledgeable contractors?
4. Greater energy savings?
5. Easier operation by in-house staff?
6. A greater need for more dimming or light variability at your facility?
7. [EXCLUSIVE] [Nothing would motivate us.]
8. [EXCLUSIVE] [Already plan to do this in the future]

DK
REF

G. Firmographics

G1. Thank you. My final questions ask for some characteristics of your organization. About what percent of the lighting at <LOCATION> would you say uses LEDs:
1. [RECORD %: _____]

DK

REF

G2. Can you tell me about how old the majority of the lighting fixtures at <LOCATION> are?
1. 0-4 years old
2. 5-9 years old
3. 10-20 years old
4. More than 20 years old
DK
REF

G3. How would you describe the primary business activity in the facility at **<LOCATION>**?
1. Administrative and Support Services
2. Health Care
3. Educational Services
4. Manufacturing
5. Food and Beverage Stores
6. Food Services and Drinking Places
7. Wholesalers
8. Warehousing and transportation
9. Non-food consumer retail
10. Professional, Scientific, and Technical Services
11. Real Estate
12. Religious, Grantmaking, and Civic, and Nonprofits Organizations
13. Recreation and entertainment
14. Government
15. Lodging
16. Other (Specify: _____)
DK
REF

G4. What is the approximate total square footage of all the building space occupied by your organization at <LOCATION>?
1. [NUMERIC]
DK
REF

G5. Does your organization own, lease, or rent your facility at [LOCATION]?
1. Own
2. Lease / Rent
3. Other _____
DK
REF

[IF H4≠ 1]
G6. Does your organization pay your Xcel Energy bill, or does someone else (e.g., a landlord or building manager)?
1. Our organization pays the bill
2. Someone else pays the bill
DK

REF

H. Closing

H1. Those are all the questions I have. As a thank you for your input, we'd like to send your $25 Amazon gift card. We can send the gift card to you or someone of your choosing.

1. [COLLECT CONTACT INFORMATION]
2. [RESPONDENT DOES NOT ACCEPT GIFT CARD]

[IF **<STATE>** = CO]
RECRUITMENT1. Xcel Energy is conducting a separate study to gather information about the types of lighting currently installed in customer facilities. We are looking for facilities that are willing and able to allow a trained technician to walk through your facility and record the types of lighting products and equipment at your location. Would you be interested in being a part of this study?

1. Yes
2. No

DK
REF

[ASK IF RECRUITMENT1. = Yes]
RECRUITMENT2. [Recruiter], a national research firm, is conducting this study on behalf of Xcel Energy, and a representative from [Recruiter] may be reaching out to you by phone over the next few weeks to schedule the on-site visit at your facility.

Is this the best phone number to reach you to schedule the on-site visit at your facility?

1. Yes
2. No [Collect correct phone number]:

[IF NEEDED] Below are answers to some frequently asked questions:
How long will this take?
Visits should last approximately two hours, depending on the size of your facility.

What does the visit involve?
Technicians will walk around your location and record the various types of lighting products you have installed. They will also ask basic information regarding your facility's hours of use and building characteristics such as square footage. This representative will not request any personal information.

What is the purpose of this study?
The purpose of the study is to gather information that will be used by Xcel Energy as a guide and will help them improve their energy efficiency programs and help customers save money.

How do I know you are legitimate?
Xcel Energy is sponsoring this program and study. If you would like to contact Xcel Energy to confirm, the contact person is Paige Romero-Freeland at 303-294-2056.

What is the next step?

If you are selected for the study, we will contact you by phone and email to schedule a site visit and to answer any remaining questions you may have.

B.4 Trade Partner Interview Guide

a. INACTIVE TRADE PARTNERS

Introduction

To support the 2022 Xcel Energy Lighting Efficiency Product evaluation, members of the TRC Consulting evaluation team are conducting in-depth telephone interviews with Non-Participating Trade Partners. This guide presents the questions to be covered in the in-depth interviews for the Xcel Energy Lighting Efficiency program in Colorado or Minnesota. The remainder of the introduction provides the research questions this guide is designed to address and fielding instructions for the interviewers.

Evaluation Objectives

Specific research objectives and questions which this in-active trade partner survey is designed to address are the following:

- **NTGR (Spillover):** Do non-participating trade partners believe the product has influenced their LED sales? Do they believe the overall lighting market has shifted as a result of the product? What market share of their current lighting sales are program qualified (LED-based)?
- **Trade partner level of engagement and barriers:** The team will ask why inactive trade partners are no longer using the program. In addition, if trade partners are familiar with the program, the team will ask about staff understanding of the Product (and perceived need for training), how staff stay informed, and opportunities for improving the Product's integration with trade partner business (including ideas from other utility programs).

Table B.4-1 presents the link between each research objective, research question, and survey question.

Table B.4-1. Evaluation Objective, Survey Research Themes & Survey Question Crosswalk

Research Objective	Research Question	Survey Question Number(s)
NTGR	Does the program influence additional energy savings outside of what is captured through the program (spillover)? Should the trade ally be considered a "program factor" in the participant NTG battery?	Sec B
Trade Partner Engagement and Barriers	Why are inactive trade partners no longer using the program? How familiar are trade partners with the current program measures and rebate levels? How familiar are they with the current requirements? How can Xcel Energy help trade partners stay informed, better understand the program, or otherwise improve the program	Sec X

Sample Variables

The following table include the sample variables that will be used to conduct this survey, as well as descriptions of these variables and potential codes.

Sample Variable	Variable Description
Interviewer Name	Name of interviewer Apex
Organization	Organization name
Contact	Contact at organization
Phone	Phone number for contact at organization
LAST YEAR	Last year active in program

Recruitment

To recruit participants, the evaluation team requests that the Xcel Energy Trade Partner Manager send an initial email notifying the appropriate contact of the study and to expect an interview request. Then the Apex Analytics staff will proceed with email recruitment, using a link to Calendly. If we do not get a response, we will follow up with a telephone call, depending on available contact information and until all interview quotas are scheduled. The ten interviews with high-performance trade partners (identified through the survey) will be conducted after surveys are completed. These ten may overlap with other strata. If a high performance contractor has already been interviewed as a high-activity, low activity or inactive trade partner,

we will change the label for that trade partner to 'high performance" and complete an additional interview in the original stratum to ensure all quotas are met. The TRC/Apex team will provide recruitment scripts in a separate document.

Survey/Interview

Section A: Introduction/Background Information

Thank you for agreeing to talk with me today. I expect this conversation to take about 30 minutes. To help me capture your responses accurately, is it okay if I record this call? The recording will be used for my note-taking purposes only. It won't be shared with Xcel Energy.

Do you have any questions before I start?

First, I want to take 5 minutes to better understand your role and set the stage for the rest of the questions.

A1. What is your title or role at COMPANY NAME [**PROBE:** Owner, Engineer, Contractor, Field Technician, Project Manager, etc.]

A2. What are your primary responsibilities at COMPANY NAME, and how long have you been in that role?

A3. Please briefly describe your company's work? [PROBE ON THE FOLLOWING: ROLE: DISTRIBUTOR, MANUFACTURER, CONTRACTOR, RETAILER? SPECIALTIES: DO THEY ONLY SELL TO PARTICULAR BUSINESS TYPES? MARKETS: COMMERCIAL, RESIDENTIAL, MULTIFAMILY.]

A4. [IF DID NOT RECEIVE TABLE VIA EMAIL] Which of the following types of lighting products does your company sell, and approximately what percent of your lighting equipment sales are each of these types? [IF NEEDED: WE ARE LOOKING FOR APPROXIMATE PERCENT OF **UNIT SALES**, NOT SALES IN DOLLARS]

Type	Sell? (Y/N)	% of Equipment Sold	
Linear Lamps			
Linear LEDs [t-LEDs]			
Linear Fluorescent			
LED Fixtures and Retrofit Kits		w/o Integrated controls	w Integrated controls
High bay			
Downlights			
Linear and troffers			
Outdoor			
Parking garage			
Controls			
Stand-alone occupancy or daylight sensors			
Networked lighting controls			
Screw-based Lamps			
LEDs			
Other			
Other Products			
SUM TO 100%		*100%*	

A5. **[CO ONLY]** Xcel Energy's Lighting Efficiency program offers rebates on LED lighting fixtures and LED retrofit kits, and lighting controls for commercial and industrial customers. Before today, have you heard of Xcel Energy's lighting efficiency program?

[MN ONLY] Xcel Energy's Lighting Efficiency program offers rebates on LED linear lamps, lighting fixtures and retrofit kits, and lighting controls, for commercial and industrial customers. Before today, have you heard of Xcel Energy's lighting efficiency program?

a. Yes

b. NO - SKIP TO B8

A6. Do you know if you sold any products or completed any projects in 2021 that you or your customer submitted for an Xcel Energy rebate?

A7. [IF A5 = YES] Do you know about how many projects you completed that received rebates?

a. Do you know why your company name was not included on the rebate application?

Section B: Non-Participating Trade Partner Marketing, Freeridership, & Spillover [CO VERSION]

NOW I'D LIKE TO DISCUSS HOW THE XCEL ENERGY LIGHTING PROGRAM MIGHT INTERACT WITH YOUR BUSINESS, EVEN IF THE CUSTOMER DOES NOT RECEIVE A REBATE.

[IF NOT AWARE OF PROGRAM (A4=NO), SKIP TO B8]

B1. How often do you or your sales representatives recommend the Xcel Energy rebates to customers? What determines whether you mention the program to a particular customer?

[IF UNFAMILIAR WITH PROGRAM OR NEEDS REFRESHER, OFFER: "The lighting efficiency program offers rebates for LED fixtures, retrofit kits, and lighting controls."

B2. In 2021, did you sell any program eligible products that your customer likely did **not** submit for an Xcel Energy rebate? I understand the customer may submit a rebate application without your knowledge - I am just looking for your best guess. **[IF NO, SKIP TO B3]**

1. Approximately what percent of Xcel Energy rebate eligible lighting fixtures and retrofit kits you sold did not receive rebates?

    a. To confirm, of all the program eligible lighting fixtures and retrofit kits you sold in 2021, [1- ANSWER FROM B2.1] likely received a rebate and [ANSWER FROM B2.1] likely were not rebated. Does that sound about right?

2. Why did you not, and why do you think your customer did not apply for a rebate?

3. How, if at all, did the Xcel Energy Lighting Efficiency program influence the sales/installation of these eligible products that did not receive rebates?

4. Thinking about these program eligible products that likely did not receive a rebate, on a scale of 0 to 10 where 0 is not at all important and 10 is extremely important, how important was the Xcel Energy Lighting Efficiency program in influencing sales?

[GREAT, THANKS. NOW I WOULD LIKE TO MOVE ON TO DISCUSS YOUR BUSINESS DECISIONS RELATED TO LED PRODUCTS.]

B3. On a scale of 0 to 10 where 0 is not at all important and 10 is extremely important, how important was the Xcel Energy Lighting Efficiency program, including rebates and program information, in:

A. [IF B1 = RECOMMENDING PROGRAM] Your decision to recommend LED lighting fixtures and retrofit kits to your customers?

B. Deciding which lighting fixtures and retrofit kits you stock as a whole?

[IF B1 = NOT Recommend, SKIP TO B6]

B5. Are you familiar with your company's past participation in the Xcel Energy rebate program?

A. [IF YES] On the same scale, how important was your firm's past participation in the Xcel Energy Lighting Efficiency program in influencing your decision to recommend LED lighting equipment?

[**IF EARLIER EMAIL RECRUITMENT WAS ABLE TO PROVIDE SALES VOLUMES, HAVE THEM AVAILABLE HERE FOR CONFIRMATION**]

B6. We would like to compile a general picture of market volume in 2021. Can you estimate your company's LED SALES IN TERMS OF UNITS SOLD, by product type? Lets start with fixtures. [Ask about each type].

LED Fixtures and retrofit kits: _____[CONFIRM: "You sold about [RESPONSE] units in 2021, correct?"]

B7. Similarly, what is the **approximate PERCENTAGE** of all fixtures and kits sold in 2021 that are LEDs?

LED Fixtures and kits: _____% LEDS_[CONFIRM: "About [RESPONSE] percent of your total fixture sales were LEDs in 2021, correct?"]

NOW I WANT TO SHIFT TO WHAT SALES MAY LOOK LIKE NEXT YEAR, IN 2023, BASED ON RECENT TRENDS.

B8. According to your response above, you sold [enter B6 units sold] LED fixtures and retrofit kits in 2021. **[IF AWARE OF PROGRAM:** Assuming continued Xcel Energy incentives and program support**]** Do you expect your LED fixtures and retrofit kits SALES IN UNITS SOLD in 2023 to be higher, lower, or the same? We are asking about the quantity of LED fixtures and retrofit kits, not dollars.

[If B8 is higher or lower, then ask]

B8a. By what percent do you expect your 2023 LED fixtures and retrofit kits unit sales to be [HIGHER/LOWER]?

[ASK ALL]

B8b. Why do you believe your 2023 sales will be [response from B8, higher/lower/same]?

NOW PLEASE ASSUME THAT XCEL HAD NEVER OFFERED THEIR LIGHTING EFFICIENCY PROGRAM, AND WILL NOT OFFER IT IN 2023.

B9. According to your response above, you sold [enter B6 units sold] LED fixtures and retrofit kits in 2021. If Xcel Energy had never offered and will not offer the lighting efficiency program in 2023, would you expect your SALES IN UNITS SOLD of LED lighting fixtures and retrofit kits in 2023 to be higher, lower, or the same? We are asking about the quantity of LED lighting fixtures and retrofit kits, not dollars.

[If B9 is higher or lower, then ask]

B9a. By what percent do you expect your 2023 LED fixtures and retrofit kits unit sales to be [HIGHER/LOWER]?

[ASK ALL]

B9b. Why do you believe your 2023 sales will be [response from B9, higher/lower/same]?

B10. Lots of factors may have contributed to the growth in energy efficient lighting over the past ten years. What do you believe are the most important drivers that have resulted in market adoption of LED lighting? [PROBE: Xcel Energy rebates, Xcel Energy marketing, distributor/mnftr/retailer marketing, increased customer awareness][OPEN END]

Section X: Feedback on Design

[ASK AS APPROPRIATE DEPENDING ON RESPONDENT FAMILIARITY WITH PROGRAM]

Ok, lets move on to some questions about your sales process more broadly, and how the Xcel Energy rebate program fits in.

X1. [IF AWARE OF PRIOR ACTIVITY] You mentioned you were familiar with your company's past participation in Xcel energy's program. Why do you think your company has not participated in the program more recently? (Probe: rebates not useful as a sales tool, sales team not familiar with program details, want to avoid project delays, past bad experiences with the program, etc.)

X2. In general, how well do you feel you and your sales team understand the Lighting Efficiency program offerings and requirements? For example, would you say you are familiar with current products eligible for prescriptive rebates, and rebate amounts?

X3. How do you stay informed about changes to the program, such as limited time bonus rebate offers? Could Xcel Energy do anything to help you stay informed?

X4. Could you or your team benefit from any training on the program? What topics would like to be trained on, and what training format works best for you?

X5. [IF FAMILIAR] How effective are current rebate levels? Think about custom versus prescriptive [MN: and new construction] as well as different prescriptive rebates. Are rebates more effective for some product types than others? Would you recommend any changes to the rebate amounts or how the rebates are structured?

X6. Are you familiar with the bonus incentives that Xcel Energy offered [CO: for prescriptive rebates in 2020] [MN: for and 2021? What would have made the bonus rebates more effective?

[IF #Custom >0]

X7. In 2021, Xcel Energy changed the requirements for pre-approval for custom projects. Customers no longer have to submit the full project details. Instead, they can submit a blank signed application form, and they do not need to wait for pre-approval. Were you aware of this change? What is your opinion of this new option in terms of the customer experience?

X8. Have you ever participated in other utility rebate programs? How does Xcel Energy's program compare?

X9. Do you have any recommendations to improve the program that you haven't already mentioned?

Section C: Firmographics

Finally, I'd like to gather some information about your organization.

C1. Approximately how many full-time equivalent (FTE) employees does your organization currently have in the state of Colorado?

1. < 20
2. 20 - 49
3. 50 - 99
4. 100 - 249
5. 250 - 499
6. 500 - 999
7. 1,000 - 2,500
8. > 2,500

DK

REF / Prefer not to say

C2. Approximately what was your gross lighting sales in 2021 (in dollars)?

1. [OPEN END]

DK

REF / Prefer not to say

Section D: Closing

D1. Is there anything we didn't cover that you'd like to mention or discuss about your experiences with the Lighting Efficiency program?

D2. Thank you. Those are all the questions I have today. As a thank you, we would like to send you a $50 Amazon gift card. What email address should I use to send you your gift card?

1. Email_____
2. Declined gift card

You should expect an email with your gift card to arrive in 2-4 weeks. If you don't receive it, please let me know.

[THANK AND TERMINATE]

b. ACTIVE TRADE PARTNERS

Introduction

To support the 2022 Xcel Energy Lighting Efficiency Product evaluation, members of the TRC Consulting evaluation team are conducting in-depth telephone interviews with Trade Partners. This guide presents the questions to be covered in the in-depth interviews with Trade Partners who participated in the Xcel Energy Lighting Efficiency program in Colorado or Minnesota. The participating sample for these interviews may include a mix of both high and low performing trade partners. The remainder of the introduction provides the research questions this guide is designed to address and fielding instructions for the interviewers.

Evaluation Objectives

Specific research topics which this interview guide is designed to address are the following:

- **Key decision drivers:** The team will ask questions about how trade partners solicit customers, how they structure sales conversations, and the role of the Lighting Efficiency Product in their sales process. **For Colorado respondents**, the team will also ask about how shifting lamps to the midstream channel affected trade partners sales approach, if at all.
- **Market outlook and feedback on design**: Interviews will include questions about how customer interest in lighting is changing as COVID-19 restrictions ease, and the impact of other potential economic issues such as inflation and supply chain delays on the lighting market in the near term. Questions will be structured to break out market response by customer characteristics such as market segment or size where possible. Questions will also ask about the appropriateness and effectiveness of eligible measures, available rebates, and requirements and process to apply for rebates (including the option of the online application, and the alternative to pre-approval, as appropriate).
- **Lighting controls**: The evaluation team will ask trade partners about their experience with selling, installing and programming lighting controls. The team will ask how often and under what circumstances they discuss controls with customers. The team will also seek trade partners perspective on barriers to lighting controls other than cost, and potential ways to overcome these barriers.
- **Application process and tools**: The team will ask questions about how the trade partner participates in the application process, including their role in pre-approval for custom projects, selecting qualifying equipment, completing the application (using online portal or PDF forms), whether the trade partner receives the incentive check directly (and what application assistance they provide the customer when they do not receive the check directly). The team will also ask if trade partners have experience with other utility rebate programs, and how Xcel Energy's programs compare.
- **Trade partner level of engagement and barriers**: The team will ask about staff understanding of the Product (and perceived need for training), how staff stay informed, and opportunities for improving the Product's integration with trade partner business (including ideas from other utility programs).

- **NTGR**: Finally, the team will ask questions about program attribution, or the impact the program had on their decision to recommend and stock high efficient lighting and potential non-program measures installed because of the Xcel Energy Lighting Efficiency program. The evaluation team will discuss how the program impacts their product recommendations as a whole as well as anticipated future trends in customers installing energy efficiency lighting with and without the product.

Table B.4-2 presents the link between each evaluation objective, research question, and survey question.

Table B.4-2. Evaluation Objective, Survey Research Themes & Survey Question Crosswalk

Evaluation Objective	Research Question	Interview Question
Decision Drivers	How do they integrate rebates into their sales approach? What was the impact of the midstream program launch on trade partners? (CO ONLY)	D1, D2, Sec B A5, A6
Market Outlook and Feedback on Design	How did COVID affect the retrofit market? How is the market changing now that COVID is easing, but other challenges are on the rise? How effective/appropriate are eligible measures and rebate levels?	Sec E D6, D7
Lighting Controls	What experience do trade partners have selling and installing lighting controls? Do they program systems themselves? When and how do they discuss lighting controls with customers? What are the barriers to installers to sell lighting controls? What barriers, besides cost, impact customers?	Sec C
Application Process and Tools	How does the trade partner participate in the application process? How do trade partners view the online application portal? How do they view the streamlined approval process for custom projects? Do trade partners value the customer's ability to assign the rebate to them? How does it compare to other programs? How could Xcel Energy improve the program?	Sec D
Trade Partner Engagement and Barriers	How familiar are trade partners with the current rebate levels? How familiar are they with the current requirements?	Sec D

Evaluation Objective	Research Question	Interview Question
NTGR	What impact did the program have on trade partners decisions to recommend eligible products? What impact did the program have on the market volume of LEDs?	Sec B

Target Completes and Process

The Evaluation Team will conduct in-depth interviews with up to 40 trade partners in each state, according to their activity level and type of work. Apex Analytics staff will conduct the interviews, which are expected to last about 30 minutes on average, by phone. Table B.4-3 shows the population and target completes by strata for Colorado, and Table B.4-4 shows the population and targets for Minnesota. (Note: Although inactive trade partners are included in the tables, the interview guide specific to that stratum is a separate document.)

Table B.4-3. 2021 Colorado Lighting Efficiency Trade Partner Population and Interview Targets

Strata	Population	Percent of Product Savings (kWh)	Target Interviews
High Performers *(generating >1% of total product savings)*	17	64%	10
Mid/Low Performers *(active but generating <1% of total product savings)*	184	28%	10
High-influence *(determined by participant survey, may be either high or mid/low performers)*	NA	NA	10
Inactive	TBD	0%	10
Trade Partner not listed	NA	7%	NA
Total	**201**	**100%**	**40**

Table B.4-4. 2021 Minnesota Lighting Efficiency Trade Partner Population and Interview Targets

Strata	Population	Percent of Product Savings (kWh)	Target Interviews
High Performers *(generating >1% of total product savings)*	20	49%	10
Mid/Low Performers (*active but generating <1% of total product savings)*	372	42%	10
New construction	TBD	TBD	10
Inactive	TBD	0%	10
Trade Partner not listed	NA	9%	NA
Total	**392**	**100%**	**40**

Sample Variables

The following table include the sample variables that will be used to conduct this survey, as well as descriptions of these variables and potential codes.

Sample Variable	Variable Description
Interviewer Name	Name of interviewer Apex
Organization	Organization name
Contact	Contact at organization
Phone	Phone number for contact at organization
Midstream Dist [CO ONLY]	Indicates whether company participates in the CO Instant Rebate program
#Projects	Total number of projects the company completed through the program in 2021
#Custom	Number of custom projects the company completed in 2021

Sample Variable	Variable Description
#Prescriptive	Number of prescriptive projects the company completed in 2021
#NC [MN ONLY]	Number of new construction projects the company completed in 2021
#NLC	Number of NLC projects the company completed in 2021
#Checks	Number of times the company received the rebate check

Recruitment

To recruit participants, the evaluation team requests that the Xcel Energy Trade Partner Manager send an initial email notifying the appropriate contact of the study and to expect an interview request. Then the Apex Analytics staff will proceed with email recruitment, using a link to Calendly. If we do not get a response, we will follow up with a telephone call, depending on available contact information and until all interview quotas are scheduled. The ten interviews with high-performance trade partners (identified through the survey) will be conducted after surveys are completed. These ten may overlap with other strata. If a high performance contractor has already been interviewed as a high-activity, low activity or inactive trade partner, we will change the label for that trade partner to 'high performance" and complete an additional interview in the original stratum to ensure all quotas are met.

Once a contact is scheduled for an interview, Apex staff will send interviewees the sales table in question A4 via email, and request that interviewees complete and return the table prior to the interview. The team will also send a copy of the lighting brochure for the state in the email, and ask the trade partner to review ahead of the call.

Notice Script

Subject: Notice of Xcel Energy Lighting Efficiency Rebate Program Study

Dear Xcel Energy Trade Partner,

In the coming weeks, you may be invited by Apex Analytics to participate in an interview to discuss your experience with our Lighting Efficiency Rebate program. We have hired Apex Analytics, a national research firm, to identify opportunities to improve the program experience for customers and trade partners. We hope you will accept this interview invitation. **Your insights are important to help us understand how our programs can work better for your business!**

The interview should only 30 minutes. As a thank-you for supporting this research study, we are offering all participating contractors a $50 gift card.

If you have any questions relating to this study or the interview, please contact me.

Sincerely,

[TRADE PARTNER MANAGER SIG]

Email Recruitment Script

Subject: Interview Request for Xcel Energy Lighting Efficiency Rebate Study

Hi _____,

Xcel Energy has hired my company, Apex Analytics, to find ways to improve their Lighting Efficiency Rebate Program. **I would like to interview you about your experience with the program, and any thoughts you have as to how the program could be improved.**

Contractors like you play a key role in the program, and your feedback would be very valuable as we consider ways Xcel Energy can improve the program. **<If HIGH Activity>**: "As one of the most active contractors in the program, your perspective would be particularly helpful." <**If Mid/Low Activity or NC**>: "As a contractor that completes projects through the program, it would be very helpful to hear your perspective on the program and the lighting market." **<If INACTIVE>** "As a contractor that has used the program in the past, it would be very helpful to hear your perspective on the program and the lighting market."

Please click the link below to schedule this 30-minute conversation at a time that works for you. We are offering a $50 gift card as a thank you for your time.

[CALENDLY LINK]

I look forward to talking with you. If you have any questions about this research, please contact the Xcel Energy Trade Partner Manager, [**MN:** Jeff Kosak, jeffrey.p.kosak@xcelenergy.com] [**CO**: Robert Macauley at robert.macauley@xcelenergy.com]

Sincerely

[Interviewer]

Interview Guide

Section A: Background and Project Overview

Thank you for agreeing to talk with me today. This conversation should take about half an hour. To help me capture your responses accurately, is it okay if I record this call? I will use the recording for reference purposes only, and wont share it with Xcel Energy. **Do you have any questions before I start?**

A1. First, I want to take a minute to better understand your role, and your company's services. What is your title or role at COMPANY NAME [**PROBE:** Owner, Engineer, Contractor, Field Technician, Project Manager, etc.]

A2. What are your primary responsibilities at COMPANY NAME?

A3. Please briefly describe your company's services. [PROBE ON THE FOLLOWING: ROLE: DISTRIBUTOR, MANUFACTURER, CONTRACTOR, RETAILER? SPECIALTIES: DO THEY ONLY SELL TO PARTICULAR BUSINESS TYPES? MARKETS: COMMERCIAL, RESIDENTIAL, MULTIFAMILY.]

A4. [IF DID NOT RECEIVE TABLE VIA EMAIL] Which of the following types of lighting products does your company sell, and approximately what percent of your lighting equipment sales are each of these types? [IF NEEDED: WE ARE LOOKING FOR APPROXIMATE PERCENT OF **UNIT SALES**, NOT SALES IN DOLLARS]

Type	Sell? (Y/N)	% of Equipment UNITS Sold*	
Linear Lamps			
Linear LEDs [t-LEDs]			
Linear Fluorescent			
LED Fixtures and Retrofit Kits		w/o Integrated controls	w Integrated controls
High bay			
Downlights			
Linear and troffers			
Outdoor			
Parking garage			
Controls			
Stand-alone occupancy or daylight sensors			
Networked lighting controls			
Screw-based Lamps			
LEDs			
Other			
Other Products			
Any other lighting-related products			
SUM TO 100%		*100%*	

**Note, we are looking for percent of units, not percent of dollar sales*

A5. [**CO ONLY:** IF NOT MIDSTREAM PARTICIPANT DIST, AND SELLS LINEAR/SCREW-BASED LAMPS] In 2019, Xcel Energy shifted from prescriptive rebates for LED lamps to a model that offers discounts through participating distributors. Were you aware of this shift?

1. If yes: Did this new program model for lamps cause you to change your sales approach in any way? If so, how?

A6. [**CO ONLY:** IF **MIDSTREAM PARTICIPANT DIST**] Our records show that you participate in the Xcel Energy LED Instant Rebate program for LED lamps, is that right?

1. If yes: Did you change your sales approach in any way after joining this program as a participating distributor? If so, how?

Section B: Trade Partners Marketing, Freeridership, & Spillover [CO VERSION]

[CO ONLY: For this next set of questions, please think specifically about LED fixtures and retrofit kits that are eligible for prescriptive after-purchase rebates. In other words, these next questions are not about LED lamps.]

B1. About what percent of the lighting fixtures and retrofit kits you sell or install are eligible for rebates in the Xcel Energy Lighting program? [REFER TO BROCHURE IF NECESSARY]

B2. In 2021, did you sell any program-eligible LED fixtures and retrofit kits that you think likely did not receive an Xcel Energy rebate? I understand the customer may submit a rebate application without your knowledge - I am just looking for your best guess.

1. Approximately what percent of Xcel Energy program eligible fixtures and retrofit kits products you sell do not receive rebates?

2. To confirm, of all the program-eligible lighting products you sold in 2021, [1- ANSWER FROM B2.1] likely received a rebate and [ANSWER FROM B4.1] likely were not rebated. Does that sound about right?

3. To your knowledge, why did you or your customer not apply for a rebate?

4. How, if at all, did the Xcel Energy Lighting efficiency program influence the sales/installation of these eligible products that did not receive rebates?

5. Thinking about these program eligible fixtures and retrofit kits that likely did not receive a rebate, on a scale of 0 to 10 where 0 is not at all important and 10 is extremely important, how important was the Xcel Energy Lighting Efficiency program in influencing the sales of these products? [INTERVIEWER NOTE: PLEASE FLAG ANY INCONSISTENCIES WITH THIS ANSWER AND ASK FOR CLARIFICATION]

[GREAT, THANKS. NOW I WOULD LIKE TO MOVE ON TO DISCUSS YOUR EXPERIENCE WITH PRODUCTS SOLD THAT WERE ELIGIBLE FOR XCEL ENERGY'S LIGHTING EFFICIENCY PROGRAM.]

B3. On a scale of 0 to 10 where 0 is not at all important and 10 is extremely important, how important was the Xcel Energy Lighting Efficiency program, including rebates and program information, in:

1. Your decision to recommend program eligible LED lighting fixtures and retrofit kits to your customers?

2. Deciding which lighting products you stock as a whole?

B4. On the same scale, how important was your firm's past participation in the Xcel Energy Lighting Efficiency program in influencing your decision to recommend LED fixtures and retrofit kits?

[IF EARLIER EMAIL RECRUITMENT WAS ABLE TO PROVIDE SALES VOLUMES, HAVE THEM AVAILABLE HERE FOR CONFIRMATION]

B5. We would like to compile a general picture of LED fixture and retrofit kit market volume in 2021. Can you estimate your company's SALES IN TERMS OF UNITS of fixture and retrofit kit SOLD?.

1. _____[CONFIRM: "You sold about [RESPONSE] units in 2021, correct?"]

B6. Similarly, what is the approximate PERCENTAGE of all fixtures and kits you sold in 2021 that are LEDs?

1. _____% LEDS_[CONFIRM: "About [RESPONSE] percent of your total fixture and kit sales were LEDs in 2021, correct?"]

[I WANT TO SHIFT THIS DISCUSSION TO WHAT SALES MAY LOOK LIKE NEXT YEAR, IN 2023.]

B7. According to your response above, you sold [enter B5total units sold] LED fixtures and retrofit kits in 2021. Assuming continued Xcel Energy incentives and program support, do you expect your LED fixtures and retrofit kit SALES in 2023 to be higher, lower, or the same? We are asking about the quantity of units sold of LED lighting products (if necessary, repeat excluding linear or medium screw-based bulbs).

[If B7 is higher or lower, then ask]

1. By what percent do you expect your 2023 LED fixture and retrofit kit unit sales to be [HIGHER/LOWER] in 2023?

[ASK ALL]

2. Why do you believe your 2023 sales will be [response from B7, higher/lower/same]?

[NOW PLEASE ASSUME THAT XCEL ENERGY HAD NEVER OFFERED THEIR LIGHTING EFFICIENCY PROGRAM, AND WILL NOT OFFER IT IN 2023.]

B8. According to your response above, you sold [enter B5 units sold] LED fixtures and kits in 2021. If Xcel had never offered and would not offer the lighting efficiency program in 2023, would you expect your SALES of LED fixtures and retrofit kits in 2023 to be higher, lower, or the same? We are asking about the quantity of LED fixtures and retrofit kits, not dollars.

[If B8 is higher or lower, then ask]

1. By what percent would you expect your 2023 LED fixture and retrofit kit unit sales to be [HIGHER/LOWER], without the program?

[ASK ALL]

2. Why do you believe your 2023 sales will be [response from B8, higher/lower/same]?

B9. Lots of factors may have contributed to the growth in LED fixture and retrofit kit sales over the past ten years. What do you believe are the most important factors that have resulted in increased market adoption of LED lighting in commercial spaces? [PROBE: Xcel Energy rebates, Xcel Energy marketing, distributor/mnftr/retailer marketing, increased customer awareness][OPEN END]

B10. How, if at all, do you think the market share of LED fixtures and retrofit kits would be different had Xcel Energy and other utilities never offered lighting rebates? Why do you say that?

Section C: Evolving Marketplace

C1. How did COVID affect marketplace for lighting retrofits generally, and for LEDs specifically? (Probe: price, supply issues) Did you notice any change by market segment or customer type? What changes are you seeing in the market now that COVID restrictions have ended?

C2. Although COVID restrictions have ended, at least for now, there are still numerous uncertainties impacting the economy. I'm thinking of inflation, potential recession, supply chain delays and sourcing issues, labor shortages, etc. Which of these concerns are having an impact on the market for lighting retrofits, and in what ways? (Probe: is respondent's company facing staffing issues? different impacts by customer type or segment?)

1. What trends are you seeing in equipment pricing, and what do you expect to see over the next year or so?

C3. Going forward, what do you see as near term opportunities for the market for LEDs? Are there any new or emerging LED products? Are these opportunities different by market segment at all?

Section D: Networked Lighting Controls

[IF #NLC = 0]

D1. Are you familiar with networked lighting controls? When I say networked lighting controls, I mean a system where multiple lamps are connected to occupancy and daylight sensors, either by zone or individually, and controlled remotely through a control panel or online app.

1. Are you aware that Xcel Energy offers rebates for networked lighting controls?

D2. Does your company sell or install networked lighting control systems? If not, why not?

[IF DOES NOT SELL/INSTALL, SKIP TO C6]

[IF SELLS/INSTALLS, OR IF #NLC>0]

D3. How long has your company sold or installed networked lighting systems, and what motivated you to start offering them?

D4. When do you discuss controls with customers? What talking points do you provide to customers? (PROBE: Discuss energy savings? What features of lighting controls are most interesting to customers?)

D5. What questions do customers typically ask about controls? What are their concerns?)

D6. How many of these systems have you sold/installed? Did you complete all the installation yourselves? Do you also program/commission systems you install?

D7. **[HIGH PRIORITY]** What preparation do installers need to do in order to successfully sell advanced lighting controls to customers, in terms of training, hiring, or building new supply relationships, etc? Has any of this preparation been especially challenging? (PROBE: lack knowledgeable technicians, understanding available equipment options, lack of customer understanding or interest)

D8. What would help you overcome these challenges?

D9. **[HIGH PRIORITY]** Besides the high cost of the system itself, what challenges do potential buyers face? Do the Xcel Energy rebates or application process present any challenges?

D10. Is there any way Xcel Energy could better support sales of advanced lighting controls?

[IF DOES NOT SELL/INSTALL, SKIP TO NEXT SECTION]

Section E: Satisfaction and Application Experience

Ok, lets move on to some questions about your sales process more broadly, and how the Xcel Energy rebate program fits in.

E1. How often do you mention Xcel Energy rebates/incentives in sales discussions with customers?

1. [IF NOT ALWAYS] What determines whether you mention rebates to a particular customer? Is there a particular reason why don't you mention rebates more often?

2. How often do you include mention of the rebates in your sales proposal sheets or presentation slides?

3. How often do customers ask you about Xcel Energy rebates, before you mention them?

E2. **[HIGH PRIORITY]** In general, how well do you feel you and your sales team understand the Lighting Efficiency program offerings and requirements? For example, would you say

you are familiar with current products eligible for prescriptive rebates, and rebate amounts? Are you familiar with requirements for custom rebates?

E3. How do you stay informed about changes to the program, such as limited time bonus rebate offers? Could Xcel Energy do anything to help you stay informed?

E4. **[HIGH PRIORITY]** Could you or your team benefit from any training on the program? [IF YES] What topics would like to be trained on, and what training format works best for you?

E5. [IF FAMILIAR] How effective are current rebate levels? Think about custom versus prescriptive [MN: and new construction] as well as different prescriptive rebates. Are rebates more effective for some product types than others? Would you recommend any changes to the rebate amounts or how the rebates are structured?

E6. **[HIGH PRIORITY] [CO]** Are you familiar with the 50% bonus rebates that Xcel Energy offered on Interior fixtures in 2020? In your experience, were these bonus rebates effective? What effect did bonus rebates have on your sales process?

[HIGH PRIORITY] [MN] Are you familiar with the double-rebate bonus on linear LEDs that Xcel offered in 2021? In your experience, were these bonus rebates effective? What effect did bonus rebates have on your sales process?

E7. Do you typically submit the application for rebates on your customers behalf? What determines whether you fill out the application form or not?

E8. **[HIGH PRIORITY]**[IF TRADE PARTNER SUBMITS APPL] Do you use the Digital Application Process (also known as DAP) or utilize paper applications? If paper, why have you not transitioned to DAP?

E9. Do you have any suggestions for Xcel Energy on how they could improve the online application?

[IF #Custom >0]

E10. In 2021, Xcel Energy changed the requirements for pre-approval for custom projects. Customers no longer have to submit the full project details prior to purchasing their equipment. Instead, they can submit a blank signed application form, and they do not need to wait for pre-approval. Were you aware of this change? What is your opinion of this new option in terms of the customer experience?

E11. Xcel Energy allows customers to sign the rebate over to their trade partner, so that the trade partner can offer an equal amount as an instant discount to customers. How often, and under what circumstances, do you have the customer sign the rebate over to your company?

[ASK ALL]

E12. **[HIGH PRIORITY]** Have you ever participated in other utility rebate programs? How does Xcel Energy's program compare?

E13. Do you have any recommendations to improve the program that you haven't already mentioned?

Section F: Firmographics

F1. Approximately how many full-time equivalent (FTE) employees does your organization currently have in the state of Colorado? [DO NOT READ]
1. < 20
2. 20 - 49
3. 50 - 99
4. 100 - 249
5. 250 - 499
6. 500 - 999
7. 1,000 - 2,500
8. > 2,500
DK
REF / Prefer not to say

F2. Approximately what was your gross lighting sales in 2021 (in dollars)?
1. [OPEN END]
DK
REF / Prefer not to say

Section G: Closing

G1. Is there anything we didn't cover that you'd like to mention or discuss about your experiences as a registered Trade Partner for Lighting Efficiency program?

G2. Thank you. Those are all the questions I have today. As a thank you, we would like to send you a $50 Amazon gift card. What email address should I use to send you your gift card?

1. Email_____
2. Declined gift card

You should expect an email with your gift card to arrive in 2-4 weeks. If you don't receive it, please let me know.

B.5 Peer Utility Benchmarking Interview Guide

Introduction

To support the process and impact evaluation of the 2021 Xcel Energy efficiency programs, the TRC evaluation team will benchmark the Xcel Energy programs against peer utilities. The objective of the benchmarking is to identify opportunities to improve the Xcel Energy programs

based on a comparison of peer utility programs' design, delivery, and processes. In addition, benchmarking allows the evaluation team to understand the performance of the program in context with the performance of other utilities. To conduct the benchmarking, the evaluation team will conduct secondary research on the peer utilities identified and perform in-depth interviews with program managers at the peer utilities.

This document presents the in-depth interview guide for peer utility commercial lighting programs. Table B.5-1 identifies the interview questions related to each contextual theme.

Evaluation Objectives

Specific research topics which this interview guide is designed to address are the following:

- **Gauge peer utility's experiences:** Successes or challenges peer utilities are having with their program, including most active market segments and success of any segment-targeted marketing
- **Identify new strategies or design ideas:** Ask peer utilities about recent program changes. Ask which other utilities/organizations do the peer utilities look to for new ideas?
- **Identify opportunities for more savings:** Identify opportunities to encourage more or deeper lighting retrofits, including new approaches to program design or marketing, especially with regard to networked controls
- **Compare program characteristics:** document general information about peer utilities programs to compare them to the Xcel Energy program, including the measures offered, and incentive amounts, and identify any peer utility program characteristics that may be beneficial to Xcel.

  NTGR Approach: Inquire about their most recent NTGR value and details on their methodology.

Table B.5-1 presents the link between each evaluation objective, research question, and survey question.

Table B.5-1. Evaluation Objective, Survey Research Themes & Survey Question Crosswalk

Evaluation Objective	Research Question	Survey Question Number(s)
Peer Experience	Overall, what aspects of the program work well? What are the most active market segments? What challenges have peer utilities had over the past several years, related to COVID-19, and prior to COVID-19? What challenges are managers expecting?	Sec D
Innovative Design Ideas	What recent changes has the program implemented, and what drove those changes?	Sec B

Evaluation Objective	Research Question	Survey Question Number(s)
	What has been the outcome? What resources (especially other programs) do program managers use to ensure they are keeping up with industry trends and taking advantage of new ideas?	
Savings Opportunities	How does the program target the most active market segments? Does the program use any strategies to encourage trade allies to promote, or customers to implement, larger projects? Or to install more expensive equipment such as advanced lighting controls?	Sec C
Program Comparison	What are program details such as types and levels of incentives offered, eligible measures, customer and project requirements, and role of trade partners. What are the program goals, and how well is the program performing relative to those goals?	Sec A, Sec D
NTGR Approach	What is the most recent NTGR? How was that value determined?.	Sec E

Target Completes and Process

The Evaluation Team will conduct in-depth interviews with **4 to 6** program managers for each state's evaluation (Minnesota and Colorado), for a total of at least 8 interviews. Interviewees will be randomly selected from each state's list of peer utilities, determined during the staff interviews and included in the Minnesota and Colorado Lighting Efficiency 2022 Evaluation Plans.

Apex Analytics staff will recruit participants and conduct the interviews, which are expected to last about 30 minutes on average, by phone.

Interview Guide

A. Introduction

As mentioned when I set up this interview, we are conducting a benchmarking study of commercial lighting rebate programs. I have a few questions I have prepared, which I expect will take about 30 minutes. In exchange for your participation we will send you anonymized results. Do you have any questions before I start?

[PRIOR TO INTERVIEW, TRC/Apex team will review available online information about the program to address questions in A1 and A2 to the extent possible. Interview will confirm information and fill gaps.]

A1. First, I'd like to talk through the basic design and organization of your commercial lighting program. [ASK/CONFIRM BASED ON HOLES IN BACKGROUND RESEARCH ON PROGRAM]

1. Can you describe your lighting program at a high level?
2. Is your program run by utility staff or a third-party implementer?
3. How are your lighting incentives offered? (Midstream? Downstream? Direct install? Which lighting equipment is offered midstream vs downstream, etc?)
4. Do you offer bonus incentives?
5. What percentage of incremental costs are rebates?
6. Do you have any target customer segments or product focus' for this program? (focusing on LEDs in hospitals, for example) If yes, are they offered for limited time or ongoing year after year?
7. What is the role of trade partners such as installers or distributers in your program? Do you offer incentives for trade partners?

A2. Next, I'd like to talk about your commercial lighting offerings. [ASK/CONFIRM BASED ON HOLES IN BACKGROUND RESEARCH ON PROGRAM]

1. What types of incentives are offered through your program? [PROBE: Prescriptive/downstream, custom, new construction]
2. What specific products are eligible for each type?
3. Do you require rebated lighting products to be certified or listed by DLC or other third party organization?

4. Do you offer incentives on networked lighting controls?

   4(a) [IF YES] How are your rebates structured? [E.g., per sensor, per watt controlled, etc.]

   4(b) What control strategies do you require for customers to earn the rebate? (i.e. occupancy sensing, daylight harvesting, scheduling?)

   4(c) Where did you get the costs associated with the controls? Do you think they are accurate? What do you think are the biggest obstacles to greater adoption of advanced lighting controls? What have strategies have you found successful in promoting the offering?

B. Innovative Design Ideas

Thank you. Let's move on to some questions about changes to your program design.

B1. When was the last time you implemented a significant change to your commercial lighting program? This could be redesigning incentive structures, offering bonus incentives, changing your relationship to trade partners, redefining eligible lighting technologies…

1. What did you change, and why?

2. What has been the outcome of the change, in terms of participation?

B2. Are you planning to make any changes to your commercial lighting programs in 2022 or beyond? What changes are you planning? (PROBE: Changes to products, baselines, incentives, marketing, etc.)

1. When will these program changes come into effect? (Is there a gradual phase in for these updates?)

2. Why are you making these changes? What outcome are you hoping for?

B3. [IF NOT MENTIONED ABOVE] How has your program been impacted by the proposed implementation of the 45 lumen-per-watt standard for screw-based bulbs?

1. Will you (or have you) implemented any changes to your program design in response? What outcome are you expecting from the change?

2. Do you plan to offer lighting rebates after the EISA backstop is implemented? If so, how will the program be configured?

B4. [IF NOT MENTIONED ABOVE] How has your program been impacted, or how do you expect it to be impacted, by the growing prevalence of LEDs in the market (market transformation)? Is saturation at all a concern for you?

1. Will you (or have you) implemented any changes to your program design in response? What outcome are you expecting from the change?

2. Are you offering or plan to offer LED to LED rebates? If so, would they be configured?

3. Do you know the saturation percentage of LED lighting in your area for business customers?

B5. What resources do you use, or what programs do you look to, to make sure you are aware of latest program design innovations, and why?

C. Savings Opportunities

C1. What are your primary marketing strategies for this program? What do you think the biggest drivers are for awareness and participation?

C2. What do you think drives your key market segments to participate more than other market segments? Do you target key market segments differently than the general market? In what way do you target them differently, and why?

1. What about larger versus smaller customers?

C3. Do you employ any strategies to encourage customers to do larger projects? [PROBE: tiered incentives, multi-measure or bundled incentives, financing, technical assistance etc.)

C4. How do you engage with trade partners, and specifically, how do you encourage them to promote the program to customers?

C5. [IF ADVANCED LIGHTING CONTROLS OFFERED] Do you have any marketing or other strategies specifically to promote installation of advanced lighting controls?

C6. Do you have any information on how well these approaches are working?

D. Recent Experience and Program Performance

Next, I'd like to talk about the program's performance over the past few years.

D1. Overall, what aspects of the program would you say work especially well?

D2. What challenges have peer utilities had over the past several years – both any challenges related to COVID-19, and any challenges prior to COVID-19?

D3. Have you seen any supply chain or installation issues since COVID?

D4. Have you seen your lighting incremental costs (equipment or labor) increase with the recent inflation?

D5. What were the program's energy savings goals and actual achievement in 2021? (MWh and MW)?

E. NTGR

E1. Do you apply a net-to-gross ratio to your program savings? If so, what net-to-gross ratio is your program currently claiming for 2021?

1. Does this ratio vary by implementation type (midstream vs downstream) or product (Customer vs. prescriptive)?

2. Is this NTGR a deemed or evaluated value? If evaluated, can you briefly describe the evaluation approach?

3. Do you have a different, prospectively applied net-to-gross ratio? If so, how is that determined?

F. Closing

F1. Great! Thank you so much for your time. Would it be okay with you if we identify your program when we share these results with Xcel Energy staff? It is not mandatory. Note that for the anonymized results we share with you and other respondents, we will not identify programs by name.

Those are all the questions we have for you today. Before we finish, do you have any questions for me, or anything else you would like to add?

B.6 Networked Lighting Controls Interview Guide

Introduction

To support the process and impact evaluation of the 2021 Xcel Energy efficiency programs, the TRC evaluation team will conduct in-depth interviews with Colorado participants that installed networked lighting controls with a rebate from Xcel Energy. These interviews will explore how and why these participants made the decision to install networked lighting controls, including exploring sources of information, the role of the rebate, and primary objectives for installing networked controls.

Evaluation Objectives

Specific research topics which this interview guide is designed to address are the following:

- **Motivation and Awareness:** What participants viewed as benefits of the system, and motivations for installing networked lighting controls.
- **Decision-making Process:** Key roles and resources needed in project planning
- **Program Impact:** The impact of the Xcel Energy rebates, or other aspects of the Xcel Energy program, on the decision to install networked lighting controls.
- **Resources:** Who was involved in the decision-making, and what information resources were most helpful.
- **Installation experience:** Details of the installation experience, including product availability, availability of knowledgeable lighting professionals, and impact on project schedule, if any.
- **User experience:** Details of the participants' experience using the controls to date, and whether the system has met expectations.

Table B.6-1 presents the link between each evaluation objective, research question, and survey question.

Table B.6-1. Evaluation Objective, Survey Research Themes & Survey Question Crosswalk

Evaluation Objective	Research Question	Survey Question Number(s)
Motivation and awareness	What did participants view as benefits of the system, and what experience did they have with lighting controls? What were their motivations for installing networked lighting controls?	Sec B
Decision-making process	Who was involved, what information resources were most important, and how did the process differ (if at all) from other lighting improvement projects?	Sec C

Evaluation Objective	Research Question	Survey Question Number(s)
Program impact	What role did the Xcel Energy rebates, participating trade partners, and Xcel Energy representatives play in the project decision-making process?	Sec C, Sec D
Installation experience	Details of the installation experience, including product availability, availability of knowledgeable lighting professionals, and impact on project schedule, if any.	Sec E
User experience	Details of the participants' experience using the controls to date, and whether the system has met expectations.	Sec F

Target Completes and Process

The Evaluation Team will conduct in-depth interviews with **up to 4** of a total of 8 Colorado participants that installed a networked lighting controls system in 2021. (These 8 participants will be excluded from the participant survey sample.)

Apex Analytics staff will conduct the interviews, which are expected to last about 45 minutes on average, by phone.

Recruitment Email Scripts

To recruit participants, the evaluation team requests that the Xcel Energy program manager send an initial email notifying the recipient of the study and to expect an interview request. Then the Apex Analytics staff will proceed with email recruitment. If we do not get a response, we may follow up with a telephone call, depending on available contact information and until all four interviews are scheduled.

Xcel Energy Staff [Sample Text]

Subject: Share your experience with networked lighting controls

Dear [Name],

Thank you for participating in the Xcel Energy Lighting Efficiency program through your installation of a networked lighting control system in your facility on [PROJECT STREET NAME], for which you received a rebate from Xcel Energy.

We have hired Apex Analytics, an energy-focused research firm, to conduct a study of customers' experiences with networked lighting controls. We will use this study to inform

program and rebate design, and to better support customers interested in installing this technology.

In the coming days, you may be invited by a representative of Apex Analytics to participate in a telephone interview to discuss your lighting controls project. Your participation is completely voluntary, but we hope you will consider accepting the invitation. Your insights and experience are a valuable contribution to our study.

The interview should take about 45 minutes. Apex Analytics will provide a $50 Amazon gift card to participants, as a thank-you for their time.

If you have any questions or concerns about this study, please contact me at this email address.

Regards,

Paige Romero-Freeland

[title]

Apex Analytics Staff

Subject: Xcel Energy Networked Lighting Control Study – Interview Request

Hi _[NAME],

I work for Apex Analytics, a research firm hired by Xcel Energy to study customer experiences with networked lighting controls. We are reaching out to customers such as [ORGANIZATION] to learn more about the networked lighting controls you installed in your facility on [PROJECT STREET NAME] last year, for which you received a rebate from Xcel Energy.

I would like to schedule a time to conduct a 45 minute interview with you, or the person at your organization who is most familiar with the details of the project. We are offering a $50 Amazon gift card as a thank-you to anyone who participates in our study.

Below I have listed times I am available over the next two weeks. Please let me know if any of these times might work for you. If not, please let me know a time that would be convenient.

Thanks for considering this request. I hope to talk with you soon. If you have any questions regarding this study, please contact Paige Romero-Freeland, Lighting Efficiency Program Manager, at paige.romero@xcelenergy.com.

Regards,

[Sig]

Interview Guide

A. Background and Project Overview

Thank you for agreeing to talk with me today. I expect this conversation to take about 45 minutes. To help me capture your responses accurately, is it okay if I record this call? The recording will be used for my note-taking purposes only. It won't be shared with Xcel Energy.

Do you have any questions before I start?

A1. To get us started, can you state your title, and briefly describe [IF NEEDED: "your organization and"] your position?

A2. Can you also tell me a little about the building at [PROJECT ADDRESS], and how it is used? (Probe for space types: office, education, warehouse, etc.)

1. What hours is the facility in use? (Probe: try to get detail. Open to customers vs open to employees, weekday hours vs weekend hours, etc.)

A3. I show that you installed controls connected to XX lighting units, and received a rebate of $XX. Does that sound right? Can you give me a little more detail on the project?

1. What type of lighting control system did you install at [PROJECT ADDRESS]? (Wired or wireless? Zone-level sensors/controls, or LLLC? Which manufacturer?)

2. How much of the building lighting is controlled through the system?

3. Did the project involve rewiring fixtures, or lighting redesign (versus 1 to 1 replacement)? Was this project part of a larger retrofit or remodel project?

B. Motivation and Awareness

B1. Did your organization have any experience with networked lighting controls prior to this project? What about stand-alone controls?

1. Are the prior controls still in place, or were they replaced by the new system? If still in place, where are they?

B2. How was this lighting controls project first identified?

B3. When you were first considering installing networked lighting controls, what initial questions did you (or the organization) have about the technology? Did you have any initial concerns or hesitation about installing networked lighting controls?

B4. Thinking back to when you made the decision to install networked lighting controls, what specific outcomes were you interested in? What made the project worthwhile? [Probe: energy

savings/short payback/high ROI, improved brightness/color/aesthetics, security, ability to redesign lighting to suit different usage needs, "future proof" lighting design, integrate with building automation system, employee or customer satisfaction?]

2. Of the factors you mentioned, which were the most important?

B5. Did you consider installing stand-alone controls, or no controls at all? If so, why did you select networked lighting controls instead?

C. Decision-making Process

C1. Who was involved in the planning and project design, in terms of both internal staff and external service providers? [Probe: Facilities/maintenance staff, operations staff, architect, lighting engineer, general contractor, installer, Xcel Energy representative?]

1. [IF NOT PART OF A LARGER RENOVATION] Was the process to plan or approve this project any different from a typical lighting retrofit project? If so, in what way?

C2. As you were planning your project, including specifying equipment, getting budget approval, etc, what information resources were most helpful, and in what way? [Probe for any of the following: Manufacturer, manufacturer rep, manufacturer websites, product spec sheet, knowledge/experience of staff, knowledge/experience of service provider, Design Lights Consortium website, online research, trade association, etc.]

1. [If payback/ROI was an important motivation in 0] You mentioned the [payback/ROI] calculation was an important motivation for doing the project. Where did you get the data needed to calculate the [payback/ROI]? What was the cost of the controls system?

2. Did the calculation include operating and maintenance cost savings? Did you include an estimation of energy cost savings in the calculation?

C3. What did you consider the most important decisions to be made when selecting lighting controls or designing your project? Were there any difficult decisions? How did you make those decisions?

D. Program Impact

[Ask each if not yet addressed.]

D1. How would you describe your installer's role in project planning – meaning, the process to scope, design and specify equipment for the project?

D2. At what point in the project planning did you learn about rebates available from Xcel Energy? What resources, or people, were most helpful for understanding what rebates were available, and what the requirements were?

D3. Did you or your contractor consult an Xcel Energy account manager or other Xcel Energy representative during the project? What information did you seek from them? How would you describe their role in the process?

D4. Did you calculate the impact of rebates on the [payback period / ROI] as part of reviewing or approving the project?

1. About how much of the upfront cost of the project was covered by the rebate?

2. About what was the [payback period/ROI] with, and without the rebate?

D5. On a scale of 0-10, with 0 not at all important and 10 extremely important, how important would you say the information and rebate provided by Xcel Energy was to your organization's decision to install networked lighting controls? [Probe: why that rating?]

1. What do you think your organization might have done if no Xcel Energy program had been available?

E. Installation Experience

E1. How did you solicit bids and vet potential vendors? What were your criteria or requirements for services providers?

E2. Were there any implications for the initial project timeline from installing networked lighting controls, versus stand-alone controls or no controls? [E.g., project may have been faster, if re-wiring was avoided with LLLC, or may have been longer due to more detailed programming relative to no controls or simpler controls.]

E3. Did you have any challenges during the project implementation; for example, challenges sourcing equipment, or significant changes required to the project design or specifications?

E4. Who completed programming and commissioning of the system? How satisfied were you with the programming and commissioning?

E5. What were some lessons learned from the experience, if any? Anything you wish you had done differently?

F. User Experience

F1. What lighting strategies are you currently using with your connected lighting (e.g. high-end trim, daylight harvesting, occupancy sensing, task tuning, etc.)?

1. Do you have multiple zones? If so, how many?

2. Is all the connected lighting currently being controlled by one or more lighting strategies? If not, why not?

F2. Have you changed the programming of the controls at all since they were initially programmed/commissioned? If so, what prompted the change? Were you able to get the outcome you wanted?

F3. Was there any training for internal facilities staff on how to operate or maintain the system?

1. If so, who provided the training and what did it entail? How satisfied were you with the training?

2. If not, would training be helpful?

F4. What data are you capturing, and how are you using it? Are you able to monitor energy savings?

F5. What communication was there with building end-users before, during or after the project, if any? What kind of feedback have you gotten from building end-users?

F6. Are you realizing the benefits you expected when you initially decided to install networked lighting controls? In what ways yes, or in what ways no?

F7. Overall, how satisfied are you with the networked lighting controls you installed? Please rate your satisfaction on a scale of 0-10, with 0 not at all satisfied and 10 extremely satisfied. [Probe: why that rating? Is the system providing al the expected benefits described Section B?]

F8. What advice would you have for another organization considering a similar project?

G. Closing

G1. Thank you for taking the time to talk with me today. We would like to send you, or a person you identify, an Amazon gift card for $50 as a thank-you for your participation in our study. Can you give me the name and email address where the card should be sent?

1. Name:_____
2. Email: _____

Appendix C: Data Collection Findings

Appendix C contains materials related to data collection findings including staff interview findings, participating customer survey results, nonparticipating customer survey results, trade partner interview results, peer utility benchmarking results, and networked lighting controls interviews results.

C.1 Staff Interview Findings

Introduction

To support the process and impact evaluation of the 2022 Xcel Energy Demand Side Management (DSM) products, members of the TRC Companies (TRC) evaluation team from Apex Analytics conducted virtual interviews with key staff managing and implementing the Colorado Xcel Energy Lighting Efficiency Product. The interview objectives were to collect staff feedback on product experiences and input on evaluation priorities. The evaluation team interviewed the following key staff managing and implementing the Lighting Efficiency Product.

Colorado Xcel Energy Staff:

- Product Manager
- Evaluation Manager
- Key Account Manager
- Trade Partner Relations Manager
- Small Customers Business Solutions Center Staff Member

CLEAResult Staff:

- Program Consultant

This document contains our summary of the key takeaways, a description of the product, an inventory of the product's strengths and barriers, and feedback on evaluation priorities including a list of utilities identified as peers. The team has also included a section with observations on other products which are outside the scope of the Lighting Efficiency evaluation, but may be useful to Xcel Energy

Key Takeaways

Below are key takeaways from staff experiences with the Lighting Efficiency Product. These key takeaways provide a summary of the product context and feedback received during both the kick-off meeting and the subsequent staff interviews.

- **The Lighting Efficiency product is well established, with strong trade partner and customer participation year-over-year.** Despite recent declines in trade partner participation and total savings, the product continues to be a principal contributor to overall portfolio savings.

- **COVID-19 pandemic resulted in numerous challenges for the product staff, trade partners, and customers.** These included supply-chain issues (contractors had difficulties keeping products in stock), price increases, loss of in-person sales and trade partner recruitment opportunities (i.e., trade shows), labor shortages and staff turnover for all parties, and stalled projects.
- **COVID-19 pandemic impacts were uneven.** Lighting projects in some segments, such as healthcare and federal government facilities, were relatively unaffected, while others, such as commercial real estate (which was facing uncertain tenant continuity), were severely affected.
- **LEDs are becoming more mainstream**, and larger customers may be approaching saturation. This erodes savings opportunities and may also result in increasing free ridership.
- **Advanced lighting controls offer new savings beyond LEDs.** However, the market uptake of these measures has been slow because the energy savings and available rebates are insufficient to overcome the high equipment costs associated with these measures.
- **Xcel Energy staff want to identify the best opportunities for lighting savings and understand how to capture them**, including best strategies to target promising market segments, any barriers that customers face besides cost, and additional services besides incentives that could encourage more participation.
- **Xcel Energy staff want to optimize their relationship with trade partners.** To do this, staff want to understand how and when trade partners use the product in their sales process, why some previously active trade partners have been less active recently, and where trade partners might need more training or other support.
- **Xcel Energy staff want to leverage any innovations or lessons learned by Xcel Energy's regional peers.** Staff want to understand what new strategies or program design ideas peers are exploring, and whether those ideas might be applicable to the Xcel Energy territory. Staff also want to know other programs that peer utilities look to for new strategies or program design ideas.

Product Activities, Goals, and Resources

The following sections present the evaluation team's understanding of the product based on staff interviews and review of available product documentation.

Goals and Objectives

The Lighting Efficiency product's savings goals, including prescriptive, midstream and custom components, are based on net MW and GWh, respectively. The goals for the Lighting Efficiency product are 15.7 MW and 100.1 GWh for both 2021 and 2022 (Table C.1-1).

According to staff, the product achieved about 74 GWh in 2021, below its target 100 GWh. Both the prescriptive and midstream offerings achieved less savings than in 2020. However, the custom channel grew in 2021 due to large numbers of custom indoor agriculture projects. Indoor agriculture projects are expected to shift to a new segment-specific product in 2022.

Table C.1-1. Colorado Xcel Energy Lighting Efficiency Product Filed Savings Goals

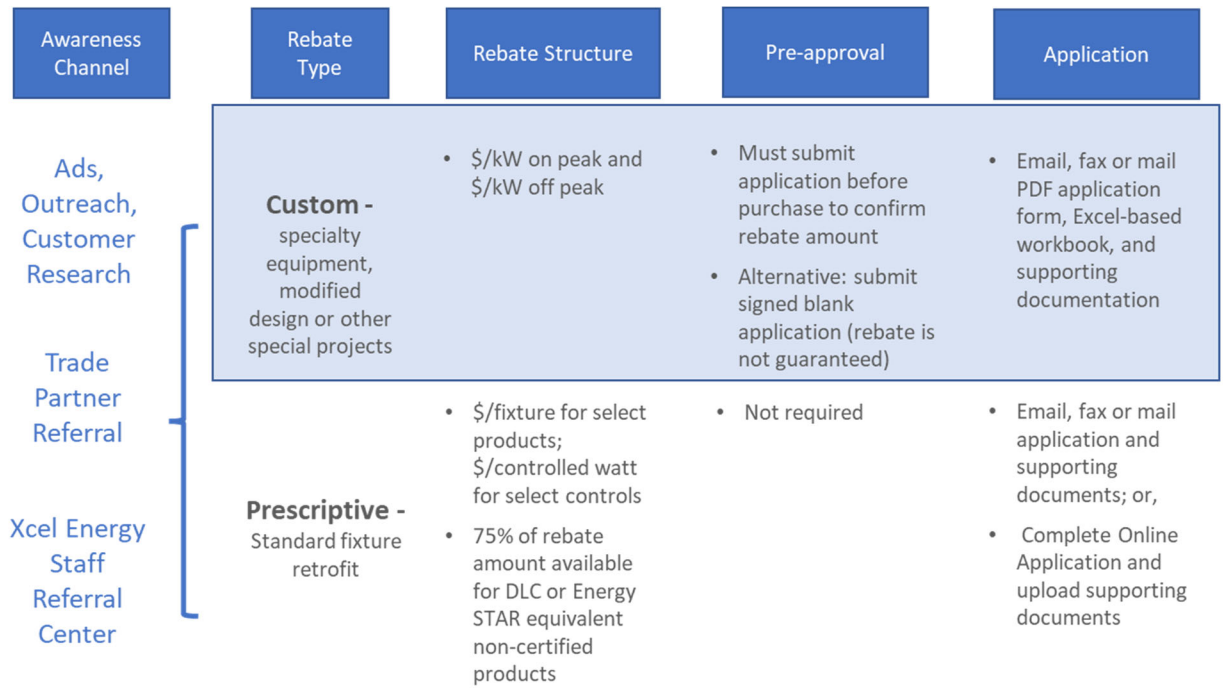
Lighting Efficiency Product*	2021	2022
Demand Reduction	15.7 MW	15.7 MW
Energy Savings	100.1 GWh	100.1 GWh

* Lighting Efficiency savings targets from the 2021-2022 Colorado Demand Side Management Plan include savings from the custom, prescriptive and instant incentive (midstream) channels. The instant incentive channel is not included in the scope of this evaluation.

Design & Activities

Figure C.1-1 presents the evaluation team's understanding of the product design for the custom and prescriptive channels of the Lighting Efficiency product. The components of the figure are discussed in the following sections. (The midstream, or "Instant Incentive", channel is not included here because that channel is not included in the scope of the evaluation.)

Figure C.1-1. CO Xcel Energy Lighting Efficiency Product Activities



Customers become aware of the product rebates through various channels: their own research, through marketing and advertising, a Trade Partner referral, and referrals from Xcel Energy Staff Referral Center. All three channels are important for both prescriptive and custom projects.

Most customer projects qualify for prescriptive rebates, which are offered for the most common fixtures and controls. Retrofits that include a lighting redesign or more complex controls may qualify for custom rebates. Each rebate type has its own application process and requirements.

(Importantly for customers, Xcel Energy offers several other products that provide rebates and technical services to support efficient lighting improvements, such as the Small Business Energy Solutions for small business customers. These alternative channels are outside the scope of this evaluation, but account for about 20% of all 2021 lighting savings in the Xcel Energy portfolio.)

Prescriptive Rebates. Xcel Energy offers prescriptive rebates on a per-unit basis for pre-approved products that are qualified by the DesignLights Consortium (DLC) or certified by Energy STAR. Equivalent non-certified products are typically eligible for 75% of the rebate amount for certified products. In 2020, Xcel Energy offered a 50% bonus rebate for interior fixtures for a limited period to boost participation.

Custom Rebates. For customers doing more specialized retrofits, such as projects that do not involve a one-to-one fixture exchange, Xcel Energy offers rebates on the basis of total demand reduction at the project level, accounting for on- and off-peak savings. The standard application process requires customers to submit detailed projects information before purchasing their equipment, in order for Xcel Energy staff to confirm the project is eligible and determine the rebate available. Customers can waive the pre-approval in order to speed up the project timeline. However, customers must still submit a signed blank application form, indicating they are completing the project with the expectation of a rebate. Customers also have no guarantee of project eligibility or the rebate amount in this case. To receive the rebate, the customer or their trade partner must submit the application form, the excel-based savings workbook detailing the specifics of the project, product invoices and other supporting documentation via email.

No pre-approval is needed for the prescriptive pathway. Customers or their trade partner can submit a PDF application form and supporting documentation by email, fax, or mail. Alternatively, customers can use the Online Application portal to enter necessary information and upload required documents (including a customer signature form).

Roles and Resources

Lighting Efficiency product implementation relies on the following staff and partner roles and resources:

Product Manager

- Creates product plans and strategies, coordinates all product-related activities across other staff, and disseminates information on product changes
- Identifies and leads implementation of design changes, such as shifting products to prescriptive or instant incentive channels
- Determines bonus structure and schedule each year
- Approves reviewed applications for payment

Trade Partner Manager

- Motivates trade partners to participate in programs and promotions

- Disseminates information on product offers to all trade partners through newsletters, on-site education (e.g., lunch and learn sessions), trade shows, etc.
- Serves as a resource for trade partners to answer questions about the product process

Trade Partners

- Use product rebates as a sales tool to encourage customers to purchase more energy efficient equipment
- May help customers prepare and submit rebate applications
- May offer customers the rebate amount as a discount on their invoice and then submit the application on the customers behalf and receive the rebate directly

Account Managers

- Inform assigned customers about rebates available through the product and motivate them to participate in Xcel Energy DSM products
- Help customers to identify energy efficiency opportunities, and respond to questions about Product details
- Connect customers to engineering staff for project design support
- Review managed account applications and submit for approval and payment

Business Solutions Center (BSC)

- Proactively solicit customers on their energy efficiency plans and presents Xcel Energy opportunities
- Reach out to non-managed customers with information about Product offers
- Respond to non-managed customer questions about available rebates and the application process
- Review non-managed account applications and submit for approval and payment

Corporate Marketing Team

- Work with product manager to develop marketing strategies and messaging
- Implement advertising campaigns

Engineering Team and CLEAResult Engineering support

- Support customers to identify lighting efficiency opportunities, select eligible equipment and prepare application forms
- Support product managers to determine equipment and project savings

Product Strengths and Challenges

During interviews, staff identified the following strengths and challenges to implementing the Lighting Efficiency product. Strengths include factors that product staff identified as supporting the success of the product; challenges include factors that product staff identified as preventing the product from reaching its goals.

Strengths

- Participation has been growing in Indoor Agriculture and holding steady in public schools and other select segments, despite the COVID-19 pandemic.
- The product has a mature design that has been modified several times in response to trade partner and customer feedback, so that the design and implementation operate smoothly and are considerably improved over past years.
- Xcel Energy Staff perceive that the product is well known in the market – many customers and installers generally know that Xcel Energy offers lighting rebates even if they don't know the specific details.
- Marketing uses targeting strategies such as identifying customers that have not previously received a lighting rebate (and may therefore still have T-12 or T-8 bulbs).
- Certain segments with secure funding sources, such as healthcare facilities or schools that received a public bond and federal government facilities, were relatively unaffected by COVID-19-related impacts. In some cases, schools and other facilities were able to move forward with projects more quickly during COVID-19 shut-downs, due to empty buildings.

Challenges

- COVID-19 pandemic brought numerous challenges to the Lighting Efficiency product. These challenges affected most customers segments to some degree, and included:
    - supply-chain delays and longer project lead times
    - price increases
    - loss of in-person sales opportunities
    - reluctance to commit budget given uncertainty about future (especially for segments such as commercial real estate and some schools)
    - loss of trade partner recruitment opportunities (trade shows/workshops)
    - reduction in trade partner participation
- LEDs are becoming more mainstream and eroding savings opportunities.
- Lighting controls could provide more savings, but uptake has been very limited. Staff report lighting controls savings are not enough relative to high equipment costs.
- According to staff, prices are now increasing, making rebate amounts progressively less effective.
- Some savings may be missed because customers pursue easier prescriptive rebates rather than investing the time needed for a custom rebate, despite opportunities for greater savings through a custom project; additionally, some customers may not have the resources to identify custom lighting opportunities.

- Current staff resources are insufficient to analyze participant and customer demographic data to improve marketing strategies.
- Current only one full-time equivalent position for trade partner management across all non-residential Products due to attrition in recent years (former half full-time equivalent position has not been filled); this may be insufficient to optimally manage trade partners
- BSC specific challenges included:
    - BSC staff turnover resulting in heavy workloads
    - Website is a primary resource for customers and BSC staff, but updates and new information are sometimes slow to appear.
    - BSC staff need more training and better resources to understand the custom product (especially the Excel workbook) and explain it to customers and vendors. One Xcel Energy staff person requested more detail in the workbook, such as the "technology tab" resource that exists in custom workbooks for other equipment types.
    - Small customers sometimes don't engage with the product staff until after they have started their project and purchased specific equipment. These projects might have qualified for custom incentives, but do not because the customer did not submit paperwork before starting the project.
- BSC staff are sometimes hesitant to refer customers to CLEAResult, because staff want to retain a direct relationship with the customer.

Feedback on Evaluation Priorities

During interviews, Xcel Energy staff identified research topics and questions they would like the evaluation to address. The following bullets compile these topics along with additional topics that the evaluation team identified based on staff interview findings. The evaluation team will consider these research topics when prioritizing portfolio-wide evaluation needs and as able, incorporate them into the final evaluation plan for the 2022 Lighting Efficiency product.

- Market Opportunities/Program Design

What segments or products offer the best opportunities for savings as LEDs continue to become more mainstream?

What are promising market segments, and what product marketing or design strategies would best target those segments?

What barriers do customers face in considering efficient lighting and controls upgrades, besides cost?

What additional services, besides incentives, could encourage more participation

Some equipment is only offered through midstream via our participating distributors, are sales being missed due to this?

- Participation Process/Customer Perceptions

In what ways could Xcel Energy simplify and/or streamline the application process?

Are customers satisfied with the application process and time to receive a rebate?

Should any equipment be shifted from custom incentives to prescriptive, or from prescriptive to midstream (i.e., LED Exit signs)?

- Trade Partners

How important is the product to trade partners, as a sales tool? How and when do they use it?

How often do trade partners recommend stand alone or networked lighting controls in conjunction with fixture retrofits.

What tools or training do trade partner need to sell lighting controls projects to customers?

How do the trade view our current controls rebate offerings in terms of design and rebate amount?

Are there aspects of other utility lighting programs that they prefer over Xcel Energy's. If yes, what are those?

Why did some companies that were formerly active trade partners dramatically reduce their participation in 2020 and 2021?

How do trade partners develop proposals for customers (what type of equipment do they specify, and why)

Do trade partners have the resources (information, training, etc.) they need to confidently offer the product to customers? Where do most trade partners get information on product changes?

How important are trade partners relative to Xcel Energy staff and consultants (account managers and Business Solutions Center, and CLEAResult project consultants) in driving participation, and do trade partners and Xcel Energy staff work together effectively?

- Understanding regional peers

What new strategies or design ideas are peer utilities exploring?

What organizations do peer utilities look to for new ideas?

Do programs offer rebates for the same equipment in multiple rebate channels? For instance offer rebates for LED tubes in midstream and downstream?

What do their trade partner training efforts look like?

Regional Peers

Xcel Energy staff identified the following utilities as appropriate peer institutions to study in benchmarking the Lighting Efficiency product.

- Arizona Public Utilities
- Rocky Mountain Power
- Pacific Power
- Tucson Electric
- Salt River Project
- Avista
- National Grid Massachusetts/Eversource
- NYSERDA
- Puget Sound Energy
- Portland General Electric

- PG&E

C.2 Participating Customer Survey Results

Introduction

To support the process and impact evaluation of the 2022 Xcel Energy efficiency products, the TRC Companies evaluation team of Apex Analytics and TRC Companies conducted telephone surveys with participants of the Colorado Lighting Efficiency Product. The evaluation team defined a participating customer as any customer who initiated a project in 2020, 2021, and 2022. The interview objectives were to collect participant feedback related to decision drivers, product design, role of trade partners and Xcel Energy staff, attitudes toward networked lighting controls, and product influence.

Key Takeaways

Key takeaways from participant experiences with the Colorado Lighting Efficiency Product are below. These key takeaways provide a summary of the product context and feedback received during the phone surveys.

Decision Drivers

- Over half of the participants (59.1%) learned about available rebates through their contractor or vendor.
- Most participants (68.6%) considered projects as they were identified. A smaller percentage of participants (18.6%) decided based on their annual budget.
- Overall, participants found that their projects were relatively unaffected by the COVID-19 pandemic, with 75.7% claiming that there were no aspects of their projects that had been affected.
- Of all the benefits from the new equipment installed from the rebated project, the participants were mostly expecting 1) lower energy costs, 2) better light quality, and 3) reduced energy usage.

Product Design

- The average customer satisfaction ratings were 4.5 or greater (on a scale of 1 to 5 with 1 being low and 5 being high) for each of the five topics asked about: ease of understanding the different lighting rebate and discount programs offered by Xcel Energy (4.6), identifying the best fit for their needs (4.5), range of options eligible for a rebate (4.6), rebate amounts available (4.6), and application process (4.6).
- Overall product satisfaction received an average rating of 4.7 out of 5. Most suggestions on how Xcel Energy could improve their lighting product related to easier forms, higher rebates, and clearer communication.

Role of Trade Partners and Xcel Energy Staff

- About half of participants relied on either a contractor (46%) or Xcel Energy representative (4%) to identify equipment eligible for a rebate. Those that did utilize a contractor or Xcel Energy representative were very satisfied with the assistance (4.89 and 4.94 respectively out of scale of 1 to 5).

Attitudes Toward Networked Lighting Controls

- About two-thirds of the participants (67.6%) had not heard of networked lighting control systems. Of the participants who had heard of networked lighting controls, 54.2% did not know that Xcel Energy offered rebates for them. Additionally, 81.3% of the participants who knew about networked lighting controls claimed that their contractor did not suggest a networked lighting control system.
- The top three reasons of why participants who were aware of lighting controls had not installed networked lighting controls were 1) no need for occupancy sensors or dimming, or centralized remote control, 2) cost, and 3) facility running constantly so lighting controls would not be feasible.

Product Influence

- The three most important factors participants cited as influencing measure installation were 1) desire to minimize cost, 2) age or condition of equipment, and 3) desire to improve other lighting features besides efficiency.

The following sections present the evaluation team's understanding of customer feedback about decision drivers, product design, role of trade partners and Xcel Energy staff, networked lighting controls, and product influence.

Decision Drivers

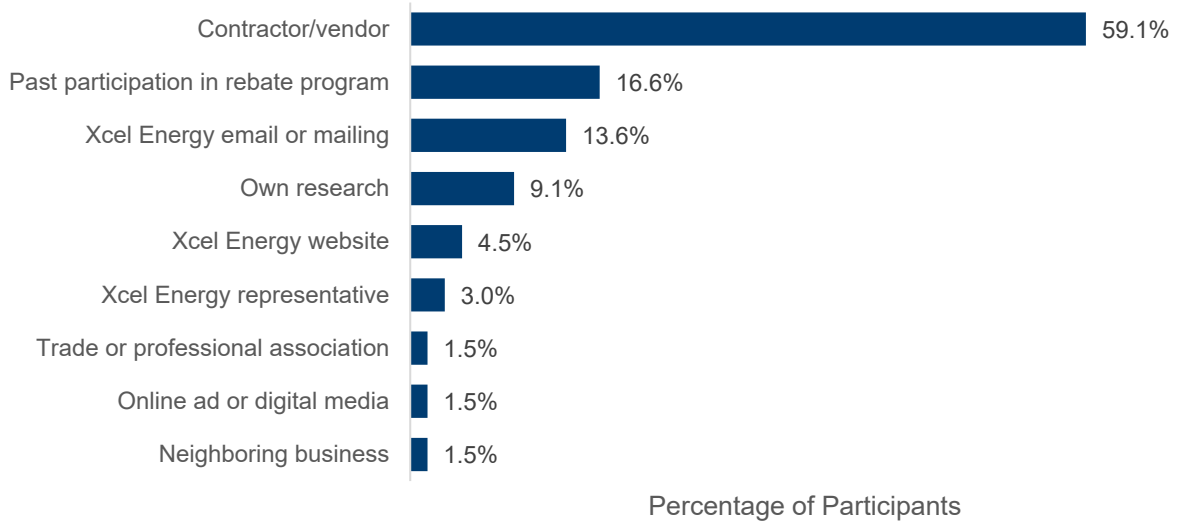
The evaluation team asked about various topics that could be driving the decision to participate in the product. The following decision drivers are discussed in the sections below: product awareness, project need, project planning and funding, participant types, impact of COVID-19, and expected benefits.

Product Awareness

The evaluation team began by gathering information about how and when the participants in the Xcel Energy Lighting Efficiency Product became aware of the product.

Figure C.2-1 shows that over half of the participants (59.1%) learned about the lighting rebates from their contractor or vendor. Another 21.1% of the participants learned about the rebates from Xcel Energy via a representative, email, or website, and 16.6% knew about the rebates from past participation in the product. The rest of the participants learned about the product through various other methods, including their own research and neighboring businesses.

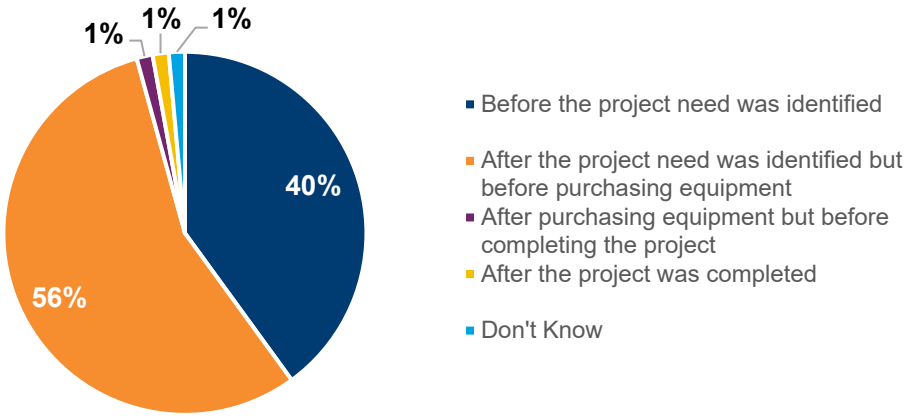
Figure C.2-1: How Participants Learned About Available Rebates (n=66)



Note: Multiple responses allowed

As shown in Figure C.2-2, 40% of participants knew about potential rebates before the project need was identified. More than half (55.7%) found out about the rebates after the project need was identified but before they purchased the equipment, and the rest learned about it later in the process.

Figure C.2-2: When Participants Learned About Rebates (n=70)



Participants were also asked about their awareness of other lighting products offered by Xcel Energy. Most of the participants (62.9%) were not aware that Xcel Energy also offered discounted replacement lamps through partner distributors. Of those who were aware, only 15.4% had purchased or considered purchasing lamps using the discounts available. Of the four participants in the lamp discount product, only one had any challenges in participating, which was due to cost.

Similarly, of the participants who had a prescriptive rebate, most (69.2%) were also not aware that Xcel Energy offered custom rebates on a per-kilowatt-hour-saved basis for energy efficient lighting projects that do not fit into the prescriptive rebate structure.

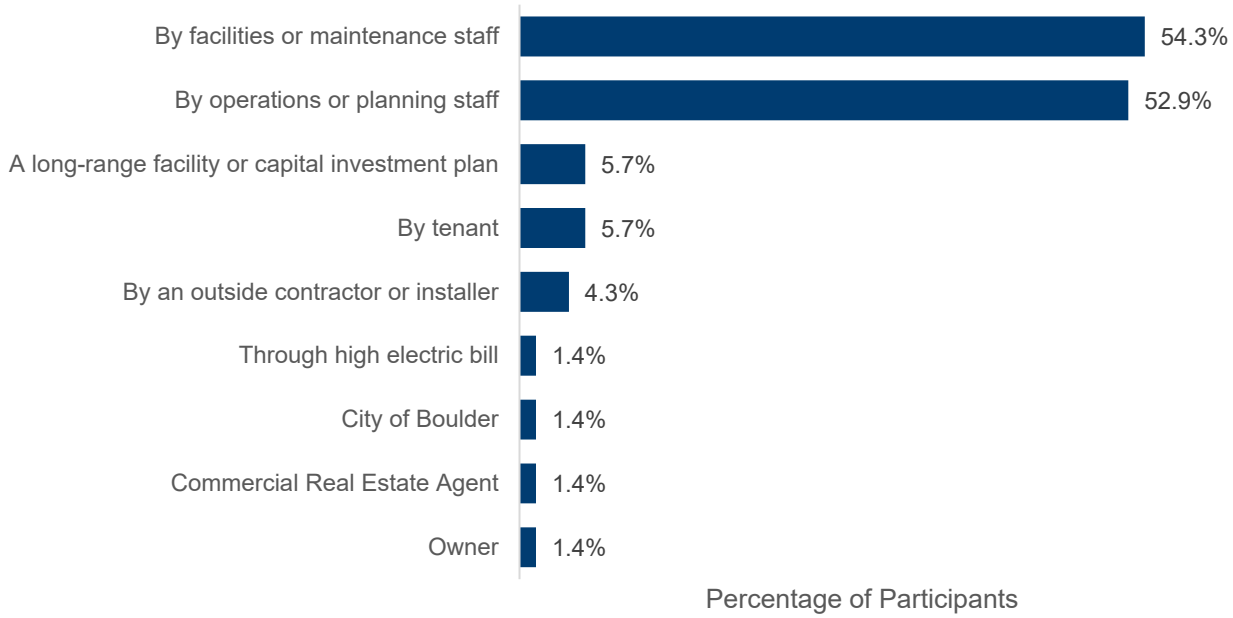
Finally, 60% of the participants who had a custom rebate were not aware that Xcel Energy offered fast and easy prescriptive rebates for certain common high-efficiency fixtures that do not require preapproval.

Project Need

To gauge what type of projects were being completed under this product, the survey asked customers if their project was part of a renovation or new construction. Of the participants sampled, 27.1% had projects that were part of a renovation or new construction.

The survey also asked participants how they identified the need for the rebated lighting project. As displayed in Figure C.2-3, many participants (54.3%) identified the need from their facilities or maintenance staff. An additional 52.9% identified the need from their operations or planning staff. The rest of the participants had various people or methods to identify their need.

Figure C.2-3: How Need was Identified (n=70)



Note: Multiple responses allowed

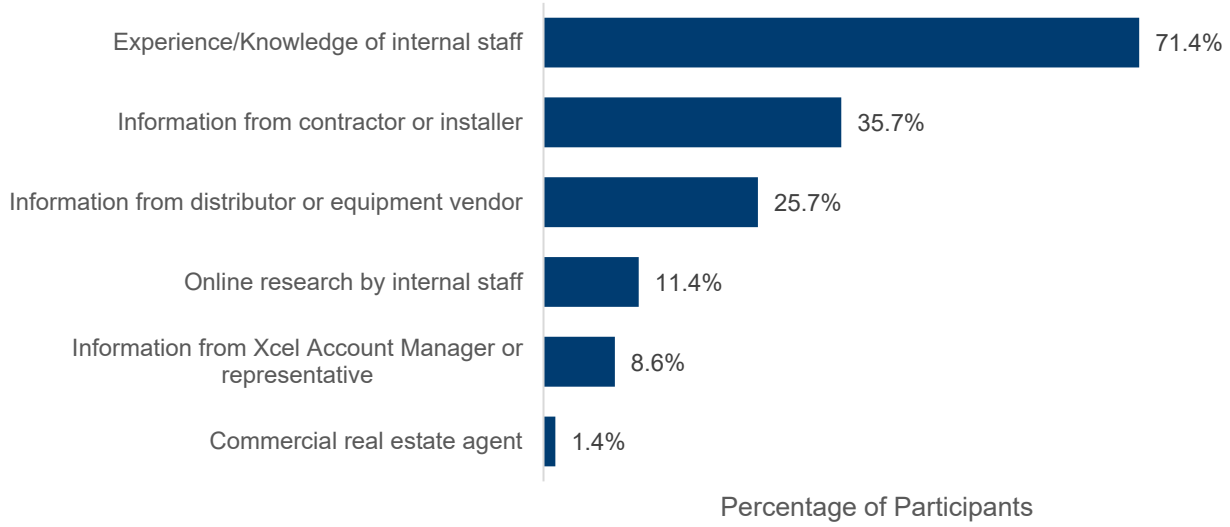
Some participants had multiple projects in the Lighting Efficiency Product. Of those with multiple projects, all (100%) used a single decision maker for these projects. Of those, 87.5% made one decision that applied to all projects, while the other 12.5% varied their decision by project.

Project Planning and Funding

Figure C.2-4 below summarizes the information most helpful to the participants when planning their projects. Overall, participants found the experience of their internal staff the most helpful.

Additionally, about a third (35.7%) said that the information from their contractor and or installer was helpful.

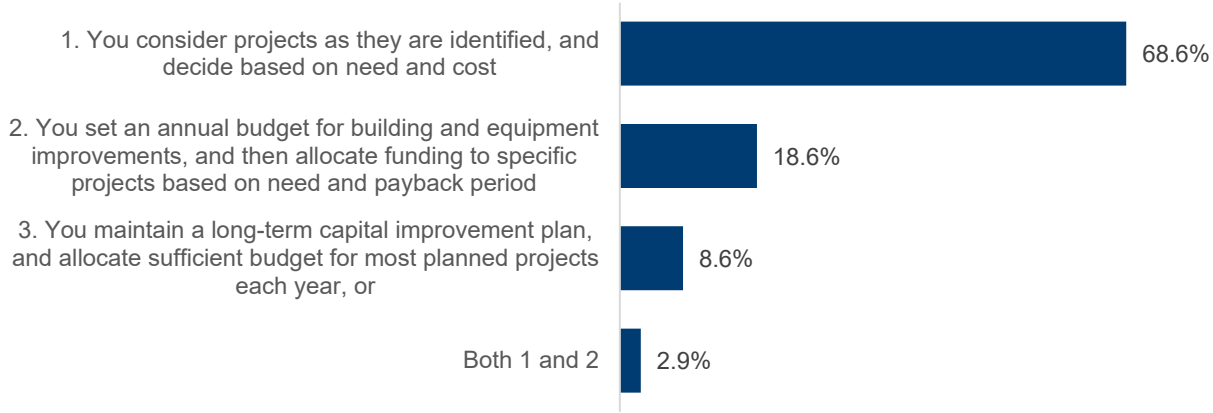
Figure C.2-4: What Information was Helpful in Planning Projects (n=69)



Note: Multiple responses allowed

The evaluation team asked participating customers how they decided to fund their projects. As seen in Figure C.2-5, the majority (68.6%) of participants consider projects as they are identified, while another 18.6% decide based on their annual budget.

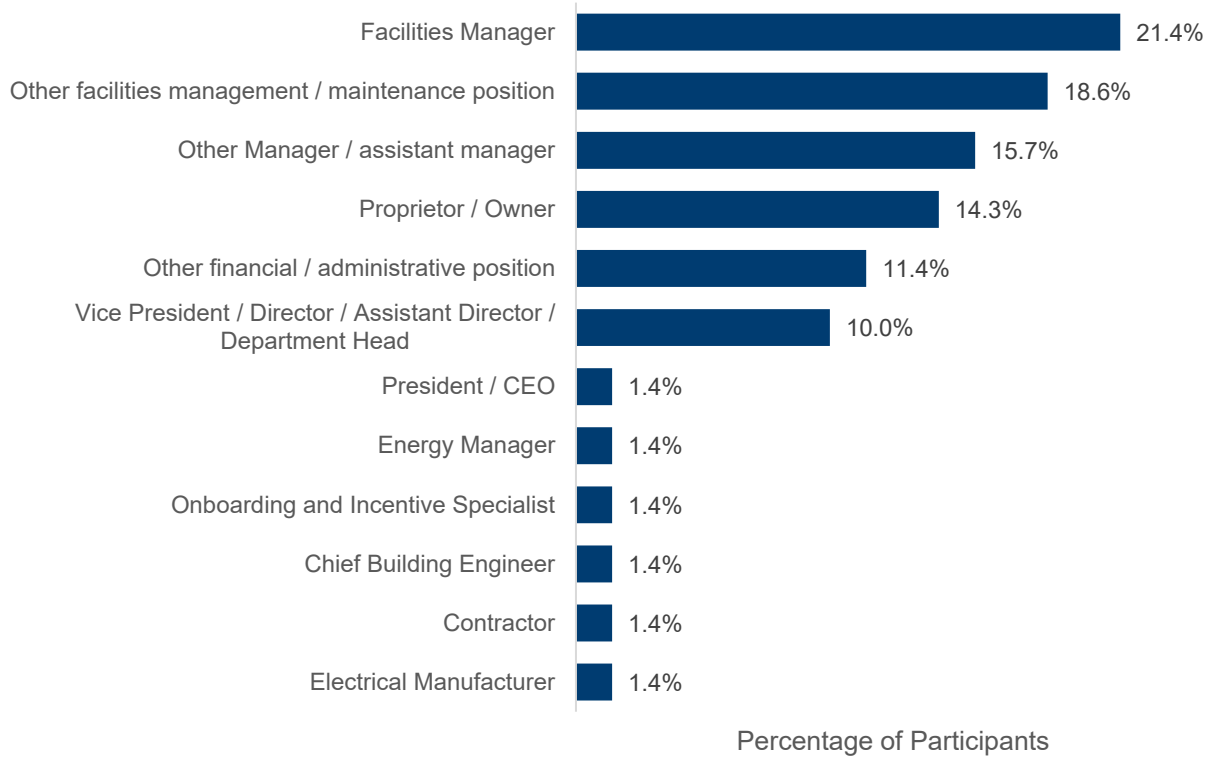
Figure C.2-5: How Funding Projects is Decided (n=70)



Participant Types

The evaluation team gathered information on what people and what types of facilities were participating in the Product. First, the team asked the occupational title of the person responding to the phone survey. The majority of the respondents (57.1%) were some type of manager within the facility. Another 14.3% were proprietors or owners of the facility. Figure C.2-6 lists these and the other occupational responses.

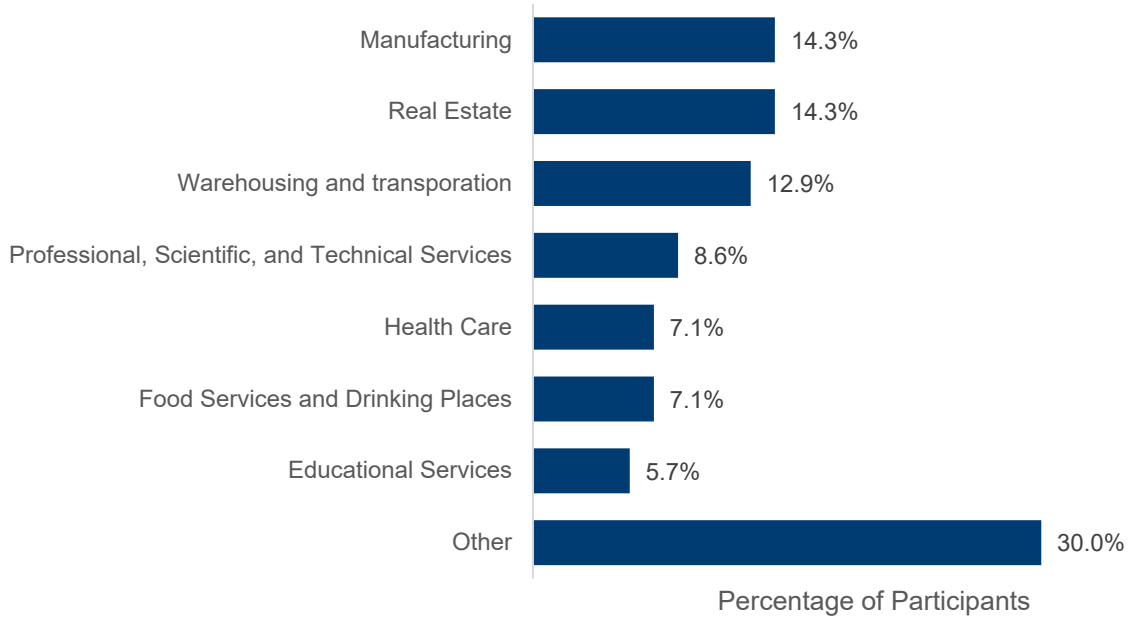
Figure C.2-6: Occupational Title of Survey Respondents (n=70)



Most respondents (67.1%) owned the facility in which the rebated lighting equipment was installed, while another 22.9% either leased or rented the facility, and the rest had other various management agreements.

Of all the facilities surveyed, the most common business activities were 1) manufacturing, 2) real estate, and 3) warehousing and transportation, with an average square footage of around 130,000 sq ft. The "other" category, as shown in Figure C.2-7, reflects businesses with less than 5% of participants, including non-food consumer retail, government, mixed-use, nonprofit organizations, recreation, lodging, cannabis, construction, contracting, horse boarding, and offices.

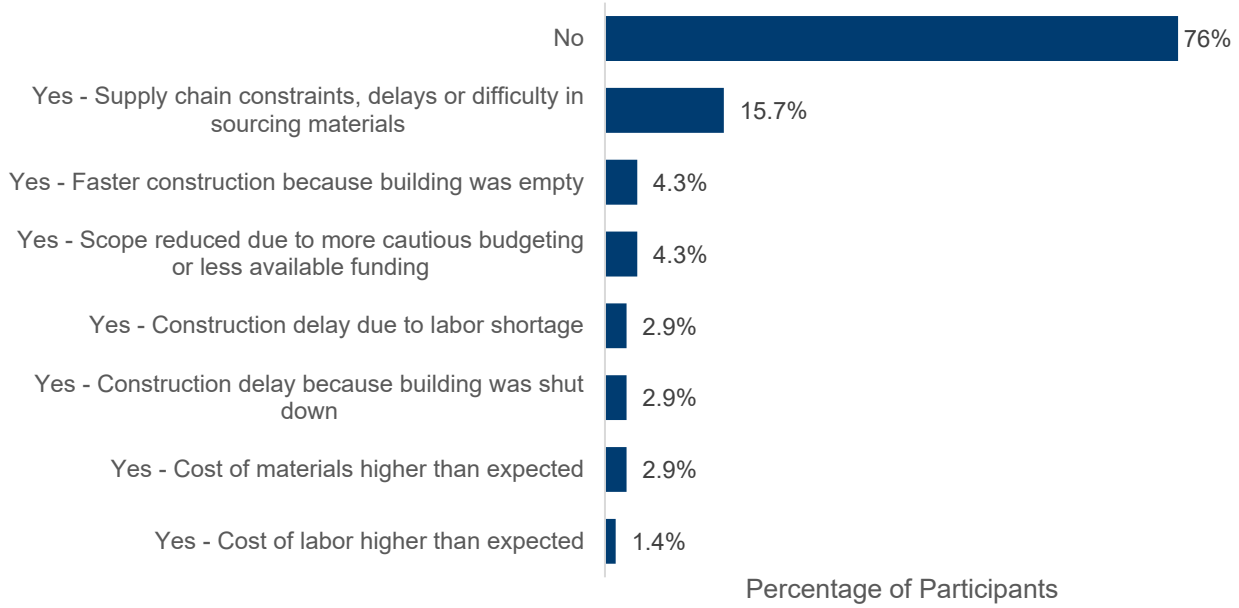
Figure C.2-7: Business Activities at Facility (n=70)



Impacts of Covid-19

Because of the global effects of the Covid-19 pandemic, the evaluation team surveyed participants on how it affected their projects. Most of the participants (76%) felt that there was not any aspect of their project that was impacted by the Covid-19 pandemic. Of the 24% that did feel impacts to their projects, most (64.7% [or 15.7% of all participants]) claimed that the pandemic caused supply chain constraints, delays, or difficulty in sourcing materials. About a quarter (23.5% [or 2.9% of all participants]) claimed they felt effects through construction delays. A few (17.6% [or 2.9% of all participants]) claimed that costs of labor and materials were higher than expected, 17.6% (or 4.3% of all participants) had to reduce the scope of their projects due to less available funding, and another 17.6% (4.3% of all participants) claimed that construction was faster due to buildings being empty. Figure C.2-8 lists the stated impacts from participants.

Figure C.2-8: Effects of COVID-19 (n=70)



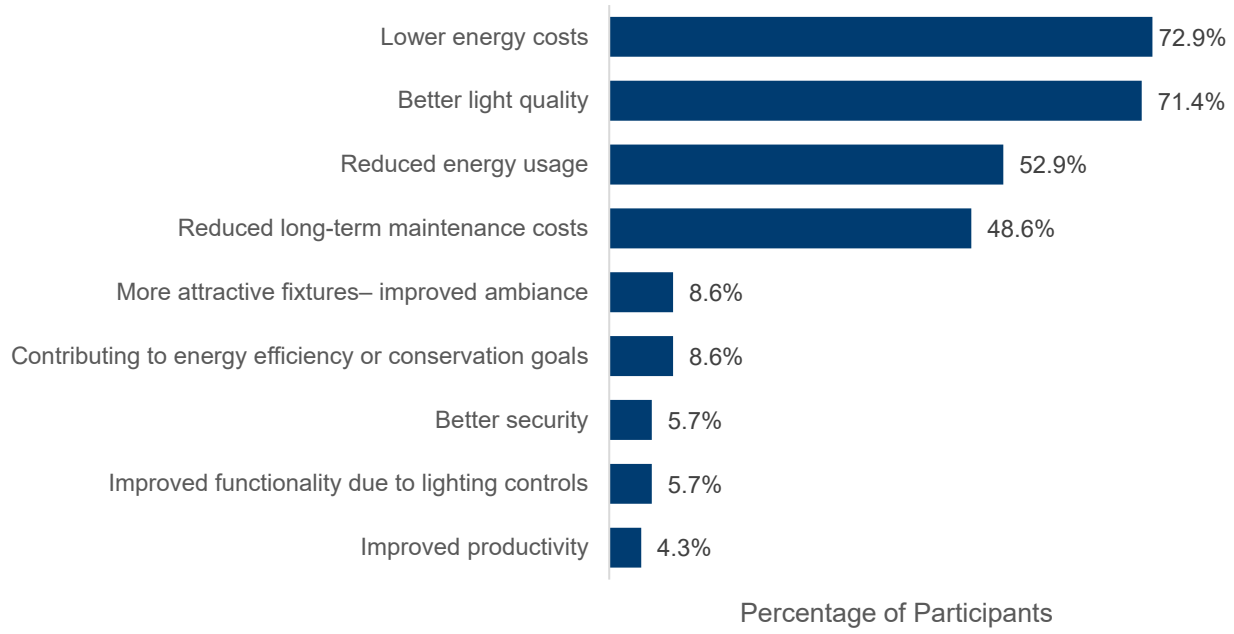
Note: Multiple responses allowed

Despite the COVID-19 pandemic, a vast majority (81.4%) of all the participants claimed that their organization was equally likely to invest in improvements projects during 2020 and 2021 as other years. A smaller percentage (11.4%) responded that the organization was less likely to invest in improvement projects, and 5.7% responded that they were more likely to invest in improvement projects.

Expected Benefits

Participants were asked about what benefits they expected in pursuing their projects. Of all the benefits from the new equipment installed in their project, the participants were mostly expecting 1) lower energy costs, 2) better light quality, and 3) reduced energy usage. The expected benefits are listed in Figure C.2-9.

Figure C.2-9: Expected Benefits from New Lighting Equipment (n=70)



Note: Multiple responses allowed

Product Design

The evaluation team asked a series of questions to understand the participant's satisfaction levels with the Product and then specifically about the application process.

Product Satisfaction

The first set of satisfaction ratings were related to rating the participants' satisfaction in both understanding Xcel Energy's Lighting-related Products and having a good range of equipment available for rebates.

When asked about satisfaction regarding the ease of understanding the different lighting rebate and discount Products offered by Xcel Energy, and identifying the best fit for their needs, the average rating was 4.5 out of 5.

Participants rated their average satisfaction of the range of equipment options eligible for a rebate a 4.6 out of 5.

The last set of ratings was related to the participants' satisfaction with the rebate amounts available. For this question, participants rated their satisfaction at an average of 4.6 out of 5. Most of the suggestions to improve satisfaction related to higher rebates and making the application simpler. Figure C.2-10 provides a summary of these ratings.

Figure C.2-10: Satisfaction with Product (n=70)

When asked what would have increased satisfaction with the range of available equipment, participants responded:

- *"Because I've been doing these rebates since inception and I know types of equipment that have fallen off the list, so the range seems smaller."*
- *"Confused about what fit under the program."*
- *"I think the ranged were too narrow and the options were too few. It was too hard to pick the right choice and to know which of the options would give you the best value and best rebates."*
- *"I wasn't aware of all the available equipment."*
- *"It's very restrictive on what they allow, and if it's one over you can not do it."*
- *"Making it easier to understand, so we don't have to rely on the contractor to interpret it for us."*

When asked about the Xcel Energy Lighting Efficiency Product as a whole, the average satisfaction level was a 4.7 out of 5. Suggestions on how to make the product easier for customers or achieve better energy savings are listed below:

Relating to communication:

- *"Better communication from Xcel."*
- *"More emails to update on the program."*
- *"They could advertise it more."*
- *"I hadn't learned about it until the project got started. So maybe more upfront information."*

Relating to costs:

- *"The cost of the lighting and installation turned out to be less than what I had expected - just a comment: keeping the overall costs of upgrading low would be an additional incentive besides the rebate."*
- *"Just offer higher rebates."*

Relating to clarity of information:

- *"Just making the available rebates more clear and more understandable"*

- *"It would be helpful to make the rebate information more accessible and consumer friendly."*
- *"Rebate application processing seems disorganized."*
- *"My only complaint was the length of time it took to process the rebate."*
- *"Just a comment: the rebates and eligibility criteria change each year, so keeping up with what's available can be a challenge."*

Relating to those who provide assistance:

- *"Staff changes made it difficult. I had to start at square one each time, no knowledgeable consistent staff to deal with throughout the application process."*
- *"Not really besides it just took us a while to find the right contact at Xcel. Once we did, they were really helpful. Getting in contact with the right person was the challenge."*
- *"if they could send some guidance or a rep out and communicate with me directly, I probably could take advantage of more of their incentives."*

Others:

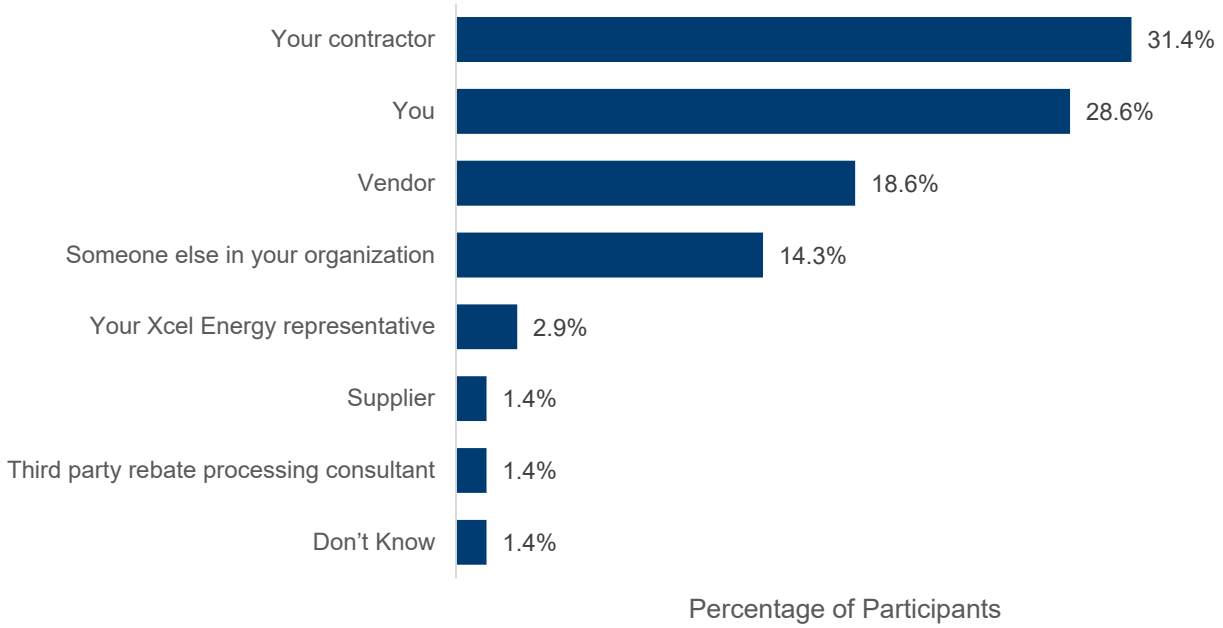
- *"For external lighting, we really don't notice they need to be fixed until the fall when the time changes. So maybe do more outreach/phone calls around that time to make sure we know about the rebates."*
- *"Maybe more tools to do more before and after comparisons."*
- *"More education about the programs for commercial applications."*
- *"Offering for smaller fixtures."*

Application Process

Additionally, the evaluation team surveyed the participants about their opinions on the rebate application process.

As shown in Figure C.2-11, about a third of the participants (31.4%) had their contractor fill out the rebate application, 28.6% of the participants taking the survey also filled out the majority of the rebate application, and the rest had someone else fill out the application (Figure C.2-11).

Figure C.2-11: Who Completed Rebate Application (n=70)



Of the five participants that received custom rebates, only two were aware that there was an option to submit either a pre-approval form to calculate their rebate or a signed application form to record their intent to apply for a rebate. Only one participant was aware of which option they chose to submit their application.

Of the participants who had a rebate that was not a part of a new construction project, 72.5% submitted their rebate application using a preprinted form. The other 27.5% used the online portal. Of those who used a preprinted form, about a third (35.7%) were aware of the online rebate application portal, and the other 64.2% were unaware of the portal.

When asked why participants chose the preprinted form over the online portal, responses included:

- *"Because the fixtures I purchased did not match that as on their form."*
- *"Because they were given to me by the contractor."*
- *"I didn't want to get timed out."*
- *"I read it is easier that way."*
- *"It's what I did before."*

The median amount of time to fill out the application forms fell between 16 to 30 minutes. The average satisfaction with the application process on a scale of 1 to 5 was a 4.6

Some suggestions on how to increase satisfaction with the application process included:

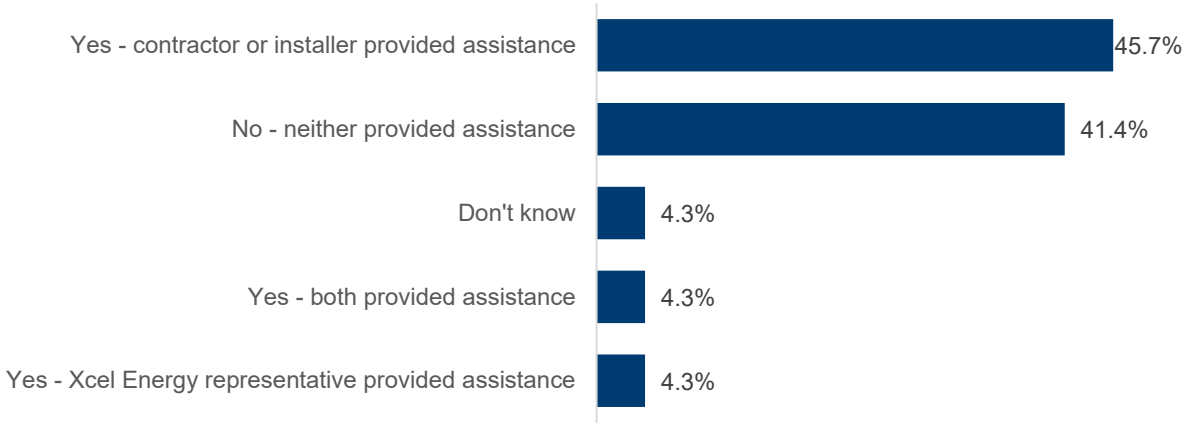
- *"There is a qualifier for what type of lights is eligible, I think DLC, and it would have been nice if I did not have to verify it elsewhere."*
- *"Not anything specific; maybe a wider range of options to identify the old equipment and new equipment or to categorize it."*

- *"Better in-person communication with me. Make a phone call to talk to me. I called them to contact me to discuss and they never got back to me. Consequently, they rejected my first application and I had to re-do it which was inconvenient and a frustration. They are disrespectful of customers' time."*
- *"Better communication with the customer."*
- *"Make the application simpler."*

Role of Trade Partners and Xcel Energy Representatives

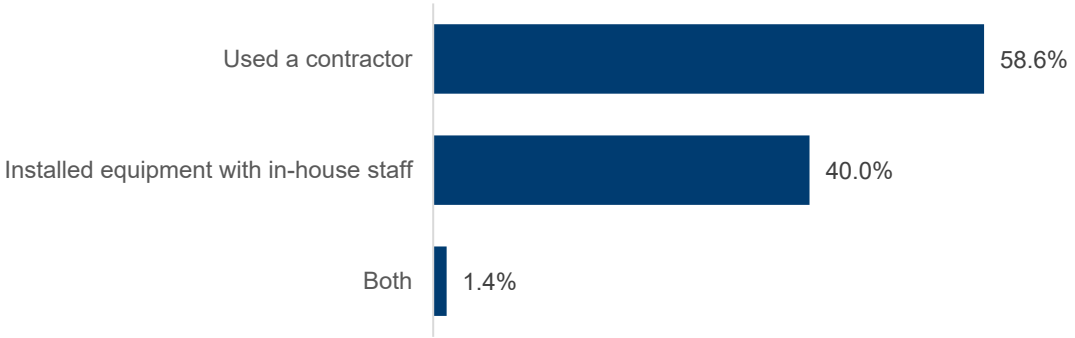
The evaluation team continued by surveying participants about the support they received from both contractors and Xcel Energy representatives. First, the team asked if contractors or/and Xcel Energy representatives assisted in identifying eligible equipment. Figure C.2-12 shows that a little less than half of the participants (45.7%) claimed that their contractor or installer assisted them in the identification of this equipment. Another 41.4% claimed that neither their contractor nor their representative assisted them in the identification.

Figure C.2-12: Who Identified Eligible Equipment (n=70)



Next, to understand how the lighting equipment was being installed, the evaluation team asked customers whether they used in-house staff or contractors. As shown in Figure C.2-13, over half of the participants (58.6%) installed the lighting equipment from this project with in-house staff, while 40.0% participants used a contractor. The other 1.4% used a combination of the two.

Figure C.2-13: Who Installed Lighting Equipment (n=70)



Of the participants that used a contractor, the average rating on a scale of 1 to 5 of their contractor's understanding of the Xcel Energy Lighting Efficiency Product and their ability to help the participant complete the rebate application was a 4.9. Of those responses, 80% were very satisfied with a rating of 5 out of 5. The one participant who rated their satisfaction a 3 out of 5 claimed that they "*were satisfied but did not know the process*."

The participants who did not have an Xcel Energy representative identify the equipment eligible for rebates were then asked if they had an Xcel Energy representative assist them in participating in the product. Only 17.2% of these participants still had assistance from an Xcel Energy representative in some way, while 75% did not and 7.8% were unsure.

From the group that did have the assistance of an Xcel Energy representative, the average satisfaction level of their representative's understanding of the Xcel Energy Lighting Efficiency Product and their ability to support their participation on a scale of 1 to 5 was 4.9.

Attitudes Towards Networked Lighting Controls

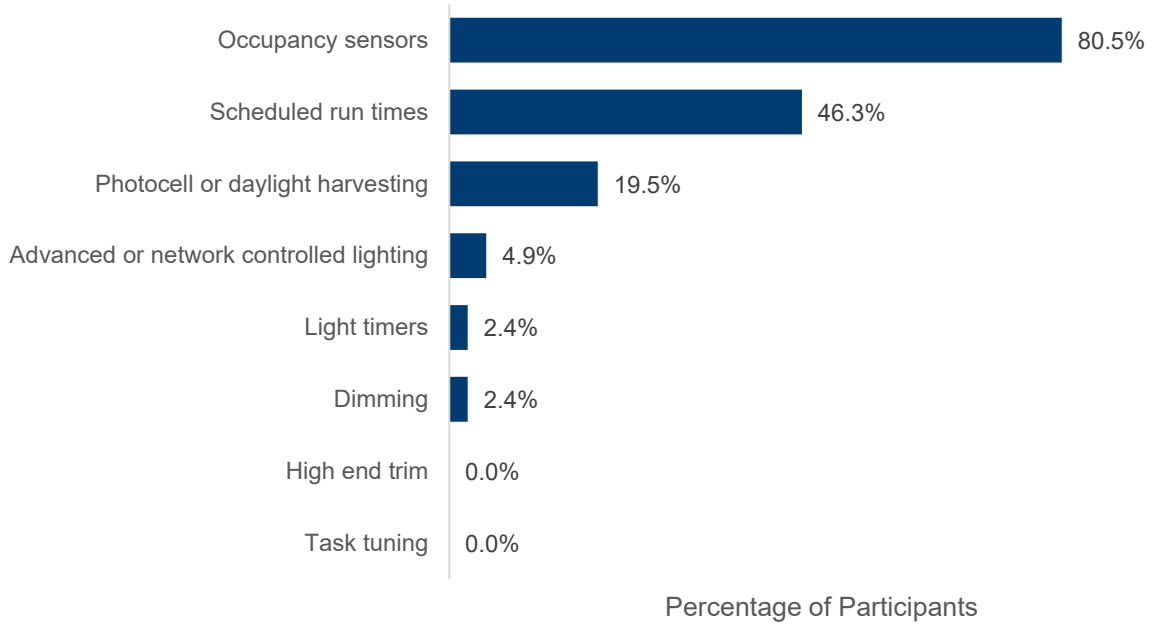
The evaluation team also asked participating customers about their use of lighting controls and then specifically about networked lighting controls.

Lighting Controls

A majority (59.3%) of participants have some type of lighting controls installed in the interior on their facility. The rest of the participants (40.7%) did not have lighting controls installed.

Of the facilities that used lighting controls, 80.5% of participants used occupancy sensors, 46.3% had scheduled run times implemented, and 19.5% used photocell or daylight harvesting. Two participants (4.9%) used advanced or networked control lighting, one participant (2.4%) used dimmers, and one participant (2.4%) had light timers, as displayed in Figure C.2-14.

Figure C.2-14: Type of Lighting Controls Installed (n=41)



Note: Multiple responses allowed

Of the participants who had lighting controls installed, approximately 53.8% of the indoor lighting in their facility was controlled. The top three reasons for not having all indoor lighting managed through lighting control strategies were 1) no need for controls everywhere, 2) incompatibility with existing features, and 3) hassle of rewiring.

The evaluation team asked participants to define what types of spaces do not need controls. Select responses are included below:

- *"Classrooms"*
- *"Dining areas and prep areas"*
- *"Equipment rooms"*
- *"Hallways"*
- *"Pump rooms, storage rooms"*
- *"Restrooms"*
- *"Small offices"*
- *"The riding arena"*
- *"Warehouse space"*

Networked Lighting Controls

Participants were also surveyed on their knowledge and use of networked lighting controls in the facility where they had installed the lighting equipment.

About two-thirds of the participants (67.6%) had not heard of networked lighting control systems. The other 32.4% had heard of them. Of the participants who were familiar with these systems, 54.2% did not know that Xcel Energy offered rebates for them, and 45.8% did know.

Additionally, 81.3% of the participants who knew about networked lighting controls claimed that their contractor did not suggest a networked lighting control system, while 18.7% claimed that their contractor did suggest this.

When asked about the challenges faced when deciding to install networked lighting controls, one participant responded that they had trouble ensuring compatibility with existing systems, one participant responded that they struggled with installation and labor costs, and two participants claimed that they had no challenges with this decision.

The top three reasons why participants aware of the technology had not installed networked lighting controls were 1) no need for occupancy sensors or dimming, or centralized remote control, 2) cost, and 3) facility running constantly so lighting controls would not be feasible.

Of the customers that did not have networked lighting controls installed, the top three reasons that would motivate them to be installed were 1) nothing, 2) lower cost of installation, and 3) lower cost of equipment.

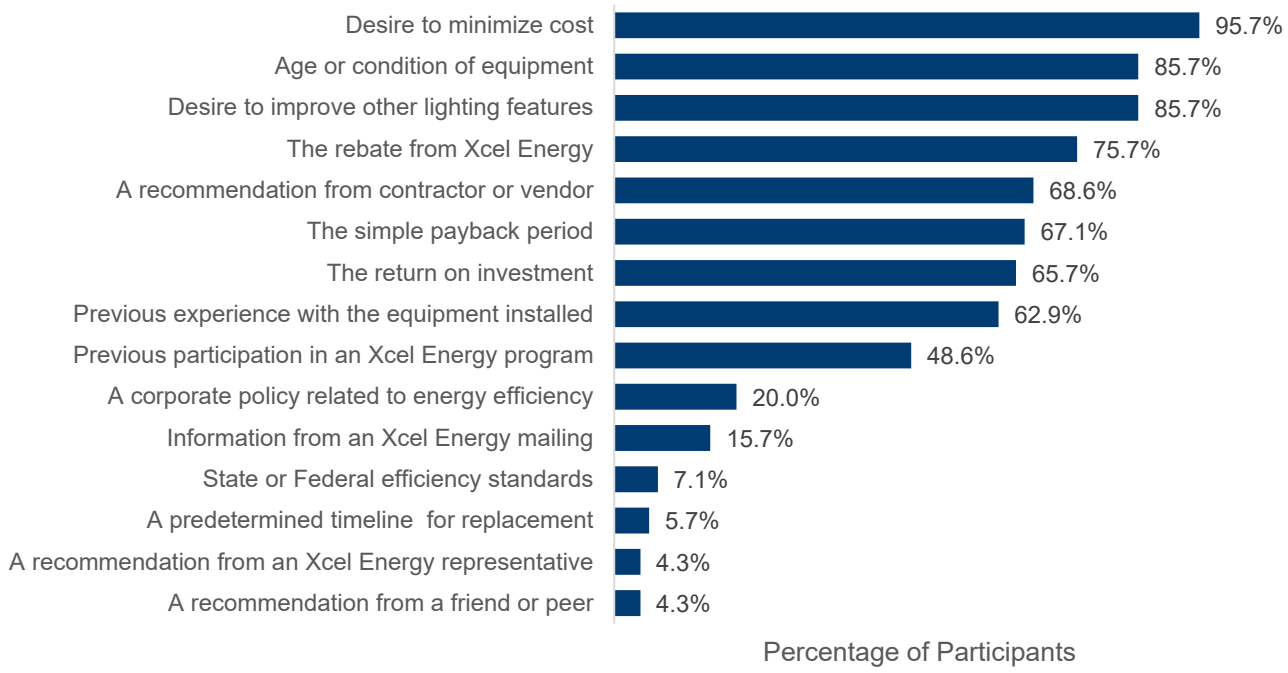
Product Influence

The evaluation team asked participating customers to identify factors important to their decision to participate, followed by an overall rating of product influence and trade partner influence, and then to identify what they would have done absent the product. These questions used in the NTGR algorithm (described in Section 3.2.1) and the frequency results of these questions are discussed in the following sections on product influence factors, overall product influence, trade partner influence, and actions absent the product.

Product Influence Factors

As shown in Figure C.2-15, the three most important factors that influenced a participant's decision to install a measure were 1) minimizing operating costs (95.7%), 2) age or condition of the equipment (85.7%), and 3) desire to improve other features besides energy efficiency (85.7%). Other important factors were the rebate from Xcel Energy (75.7%), a recommendation from contractor or vendor (68.6%), simple payback period (67.1%) and the return on investment (ROI) (65.6%).

Figure C.2-15: Factors in Deciding to Install Rebate Eligible Lighting Equipment (n=70)

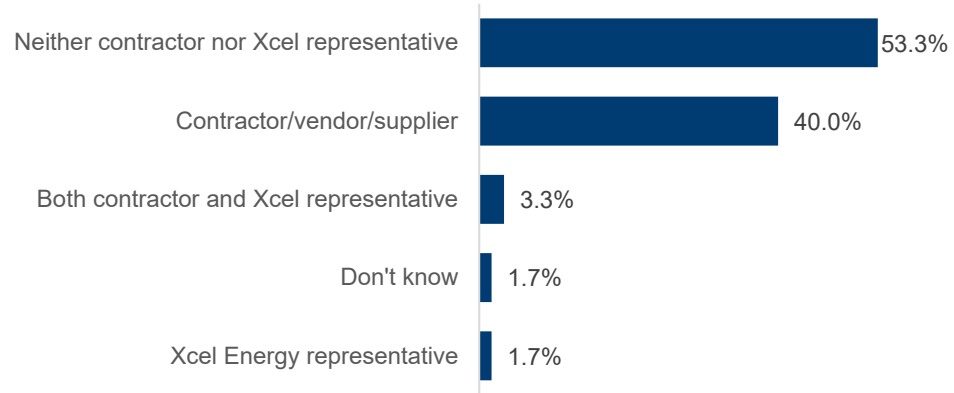


Note: Multiple responses allowed

The evaluation team asked follow-up questions about some of the other factors influencing their decision to install the lighting equipment.

Most participants (86%) considered their desire to improve ease of use, lighting quality, or other lighting features besides efficiency to be a factor in installing efficient equipment. Figure C.2-16 shows that of these participants, 53.3% responded that neither their contractor nor Xcel Energy representative introduced them to the additional features of the equipment installed. On the other hand, 40% responded that their contractor introduced them to these features of the installed equipment.

Figure C.2-16: Who Introduced Participant to Features Besides Efficiency (n=60)



Of the 68.6% of participants mentioning the recommendation from contractors or vendors, 91.7% said the contractor or vendor mentioned the Xcel Energy lighting rebate product.

Of the 67% of participants who considered the simple payback period a factor in deciding to install efficient lighting equipment, 66% included the rebate in the calculation of the payback period, or when the equipment would pay for itself. The median simple payback threshold used by these participants was between two to three years.

Of the 66% of participants who considered the ROI a factor in deciding to install efficient lighting equipment, 69.6% factored the rebate into their calculation of ROI, or total financial return from implementing the project.

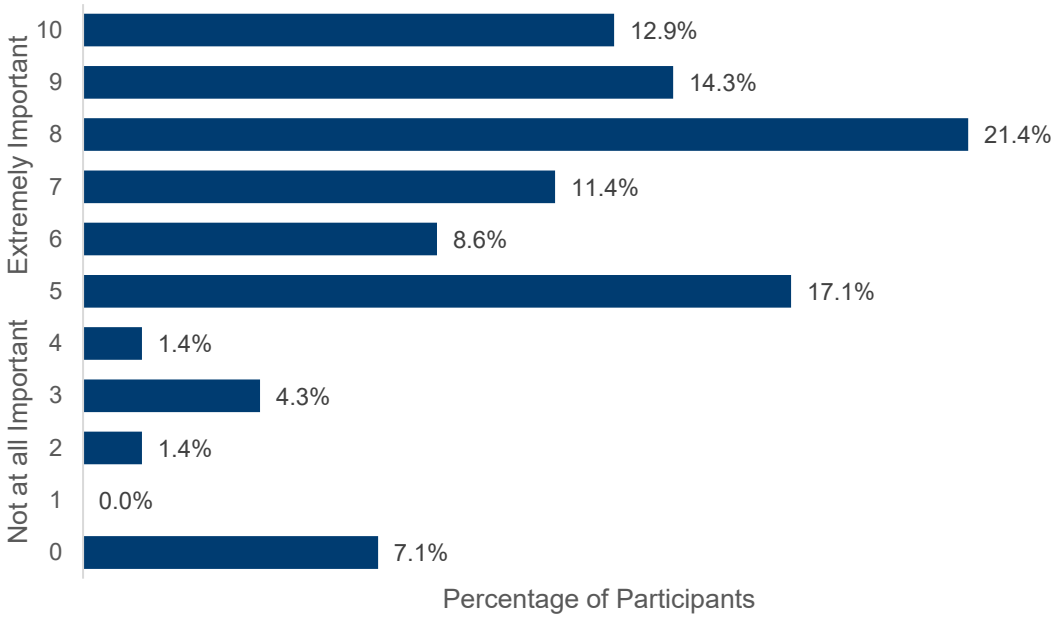
As seen in Figure C.2-15 above, 20% of the participants claimed that their corporate policies influenced their decision to install energy efficient equipment. Some examples of corporate policies related to energy efficiency that impacted project decisions included:

- *"Sustainability initiative with one of the goals being reduction of energy consumption"*
- *"City/state efficiency standards"*
- *"It's one of the core values of my field (engineering)"*
- *"Policy to reduce energy output and improve efficiency"*

Overall Product Influence

On a scale from 1 to 10, the average rating for overall importance of the Xcel Energy Lighting Efficiency Product and rebate on the participants' decision to install energy efficient equipment for this project, rather than less efficient equipment, was a 6.67. Figure C.2-17 displays all of the ratings broken down.

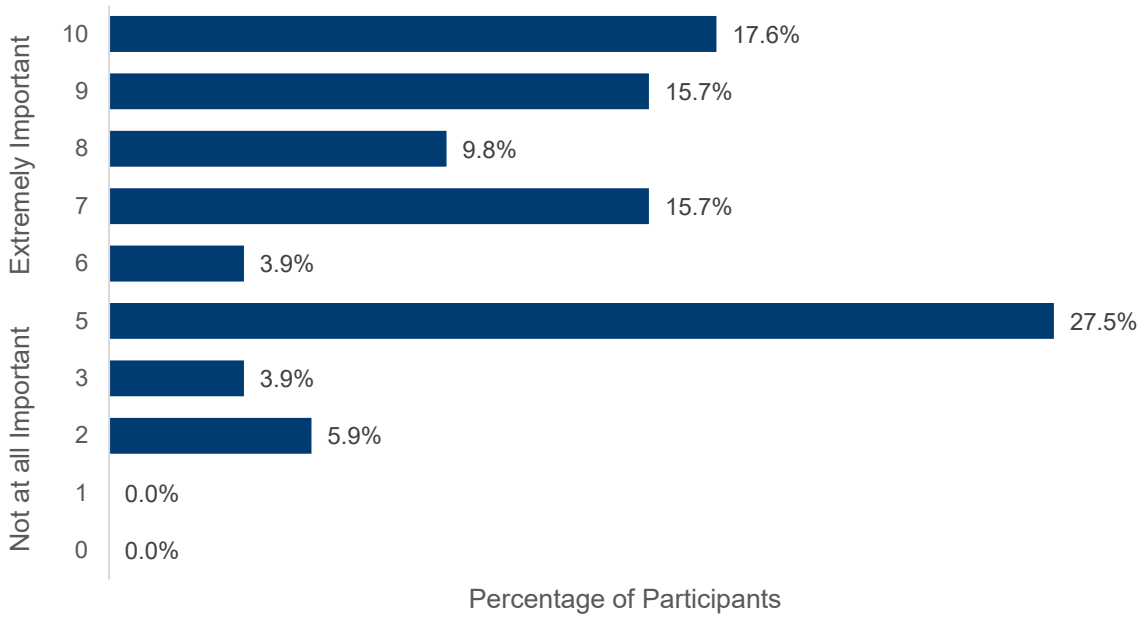
Figure C.2-17: Importance of Xcel Energy Product on Installing Equipment (n=70)



Trade Partner Influence

On a scale from 1 to 10, the average rating for overall importance of the information and recommendations from their contractor on their decision to install equipment that earned a rebate for this project, rather than less efficient equipment, was 6.90. Figure C.2-18 displays all of the ratings broken down.

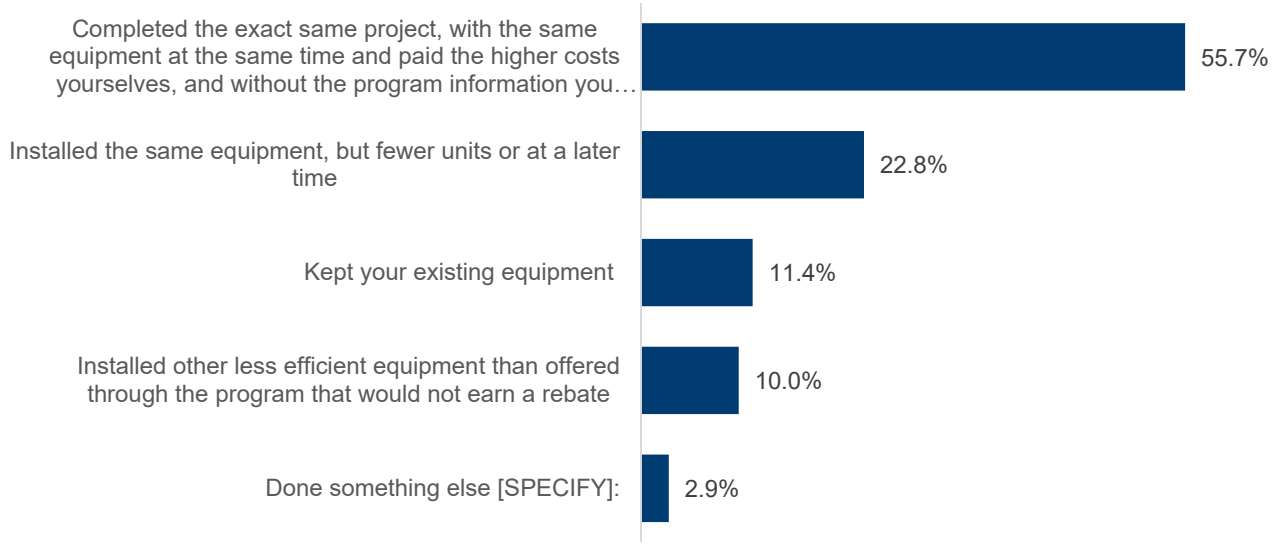
Figure C.2-18: Importance of Contractor on Installing Equipment (n=51)



Actions Absent the Product

As seen in Figure C.2-19, about half of the participants (55.7%) claimed that even if the lighting product had not been available, they would have likely completed the exact same project, with the same equipment at the same time, and paid the higher costs themselves. Another 22.9% claimed that they would have installed the same equipment, but with fewer units or at a later time; 11.4% would have kept their existing equipment; and 10% would have installed other less efficient equipment than offered through the product that would not earn a rebate.

Figure C.2-19: Likelihood of Completing Similar Projects Without Rebates (n=70)

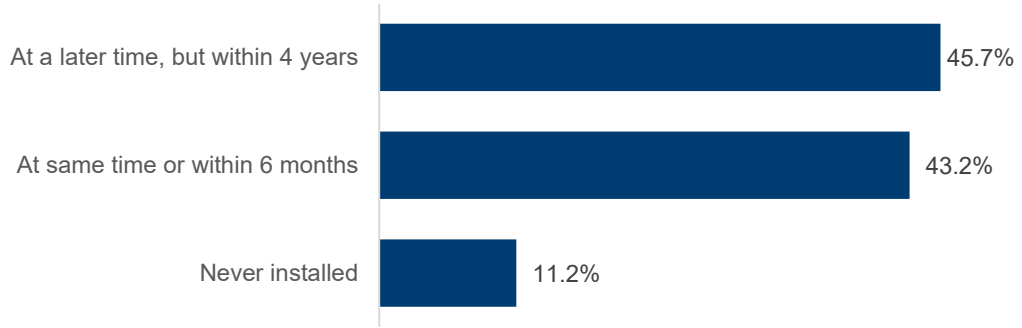


On average, those participants who would have completed the same project rated their likelihood to do so a 9.35 out of 10.

Of those who would have installed less efficient equipment, 71.4% responded that this equipment would most likely have been more efficient and more expensive than code, but less efficient than what they actually installed. The other 28.6% responded that it would have been the least expensive equipment that met the minimum efficiency required by code.

The participants who said they would have installed fewer units of the same equipment were asked how much of this equipment would have been installed in different time frames. They responded that they would have installed 43.2% of the equipment at the same time or within six months. They said that on average they would have installed 45.7% of the equipment at a later time but within four years (with a median timeframe of one to two years after completing the project), and on average 11.2% of the equipment would have never been installed. This is broken out in Figure C.2-20.

Figure C.2-20: When Lighting Would be Installed without Rebate (n=15)



C.3 Non-Participating Customer Survey Results

Introduction

To support the process and impact evaluation of the 2022 Xcel Energy efficiency products, the TRC evaluation team conducted telephone surveys with nonparticipants. The evaluation team defined a nonparticipating customer as any customer that has not completed a project through the Colorado Lighting Efficiency Product or installed lighting upgrades through any other Xcel Energy Product since 2017. The interview objectives were to collect participant feedback related to energy efficiency decision drivers, attitudes toward efficiency improvements, feedback on product design, role of trade partners and Xcel Energy staff, barriers to lighting controls, and the potential for nonparticipant spillover.

Key Takeaways

The following sections contain our summary of nonparticipant experiences with energy efficiency and Xcel Energy Colorado. These key takeaways provide a summary of the feedback received during the phone surveys.

Decision Drivers

- Nonparticipating customers indicate they are most likely to install energy efficiency if they are 1) replacing aging or broken equipment, 2) getting a fast payback or high return on investment, and 3) getting energy or maintenance cost savings. Of the common barriers asked about, the highest scoring barrier was the belief that the customer has already made all the energy efficiency improvements that they can (average 2.6 on a scale of 1 to 5). Covid-19 negatively affected the likelihood of 39.6% of nonparticipating customers implementing energy efficiency improvements.

Feedback on Product Design

- Most non-participants (69.8%) had heard of Xcel Energy's products and 40.5% of those had previously participated and been largely satisfied (they rated their average satisfaction with the product at a 4.3 out of 5). Of those not participating previously, 33.3% had considered participating but did not for reasons such as the desired equipment was not eligible, rebates were not large enough, or the application was too time-consuming.

Role of Trade Partners and Xcel Energy Staff

- Trade partners and Xcel Energy staff play a significant role with nonparticipating customers' energy interests. Of the customers aware of Xcel Energy's products, the most common method of learning about rebates was through a contractor or vendor (37.8%), and 24.8% had learned about it through Xcel Energy Staff. Further, of the 33.3% of nonparticipants that had previously considered applying for lighting rebates, more than a quarter (28.6%) had discussed the project with Xcel Energy staff.

Barriers to Lighting Controls

- The biggest barrier to lighting controls for nonparticipants appears to be awareness of the technology. About two-thirds (66%) of nonparticipants said they had never heard of these types of controls, and of those who were aware of the network lighting controls technology, 76.5% were not aware Xcel Energy offered rebates.

Potential for Nonparticipant Spillover

- Nonparticipant customers indicate they may be installing efficient projects that could qualify as spillover. About a third of nonparticipants indicate they have installed lighting efficiency projects without participating in the program. Of these, 5 respondents indicated the product had at least some influence on their decision, two were unaware of rebates and one indicated they had applied for a rebate.

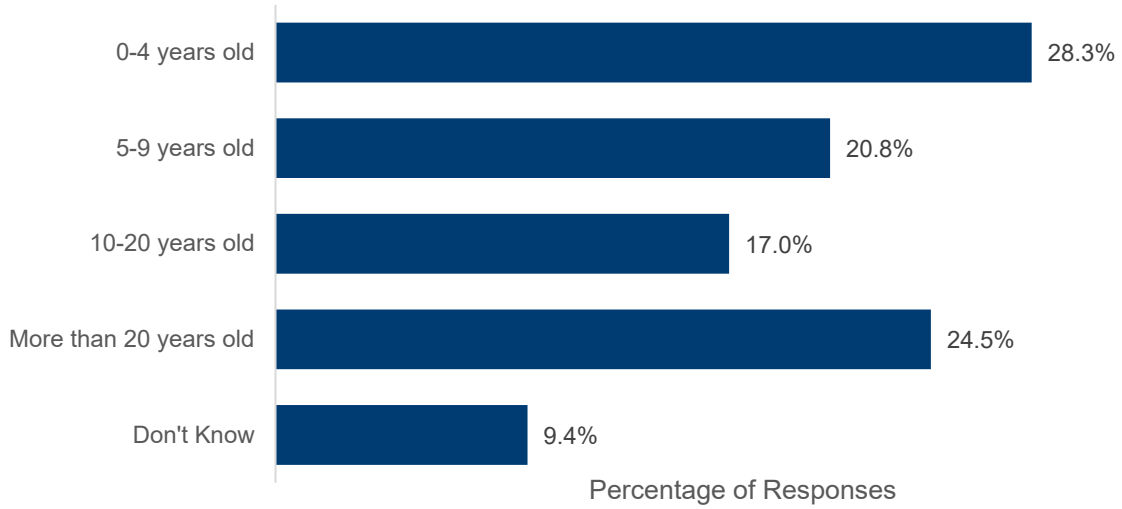
Decision Drivers

The evaluation team asked nonparticipant customers about their lighting and building characteristics, about considerations for energy projects, attitudes towards energy efficiency, and barriers or factors that may impede their ability to participate in Xcel Energy products.

Lighting and Building Characteristics

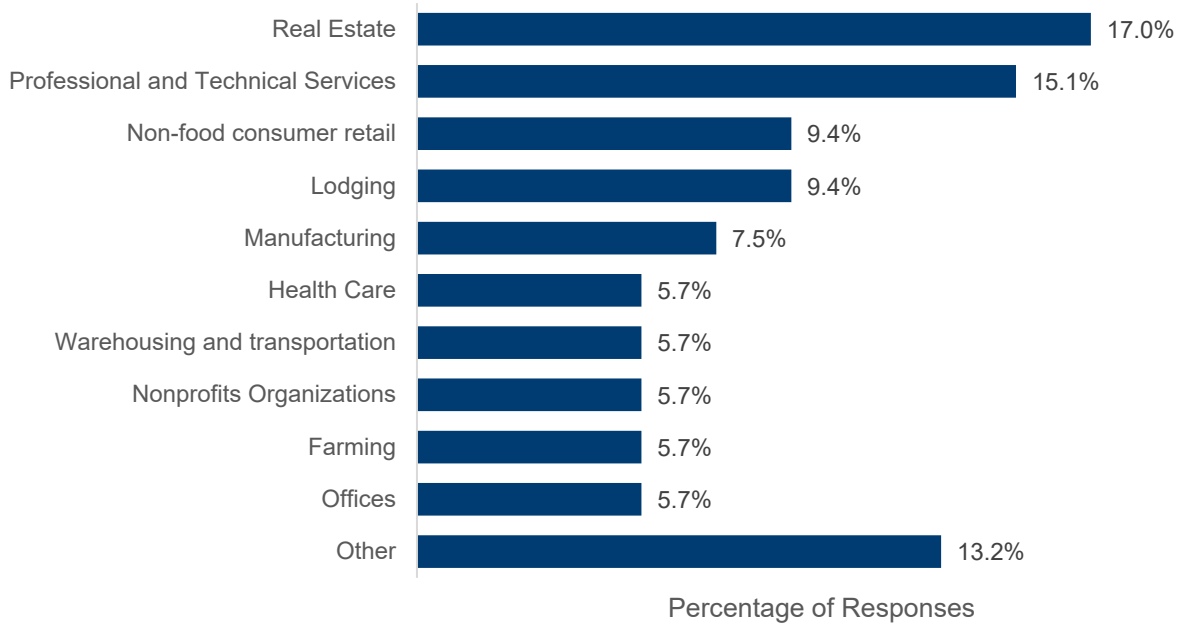
The evaluation team asked customers about their current lighting technologies in their facilities. On average, 58.3% of lighting in these facilities are LEDs. As shown in Figure C.3-1, non-participant customers reported that the median age for the majority of the lighting fixtures was between 5-9 years old, while a significant portion (24.5%) had equipment more than 20 years old.

Figure C.3-1: Age of Lighting Fixtures (n=53)



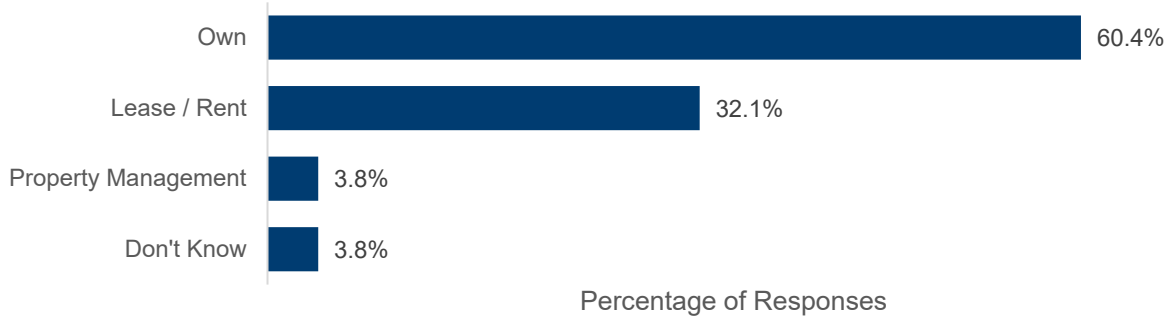
To understand what type of facilities were being surveyed, the evaluation team asked what the primary business activity at each location was. As shown in Figure C.3-2, the top three types of businesses were 1) Real Estate, 2) Professional, Scientific, and Technical Services, and 3) Non-food consumer retail. The other category from Figure C.3-2 with less than 5% of participants includes wholesalers, tourism, irrigation well, air hanger, and commissary kitchen. These facilities averaged a building size of about 30,000 square feet.

Figure C.3-2: Primary Business Activity (n=53)



As shown in Figure C.3-3, most non-participating customers (60.4%) owned the facility, while 32.1% leased or rented their facility. Another 3.8% were part of the property management teams, as shown in Figure C.3-3. Of the respondents that did not own the facility, 85.7% paid their own Xcel Energy bill, while the rest had someone else pay the bill.

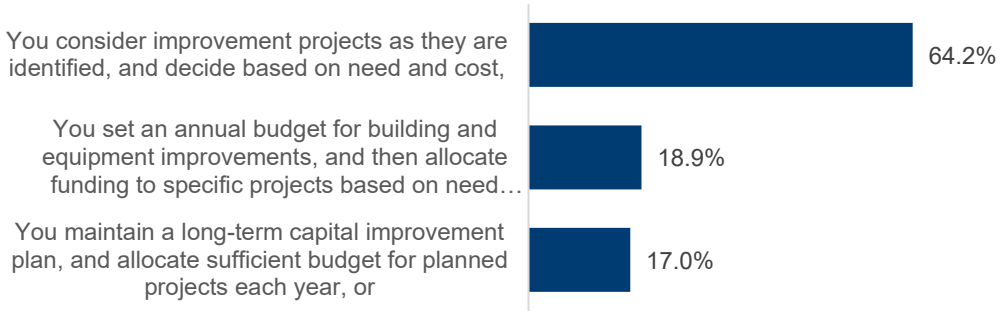
Figure C.3-3: Ownership of Facilities (n=53)



Considerations for Energy Projects

The evaluation team asked how non-participants make capital improvement decisions. As seen in Figure C.3-4, the majority (64.2%) of non-participants consider projects as they are identified, while another 18.9% decide based on their annual budget, and the rest maintain a long-term capital improvement plan

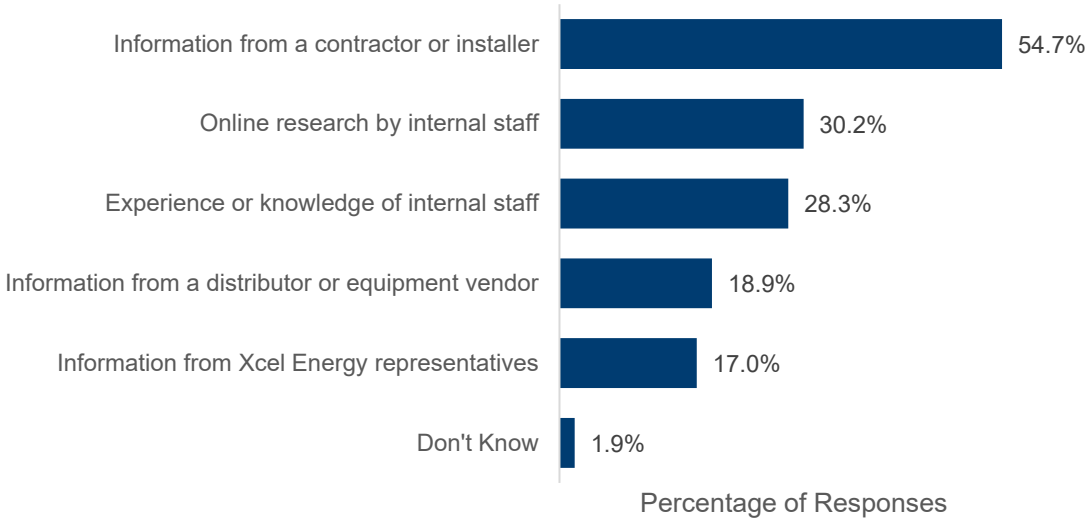
Figure C.3-4: How Capital Improvement Projects are Managed (n=53)



The evaluation team also asked non-participants if they typically consider reduced energy costs when calculating a payback period or return on investment for building or equipment upgrades. The majority (67.9%) did consider this a factor, while 17.0% did not and the rest (7.5%) did not calculate these values at all.

Figure C.3-5 summarizes the sources of information non-participants rely on most when considering an energy efficient building or equipment improvement. Overall, most non-participants found the information from their contractor and or installer helpful (54.7%). Additionally, about a third (36%) said that the experience or knowledge of internal staff was most helpful.

Figure C.3-5: What Information was Helpful in Considering Energy Improvements (n=53)

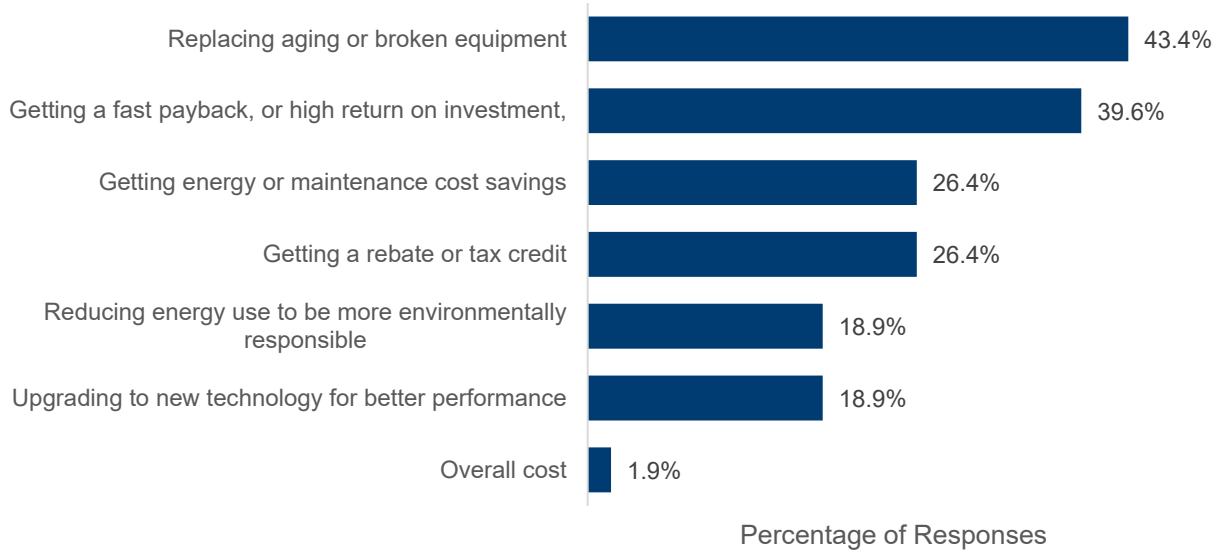


Note: Multiple responses allowed

Attitudes Toward Efficiency

The evaluation team asked non-participating customers about their attitudes towards energy efficiency. First, they were asked what factors would be most likely to motivate their organization to make an energy efficient upgrade. As displayed in Figure C.3-6, the top 3 factors were 1) replacing aging or broken equipment, 2) getting a fast payback or high return on investment, and 3) getting energy or maintenance cost savings.

Figure C.3-6: Motivating Factors to make an Efficient Upgrade (n=53)



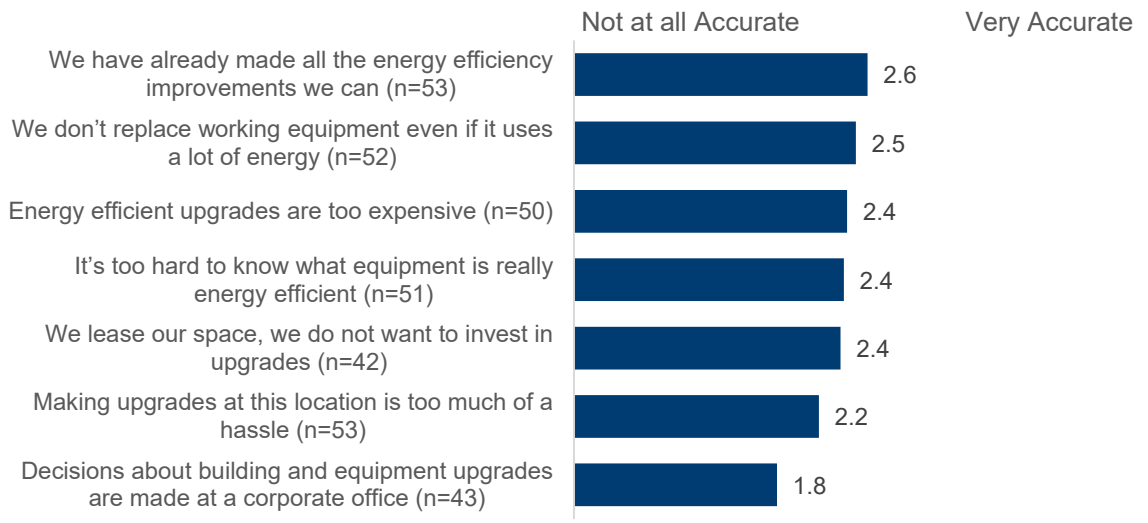
Note: Multiple responses allowed

The evaluation team asked non-participant customers if their organization had a specific energy efficiency or conservation goal to reduce energy use. About a quarter (22.6%) responded that they did have a goal or policy in place, while the other 75.5% did not.

Common Barriers

Next, the customers were questioned about common barriers that organizations face when considering energy-efficient improvements and how accurate they were. As seen in Figure C.3-7, the most common barrier was that the facilities have already made all the energy improvements they could (2.6 out of 5). The least common barrier is that decisions are made at a corporate office (1.8 out of 5).

Figure C.3-7: Barriers to Energy Efficient Improvements

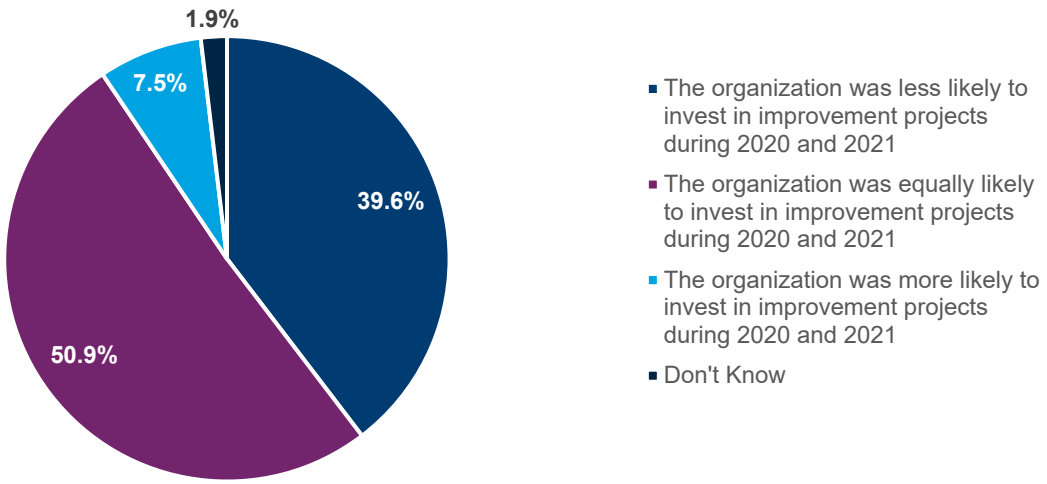


Barriers: Impacts of Covid-19

Because of the global effects of the Covid-19 pandemic, the evaluation team surveyed non-participants on how it affected their projects.

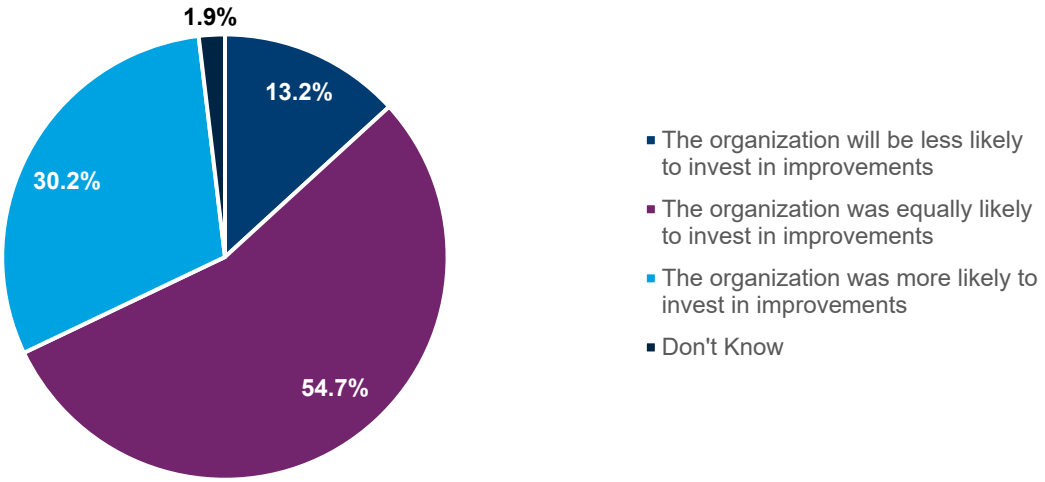
Overall, 39.6% indicated that the organization was less likely to invest in improvement projects during the COVID-19 pandemic About half of the non-participants (50.9%) claimed that their organization was equally likely to invest in improvements projects during 2020 and 2021 as previously and another 7.5% responded that they were more likely to invest in improvement projects. This is shown in Figure C.3-8 below.

Figure C.3-8: Impacts of COVID-19 (n=53)



Looking ahead to 2023, 13.2% of customers indicated they will be less likely to invest in improvements, while 30.2% claim they will be more likely to invest in 2023. About half (54.7%) claimed that their organization will be equally likely to invest in improvements in 2023 (Figure C.3-9).

Figure C.3-9: Likelihood of Improvements in 2023 (n=53)

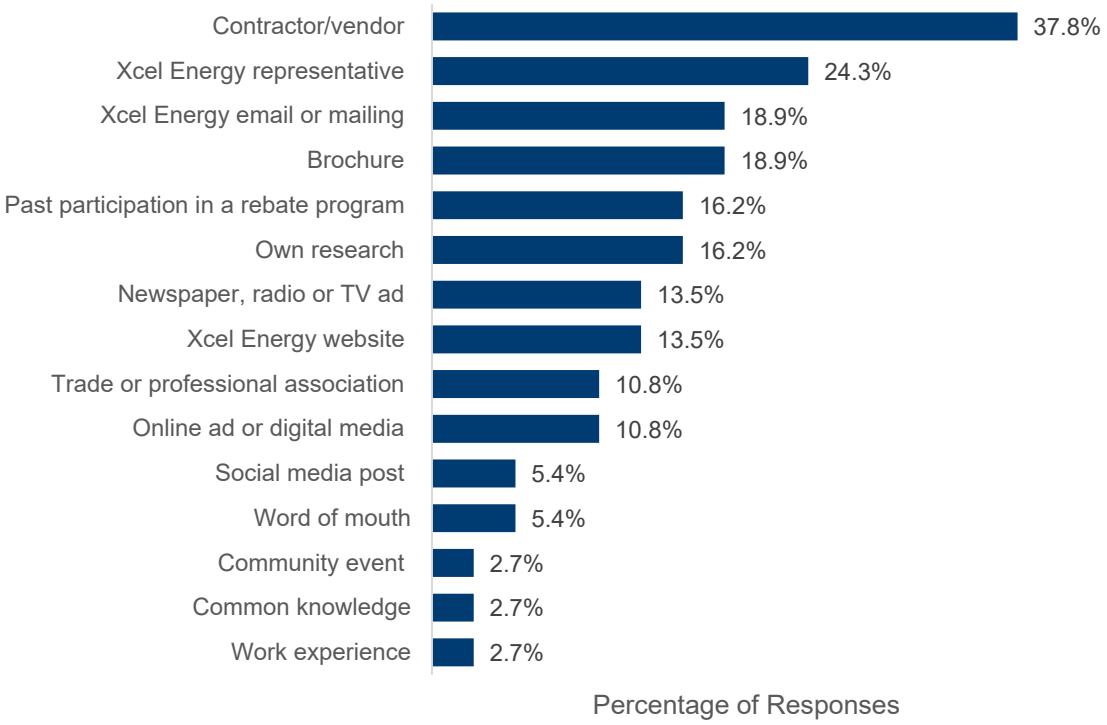


Product Design and Roles of Trade Partners and Xcel Energy Staff

To obtain feedback on the Xcel Energy Lighting Efficiency Product design, the evaluation team asked non-participating customers about their awareness and participation in Xcel Energy Products.

Over half of the customers surveyed (69.8%) had heard of the Products previously. Of the customers already aware of the Products, the most common method of learning about rebates was through a contractor or vendor (37.8%). Another quarter (24.3%) learned about rebates through their Xcel Energy representative. These and other methods are summarized in Figure C.3-10.

Figure C.3-10: Methods of Learning about Rebates (n=37)



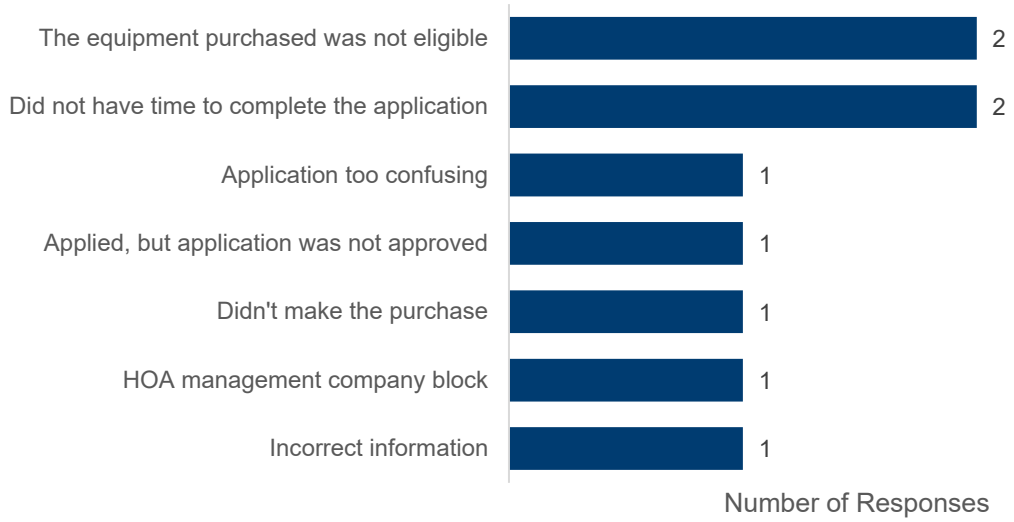
Note: Multiple responses allowed

Those that were aware of the rebate programs were next asked if they had ever received a rebate or discount from Xcel Energy in the past. Many (40.5%) had participated before. Of these customers who had previously received a rebate, they rated their average satisfaction with the product at a 4.3 out of 5. The reasons for scores lower than a 4 were as follows:

- "I am not a fan of the rebate process and overhead hassle. Not worth it."
- "It was a long time ago but the paperwork involved was longer than it should have been."
- "Kind of time consuming"

The non-participating customers who had never received a rebate from Xcel Energy were then asked if they had ever researched or considered applying for a rebate in the past. A third (33.3%) had considered this, and their reasons for not receiving a rebate are displayed in Figure C.3-11 below.

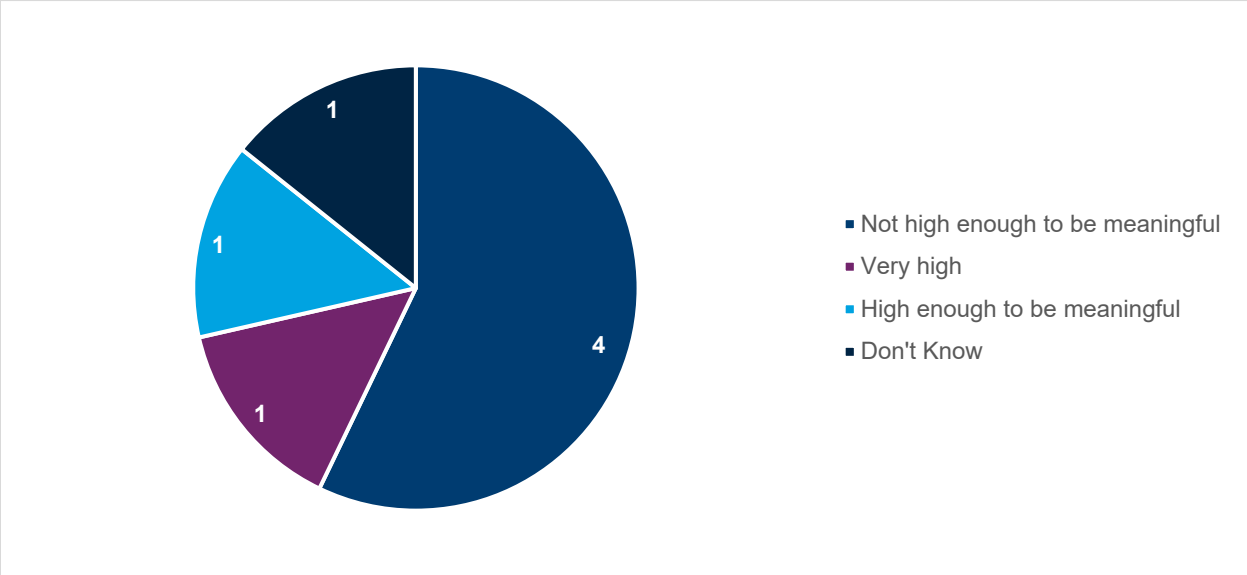
Figure C.3-11: Reasons for not Receiving a Rebate (n=7)



Note: Multiple responses allowed

Those who had considered applying for a rebate were then asked a series of questions about how they felt at the time. A majority (4) felt that the list of eligible equipment was limited but included some equipment they wanted, and the other two felt that the list included most equipment that they wanted. Figure C.3-12 shows that most (4) felt that the rebate amounts were not high enough to be meaningful.

Figure C.3-12: Feelings about Rebate Amounts (n=7)



Additionally, about half of the non-participants (57.1%) discussed rebate requirements or applications with their contractor at the time they considered applying for a rebate. The other 42.9% did not discuss this with their contractor or vendor. Less (28.6%) had discussed these topics with their Xcel Energy representative, with a vast majority (71.4%) not having discussed

this with their representative. Finally, about half (42.9%) did complete their project despite not receiving a rebate, and the other half (57.1%) did not complete their project.

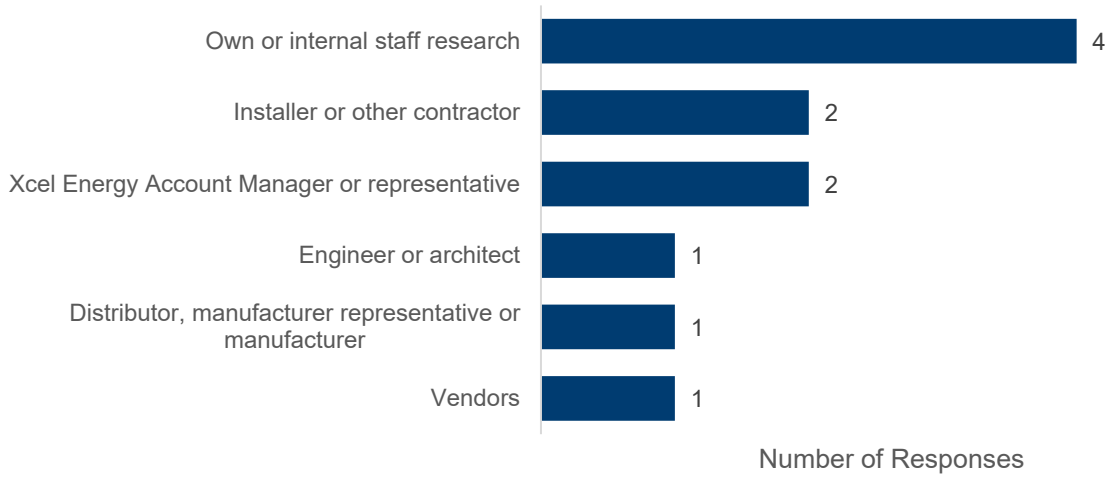
Networked Lighting Controls

The next section of the survey related to networked lighting controls. The customers who previously said they had lighting controls installed in their facility were next asked if they had any networked controls specifically. Most (84.2%) said they did not have these installed.

All customers were asked if they had heard networked lighting controls prior to the survey. About two-thirds (66%) said they had never heard of these types of controls. Those who were familiar with this equipment were then asked if they were aware that Xcel Energy offered rebates for them. The majority (76.5%) were unaware of these rebates.

The customers who had heard of networked controls (17 customers) were asked if they had ever researched or considered installing them. Most (10 customers) said they had not. Those who had considered installing networked lighting controls or had networked lighting controls already installed (7 customers) were then asked a series of questions. First, they were questioned about what resources they found most helpful when considering the installation. As seen in Figure C.3-13 the most helpful resource to the customers was the research they did themselves (4 customers).

Figure C.3-13: Helpful Resources in Considering Networked Lighting Controls (n=7)

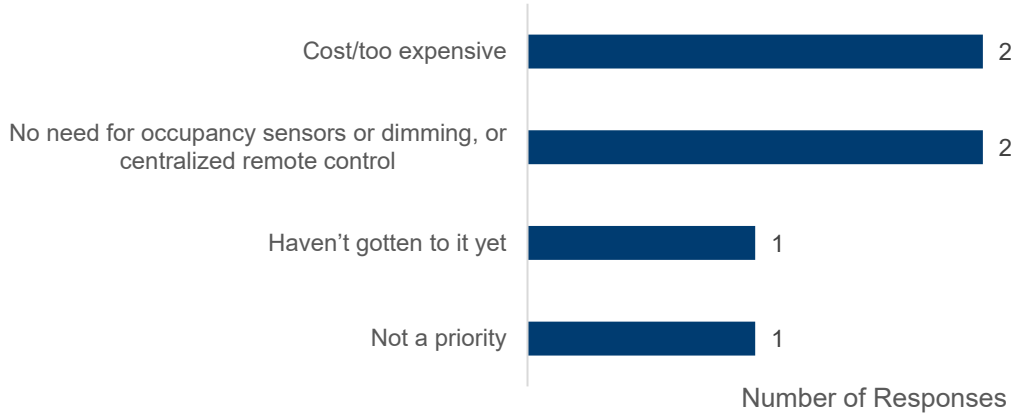


The evaluation team next asked the customers if they had faced any challenges during their research. Figure C.3-14 shows that most of the customers (5) struggled in determining the cost. While another 3 customers struggled understanding different equipment and programming options (See Figure C.3-14).

Figure C.3-14: Challenges in Considering Networked Lighting Controls (n=7)

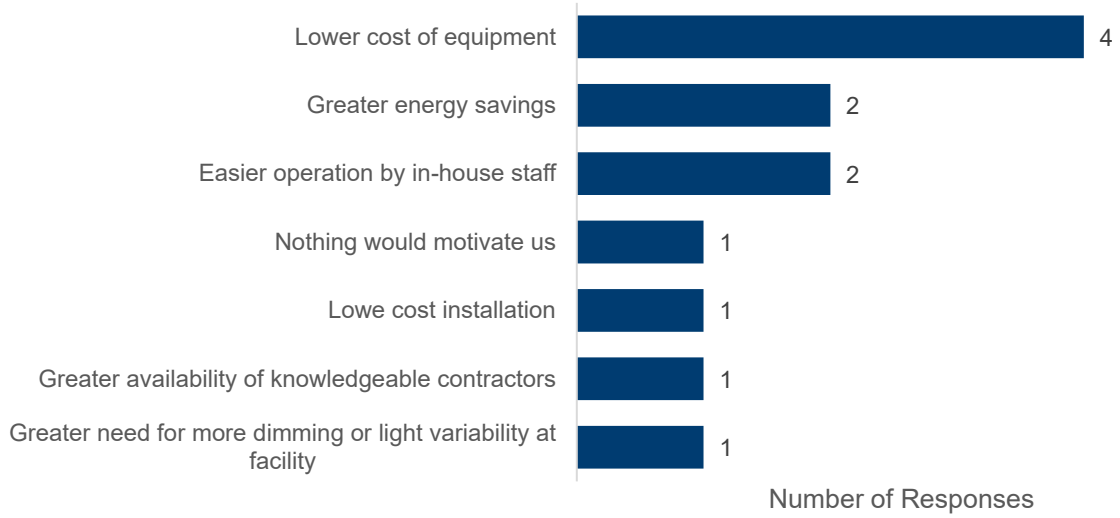
Next, the non-participating customers who had not installed these controls were asked why. The four reasons listed were 1) cost, 2) no need, 3) haven't gotten to it yet, and 4) not a priority, as displayed in Figure C.3-15.

Figure C.3-15: Reasons for not Installing Networked Lighting Controls (n=5)



Finally, the evaluation team asked what might motivate their organization to install these controls in the future. Figure C.3-16 displays the responses. The top 3 motivations would be 1) lower cost of equipment, 2) greater energy savings, and 3) easier operation by in-house staff (See Figure C.3-16)

Figure C.3-16: Motivating Factors to Install Networked Lighting Controls in the Future (n=5)

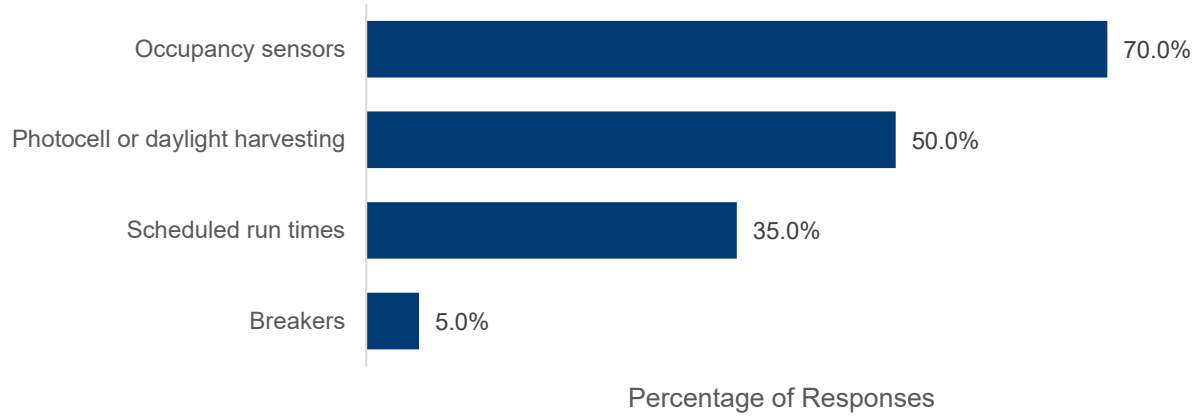


Barriers to Lighting Controls

The evaluation team asked non-participating customers about their usage of lighting controls. When asked if the customers had lighting controls, such as photocell or occupancy sensors, or lighting timers installed at their facility, 61.5% said that they did not.

As shown in Figure C.3-17, of the customers that had lighting controls installed, 70% used occupancy sensors, 50% used photocell or daylight harvesting, 35% used scheduled run times, and one customer used breakers.

Figure C.3-17: Types of Lighting Controls Installed (n=20)

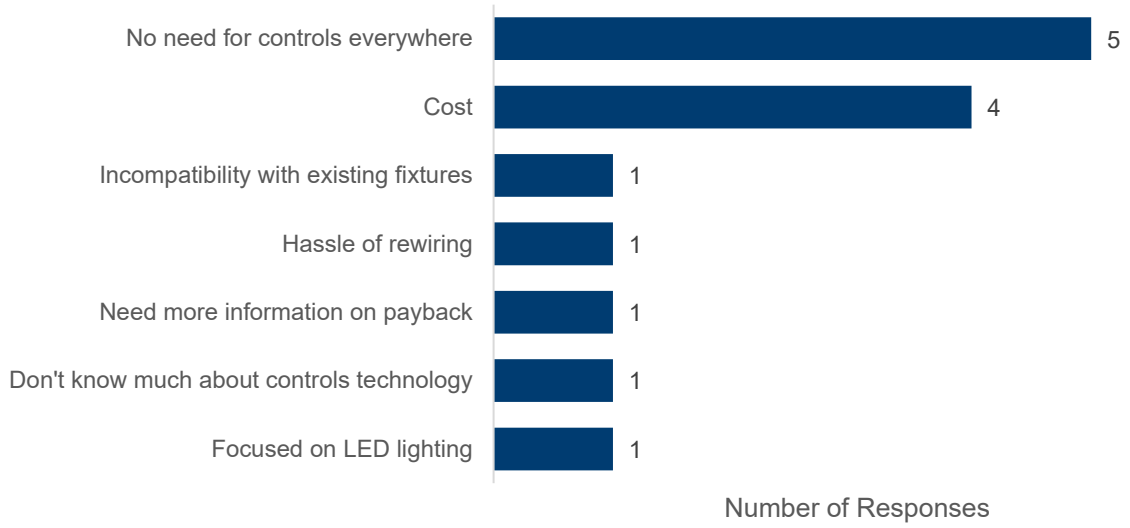


Note: Multiple responses allowed

The customers who did use lighting controls had on average 55.7% of their indoor lighting using one of these strategies. They were then asked why all of their lighting did not use these

controls, and their responses are summarized in Figure C.3-18. The top two reasons included 1) that there is no need for controls everywhere, and 2) cost.

Figure C.3-18: Reasons for not Using Lighting Controls Everywhere (n=12)



Note: Multiple responses allowed

Next, they were asked what types of spaces did not need lighting controls. Examples of responses are listed below:

- "All"
- "Common and exterior spaces"
- "Exterior"
- "Exterior lighting"
- "Outdoors"

Spillover

The final section of the survey attempted to determine if there was any spillover from the non-participating customers. Spillover occurs when a customer installs additional high efficiency equipment on their own without a rebate that was influenced by the Product.

About a third (35.8%) of the non-participating customers had installed some efficient lighting products without a rebate in 2021 or 2022. Of those customers, 5 or (26.3%) claimed that the information from Xcel Energy about energy efficiency or available rebates had some influence on their decision to install the efficient lighting, however none of them meet the scoring criteria to be counted as nonparticipant spillover. The customers that claimed to have been influenced by information from Xcel Energy were next asked why they did not apply for a rebate. The responses were as follows:

- "Didn't know there was such a thing."
- "Don't know"

- "I was not the manager"
- "We did apply"

Customers were also asked if they had installed any energy efficient equipment other than lighting in 2021 or 2022 that they did not receive a rebate for. Some customers (15.1%) had installed this type of equipment. Of those customers, 3 of the 8 claimed to have been influenced by information from Xcel Energy.

C.4 Trade Partner Interview Results

Introduction

As part of the TRC evaluation of the Xcel Energy Colorado Lighting Efficiency Product (Lighting Efficiency Product or Product) in 2022, TRC and Apex Analytics conducted interviews with 42 trade partners who participated in the Lighting Efficiency Rebate Product in 2021 or had in years prior.

Specific research topics for the interviews included the following:

- **Key decision drivers:** How trade partners solicit customers, how they structure sales conversations, and the role of the Lighting Efficiency Product in their sales process. How shifting lamps to the midstream channel affected trade partners sales approach, if at all.
- **Market outlook and feedback on design:** How customer interest in lighting is changing as COVID-19 restrictions ease, and the impact of other potential economic issues such as inflation and supply chain delays on the lighting market in the near term and differences among market segments. Appropriateness and effectiveness of eligible measures, available rebates, and requirements and process to apply for rebates (including the option of the online application, and the alternative to pre-approval, as appropriate). Experience with other utility rebate programs, and how Xcel Energy's products compare.
- **Lighting controls:** Experiences with selling, installing, and programming lighting controls. How often and under what circumstances trade partners discuss controls with customers. Perspectives on barriers to lighting controls other than cost, and potential ways to overcome these barriers.
- **Application process and tools:** How the trade partner participates in the application process, including their role in pre-approval for custom projects, selecting qualifying equipment, completing the application (using online portal or PDF forms), and whether the trade partner receives the incentive check directly (and what application assistance they provide the customer when they do not receive the check directly).
- **Trade partner level of engagement and barriers:** Trade partner staff understanding of the Product (and perceived need for training), how staff stay informed, and opportunities for improving the Product's integration with trade partner business (including ideas from other utility programs).
- **Net-to-Gross Ratio (NTGR):** Impact the Product had on trade partners' decision to recommend and stock high-efficiency lighting and potential non-program measures installed because of the Lighting Efficiency Product. How the Product impacts their

measure recommendations as well as anticipated future trends in customers installing energy efficiency lighting with and without the Product.

The evaluation team's findings were informed by interviews with trade partners in four different strata: high performers, mid/low performers, high-influence trade partners, and inactive trade partners (those that did not submit rebates during 2021). The evaluation team selected these strata to ensure a representative sample of program participation across the interviewed trade partners.

Key Takeaways

Key takeaways from interviews with trade partner representatives regarding their experience with the Lighting Efficiency Product are listed below.

Decision Drivers

- Trade partners are highly engaged in the Lighting Efficiency Product, 92% of the fixtures and retrofit kits sold by active trade partners are eligible for rebates. Seventy-six percent of all trade partners interviewed always mention the Product to customers.
- Most trade partners defined as "inactive" (had not submitted for rebates in 2021) are actually engaged with the product. Ten of the eleven inactive trade partners indicated some level of recent participation, having customers submit their own applications.

Market Outlook and Feedback on Design

- The COVID-19 pandemic affected almost all trade partners in 2020, and some continued to feel its effects into 2021 and 2022. Only trade partners serving essential industries were spared the immediate shut-down. Ultimately, 62% of trade partners reported a decline in business in 2020. Pandemic-related issues continued to impact trade partners into 2021 and 2022, including supply chain delays, equipment price increases, and labor shortages.

Lighting Controls

- Seventy-eight percent of trade partners report selling and installing Networked Lighting Controls (NLC), but many still feel uncertain about the technology. Trade partners would like Xcel Energy to conduct outreach and training to both customers and them to improve understanding, confidence in, and investment in NLC. Trade partners insist that higher and better structured rebates are necessary to increase adoption of NLC.

Application Process and Tools

- Trade partners are most often the party filling out and submitting applications for rebates. They would like to see applications simplified and online systems improved. Many trade partners avoid or will not use the custom channel for rebates.
- Trade partners report that bonus rebates help move customers and secure more business. Trade partners would like to see bonuses continue, especially in the wake of substantial lighting equipment price increases.
- Trade partners compared Xcel Energy's Lighting Efficiency Product favorably to that of other utilities. Almost universally, Xcel Energy's Product rates higher than those of the

smaller utilities around Colorado, with the exception of Efficiency Works[4], which five of thirty-seven respondents mentioned as equal to or better than the Xcel Energy Product.

Trade Partner Engagement and Barriers

- Trade partners indicated a strong understanding of the Lighting Efficiency Product, with over 70% indicating they know the Product well or very well. Most trade partners also simultaneously requested more training from Xcel Energy on the Product.
- Respondents mentioned feeling disconnected from the Product after two pandemic years and hoped Xcel Energy would resume trainings, trade shows, breakfast & lunch meetings, and quarterly meetings.
- Fourteen of thirty-four respondents reported a desire for improved communications from Xcel Energy and Product staff.

Net to Gross and Spillover

- Most trade partners participate in Xcel Energy's Lighting Efficiency Product as often as possible, applying for rebates on all but a few fixtures they install. Lighting contractors, lighting design consultants, and ESCOs have built their businesses, in part, off the Lighting Efficiency Product.
- Four trade partners reported the Product had influenced sales of Product-eligible, but unrebated, lighting. The evaluation team calculated spillover impacts totaling 5.2%.
- Looking ahead to 2023, trade partners see business increasing for their firms if the Lighting Efficiency Product remains the same. In the absence of the Product, most trade partners would expect a deep decline in business, and some believe they would fail.
- Trade partners agreed that rebates from Xcel Energy and other utilities have helped move the market to adopt LED lighting. In absence of the rebates, only big businesses and those committed to being "green" would use LEDs, and the lighting equipment would not have evolved as quickly.

Interviewee Characteristics

The team interviewed 42 of Xcel Energy's 200 trade partners. The breakdown of interview respondents by program performance is shown in Table C.4-1. The evaluation team defines high performers as trade partners who return more than 1% of total product rebate dollars, and mid and low performers as trade partners who return less than 1% of rebate dollars. High-influence trade partners are those who are identified as influential by participants through the participant survey, and therefore factor into the NTGR calculation.

[4] Efficiency Works is a municipal utility collaboration of Estes Park Power & Communications, Fort Collins Utilities, Longmont Power & Communications, Loveland Water and Power, and Platte River Power Authority.

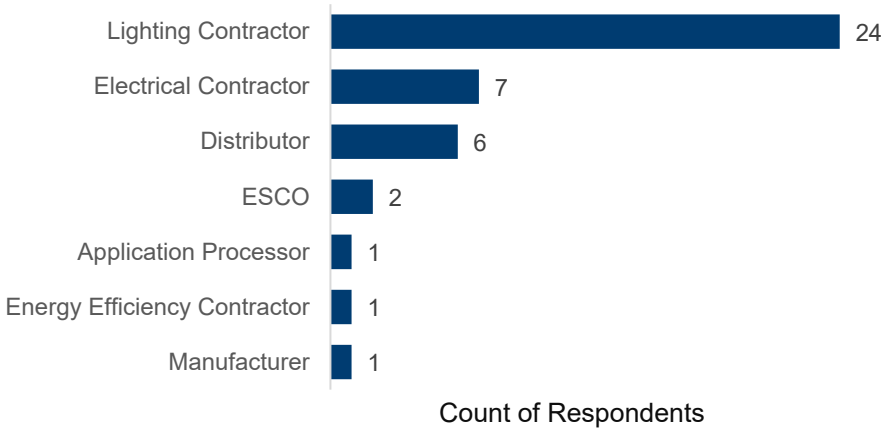
Table C.4-1. Colorado Trade Partner Interviews Completed by Strata

Strata	Final Population	Completed Interviews
High Performers *(generating >1% of total product savings)*	11[a]	6
Mid/Low Performers *(active but generating <1% of total product savings)*	95[b]	18
High-influence *(determined by participant survey)*	11[c]	8
Inactive	83[d]	10
Total	**200**	**42**

[a] Four contacts were moved to high-influence
[b] Four contacts were moved to high-influence
[c] One contact was not in the original contact list
[d] Two contacts were moved to high-influence

Trade partner respondents represented lighting contractors, electrical contractors, distributors, and others, as shown in Figure C.4-1.

Figure C.4-1. Company Type (n=42)



Trade partner respondents were mostly (63%) executives at or owners of the company. Twenty-four percent (10 of 41) respondents were project managers, and five respondents were sales managers. Some respondents did not have the expertise to respond to all interview questions. For each topic discussed in this memo, the number of respondents is noted.

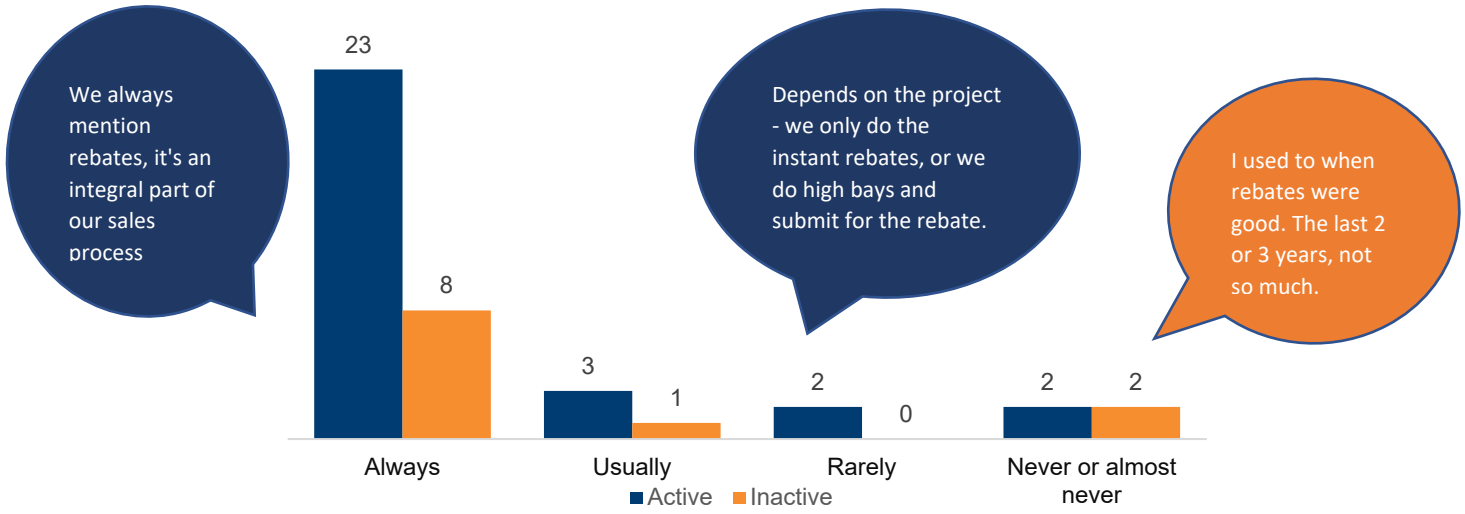
Decision Drivers

The evaluation team asked trade partners about the role of the Lighting Efficiency Product in their sales process. Trade partners reported selling mostly rebate-eligible lighting to customers and discussing the lighting efficiency product with customer almost always in sales conversations. Sixty-five percent of active trade partners were also midstream distributors of

instant rebate LED lamps, and most trade partners appreciated the flexibility of the instant rebate.

- Active trade partners report selling mostly rebate-eligible lighting to customers; 92% of the lighting they provide is LED and rebate-eligible.
- Trade partners frequently recommend lighting efficiency rebates to customers, with 76% mentioning the rebates always and an additional 10% mentioning them usually, as shown in Figure C.4-2.

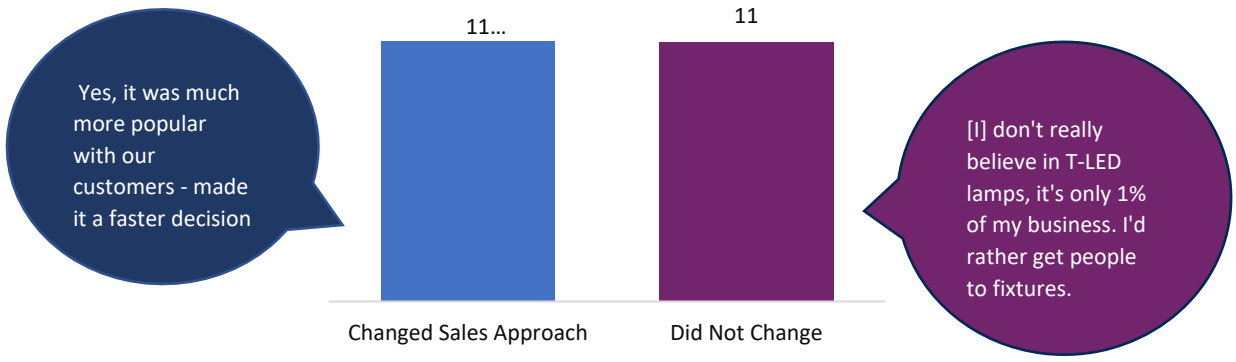
Figure C.4-2. Trade Partners' Frequency Mentioning Rebates (n=41)



Only one trade partner said that they never mention rebates. Three trade partners indicated they almost never mention rebates opportunities to customers.

- Most trade partners identified as "inactive" were, in fact, active participants. They either had customers who submitted projects on their own, or their business fits in niche markets where they were less likely to participate regularly. One such market was an inactive trade partner who served car washes and installed 50-foot LED tape lights that are eligible, but don't fit into the application neatly. Only one of the trade partners stated they had chosen not to participate in the Lighting Efficiency Product.
- Sixty-five percent of active trade partners interviewed were also midstream distributors of instant rebate LED lamps. Several trade partners attributed increased sales of LED lamps to the instant rebates and others appreciated the flexibility provided by instant rebates for themselves and customers. Other trade partners did not change their sales approach because of the instant rebates (Figure C.4-3).

Figure C.4-3. Trade Partners' Response to LED Lamp Instant Rebates (n=22)



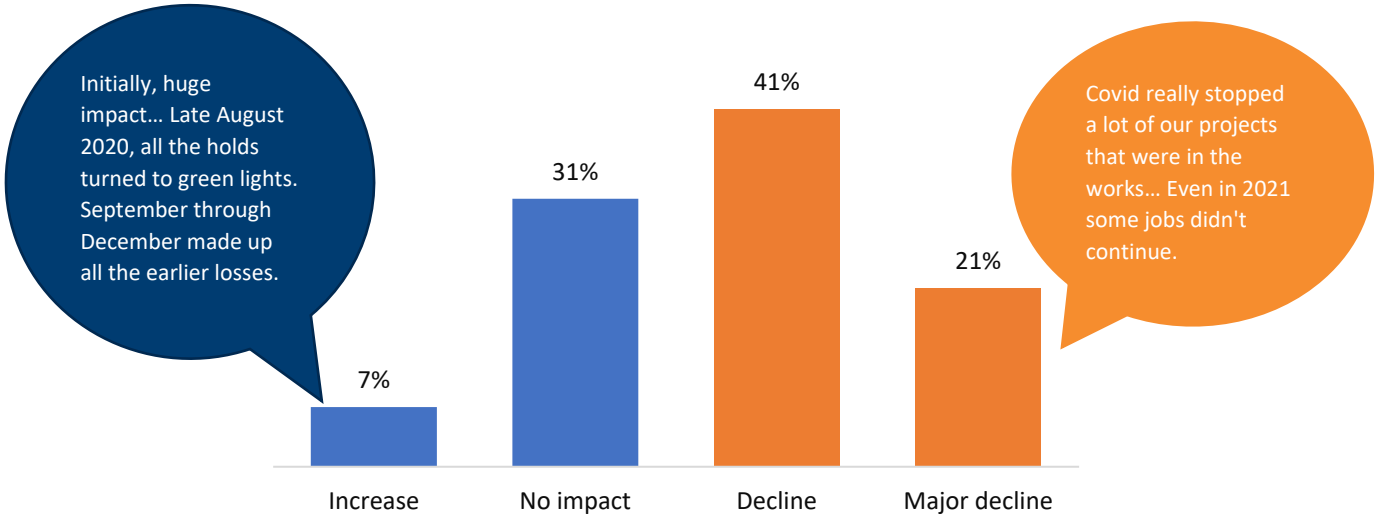
- Two trade partners that did not make changes to their sales approach plan to gear next year's business towards LED lamp sales to take advantage of instant rebates. Interestingly, three trade partners reported never installing lamps and utilizing instant rebates, preferring instead to get their customers to upgrade to new fixtures. One distributor was glad that lamps moved to the midstream channel, saying: "Instant is great - customers actually get the cost savings, too many salespeople and contractors won't do rebates." This distributor and one other further suggested that fixtures be moved to the midstream channel as well.

Market Outlook and Feedback on Design

The Covid-19 pandemic threw businesses into flux in Spring 2020. Most trade partners had their business immediately interrupted. While some saw their businesses come back in the fall of 2020 and make up for initial losses, 62% saw an overall decline in business for 2020. Trade partners were also plagued by several issues affecting all businesses starting late in 2020 and continuing through 2022—supply chain delays, multiple and continued increases in equipment prices, and labor shortages. Some of these issues continue today and combined with inflation and talk of recession, are still affecting some trade partners and their customers. Amid the uncertainty and rising prices, most trade partners were grateful for the Lighting Efficiency Product's 2020 50% rebate bonus on interior fixtures. It was effective at moving customers to invest in lighting upgrades. Overall, trade partners feel the lighting efficiency rebates are good. Some would like rebates to be higher, especially in the wake of lighting equipment price increases. Most trade partners like the prescriptive program structure and several feel the custom portion is too complicated.

- The Covid-19 pandemic affected almost all trade partners in the Spring of 2020, apart from those serving essential businesses such as food processing facilities and hospitals. Ultimately, 38% of trade partners saw enough business in in the Fall of 2020 to make up for their spring 2020 losses. Two trade partners saw an overall increase in business, with one serving essential businesses and the other with customers taking advantage of empty facilities to implement lighting upgrades, as shown in Figure C.4-4.

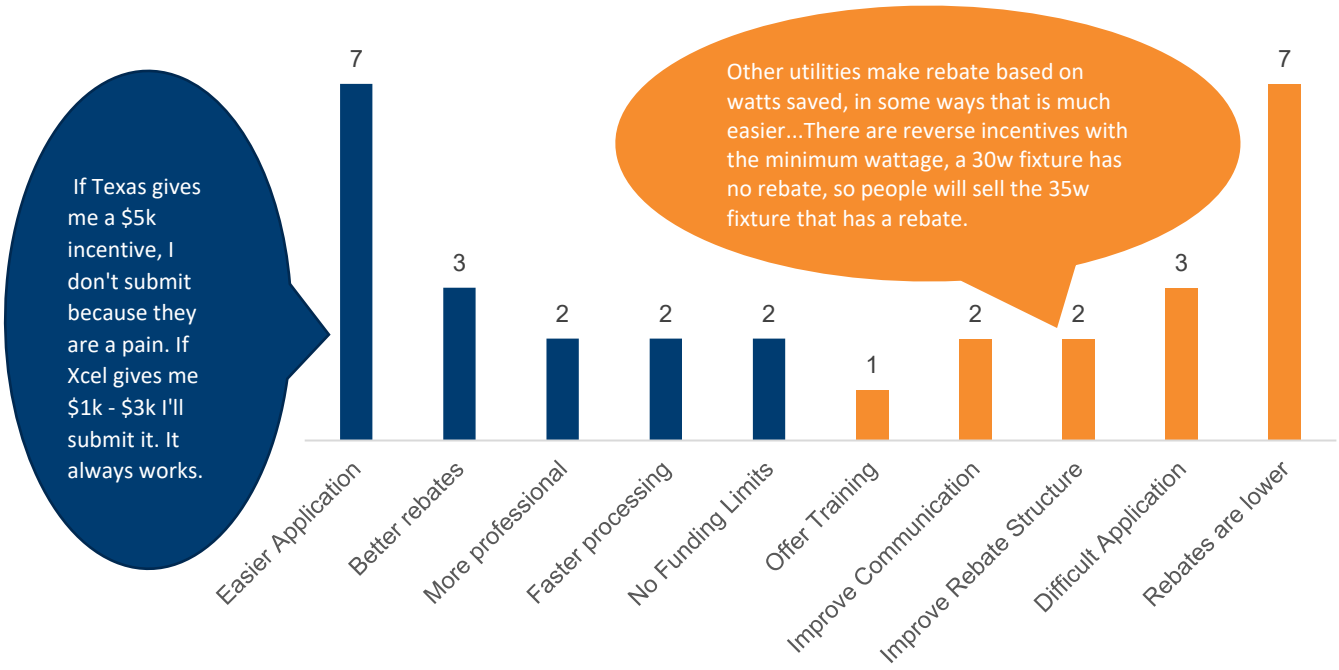
Figure C.4-4. Trade Partners' Covid Business Impacts (n=29)



- Most trade partners experienced an overall decline in business in 2020, with 21% seeing a major decline. The reduction in business continued into 2021 for many trade partners, caused by supply chain issues, equipment price increases, and customer hesitancy.
- Customers pursuing lighting upgrades amid the pandemic were those able to take advantage of empty buildings to complete retrofits easily. Other customers invested their pandemic loans in upgrading their lighting. Four trade partners pivoted their business to different market segments to keep busy. Two moved from serving private industry to government and school buildings, and two pivoted a portion of their business to new construction.
- Trade partners who were negatively affected by the pandemic laid off staff, experienced declining business of 50% and more, and sometimes went out of business. The evaluation team found that 5% of trade partners listed with Xcel Energy are now defunct.
- Trade partners described rampant price increases during Covid-19, with multiple increases a year instead of one every year. Equipment prices per item were up between 5% and 80% compared to pre-Covid prices, with an overall average of about 25%. In addition to the lighting equipment, shipping prices surged, and tools, rentals, and gas prices climbed. Trade partners responded to lighting equipment increases by switching manufacturers for some items, including expiration dates on bids, and proposing and selling more LED lamps instead of the more costly fixture replacement.
- Equipment shipping delays plagued trade partners during the pandemic. They reported shipping delays ranging from 4 weeks to 6 months. Staff time had to be spent locating shipments, identifying alternative lighting equipment, and finding new suppliers. Manufacturing delays were also reported, with manufacturers in other countries shutting down plants and slowing manufacturing times from 2 days to 20 weeks, according to one trade partner.
- In the post-Covid-19 economy, trade partners are concerned mostly about on-going supply chain issues (19 of 30) and labor shortages (13 of 30). They report inflation as the concern most impacting customer interest in lighting upgrades.

- Trade partners compared Xcel Energy's Lighting Efficiency Product favorably to that of other utilities. Almost universally, Xcel Energy's product rates higher than the smaller utilities around Colorado, with the exception of Efficiency Works[5], which five of thirty-seven respondents mentioned as equal to or better than the Xcel Energy product.
- Trade partners rated the Xcel Energy product as good overall, with 11% (3 of 27) declaring it "great", and 59% (16 of 27) rating it as "good". Their comparison comments are shown in Figure C.4-5.

Figure C.4-5. Points of Comparison, Xcel Energy Product v. Other Utilities (n=27)



Note: Multiple responses allowed

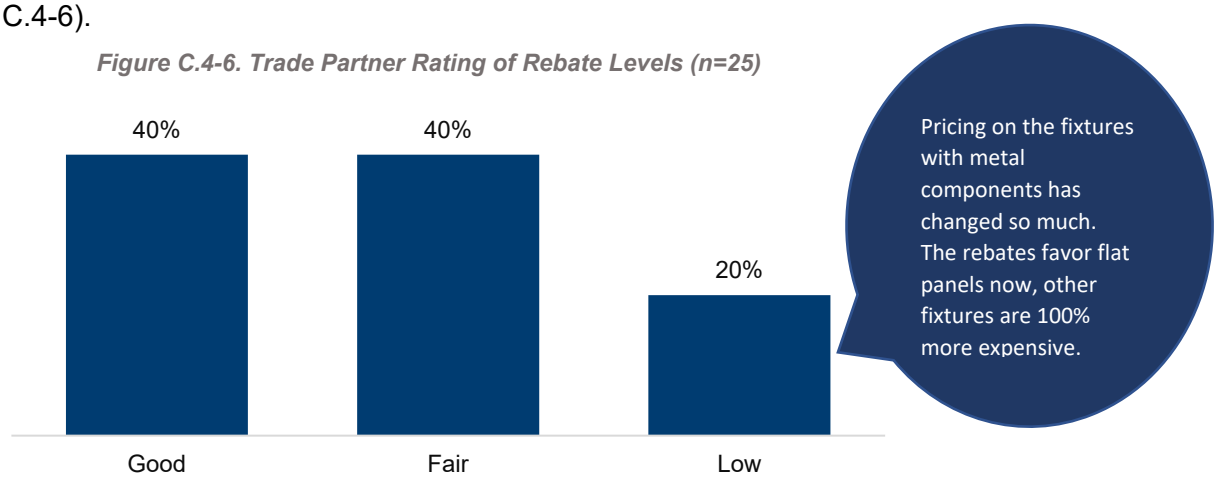
- Trade partners complimented many aspects of the lighting efficiency product. Several felt the application was easier and the requirements were less stringent than other utilities. Others felt the application was difficult, with one saying that inputting a 34-page invoice including splitting out costs, providing part numbers, per product, per location, is tedious and time consuming. A couple of trade partners noted faster processing times than other utilities, with one saying an Xcel Energy rebate takes 4 to 6 weeks, while other utilities can take 9 months. Trade partners rated the Colorado municipal utilities higher on communication but appreciated that Xcel Energy does not have the annual rebate funding limits most the municipal utilities maintain.
- The evaluation team asked trade partners if they had recommendations for other product improvements. Four trade partners would like to see a product offering that provides a dollar amount per watt saved, so that they can choose the best fixtures to fit customer

[5] Efficiency Works is a municipal utility collaboration of Estes Park Power & Communications, Fort Collins Utilities, Longmont Power & Communications, Loveland Water and Power, and Platte River Power Authority.

needs. Two trade partners would like to see a more open approach to the rebate-eligible fixtures included in the product. They argued that often the DLC-rated products are not the best, with one saying the Product pushed them to prioritize lower-quality lamps made by Chinese manufacturers instead of ones they found to be higher quality and made in the USA. Eight trade partners mentioned the importance of continued rebates both to their business and the greater business community. They would like higher rebates overall to help move customers since costs have increased. One would like to be able to submit for bonus rebates on January 15th for equipment installed by December 31st of the previous year. Two trade partners would like Xcel Energy to provide a better cost savings calculator and more tools to help small businesses.

- In the midst of business slowdowns, trade partners overwhelmingly (69%, 22 of 32) approved of the 2020 bonus rebates for interior fixtures. The bonuses added urgency and helped move customers to action, resulting in greater sales for six trade partners, and an expanded scope of work for another one. Inactive trade partners were less aware of the bonus; 4 of 11 did not know about it.
- The evaluation team asked trade partners to comment on the effectiveness of current rebate levels. Trade partners note that increased equipment prices have reduced the lighting retrofit value proposition for customers overall and especially for exterior fixtures (Figure C.4-6).

Figure C.4-6. Trade Partner Rating of Rebate Levels (n=25)



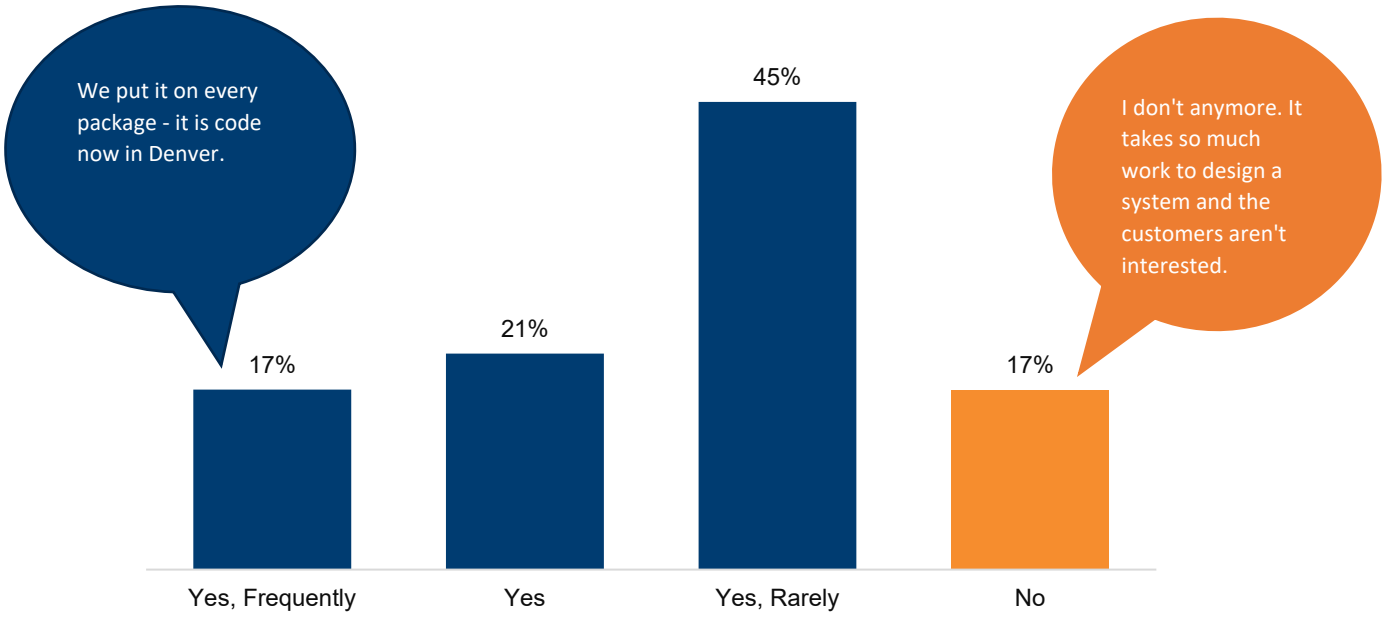
- Trade partners also indicated that the rebates for NLC are too low to move customers. Further, trade partners prefer the prescriptive rebate option to custom, and said that custom is difficult and not transparent.
- NLC topped the list of newer technologies trade partners and their customers were interested in pursuing in the future. In addition, trade partners are finding RGB LEDs fun and interesting to different market segments, including: churches, schools, and entertainment spaces. Strip lighting is already in use by many trade partners and is sometimes replacing more traditional lighting fixtures. Trade partners whose client bases are in food processing and medical services are studying and recommending germicidal UV lights to customers and hope that Xcel Energy will begin providing rebates for the technology.

Lighting Controls

The evaluation team asked trade partners about their experience selling, installing, and programming lighting controls. Seventy-eight percent of trade partners had experience selling and installing the NLC systems. A few are more committed to the technology, five trade partners sell NLC "frequently". Most trade partners do not bring up NLC, but just respond to customer requests. Trade partners report the most common customer concern with NLC is the presumed complexity of the system. Trade partners believe that Xcel Energy could best support NLC by offering better and higher rebates, NLC training for trade partners, and customer marketing and education.

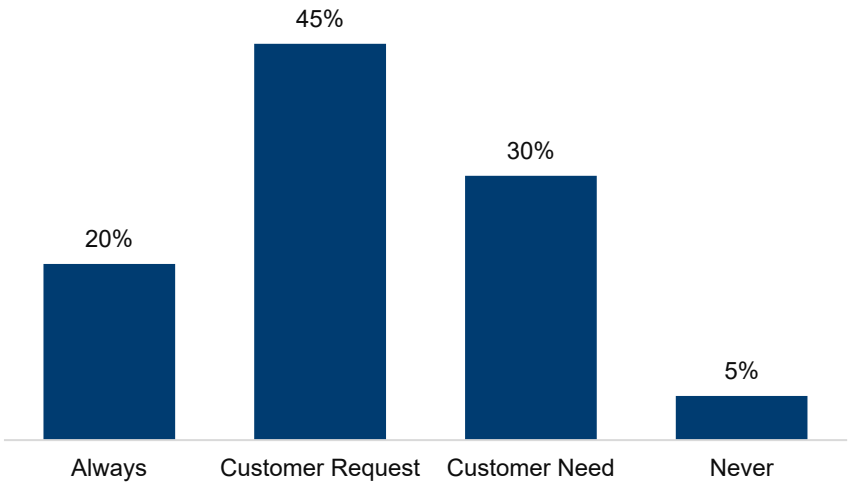
- Most trade partners sell or have sold NLC systems (83%), although the majority (45%) sell the systems only rarely, as shown below in Figure C.4-7. Most trade partners have been selling NLC for 3 to 5 years, and a couple have over ten years of experience.

Figure C.4-7. Frequency of Trade Partners Selling NLC (n=29)



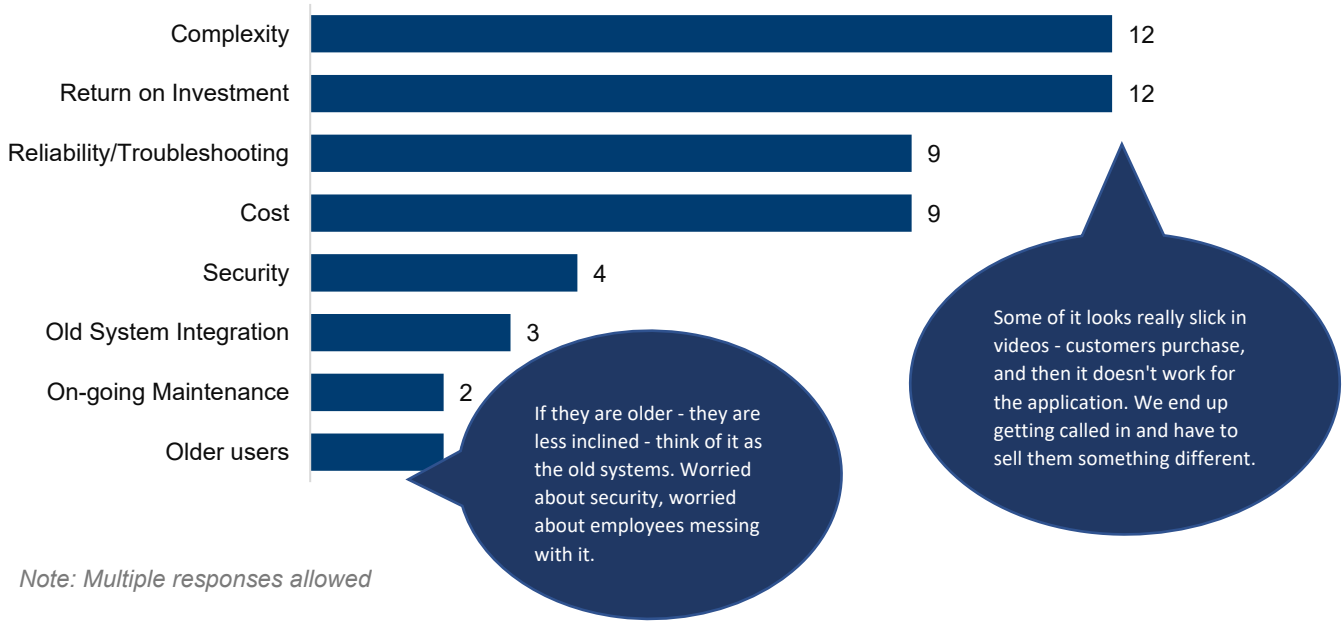
- Trade partners have success selling NLC to: larger businesses, especially those with multiple buildings and government buildings. In addition, schools and churches are investing in RGB LEDs for color and dimming capabilities. Trade partners report customer types with more reticence and less interest in NLC, including: industrial, agricultural, and 24/7 warehouses, as well as customers with older staff.
- Trade partners mostly rely on customers to request NLC before offering them (45%; Figure C.4-8).

Figure C.4-8. Trade Partners Propose NLC to Customers (n=20)



- Trade partners additionally identified Denver and Boulder as municipalities now requiring NLC for some businesses. One distributor trade partner said they have a flow chart to illustrate to customers and contractors when local code requires NLC be included in a project.
- Trade partners report that customers hesitant about NLC express several reservations, foremost being return on investment/cost, followed by the complexity of the system, and concerns about its reliability and the prospect of needing to troubleshoot issues in the future (see Figure C.4-9).

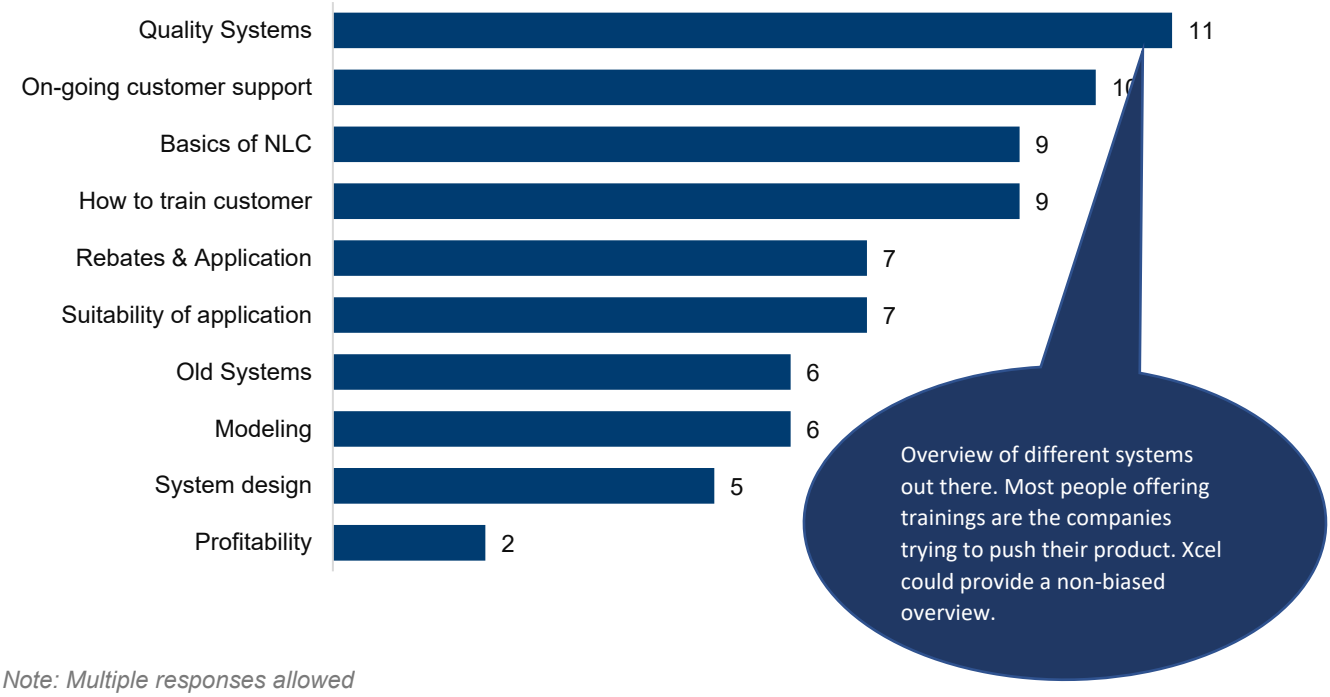
Figure C.4-9. Customer Reservations with NLC (n=22)



Note: Multiple responses allowed

- Trade partners identified challenges that they and other contractors face in selling and implementing NLC in addition to lack of customer awareness and education. Trade partners expressed concern about being "on the hook" for on-going system maintenance and troubleshooting. Some felt they did not have adequate understanding of different suppliers and system types, and others had concerns or negative experience with integration or replacement of older systems. One trade partner who had investigated several different NLC systems expressed a great deal of concern about several systems manufactured in China and the required customer data sharing agreements. That trade partner had opted to only sell a NLC system created and manufactured in the United States.
- The evaluation team asked trade partners how Xcel Energy could better support sales of NLC. Trade partners' top suggestion (70%) was contractor training. They were particularly interested in the topics shown in Figure C.4-10.

Figure C.4-10. Trade Partners Suggestions for NLC Training (n=24)



Note: Multiple responses allowed

- In addition to training, trade partners would like higher and better structured rebates, and more education and marketing targeted towards end-use customers. One trade partner with more NLC experience also suggested Xcel Energy provide mentoring to contractors who were newer to the technology.

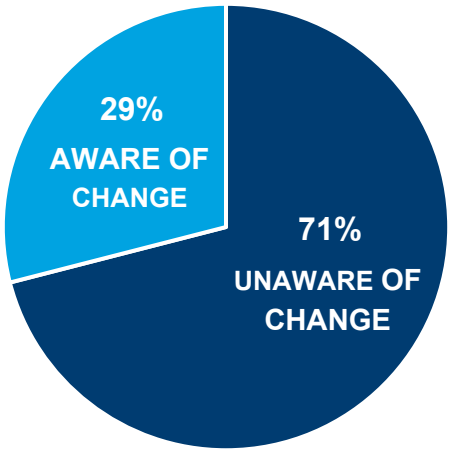
Application Process and Tools

The team asked trade partners about how they participate in the rebate application process, and most (78%) fill out the application forms for customers and submit them on their behalf. Xcel Energy hosts the Digital Application Process (DAP) for people who would like to submit their rebates online, and 46% of trade partners use it. In 2021, Xcel Energy changed the pre-approval process for custom applications, and do not require the full project details in advance.

Seventy-one percent of trade partners were unaware of the change. Customers may sign rebates over to trade partners and receive an upfront discount on the cost of their upgrades. A few trade partners take advantage of receiving the rebate on behalf of the customer, but 40% said they never take the rebate. The team also asked if trade partners have experience with other utility rebate programs, and how Xcel Energy's products compare. Seventy-three percent of trade partners interviewed had experience with other programs, of those, 7% rated Xcel Energy's product "great" and 63% said it was good in comparison.

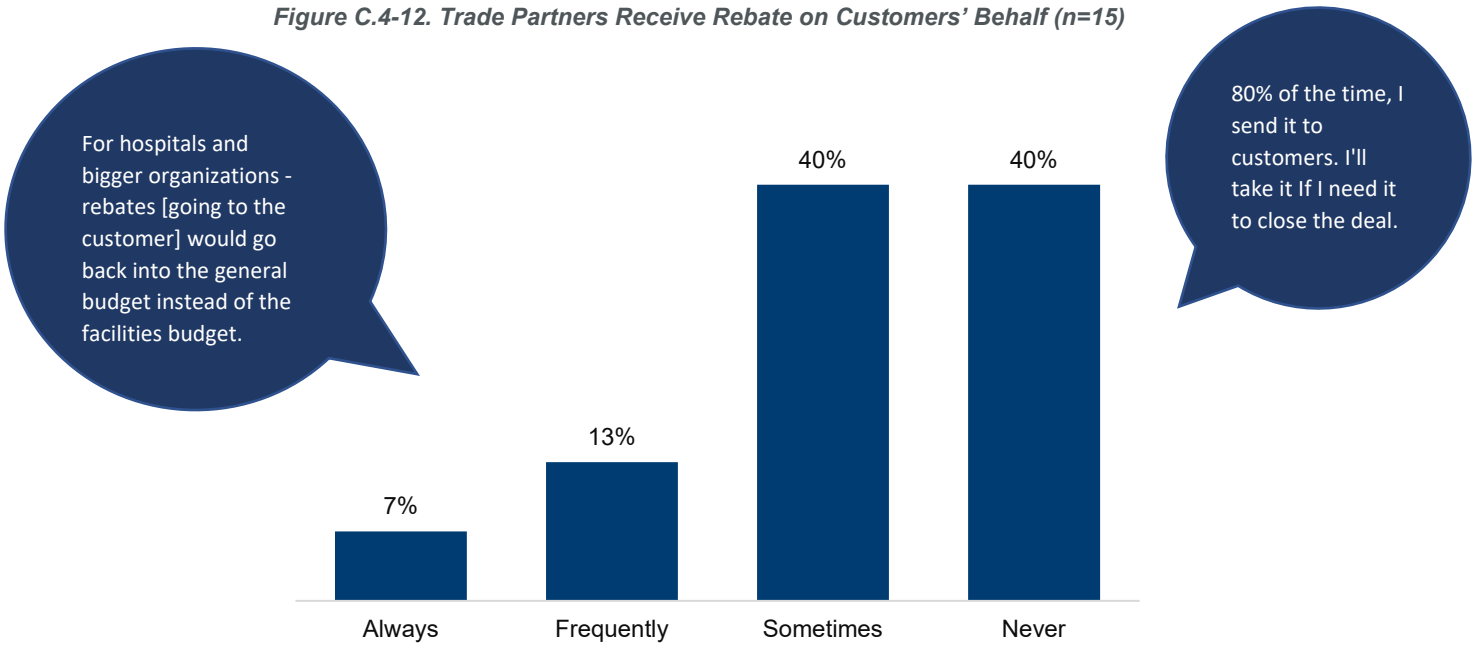
- Most (78%) trade partners fill out and submit the rebate application on the customers' behalf every time. An additional 11% (3 of 27) will sometimes submit the application. Another 11% never submit the application and leave it in the customer's hands.
- A couple of trade partners offered feedback on the application, saying that the Xcel Energy application requires them to create an entire second set of paperwork for every job, artificially separating out the cost of fixtures and labor to install them. One trade partner said that it takes an entire day to fill out an application for a large job. Three trade partners said that they preferred the application process with another utility where they could simply upload their Excel worksheets, while a different trade partner said that they were allowed to do that with the Xcel Energy product.
- Forty-six percent (13 of 28) of the trade partners submit rebates via the Digital Application System (DAP), while 19-percent (5 of 28) did not know DAP was available to them. There were trade partners quite satisfied with DAP and called it "straightforward" and "pretty simple". Other trade partners offered suggestions for improving DAP, including that they would like it to be updated and operate as a true portal. Trade partners need to be able to save their on-going applications instead of requiring all data to be entered at once. They would also like to see project status updates, an updated list of technologies, the ability for customers to sign applications via DocuSign, and a set point of contact for questions and status updates. Xcel Energy is currently developing a trade partner portal which will provide access to project information and status updates.
- In addition to comments on the DAP, a couple of trade partners offering midstream rebates said that the process to upload those documents is troublesome, usually requiring extra steps and reaching out to product staff to complete the process. One distributor said they had considered opting out of the instant rebates because of the extra work it takes to submit the paperwork.
- The evaluation team asked trade partners if they were aware of and what they thought of the changes to the pre-approval process for custom rebates. Most respondents were not aware of the change (see Figure C.4-11).

Figure C.4-11. Trade Partners Awareness of Custom Pre-approval Change (n=24)



- Two trade partners thought it was a good change, with one of them very happy they were able to submit a project that had been missed at a later date through the custom product.
- Only 21% (5 of 24) of the trade partners interviewed were interested in using the custom portion of the lighting efficiency product, and one of those five expressed great frustration with their CLEAResult contact insisting they use the prescriptive application whenever possible.
- Most trade partners (13 of 24) avoid or will not do custom projects. Those trade partners cited confusing requirements, an application that requires significant time and effort, and having experienced past application rejections. One trade partner said “Custom is a nightmare. [It is] so much work and I've always gotten declined. I won't engage with custom until there are significant changes.”
- Many trade partners are willing to have a customer sign over rebates to them, at least on occasion (see Figure C.4-12).

Figure C.4-12. Trade Partners Receive Rebate on Customers' Behalf (n=15)

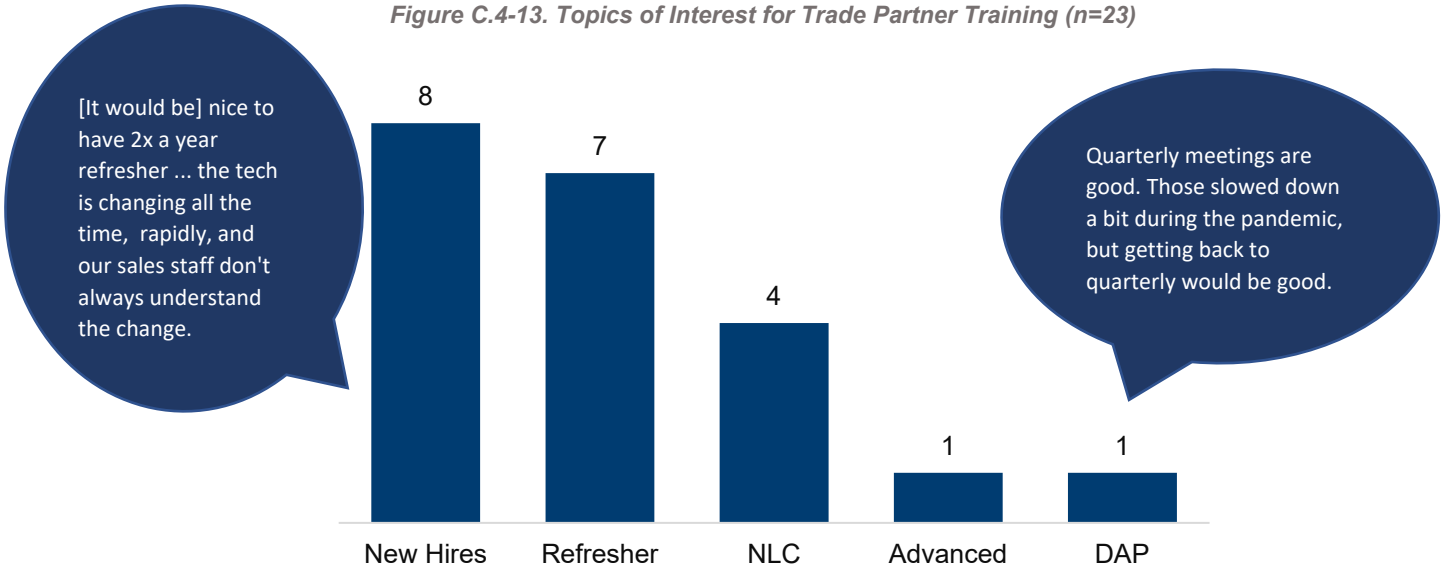


Trade Partner Engagement and Barriers

The evaluation team asked trade partners about their familiarity with the lighting rebate product requirements, current rebate levels and how they stay informed of changes to the program. Trade partners, on average, felt they had a good understanding of the product, its rebates, and requirements. However, most also expressed an interest in additional training. Trade partners stay up to date on program changes via email or contact with an Xcel Energy representative. While some trade partners are very happy with their communication with Xcel Energy, nine trade partners expressed frustration with communication.

- Trade partners indicated a strong understanding of the lighting efficiency product, with 41% (15 of 37) indicating they know it "very well" and another 30% saying they know it "well". Nine (24%) said their familiarity was just "ok" and two were unfamiliar with the product.
- Seventy-percent (23 of 33) of trade partners would like Xcel Energy to offer trade partner training for the lighting efficiency product. Eight trade partners specifically mentioned new staff that could benefit from training (Figure C.4-13).

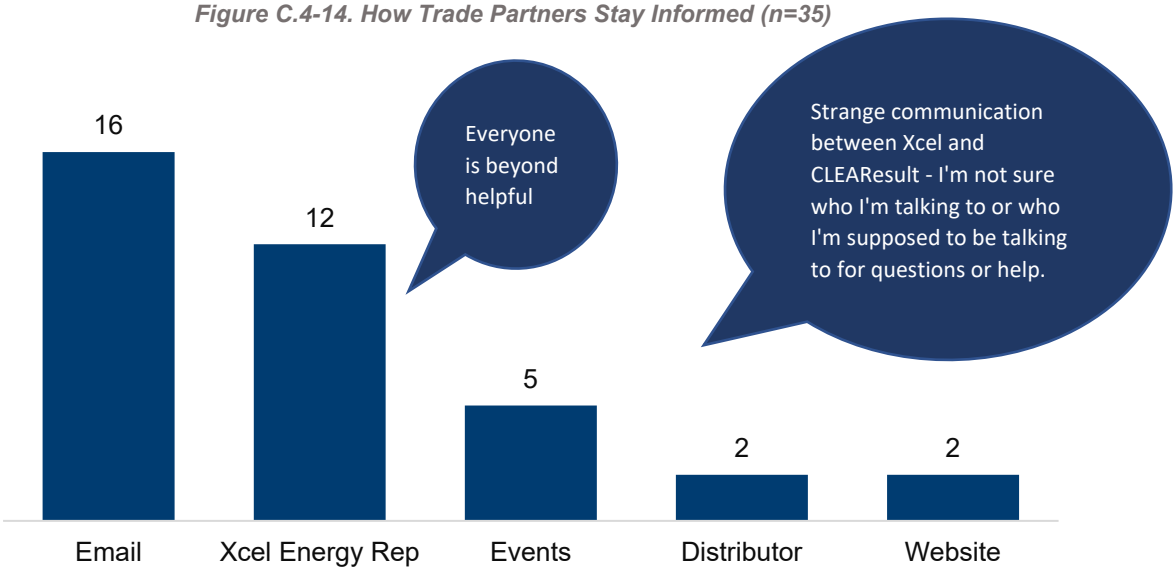
Figure C.4-13. Topics of Interest for Trade Partner Training (n=23)



Note: Multiple responses allowed

- One respondent who is a strong advocate for the Product in her workplace and very knowledgeable would like a separate "advanced" training for trade partners with more experience.
- Trade partners stay up to date on program changes mostly via email, or conversation with an Xcel Energy representative (Figure C.4-14).

Figure C.4-14. How Trade Partners Stay Informed (n=35)



Note: Multiple responses allowed

Two respondents indicated that their communication with Xcel Energy was "great" and another seven volunteered that communication was "good". Nine respondents were disappointed with communication with Xcel Energy and rated it "bad", while 5 rated communication as "OK". Some that rated communication poorly said that high staff turnover was a problem, as was insufficient

notice on program changes. Several trade partners would like to see communication on program changes well in advance to assist with their marketing and planning. Others said they would like product staff to be more accessible, return calls and emails in a timelier manner, and provide consistent information on the product offerings and requirements.

- Notably, one of the trade partners identified by a customer as being highly influential in their decision to purchase was so disgruntled with Xcel Energy communications that they said they never mention the program to customers. "…It tends to be talking in circles, I ask Xcel [Energy] what they need, they tell me, I try to clarify and they either don't respond or say the same thing over again… We just try and stay away from Xcel as much as possible."
- Several respondents mentioned feeling disconnected from the program after the turmoil of the pandemic years. They hoped trainings, trade shows, breakfast & lunch meetings, and quarterly meetings could resume. Some felt that meeting Xcel Energy and implementer staff in person would help them connect better with the product, especially after turnover in Product staff.
- One trade partner highly engaged in the Lighting Efficiency Product thought that Xcel Energy should be more actively promoting the product and the savings it achieves. This trade partner created a YouTube video (https://youtu.be/3csWlHFcVBI) showing the success of his business in helping reduce energy consumption and greenhouse gas emissions (Figure C.4-15).

Figure C.4-15. Screenshots of Trade Partner Promotional Video

The trade partner said, "This is from 2 guys in a small town in the mountains of Colorado. Think how impressive Xcel [Energy's] numbers would be."

Net to Gross and Spillover

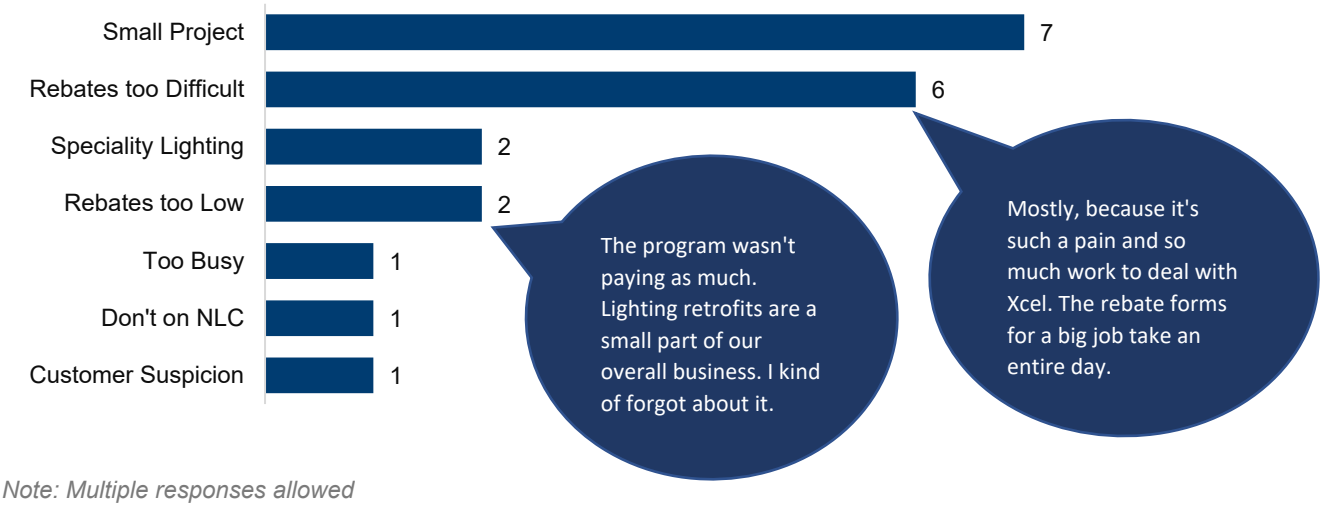
The evaluation team asked trade partners questions about the impact the Product had on their decision to recommend and stock high efficiency lighting. Most trade partners have built their businesses around Xcel Energy's lighting efficiency product. They tailor their lighting recommendations and lighting designs to maximize customer rebate opportunities. Trade partners anticipate, on average, an increase in business in 2023 if the lighting efficiency product remains intact. In the absence of the product rebates, trade partners would experience a significant decline in business.

- Most trade partners participate in Xcel Energy's Lighting Efficiency Product as often as possible, applying for rebates on all but a few fixtures they install. This is true even of most of the 2021 inactive trade partners. Lighting contractors, lighting design

consultants, and ESCOs, have built their businesses, in part, off the Lighting Efficiency Product. Trade partners that engage less with the Product and do not mention rebates as frequently to customers were electrical contractors, lighting distributors (who see more installers and fewer end-use customers), and manufacturers.

- Only four of 41 trade partners never or almost never mention the rebate opportunities to customers. Other, more active trade partners may also not apply for rebates at times. Figure C.4-16 shows reasons given for trade partners or their customers not seeking rebates.

Figure C.4-16. Reasons Trade Partner did not Seek Rebate (n=14)



Note: Multiple responses allowed

Trade partners will often forego applying for rebates on projects that are small with just a handful of fixtures or rebates of less than $500. One trade partner remarked that customers who have been around for a while are suspicious of Xcel Energy's rebate product, because it used to provide rebates via bill credits and businesses felt there was some sleight of hand in that process.

- The team asked trade partners if and how the Lighting Efficiency Product influenced the sales of these products that were not rebated. Four trade partners reported that the product had influenced those sales, generating spillover totaling 5.2%.
- The evaluation team also investigated the impact of the Lighting Efficiency Product on the decisions of trade partners to recommend eligible lighting and stock LED lighting. Trade partners answered on a scale of zero (not at all important) to ten (extremely important) the importance of the product on:

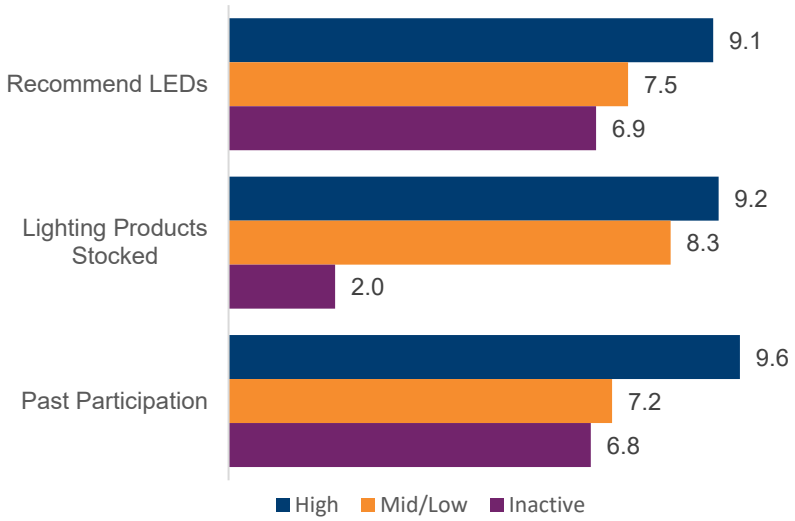
Trade partners decision to recommend eligible LED lighting to customers;

Deciding which lighting products trade partners stock as a whole;

And, how important trade partner's past participation in the product was in influencing their decision to recommend LED lighting.

Overall, the lighting efficiency product had a strong influence on trade partners, especially in their choice to recommend LED lighting to customers (Figure C.4-17).

Figure C.4-17. Influence of Product on Trade Partners (n=33, 24, 31)



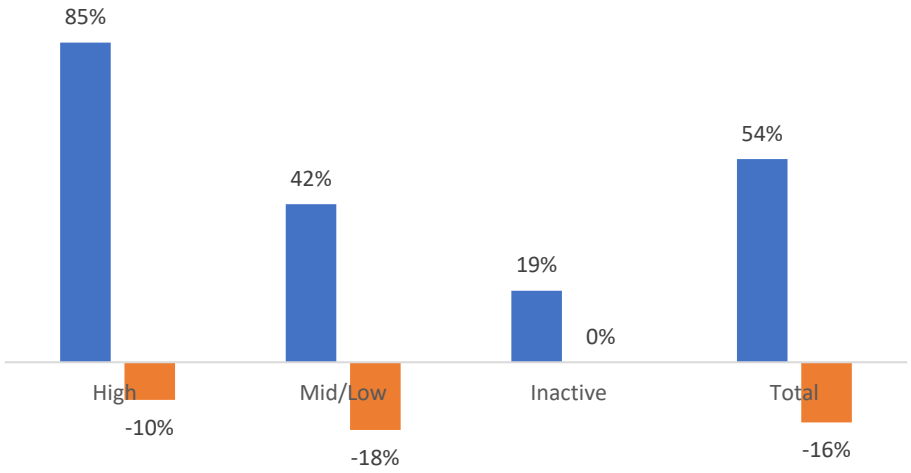
The influence of the Lighting Efficiency Product on trade partners was high overall, with high performers being most influenced by the Product in each area. This is unsurprising, given their level of participation and their reported high levels of satisfaction.

The Product influence over mid/low performers was a little less than high performers. In part, due to two electrical contractors and one distributor who rated the influence of the Product lower. Those trade partners working mostly as lighting contractors stated higher levels of influence from the Product.

Inactive trade partners report being influenced by the Product, especially on their decision to recommend rebate-eligible lighting to customers. Four inactive trade partners are electrical contractors and manufacturers, and said the Product has no bearing on the lighting products they stock.

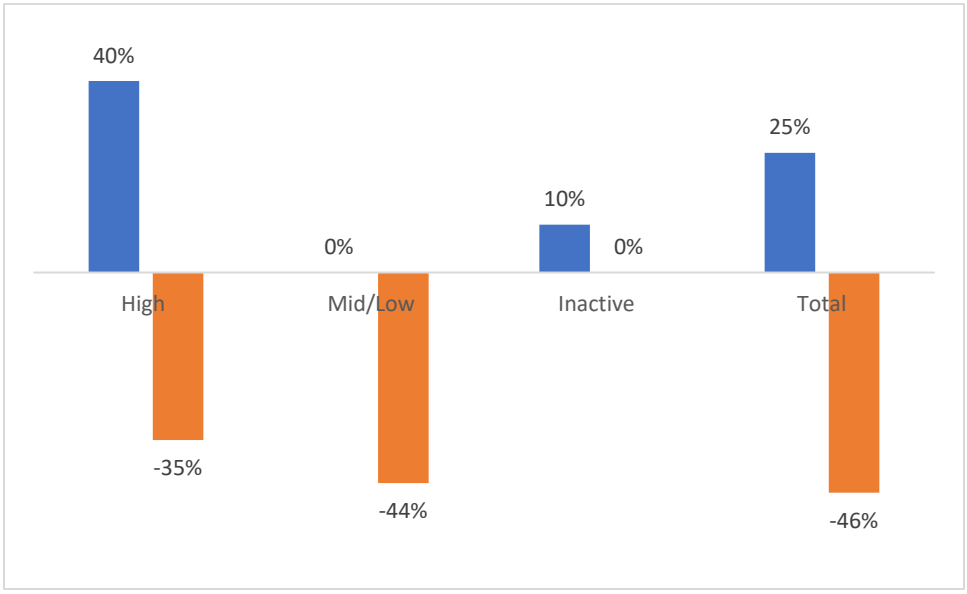
- Trade partners are optimistic about 2023 if the Lighting Efficiency Product remains the same. Twenty of thirty-five expect their retrofit kit and fixture sales to be higher, 11 of 35 expect sales to be the same, and only four trade partners expect their sales to decrease. For those trade partners that expected a change (increase or decrease) in retrofit kit and fixture sales in 2023, the evaluation team asked the expected percentage change. Figure C.4-18 illustrates the average expected percentage change in sales in 2023 by strata and separated by those expecting an increase versus a decrease.

Figure C.4-18. 2023 Average Expected Percent Change in Fixture and Retrofit Kit Sales if Product Remains the Same (n=24)



- The evaluation team asked trade partners to imagine that the Xcel Energy Lighting Efficiency Product had never existed and would not exist in 2023. Only two trade partners (one high performer, and one inactive) indicated they would still expect an increase in retrofit kit and fixture sales in absence of the product. Eight trade partners would expect their sales to remain the same. However, 27 trade partners would expect a decrease in retrofit kit and fixture sales without the Lighting Efficiency Product, and some would expect such a downturn in sales, they would likely fail. Figure C.4-19 shows trade partners expected average change (by increase or decrease) in sales in absence of the product.

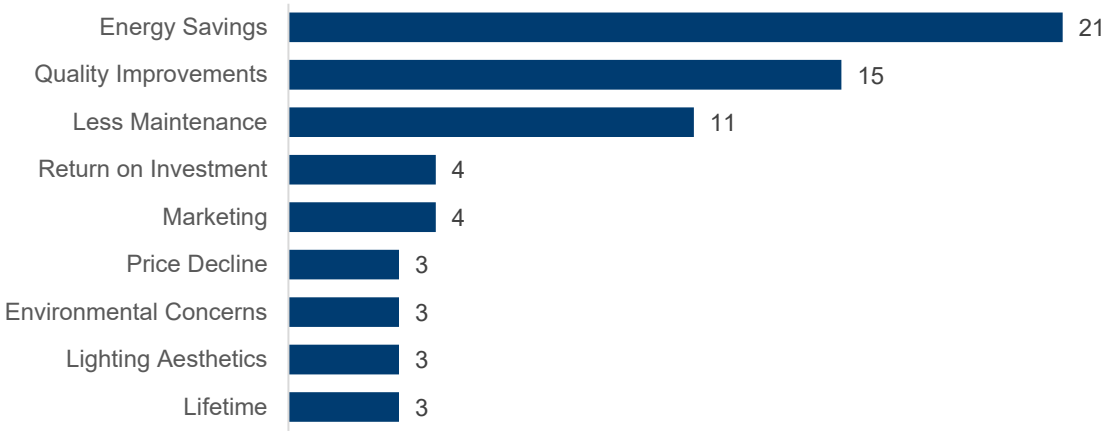
Figure C.4-19. 2023 Average Expected Percent Change in Fixture and Retrofit Kit Sales in the Absence of the Product (n=29)



One inactive and one high performer trade partner would expect lower increases in sales in the absence of the Product. Eight trade partners felt that their sales would remain the same in the absence of the Lighting Efficiency Product, and 27 believed their businesses would experience a decrease in sales of fixtures and retrofit kits of anywhere from -10% to -100%.

- Trade partners spoke on the growth of LED lighting in commercial spaces over the past ten years. They agreed rebates from Xcel Energy and other utilities have helped move the market to LED lighting, especially in the last ten years. Other factors impacting the adoption of LEDs are listed in Figure C.4-20.

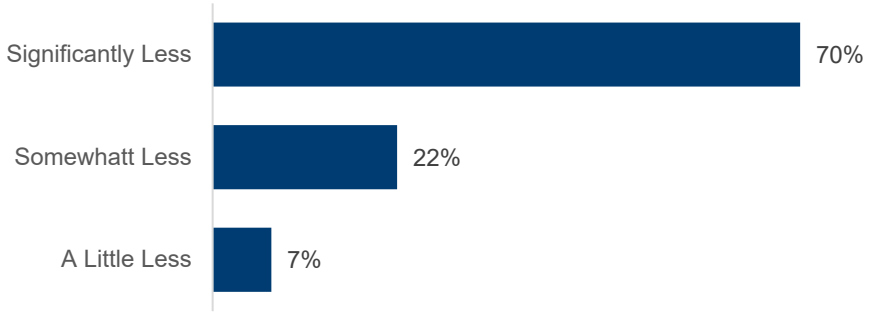
Figure C.4-20. Factors Contributing to LED Adoption (n=31)



Note: Multiple responses allowed

- The evaluation team asked active trade partners about the difference in market share of LEDs if Xcel Energy and other utilities had never offered rebates. Trade partners felt the adoption of LEDs in the commercial market would be significantly less (Figure C.4-21).

Figure C.4-21. Impact of Xcel Energy and other Utility Rebates on Penetration of LEDs (n=27)



- Respondents said that utility rebates had a “huge” impact on the market and helped to “legitimize LEDs”, as well as making the technology affordable for smaller customers and non-profit organizations. One trade partner said that ten years ago, there were virtually no LEDs in commercial spaces, but with rebates that made LEDs almost free at

times, the technology has become the standard. In addition, this trade partner said that LEDs are so effective, they can now carry part of the cost of other efficiency upgrade projects.

- Trade partners additionally offered that in absence of the rebates, there would be fewer trade partners actively supporting businesses in pursing lighting upgrades. Only big businesses and those very committed to being "green" would use LEDS; and the lighting equipment would not have evolved as quickly. Today, the quality improvements in the technology, and the ability to adapt lighting with NLC systems, alongside lower maintenance costs, longer lifetimes, and energy savings make LEDs the preferred technology. Several trade partners also noted that individual municipalities have moved companies by requiring LED lighting in some commercial spaces.

C.5 Peer Utility Benchmarking Results

Introduction

As part of the TRC evaluation of the Colorado Xcel Energy Lighting Efficiency Product in 2022, TRC and Apex conducted secondary research and in-depth interviews with key staff at peer utilities that offer business lighting efficiency programs. The objective of the peer utility benchmarking research was to understand how peer utilities approached key issues related to implementing business lighting programs. The evaluation team's findings were informed by interviews with key informants (e.g., program managers) at nine utilities (shown in this memo as Utilities A–I) and/or literature research on publicly available information. These utilities were selected because they have comparable territories and/or programs to the Colorado Xcel Energy Lighting Efficiency Product. This enables the evaluation team to, as much as possible, perform an "apples-to-apples" comparison and to evaluate the set of circumstances (such as regulation, retail channels, and demographics) that impact program plans at peer utilities.

Research objectives of the peer utility research were to:

- **Compare program characteristics:** Document general information about peer utilities programs to compare them to the Xcel Energy product, including the measures offered and incentive amounts, and identify any peer utility program characteristics that may be beneficial to Xcel Energy.
- **Gauge peer utilities' experiences:** Assess successes or challenges peer utilities are having with their program, including most active market segments and success of any segment-targeted marketing.
- **Identify new strategies or design ideas:** Ask peer utilities about recent program changes. Ask which other utilities/organizations the peer utilities look to for new ideas.
- **Identify opportunities for more savings:** Identify opportunities to encourage more or deeper lighting retrofits, including new approaches to program design or marketing, especially with regard to networked controls.
- **Learn about NTGR approach:** Inquire about peer utilities' most recent NTGR value and details on their methodology.

The remainder of this memo presents key takeaways, followed by detailed results based on each research objective.

Key Takeaways

Below are key takeaways from interviews with peer utility representatives regarding their business lighting efficiency programs and literature review research. The research and interviews provided information about peer utility programs, successes and challenges, experiences with lighting controls and their NTG methodology and results.

Compare Program Characteristics

- The Xcel Energy Lighting Efficiency Product is structured similarly to most peer utilities as all nine offer a downstream prescriptive and custom program for business customers to install lighting measures, however, most offer general business incentives programs with lighting as one option, rather than multiple specific programs targeted by end-use. Most also offer a midstream program, and some target programs specifically to additional channels, such as small business, new construction, public buildings, or horticulture. The structure of lighting programs varies across peer utilities in terms of which lighting measures are included in each program track. Most peer utilities try not to overlap the measures allowed in midstream versus downstream programs; however, a couple offer some of the same measures in both, requiring that customers may not receive two incentives for the same measure in two different programs. Xcel Energy could consider combining its business lighting Product with products targeting other technologies to allow for multiple project types within one Product and create more of a one-stop shopping experience for customers.
- The peer utilities varied significantly in how they structure the incentives. The most common approach (n=4) is to pay demand-based incentives ($/W saved), with varying levels of specificity regarding the old and new equipment. Three utilities use a similar structure to Xcel Energy, whereby incentives are a fixed dollar amount contingent upon the type/efficiency of both the new and the old equipment. Two utilities utilize energy-based incentives ($/kWh), which generally results in higher incentives than the other utilities reviewed (one utility imposes an incentive cap of 70% of the project cost). The incentives offered by Xcel Energy generally fall in the middle of those offered by the other compared utilities, as Xcel Energy does not offer the highest or lowest incentive for any of the selected measures.

Gauge Peer Utility Experiences

- Xcel Energy is not alone in its challenges in meeting goals and seeing customers and contractors experience supply constraints and price increases. Six of nine peer utilities noted challenges to their program with supply constraints and increased costs that are requiring utilities to increase incentives or add bonus incentives in order to achieve their goals. Several peer utilities fell short of 2021 savings goals and most have lower goals for 2022.

Identify New Strategies or Design Opportunities

- The peer utilities varied in terms of their recent changes and strategies. Most have either increased incentives, added bonus incentives, or tested trade partner incentives. As far as where they get ideas for changes, different utilities had different responses such as neighboring utilities, trade partners, or industry publications. Higher incentives, bonus incentives, and trade partner incentives appear to be effective in helping to meet goals.

Identify Opportunities for New Savings

- Most peer utilities are pursuing lighting controls as an opportunity for additional savings. One utility reported having significant progress by focusing on educating trade allies and also having higher incentives on every fixture that also has a control option. Xcel Energy could consider adding prescriptive rebates to include controls in fixture prices and seek more opportunities to educate trade partners and customers.

NTGR Approach

- Only four of the nine peer utilities have a 2021 NTGR. Two of these use values from research on 2018 programs, a third utility relies on data from previous program year and then an expert panel agrees on adjustments for future years. The fourth utility with a 2021 NTGR is not specific to lighting. All four utilities using a NTGR rely on a participant survey to estimate free-ridership. Five of the peer utilities do not apply a NTGR to estimating net savings. Benchmarking NTGR did not provide significant insight for use in determining a prospective NTGR for Xcel Energy.

Business Lighting Efficiency Program Characteristics

The evaluation sought to identify key characteristics of comparable business lighting efficiency programs offered by the nine peer utilities. Program characteristics are broken into program structures, incentive designs, and incentive amounts. Findings for each of these constituent pieces are presented below.

Program Structures

The team asked interviewees about the structures of their programs within their portfolio, along with whether they use an implementer, require ENERGY STAR® and/or DLC certification, or allow rebates for customers replacing existing LEDs. Summary findings can be found in the bullets below and in Table C.5-1, with additional details by peer utility below Table C.5-1.

- Three of the nine peer utilities have a program focused only on lighting, similar to Xcel Energy. The remaining six include incentives for lighting within a broader business incentives program.
- All of the nine peer utilities offer downstream program incentives, and eight of nine also offer a midstream program that provides discounts through distributors at a point of purchase. Six of the nine also offer direct install and incentives for small businesses, and four of nine also offer a separate new construction program. Two offer programs specific to horticulture, and one utility also has a program focused on public buildings.
- Most utilities do not offer any of the same products in their midstream program that are offered in the downstream program. However, one program only offers fixtures in midstream, while lamps and fixtures are offered in the downstream programs. This utility indicated they started the midstream program not to focus on lowest cost measures, but rather to change the availability of more expensive fixtures in the market. The other two utilities offer lamps in both midstream and downstream, but they require that the customer is not able to receive incentives through both programs.
- Similar to Xcel Energy, six of the peer utilities use a third-party implementer to manage the program, while three manage the program directly.
- The peer utilities varied in terms of requiring DLC or ENERGY STAR certification for products incentivized. Like Xcel Energy, two of the nine utilities do not require

certification, while three have include certification requirements across all products. The four remaining peer utilities allow exceptions or grandfathering. One utility stated that they received feedback that the testing requirements were a barrier to otherwise eligible products and are considering alternatives for the future.

- Five of the nine peer utilities allow incentives for customers replacing LEDs with LEDs. All peer utilities require there to be savings in order to earn the rebate. One utility bases all of its rebates on the energy saved against the existing lighting as a baseline, regardless of code requirements.

Table C.5-1. Summary Program Characteristics by Utility

Characteristic	Xcel Energy CO	A	B	C	D	E	F	G	H	I
Program Specific to Lighting	Yes	No	No	No	Yes	No	Yes	Yes	No	No
Lighting Program Offerings										
Midstream	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Downstream	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Small Business	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes
New Construction	Yes	Yes	Yes	Yes	No	No	Yes	No	No	No
Other	No	No	No	Yes	Yes	No	No	Yes	No	No
Downstream Implementer?	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes
DLC Certification Required?	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No
LED to LED Allowed?	Yes[a]	No	No	No	Yes	Yes	Yes	No	Yes	Yes
Products Overlap with Midstream?	No	Yes	N/A	No	Yes	Yes	Yes	No	No	No

[a] LED to LED replacements allowed in custom track only

Some details of each program are discussed below:

- **Utility A:** This utility's program offers incentives for multiple end-uses for the business sector rather than specific to lighting technology. The products offered in this utility's midstream program overlap with its downstream program. It offers midstream instant discounts on lamps, fixtures, and all types of controls. The discounts are lowest through the midstream program, but savings verification only occurs in a sample of about 5% of participants. Customers also have the opportunity for higher, prescriptive rebates through the downstream program—however, to be eligible for the higher downstream rebates, the customer must provide the data and proof of replaced equipment and incentives are based on savings. Audit and custom offerings are also offered through a separate program, and a new construction program includes lighting measures designed to achieve specific performance standards. This utility does not use an implementer for this downstream program but does require all lighting technologies to be DLC or ENERGY STAR certified.
- **Utility B:** This utility offers a standard and custom program that includes lighting as well as other measures and is the only peer utility that does not offer a midstream option. It does not require the lighting products to be DLC certified, and it does rely on an outside implementer to manage the program.
- **Utility C:** This utility has a downstream program for multiple measure types beyond just lighting. It also separately offers lighting incentives through a small business program, a facility audits and incentives program, a program targeted at the public sector, and a midstream program that offers incentives for specific lamp types (as well as a few non-lighting measures). The program does rely on an outside implementer and requires the lighting products to be DLC certified.
- **Utility D:** This utility's program is specific to lighting and includes both a downstream track and a midstream program and also has a separate program targeting horticulture facilities. This utility does not use an implementer for its downstream program and does not require DLC certification on the lighting products rebated.
- **Utility E:** This utility's program is not specific to lighting and includes both a downstream track and a midstream program. This utility uses an implementer for its downstream program. The program uses DLC certification as a guide but grandfathered in existing equipment when criteria recently changed to allow contractors to sell through existing inventory.
- **Utility F:** This utility's program is lighting only and offers lighting incentives through midstream, downstream, small business, and new construction programs. Uniquely, while the downstream program includes LED lamps, the midstream program only offers incentives for fixtures. The midstream program started in 2020 with the goal to change what was offered in the marketplace and reach customers they were not reaching in the past. This utility does not use an implementer for its downstream program. The program uses DLC certification as a guide but grandfathers existing equipment through year end when criteria changes.
- **Utility G:** This utility's program is lighting only and offers lighting incentives through midstream, downstream, small business, and a program targeted at horticulture. The midstream program sells lamps, while the downstream program sells fixtures and

controls only. Uniquely, this utility requires customers to work with a trade ally in order to participate in the program. The utility uses a third-party implementer. The program has some DLC requirements, but they are still using an older version. They received feedback from contractors after the latest updates that the DLC testing costs enough money that it is a barrier for otherwise eligible products, so they are considering other ways to vet.

- **Utility H:** This utility's program is a business general program that includes both lighting and other measures. It offers lighting incentives through midstream, downstream, and small business programs. The midstream program sells lamps, while the downstream program sells fixtures and controls only. The utility uses a third-party implementer. The program requires products be DLC certified.
- **Utility I:** This utility's program is a business general program that includes both lighting and other measures. It offers lighting incentives through midstream, downstream, and small business programs. The midstream program sells lamps, while the downstream program sells fixtures and controls only. The utility uses a third-party implementer. The program requires products be DLC certified.

Incentives Designs

The evaluation team asked utility program managers about how they determine the incentives design and whether they offer bonuses or financial incentives to trade allies. The team also asked about their 2021 goals, whether they met them, and how 2022 goals compare. Summary findings can be found in the bullets below and in Table C.5-2. Incentive levels for each utility and each individual product are shown in the Appendix.

- The peer utilities varied significantly in how they structure the incentives. One utility bases all of its rebates on energy saved, while two base the rebates on $/watt saved. The remaining respondents all indicated they don't have a specific formula, but they take into account the incremental costs, measure cost-effectiveness, and past participation rates. Two of the utilities set caps to not exceed 70% of installed cost.
- Five of the nine peer utilities utilize bonus incentives if needed and depending on remaining budget for the year. Two of those indicated the bonuses are primarily for lighting controls. Two that stated they do not use bonus incentives have increased their incentives in the past year.
- Five of eight peer utilities responding to the question on whether they offer trade partner incentives indicated they do offer these incentives. One of these indicated it was "periodic" and two said only for network lighting controls.
- Of the six peer utilities responding to the question about whether they met 2021 savings goals, three met or exceeded goals, while the other three fell slightly short of goals. Five of six utilities responding to the question about whether their 2022 goals were higher or lower than 2021, responded that 2022 goals were higher, while the other peer utility respondent has lower goals for 2022.

Table C.5-2. Incentive Design and Goals

Metric	A	B	C	D	E	F	G	H	I
Incentives Basis	No Response	$0.08/kWh	$/Watt	Qualitative up to 70% installed cost	Qualitative (cost-effectiveness and participation)	30%–50% cost	Qualitative, up to share of installed costs	$/Watt	Qualitative
Bonus Offerings?	Yes	Yes	Yes	Yes	No	No	No	No	No
Trade Partner Incentives?	No	Yes	NR	Yes	No	Yes	No	Yes	Yes
Percent of 2021 Goal Met	Met	105%	101%	94%	NR	NR	NR	96%	80%
	NR	NR	Higher	Lower	Lower	Lower	NR	Lower	Lower

NR=No Response

Incentives Amounts

The evaluation team calculated the incentive amounts under different programs' incentives structures to compare to rebates offered by Xcel Energy in Colorado. Summary findings can be found in the bullets below and the calculated rebate amounts are shown in Table C.5-3. Details on each utility's incentive offerings are listed in the Appendix.

- The peer utilities varied significantly in how they structure the incentives. The most common approach (n=4) is to pay demand-based incentives ($/W saved), with varying levels of specificity regarding the old and new equipment (i.e., Utility B offers different $/W values contingent upon the old and new equipment, while Utility C offers a flat $/W value regardless of the equipment removed/installed). Three utilities use a similar structure to Xcel Energy, whereby incentives are a fixed dollar amount contingent upon the type/efficiency of both the new and the old equipment. Two utilities utilize consumption-based incentives ($/kWh), which generally results in higher incentives than the other utilities reviewed (one utility imposes an incentive cap of 70% of the project cost).
- With the exception of occupancy controls where Xcel Energy Colorado has the lowest incentives, the incentives offered by Xcel Energy Colorado generally fall in the middle of those offered by the other compared utilities.
- 173W High Bay Fixture replacing 398W HID: Incentives for this measure ranged from $90 (based on a $0.40/Watt incentive, two utilities) to $255 (based on a $0.24kWh incentive and 5,972 hours of use, one utility). Xcel Energy Colorado falls in between these two extremes, offering $150 (non-DLC) or $200 (DLC), based on the HID high/low bay Replacements (291W–464W) Fixtures incentive.
- **173W High Bay Retrofit Kit replacing 398W Fluorescent:** Incentives for this measure ranged from $12 (based on a $/product incentive, one utility) to $322 (based on a $0.19kWh incentive and 5,972 hours of use, one utility). Xcel Energy Colorado falls on the low end of these two extremes, offering $22.50 (non-DLC) or $30 (DLC), based on the Fluorescents (95 W-189 W) Retrofit Kits incentive.
- **70W LED Linear Ambient Fixture replacing 100W Fluorescent Fixture:** Incentives for this measure ranged from $12 (based on a $0.40/Watt incentive, two utilities, or a $/product incentive, one utility) to $45 (based on a $/measure specific incentive, one utility). Xcel Energy Colorado falls in between these two extremes, offering $18.75 (non-DLC) or $25 (DLC), based on the LED direct linear ambient fixtures replacing T4, T8, T12 incentive.
- **29W Stairwell Fixture replacing 58W Fluorescent Fixture:** Incentives for this measure ranged from $12 (based on a $0.40/Watt incentive, one utility, or a $/product incentive, one utility) to $66 (based on a $0.25kWh incentive and 8,760 hours of use, one utility), with three utilities not offering incentives for this measure. Xcel Energy Colorado falls in between these two extremes, offering $30 (non-DLC) or $40 (DLC), based on Stairwell replacing fluorescent or HID (20W–60W) incentive.
- **41W LED Troffer Fixture replacing 79W Fluorescent Fixture:** Incentives for this measure ranged from $15 (based on a $0.40/Watt incentive, two utilities) to $60 (based on a $/product incentive, one utility). Xcel Energy falls in between these two extremes, offering $22.50 (non-DLC) or $30 (DLC), based on the LED troffer fixtures and retrofit kits 1x4, 2x2, or 2x4 (10W–100W) incentive.

- **Network Lighting Controls on 33W replacing Manual Switch:** Incentives for this measure ranged from $1.50/fixture (based on a $0.05/Watt controlled incentive, one utility) to $44/fixture (based on a $0.32/kWh incentive and 4,543 hours of use, one utility), with two utilities not offering incentives for this measure. One utility offers an incentive based on the number of sensors rather than the number of watts controlled or kWh reduced ($25–$50/sensor). Xcel Energy Colorado falls in between these two extremes, offering $12/fixture based on the Lighting controls NLC incentive of $0.40/watt controlled.
- **Occupancy Controls on 156W replacing Manual Switch:** Incentives for this measure ranged from $9/fixture (based on a $0.16/Watt controlled incentive, one utility) to $59/fixture (based on a $0.24/kWh incentive and 4,543 hours of use, one utility), with three utilities not offering an incentive for this measure. Two utilities offer incentives based on the number of sensors rather than the number of watts controlled or kWh reduced ($20–$50/sensor). Xcel Energy Colorado offers the lowest incentives for this measure (among those who offer an incentive, n=6), offering $7.80/fixture based on the Occupancy Controls on 156W replacing Manual Switch incentive of $0.05/watt controlled.
- **93W Exterior Fixture replacing 348W HID Fixture:** Incentives for this measure ranged from $12 (based on a $/product incentive, one utility) to $275 (based on a $/product, one utility), with three utilities not offering an incentive for this measure. Xcel Energy Colorado falls in between these two extremes, offering $37.50 (non-DLC) or $50 (DLC), based on the LED Wall Pack fixtures (61 W-–150 W) incentive.

Table C.5-3. Example Measures and Incentives Comparison

Metric	Xcel Energy CO		A	B	C	D	E[b]	F[c]	G[d]	H	I
	NON-DLC	DLC									
Incentive Structure	$/Specific Measure		$/ Specific Measure	$/Watt	$/Watt	%/kWh up to 70% installed cost[e]	$/Watt	$/ Specific Measure	$/ Specific Measure	$/Watt	$/kWh
173W High Bay Fixture replacing 398W HID	$150	$200	$200	$90	$158	$235	$90-$135	$100-$115	$100-$250	$113	$322
173W High Bay Retrofit Kit replacing 398W Fluorescent	$22.5	$	$40	$79	$158	$235	$68	$100-$115	$12-$45	$113	$255
70W LED Linear Ambient Fixture replacing 100W Fluorescent Fixture	18.75	$25	$40	$12	$21	$40	$12-$18	$15-$40	$12-$45	$15	$38
29W Stairwell Fixture replacing 58W Fluorescent Fixture	$30	$40	NA	NA	NA	$66	$12-$18	$45-$55	$12-$45	$15	$63
41W LED Troffer Fixture replacing 79W Fluorescent Fixture	$22.50	$30	$60	$15	$27	$40	$15-$23	$20-$40	$12-$45	$19	$38
Network Lighting Controls on 33W replacing Manual Switch[f]	$12.00		DNQ	$1.50-$3.00	$8	NA	$24	NA	$25-$50 (per control)	$12-$23	$44

Metric	Xcel Energy CO		A	B	C	D	E[b]	F[c]	G[d]	H	I
	NON-DLC	DLC									
Occupancy Controls on 156W replacing Manual Switch	$7.80		$20-$30	NA	$9	NA	$11	NA	$25-$50 (per control)	$11	$59
Exterior Fixture – 58 W Wall pack replacing 264 W	$37.50	$50	$150	NA	NA	$232	$51-$72	$145-$155	$12-$235	$103	$844

NA=Not Applicable

[a] includes bonus incentives

[b]Utility E has separate incentives for small/medium customers.

[c]Utility F has separate incentives for standard/premium measures.

[d]Utility G did not have a publicly available incentives list because all projects must be submitted through trade allies.

[e]Incentives listed represent 100% of measure specific incentive

[f]For the two network lighting measures with ranges: Utility B offers different incentives contingent upon the type of light replaced. Utility H offers different incentives contingent upon the existing controls that they replace.

Successes and Challenges

The team asked interviewees about any successes and challenges they are having with their program and about marketing to specific sectors. Summary findings can be found in the bullets below and in Table C.5-4.

- All utilities responding to this question (n= 8) noted successes with their program. These varied from being able to meet their goals, achievements in certain target segments or with trade allies, noted results from increased incentives, or changes to improve the customer experience.
- For challenges, six of nine peer utilities noted challenges with supply constraints and increased costs. Two peer utilities noted that unit energy savings for lighting measures had been decreasing, and one noted generally that participation was decreasing.
- The peer utilities all varied in the markets they targeted. Utility A does broad marketing focused on predominant businesses within the local geography and season. An example noted was marketing to lodging facilities in high tourist areas prior to busy season. Utility B goes back to previous participants from past T8 promotions along with largest accounts. Utility C relies on its trade-ally network to target sector-specific customers. Utility D focuses on new construction and renovations. Utility E targets different incentive levels depending on customer size. Utility F primarily markets to small businesses. Utility G has focused on its small business program and achieved rapid ramp-up. Utility H markets to warehouse, retail, and commercial office buildings. Utility I focuses on disadvantaged communities.

Table C.5-4. Summary Program Successes, Challenges, and Segment Targets by Utility

Column	A	B	C	D	E	F	G	H	I
Key Success	Meeting goals	Trade ally relationship	Public sector participants	Incentive increase boosts participants	School districts participants	Flexibility for customers through many paths	500 new small business projects	NR	Lighting most successful measure
Challenges	Supply constraints and higher costs	Supply constraints and lower uptake	Supply constraints and higher costs	Supply constraints and lower uptake	Lower uptake	Supply constraints and costs	Declining lighting savings	Lower uptake, supply constraints	Declining lighting savings
Reaching Saturation	NR	Possibly	Projected post 2025	Concerned and studying it	Not concerned	Not imminent	Monitoring	NR	No data
Target Markets	Opportunity targeting by season, geographic	Past participants in T8 incentives, largest accounts	Trade ally network	New buildings, tenant renovations	Vary by size	Small business	NR	Warehouse, retail, and commercial office buildings	Dis-advantaged communities

NR = No Response

New Strategies and Design Ideas

The team asked interviewees to describe recent program changes, the reason(s) for them, and how successful they have been. Summary findings can be found in the bullets below and in Table C.5-5.

- The peer utilities' most recent program changes varied considerably. Three utilities recently introduced trade-ally incentives and another three increased customer incentives (two of the three focused the increase on control options). Utility B decreased lighting incentives in 2022, stating that local stakeholders wanted more dollars allocated to heating and cooling measures. Three utilities made changes in application procedures to make it easier to participate; for instance, Utility C added an express incentive reservation option for projects below $10,000 to shorten the pre-application approval process as well as adding DLC lookups to the application to expedite approval. Utility E waived a requirement for larger customers to procure controls or non-lighting in order to be eligible for lighting incentives. Utility E also shifted from a lighting-only prescriptive new construction incentive to a whole-building performance new construction program. Utilities F and G both launched midstream programs to make it easier to capture smaller projects. Utility G also launched a no-cost direct install option for small businesses. Utility I revamped a small business program to target disadvantaged communities.
- Most the peer utilities responding to the question about the impacts of these changes reported positive impacts from the noted changes. The increased incentives all resulted in higher participation. Two utilities mentioning their focus on controls saw a resulting participation increase. Utility E, which waived its requirements for larger customers to purchase controls or other equipment to receive lighting incentives, is still tracking below goals in terms of participation. Those launching midstream programs found them well received, except one also had to increase incentives in that program to gain traction.
- Five of the nine peer utilities identified planned changes. Two of those were to continue furthering promotion of controls, while two others are working to streamline processes. In reference to streamlining, Utility D, who also has a midstream program, is planning a new prescriptive incentive with no pre-inspection required for smaller "maintenance-scale" projects. These are meant for small projects completed by large institutions that purchase product direction from manufacturers, or from small businesses that purchase retail, which bypass midstream and are too small to justify the time required for prescriptive application. The other utility focused on streamlining is looking at removing designated tiers for incentive levels tied to customer size.
- All nine peer utilities recognized that new EISA regulations increasing the minimum efficiency of screw-based lamps will affect offerings of screw-based LEDs post 2022. Five programs currently offer screw-based LEDs in their downstream programs and those will be impacted, although one program bases savings on existing lighting and will continue to offer screw-based LEDs until all the existing non-LED screw-based lighting is replaced. The remaining four peer utilities did not offer screw-based LEDs in their downstream program.
- Four peer utilities responded to the question about what resources they use for program design innovations. Two responded that they look at neighboring utilities and internal staff. Utility B said they rely on the trade ally network they have worked hard to develop and regularly meet with. One utility said they monitor industry publications for new ideas and the remaining respondent relies on third-party implementers.

Table C.5-5. Summary Recent Program Changes

	A	B	C	D	E	F	G	H	I
Recent Changes	Adding control options to fixtures	Lowered incentives in 2022	Reduced burdens to apply	Increased incentives and trade ally incentives	Reduced rules, added network controls	Launched midstream and added trade ally incentives	Launched midstream and small business programs	Added controls and LED grow lights	Targeted disadvantaged areas, added trade ally incentives
Recent Changes Impacts	Increased participation in controls	Lower goals but still on track to meet goals.	NR	Increased uptake	Still below goals, network controls increased	Midstream well received	New programs well received	8 new controls projects, higher overall uptake	Some uptake in controls
Planned Changes	Focus more on controls	Less lighting more HVAC	Continue promoting controls	Reduce inspection rules	Reduce rules	No changes	No changes	NR	No changes
Changes from EISA	Dropping screw-based LEDs post 2022	Dropping screw-based LEDs post 2022	Dropping screw-based LEDs post 2022	Dropped screw-based LEDs several years ago	Program doesn't offer screw-based LEDs	No change	Dropping screw-based LEDs post 2022	Dropping screw-based LEDs post 2022	Only offer pin-based lamps
Resources for program innovations	NR	Trade ally network	Industry publications, neighboring utilities	Regional working groups, other utilities	Implementer	NR	NR	NR	NR

NR=No Response

Opportunities for New Savings

The team asked interviewees to describe how they promote lighting controls, determine incentives, and address barriers to adoption. Summary findings can be found in the bullets below and in Table C.5-6.

Six of the nine peer utilities have been actively trying to increase customer participation in lighting controls. Four of the six utilities mentioned vendor incentives or vendor education as their focus.

- **Utility A:** brings in manufacturing representatives to demonstrate products and discuss uses with contractors and distributors.

Controls are offered through both the midstream and downstream portions of its program, with even higher dollars being paid through downstream when savings can be verified.

Every fixture option has a listed incentive for the fixture alone, or higher incentives for the fixture with simple controls like occupancy sensors and even higher incentives for fixtures with network controls. Each year, they widen the gap between controllable fixtures and non-controllable fixtures.

In 2021, 27.2% of Utility A's retrofit lighting program participation included some type of controls.

- **Utility B:** continues to work towards improving their knowledge and understanding of controls and relies on trade partners to help them, but decreased their controls incentives along with other lighting incentives due to a stronger focus on other measure types.

They pay $0.10/watt higher incentives to incorporate the benefits of controls.

In 2021, lighting controls savings made up about 1.4% of total lighting savings in their downstream program.

- **Utility C:** shared that they have created targeted marketing videos they can share with customers or trade partners.
- **Utility D:** just added lighting controls to its menu of options and will continue to promote them through trade partners.

They believe that higher incentives have been very effective so far.

The most participation has been in warehouse sector where high-bay fixture changeout have large delta watts per fixture which maximizes the $/kWh incentive and leverages the $75 per fixture bonus.

Utility D just added lighting controls to its menu of options and will continue to promote them through trade partners. They believe that higher incentives have been very effective so far. The most participation has been in warehouse sector where high-bay fixture changeout have large delta watts per fixture which maximizes the $/kWh incentive and leverages the $75 per fixture bonus.

- **Utility E:** had tried (but decided to drop) using an incentive structure to require controls or another measure type to receive any standard lighting measure incentive.
- Two utilities indicated they offer rebates with no special campaign.

- When asked how their controls incentives are designed, most peer utilities indicated they applied an incremental amount to fixture incentives if controls are added.

Utility D: adds a fixed bonus of $75 per fixture for network lighting controls.

Utility F: has five different levels of rebates depending on the types of control with higher incentives for integrated controls and even higher for network lighting controls.

- The team asked peer utility program managers what they perceive are the biggest barriers to adoption of controls. Of the seven utilities responding, three mentioned trade ally knowledge of the technology. One additional utility reported that equipment is changing so fast the prescriptive eligibility cannot keep up.
- **Utility E**: described the high cost and long lead times because of supply chain disruptions as the largest barrier.
- **Utility G**: reported they have been trending away from large projects and towards small businesses, which especially impacts controls.

Table C.5-6. Lighting Controls Summary

Response Type	A	B	C	D	E	F	G	H	I
Lighting Controls Promotion	Trade ally education	Through trade allies	Higher incentives, Targeted marketing videos	Through trade allies	Higher incentives	No special campaign	No special campaign	Pilot offering of trade partner incentives	Trade partner incentives
Lighting Controls Incentives Design	Higher per fixture with controls	Higher per watt saved if includes controls	Incentives based on watts controlled	Additional $/kWh saved if controls and $75 per fixture	$/watt controlled added to other incentives	Rebates by control type, higher for network controls	Incentives per sensor installed, custom for network controls	Incremental $kW controlled incentive	Higher incentives if project includes controls
Biggest Barriers to Adoption	Trade ally knowledge and comfort	Internal and trade ally knowledge	Education	High incentives are effective	High cost and supply chain delays	High cost	Customers trending away from controls	New offering	NR

NR=No Response

NTGR Comparison

The team asked interviewees to report their 2021 NTGR, as well as how it was developed. Summary findings can be found in the bullets below and in Table C.5-7.

- Four of the nine utilities reported applying a NTGR to their 2021 program savings. In addition, one utility shared its 2018–2019 results. All five utilities use participant surveys. Two of these also include trade partner surveys, and one of these also includes non-participant surveys.

Utility H does not survey trade partners, but surveys non-participants to collect data for non-participant spillover.

Three of the five utilities apply NTGR prospectively while the other two apply retrospectively.

Of the four utilities that do not apply a NTGR, one is currently conducting its first ever NTG study that will be used to inform program design. Three of the four utilities only target and report gross savings.

Utility G changed its approach from calculating net to only reporting gross in 2019, citing that determining NTGR was increasingly challenging given the long running history of programs which integrates programs into part of the “normal equipment market”. This confounds the ability to assess “program influence” and its efforts working with suppliers that make it less feasible for customers to identify what influenced their decisions.

- Given the evolving lighting market it is challenging to compare results from surveys conducted in different years. The studies for Utilities C and H, which use from 2018 research prospectively, may not be comparable due to the time passed since research was conducted.

Utility E conducted a study in 2020 on 2018 and 2019 participants.

The only study with a comparable time frame was with Utility B; however, that study calculated a NTGR across the entire business standard program, and not for just lighting (although lighting is 88% of savings). With only one comparable (Utility B), with recent research, the evaluation team did not draw any conclusions about how Xcel Energy’s net savings compared to peer utilities.

Table C.5-7. 2021 or Most Recent NTGR

Column	A	B	C	D	E	F	G	H	I
Method	Participant and trade partner surveys	Participant surveys	Participant non-participant and trade partner surveys	Deemed	Participant surveys	NR	Deemed	Participant and non-participant surveys	Deemed
Lighting Only?	Yes	No	Yes	NA	Yes	NA	NA	Yes	NA
Year Conducted	2016-2019	2022	2019	NA	2020	Upcoming	NA	2018	NA
Prospective or Retrospective	Pros	Retro	Pros	Pros	Retro	NA	Pros	Pros	Pros
NTGR	27%-96%	82%-87.1%	80%	100%	87%	NR	100%	83.9%	100%

[a] Utility A includes fixtures in its upstream program with NTGR ranging from 27% to 49%. The downstream program has lamps and fixtures, but it pays higher incentives with NTG ranging from 84% to 96%.

NR=No Response

NA=Not Applicable

More details regarding the utilities that do conduct and apply NTGR follow:

Utility A: Utility A conducts a retrospective evaluation of NTGR only once every three years and then applies it to the upcoming plan period. The 2019–2021 NTGR ratios are the same based on research conducted in 2016. The research included a participant survey (free-ridership and participant spillover) and a vendor survey for vendor spillover. The research is conducted statewide and across all technologies (not specific to lighting). Separate lighting values were calculated by state in the region but are not applied due to low sample sizes. The utility reported the following prospective values for its business program: Downstream Prescriptive End of Life (86%), Retrofit Prescriptive (93.5%), Downstream Custom End of Life (93.5%), and Retrofit Custom (94.1%). These NTGR values are not specific to lighting measures. Separately, the midstream program had retrospective 2019 NTGR values of 37% for LED fixtures and 53% for LED fixtures with controls. Prospective values are decreasing slightly each year.

Utility B: Utility B has a retrospective evaluation of NTGR each year which gets applied to that implementation year. Some years, the previous year's results get applied if the evaluator determines new research isn't necessary. The research included a participant survey (free-ridership and participant spillover) and a vendor survey for vendor spillover (the 2021 evaluation used vendor spillover from a 2019 evaluation. This utility has a sector-wide incentives program that includes both lighting and non-lighting measures, and the NTGR is calculated at the program level.

Utility C: Utility C has an evaluation of NTGR once per four-year planning period or when major program design changes occur. The result is then applied prospectively until a new evaluation is updated. The values are reviewed by a stakeholder group and may be adjusted if consensus is reached. The most recent evaluation was from program year 2018 and included participant surveys, non-participant surveys, and trade partner interviews.

Utility H: Utility H has a NTGR assessment at least once every four years or when major program design changes occur. The result gets applied prospectively until a new evaluation is updated. The values are reviewed by a stakeholder group and may be adjusted if consensus is reached. The most recent evaluation was from program year 2018 and included participant surveys for free-ridership and nonparticipant surveys to estimate spillover.

Peer Utility Incentives

Table C.5-8. Xcel Energy - Colorado

Product[6]	Non-DLC	DLC
LED direct linear ambient fixtures replacing T4, T8, T12 (10–35W)	$11.25	$15.00
LED direct linear ambient fixtures replacing T4, T8, T12 (36–60W)	$11.25	$15.00
LED direct linear ambient fixtures replacing T4, T8, T12 (61–100W)	$18.75	$25.00
Retrofit kit for LED linear ambient fixtures replacing T4, T8, T12 (10–35W)	$11.25	$15.00
Retrofit kit for LED linear ambient fixtures replacing T4, T8, T12 (36–60W)	$11.25	$15.00
Retrofit kit for LED linear ambient fixtures replacing T4, T8, T12 (61–100W)	$18.75	$25.00
LED troffer fixtures and retrofit kits 1x4, 2x2, or 2x4 (10W–100W)	$22.50	$30.00
Cooler or freezer case	$33.75	$45.00
HID high/low bay (75W–94W) Fixtures	$37.50	$50.00
HID high/low bay (95W–189W) Fixtures	$67.50	$90.00
HID high/low bay (190W–290W) Fixtures	$75.00	$100.00
HID high/low bay Replacements (291W–464W) Fixtures	$150.00	$200.00
HID high/low bay Replacements (465W–625W) Fixtures	$187.50	$250.00
Fluorescent System Replacements (75W–94W) Fixtures	$37.50	$50.00
Fluorescent System Replacements (95W–189W) Fixtures	$67.50	$90.00
Fluorescent System Replacements (190W–290W) Fixtures	$75.00	$100.00
HID or Fluorescents (75W–94W) Retrofit Kits	$22.50	$30.00
HID or Fluorescents (95W–189W) Retrofit Kits	$22.50	$30.00
HID or Fluorescents (190W–290W) Retrofit Kits	$30.00	$40.00

[6] Prices are without bonuses, bonus adder for a portion of 2022 was 25% to 50%.

Product[6]	Non-DLC	DLC
HID or Fluorescents (291W–464W) Retrofit Kits	$37.50	$50.00
HID or Fluorescents (465W–625W) Retrofit Kits	$78.75	$105.00
Parking garage fixtures replacing fluorescent or HID (25W–60W)	$86.25	$115.00
Parking garage fixtures replacing fluorescent or HID (61W–83W)	$93.75	$125.00
Parking garage wall pack (10W–25W)	$22.50	$30.00
Parking garage wall pack (26W–60W)	$45.00	$60.00
Parking garage wall pack (61W–150W)	$56.25	$75.00
Outdoor Area fixtures (45W–65W)	$26.25	$35.00
Outdoor Area fixtures (66W–89W)	$26.25	$35.00
Outdoor Area fixtures (90W–119W)	$30.00	$40.00
Outdoor Area fixtures (120W–140W)	$37.50	$50.00
Outdoor Area fixtures (141W–199W)	$45.00	$60.00
Outdoor Area fixtures (200W–550W)	$67.50	$90.00
Canopy fixtures (25W–60W)	$15.00	$20.00
Canopy fixtures (61W–150W)	$18.75	$25.00
LED street light replacing HID (55W–79W)	$18.75	$25.00
LED street light replacing HID (80W–109W)	$18.75	$25.00
LED street light replacing HID (110W–139W)	$30.00	$40.00
LED street light replacing HID (140W–209W)	$37.50	$50.00
LED wall pack exterior (10W–25W)	$11.25	$15.00
LED wall pack exterior (26W–60W)	$22.50	$30.00
LED wall pack exterior (61W–150W)	$37.50	$50.00
Stairwell replacing fluorescent or HID (20W–60W)	$30.00	$40.00

Product[6]	Non-DLC	DLC
Occupancy sensor	$0.05/watt controlled	
Lighting controls daylighting	$0.10/watt controlled	
Lighting controls dual sensing	$0.15/watt controlled	
Lighting controls NLC	$0.40/watt controlled	

Table C.5-9. Utility A

Product	Incentive	Min Saved Watts	Notes
Screw & plug based lamps	varies	10	
T8 Linear Replacement Lamps 2', 3', 4', 8' Type A, B, or AB	$5	10	
T4 Linear Replacement Lamps 4' Type A, B, or AB	$10	10	
U-Bend Linear Replacement Lamps, Type A, B, or AB	$10	10	
T8 LED Linear Retrofit Tube Kits Type C per lamp within qualifying kits	$8	10	
T5 Led Linear & U-Bend Retrofit Tubke Kit Type C per lamp within a qualifying kit	$18	20	
Mogul Screw-Base for HID Low Bays with Low and Mid Output	$50	100	
Mogul Screw-Base for HID Low Bays with High and Very High Output	$70	200	
LED Indoor Retrofit Kits 1x4, 2x2, 2x4 for Troffers	$40	23	
LED Indoor Troffers 1x4. 2x2. 2x4	$60	23	
Led Linear Ambient Fixtures	$40	23	
LED Directional Fixtures	$40	23	
LED Display Case: Retail, Cooler, Freezer, or Refrigerated Shelving Fixtures	$40	20	
Down Light Kits Hardwired (250-3500 lumens)	$20	20	
Down Light Kits Hardwired (3500-7000 lumens)	$50	40	
Down Light Kits Hardwired (>7000 lumens)	$100	60	

Product	Incentive	Min Saved Watts	Notes
Low Bay Mid Output (5,000-10,000 lumens)	$100	75	
High Bay: High Output (10,000-30,000 lumens)	$150	100	
High Bay: Very High Output (>30,000 lumens)	$200	150	
Outdoor Luminaires and Retrofit Kits with Low Output (250-5000 lumens)	$100	75	
Outdoor Luminaires and Retrofit Kits with Mid Output (5000-10000 lumens)	$150	100	
Outdoor Luminaires and Retrofit Kits with High Output (10000-30000 lumens)	$200	150	
Outdoor Luminaires and Retrofit Kits with Very High Output (10000-30000 lumens)	$250	200	
Remote Mounted Occupancy Sensor	$30	40	
Daylight or Occupancy Controlled Dimming	$15	20	
Interior Integral with motion and daylight sensors	$30	20	
Interior Integral with motion and daylight sensors with programmed controls	$40	50	networked group
Wall Mounted Occupancy sensors	$20	20	
Outdoor sensor with dual sensors	$25	50	
Outdoor sensor with dual sensors with programmed controls	$50	100	networked group
Integral Occupancy Sensor for High Bay Fixtures	$25	50	fixture wattage

Table C.5-10. Utility B

Existing Equipment	LED Type A	LED Hybrid	LED Type B	LED Type C	LED Retrofit Kit	LED Fixture Replacement
Fluorescent T12	$0.16/watt reduced	$0.16/watt reduced	$0.24/watt reduced	$0.24/watt reduced	$0.035/watt reduced	$0.040/watt reduced
Fluorescent T8	$0.16/watt reduced	$0.16/watt reduced	$0.24/watt reduced	$0.24/watt reduced		
Fluorescent T5	$0.20/watt reduced	$0.20/watt reduced	$0.30/watt reduced	$0.30/watt reduced		
with network controls added					$0.45/watt reduced	$0.45/watt reduced
Interior HID	LED lamp with existing ballast	$0.25/watt reduced				
Interior HID	Direct wire with existing ballast	$0.30/watt reduced				
Interior HID	New LED Fixture	$0.40/watt reduced				
Interior HID	New LED Fixture w/Network controls	$0.50/watt reduced				

Table C.5-11. Utility C

Product	Type	Incentive
LED Fixtures	Replacement of non-LED interiors	$0.70/watt
LED Retrofit Kits	N/A to screw-based or refrigerated	$0.70/watt
Led Open Sign		$40.00
LED Channel Sign <=2'		$12.00/letter

Product	Type	Incentive
LED Channel Sign >2'		$30.00/letter
Occupancy sensors		$0.16/watt controlled
Daylighting		$0.12/watt controlled
Time clocks		$0.03/watt controlled
Dual Sensors		$0.26/watt controlled

Table C.5-12. Utility D

Product	Incentive
LLLC Fixtures	$35/kWh up to 70% of installed cost plus $75/fixture bonus
New Fixture or Lamp	$0.25/kWh up to 70% of installed cost
Retrofit Kits	$0.25/kWh up to 70% of installed cost

Table C.5-13. Utility E

Product	Small Customer	Medium Customer	Large Customer
Interior			
New Fixture without controls	$0.60/watt reduced	$0.40/watt reduced	
New Fixture basic controls	$0.75/watt reduced	$0.55/watt reduced	$0.55/watt reduced
New Fixture advanced controls	$1.30/watt reduced	$1.10/watt reduced	$1.10/watt reduced
Retrofit Kits without controls	$0.30/watt reduced	$0.30/watt reduced	
Retrofit Kits basic controls	$0.45/watt reduced	$0.35/watt reduced	$0.35/watt reduced
Retrofit Kits advanced controls	$1.00/watt reduced	$0.90/watt reduced	$0.90/watt reduced

Product	Small Customer	Medium Customer	Large Customer
Controls only - basic	$0.20/watts controlled	$0.20/watts controlled	$0.20/watts controlled
Controls only - advanced	$0.80/watts controlled	$0.80/watts controlled	$0.80/watts controlled
Controlled Environment Agriculture - Fixtures	$0.05/kWh	$0.05/kWh	$0.05/kWh
Exterior			
New Fixture without controls	$0.35/watt reduced	$0.25/watt reduced	
New Fixture basic controls	$0.55/watt reduced	$0.45/watt reduced	$0.45/watt reduced
Retrofit Kits without controls	$0.15/watt reduced	$0.15/watt reduced	
Retrofit Kits basic controls	$0.35/watt reduced	$0.35/watt reduced	$0.35/watt reduced
Street Lighting	$0.35/watt reduced	$0.35/watt reduced	$0.35/watt reduced
Controls only - dimming	$0.40/watts controlled	$0.40/watts controlled	$0.40/watts controlled

Table C.5-14. Utility F

Product	Incentive
LED 1x4 or 2x2 or Retrofit kits (standard classification)	$20
LED 1x4 or 2x2 or Retrofit kits (premium classification)	$30
LED 2x4 or Retrofit kits (standard classification)	$30
LED 2x4 or Retrofit kits (premium classification)	$40
Ambient Luminaires or Integrated Retrofit Kit (standard classification) <=4'	$15
Ambient Luminaires or Integrated Retrofit Kit (premium classification) <=4'	$20

Product	Incentive
Ambient Luminaires or Integrated Retrofit Kit (standard classification) >4'	$30
Ambient Luminaires or Integrated Retrofit Kit (premium classification) >4'	$40
LED Cove mounted Fixtures 12" sections	$5
LED Display Case, cooler, or freezer 3-4' sections (standard classification)	$30
LED Display Case, cooler, or freezer 3-4' sections (premium classification)	$35
LED Display Case, cooler, or freezer 5-6' sections (standard classification)	$40
LED Display Case, cooler, or freezer 5-6' sections (premium classification)	$45
Low -bay Luminaries or Retrofit kits (5000-10000 lumens, standard classification)	$60
Low -bay Luminaries or Retrofit kits (5000-10000 lumens, premium classification)	$70
Low -bay Luminaries or Retrofit kits (10000-20000 lumens, standard classification)	$75
Low -bay Luminaries or Retrofit kits (10000-20000 lumens, premium classification)	$85
High -bay Luminaries or Retrofit kits (20001-28000 lumens, standard classification)	$100
High -bay Luminaries or Retrofit kits (20001-28000 lumens, premium classification)	$115
High -bay Luminaries or Retrofit kits (>28000 lumens, standard classification)	$180
High -bay Luminaries or Retrofit kits (>28000 lumens, premium classification)	$200
Stairwell Luminaires - 24/7 Operation (standard classification)	$45
Stairwell Luminaires - 24/7 Operation (premium classification)	$55
Horticultural	$150
Exterior Luminaires & Retrofit Kits for Parking & Canopy - 24/7 operation (standard classification)	$150
Exterior Luminaires & Retrofit Kits for Parking & Canopy - 24/7 operation (premium classification)	$160

Product	Incentive
Exterior Luminaires & Retrofit Kits for Parking & Canopy - dusk to dawn operation (standard classification)	$100
Exterior Luminaires & Retrofit Kits for Parking & Canopy - dusk to dawn operation (premium classification)	$110
Exterior Wall, Pole, Arm, Flood Luminaires & Retrofit Kits (standard classification,<4380 hrs)	$25
Exterior Wall, Pole, Arm, Flood Luminaires & Retrofit Kits (premium classification, <4380 hrs)	$35
Exterior Wall, Pole, Arm, Flood Luminaires & Retrofit Kits (standard classification, dusk to dawn operation, 250-5000 lumens)	$75
Exterior Wall, Pole, Arm, Flood Luminaires & Retrofit Kits (premium classification, dusk to dawn operation, 250-5000 lumens)	$85
Exterior Wall, Pole, Arm, Flood Luminaires & Retrofit Kits (standard classification, dusk to dawn operation, 5000-10000 lumens)	$145
Exterior Wall, Pole, Arm, Flood Luminaires & Retrofit Kits (premium classification, dusk to dawn operation, 5000-10000 lumens)	$155
Exterior Wall, Pole, Arm, Flood Luminaires & Retrofit Kits (standard classification, dusk to dawn operation, 10000->30000 lumens)	$265
Exterior Wall, Pole, Arm, Flood Luminaires & Retrofit Kits (premium classification, dusk to dawn operation, 10000->30000 lumens)	$275

Table C.5-15. Utility G

Product	Incentive
Retrofit kits and new fixtures	$12–$45
Retrofit kits and new fixtures with LLC controls	$50–$85
Exterior retrofit kits and fixtures	$12–$235 per fixture
Exterior retrofit kits and new fixtures with LLC controls	$50–$320 per fixture
High bay/low bay	$100–$250
High bay/low bay with controls	$155–$355

Lighting controls	$25–$50 per sensor
LED cooler/freezer displays	$1.60–$16.00 per linear foot

Table C.5-16. Utility H

Product	Incentive
Interior LED Lighting Upgrade (excluding T12 replacement and lamps fitting fluorescent pins or screw or pin-based LEDs)	$0.50/watt reduced
Interior LED Lighting Upgrade for T12 replacement (excluding lamps fitting fluorescent pins or screw or pin-based LEDs)	$0.20/watt reduced
Exterior LED Lighting Upgrade (excluding T12 replacement and lamps fitting fluorescent pins or screw or pin-based LEDs)	$0.50/watt reduced
Exterior LED Lighting Upgrade for T12 replacement (excluding lamps fitting fluorescent pins or screw or pin-based LEDs)	$0.20/watt reduced
Exterior LED Lighting Upgrade seasonal use (excluding lamps fitting fluorescent pins or screw or pin-based LEDs)	$0.10/watt reduced
LED Grow lighting upgrade	$0.80/watt reduced
Cooler/Freezer excludingT12 replacement and lamps fitting fluorescent pins or screw or pin-based LEDs	$0.45/watt reduced
Cooler/Freezer for T12 excluding lamps fitting fluorescent pins or screw or pin-based LEDs	$0.20/watt reduced
Standard occupancy controls replacing manual or no control	$0.20/watt controlled
Occupancy plus daylighting controls replacing manual or no control	$0.25/watt controlled
Cooler/Freezer LED Controls	$12.00/control
Network Lighting Controls replacing manual or no controls	$0.75/watt controlled
Network Lighting Controls replacing occupancy, vacancy, or daylight controls	$0.40/watt controlled
Permanent fixture removal	$0.15/watt reduced
LED open and exit signs replacing existing incandescent, fluorescent, or neon fixture	$20.00/sign

Table C.5-17. Utility I

Product	Type	Incentive
Interior		
Full Fixture Replacement	With upgrade to advanced controls	$0.32/kWh
Full Fixture Replacement	With upgrade to basic controls	$0.27/kWh
Full Fixture Replacement	Without controls	$0.24/kWh
Fixture Retrofit Kits	With upgrade to advanced or basic controls	$0.24/kWh
Fixture Retrofit Kits	Without controls	$0.19/kWh
Controls only retrofit	Upgrade to advanced network controls	$0.32/kWh
Controls only retrofit	Upgrade to basic controls	$0.24/kWh
Exterior		
Full Fixture Replacement	With upgrade to advanced dimming controls	$0.16/kWh
Full Fixture Replacement	Without controls	$0.09/kWh
Fixture Retrofit Kits	With upgrade to advanced dimming controls	$0.11/kWh
Fixture Retrofit Kits	Without controls	$0.08/kWh
Street lighting	With upgrade to advanced dimming controls	$0.11/kWh
Street lighting	Without controls	$0.08/kWh
Controls only retrofit	Upgrade to advanced network controls	$0.11/kWh
Freezer/Cooler		
LED Case lighting freezer/cooler	Replacing fluorescent lamp	$12/linear foot
Refrigerator/freezer controls	Occupancy sensor	$1.25/linear foot
Agriculture	Fixture replacement	$0.17/kWh

C.6 Networked Lighting Controls Interview Results

Introduction

Networked lighting controls (NLCs) are an advanced type of lighting control system that uses either area sensors or fixture-integrated sensors that communicate via wired or wireless systems. These systems can be controlled remotely with the use of a control panel or PC or mobile app and are most commonly installed with LED fixtures. The dimming capability of the LEDs combined with the ease of programming and reprogramming via a NLC system allows for a number of energy-saving lighting strategies, including occupancy sensing, daylight harvesting and customized task tuning, that go beyond the savings available from swapping an older lighting technology for LED bulbs. These systems, though they remain expensive, have significant energy saving potential.

The evaluation team interviewed three networked lighting control participants to explore the following research topics:

- What participants viewed as benefits of the system, what participants viewed as potential obstacles, and how they overcame those obstacles
- The impact of the Xcel Energy rebates, or other aspects of the Xcel Energy product, on the decision
- Who was involved in the decision, and what information resources were most helpful
- Details of the experience completing their project such as product availability, availability of knowledgeable lighting professionals, impact on project design phase if any, and impact on implementation or commissioning timeline if any
- Details of the participants' experience using the controls to date, and whether the system has met expectations

Key Findings

- Two respondents had an individual in charge of some aspect of facility operations that made the initial proposal for the retrofit project and the NLC. One respondent served as a project champion and stayed closely engaged with the project through completion. One respondent was only marginally involved in the project once the company made the decision to move forward. The other respondent was not involved in facility operations but was involved in the project throughout. All three respondents relied heavily on their installer to select a system, and for information about the system they installed.
- All participants considered the system cost to be the primary obstacle and neither mentioned any other obstacles to installing the system. Each also considered the primary benefit of the system to be energy cost savings. One respondent also considered access to data about electricity usage and load, and flexibility of the system programming to be major benefits, while the others did not.
- Two respondents said rebates were important to their companies' decision to install NLC. One respondent said some rebate is usually necessary to motivate his company, but that Xcel Energy rebates were better than other utilities. One respondent said that the Xcel Energy rebate was the primary motivation for the company to install NLC, and that they only learned about the rebate after Xcel reached out to them directly. One respondent indicated that a city mandate was the primary reason they pursued the project.

- None of the respondents reported that the controls impacted project implementation in a negative way. One respondent said the controls added 4 to 6 weeks to the project timeline; however, since the respondent was experienced with lighting controls, this delay was included in the original project timeline and did not present a burden. One respondent was less familiar with the details of the implementation process but did not remember the controls causing any significant delay.
- All participants were satisfied with their lighting system. One respondent was very satisfied with the system and reported that on-site staff continuously manage the lighting programming to maximize energy savings as production schedules change. One respondent was less satisfied: although pleased with the noticeable energy savings from the system, this respondent said the facility staff was disappointed in their inability to adjust the controls programming. Because of the company's decision early on to forego the control panel, this facility must call the installer out to the site anytime they want to adjust the lights. However, in similar projects in other facilities, the company has included the control panel based on their experience with this project.

Conclusions

- Industrial buildings may be good targets for NLC. Two respondents completed projects in industrial space – one a production facility, and the other a distribution center. Both facilities operated 24 hours a day on weekdays, with some weekend hours.
- Even with a knowledgeable installer, limited experience with NLC or lack of understanding by the customer can lead to unsatisfactory outcomes when installing NLC. All three respondents used energy efficiency service providers that have specialized knowledge and experience with NLCs. In the manufacturing facility, where the project champion also had prior experience with networked lighting controls, the project was very successful and fully met expectations. However, in the distribution center, where no one at the company was familiar with networked lighting controls, the corporate office made the decision to cut the on-site control panel from the project, making the facility reliant on the installer to update programming. This decision limited the value of the NLC system. After learning this lesson, the company changed its approach and included the on-site controls in other similar projects.
- The evaluation team recommends creating case studies from these two respondents. Emphasize the availability of Xcel Energy staff as information resources, and the benefits of specialized providers that are experienced with NLC.
- Lighting controls and LEDs can generate significant savings even when the lighting being replaced is relatively efficient. The distribution center project demonstrated that even in a relatively new facility with relatively efficient lighting, a retrofit to LED plus an NLC can generate noticeable savings.
- Xcel Energy rebates were enough for these customers to overcome first-cost hurdles**.** The respondent for the manufacturing facility said that the rebates combined with the energy savings gave the project a very favorable payback, below the company's three-year threshold. This respondent also said that Xcel Energy rebates are on par with other utilities on the west coast, and better than rebates from some other utilities in the Midwest. The distribution center was primarily motivated to maximize cost savings and ended up making significant cuts to the installer's original proposal to save money. This respondent said that while other aspects of the project were beneficial, the company would not have completed the project at all without a sufficient incentive. The respondent

for the office building noted that while they were mandated to complete the project by the local municipality, the incentive alone would have motivated them to participate in the product, though likely not as soon as they did.

- Involving local staff in the project design, especially in programming decisions, may increase satisfaction and result in enhanced benefit from the controls. The manufacturing facility on-site staff were heavily engaged in the details of the project design. Once the project was finished, staff proactively expressed satisfaction. The staff continue to routinely implement programming adjustments to maximize savings as production schedules change.

Detailed Findings

Project Overview

The first respondent is a senior engineer responsible for facility maintenance and improvements at a corporate level for a manufacturer with several facilities around the country. The Denver production facility that the company upgraded with rebates from Xcel Energy was originally built in the 1950s. It operates round the clock on weekdays all year round and may expand to weekend hours if necessary to meet production targets. Lighting needs vary throughout the facility, with production areas needing the brightest lighting. The primary objective of the lighting retrofit was to improve lighting quality, especially in production areas. Energy cost savings was a secondary objective.

The production facility lighting retrofit was part of a $40 million renovation of the entire facility. The customer replaced lighting in about 75% of the facility, excluding some storage areas. For the most part, the retrofit replaced T8s and metal halide lighting with LED fixtures. The project also replaced some existing LEDs that were too low on the color spectrum, 4100 kelvin, with fixtures at 5000 kelvin. Most of the new fixtures had integrated sensors and controls.

The customer programmed two lighting strategies at the production facility - task tuning and occupancy sensing. For safety reasons, the lights are never off, only dimmed down to 25%. Although the facility has skylights in some areas, the skylights are failing and do not allow for much light. Most of the interior space receives little light from windows. For these reasons, and because much of the operation time is at night, the customer does not use daylight harvesting.

The second respondent is the environmental health and safety advisor for a medical supplies manufacturer that retrofitted a 200,000 sq ft distribution center built in 2001. The center operates 24 hours a day on weekdays. The primary objective of the project was to save money on energy, and a secondary objective was to reduce the facility's carbon footprint. Prior to the retrofit the facility had dimmable fluorescent lights, but no sensors or controls. Through the project, all lighting was replaced with LEDs. The networked lighting controls system controls most, but not all of the lighting in the building. Although the controls are designed to be operated through a user-operated control panel, the customer elected not have the control panel installed at the facility. The system employs an occupancy sensing strategy and task tuning at about 80% of capacity.

The final respondent works for a property management group and handles most of the physical and financial management of the property that received the lighting upgrade. The building is a 4-story office building, with a multitude of different spaces and tenants. The primary motivation of the lighting upgrade was an ordinance by the City of Boulder stating that buildings of a certain square footage were required to complete one, including NLCs. The existing lighting was fluorescent, and no controls were present before the project. While this property management

group had completed lighting upgrades at facilities in the past, they had never done one of this scale at a property with so many tenants. They indicated that they had previously experienced difficulties with lighting contractors for a multitude of reasons, including not communicating project expectations effectively, not completing a thorough assessment, and overrunning costs.

They eventually identified a lighting contractor they felt confident in, which was important for this project as their biggest concern was how the process would impact the buildings' tenants. Specifically, what would be the implications of a lighting upgrade to the buildings' different tenants who operated different types of businesses with different needs. The lighting contractor helped to identify a suitable brightness and color of the lighting for all tenants, and the property manager indicated that all tenants have the option to control the programming of the lighting in their own space. Despite this, there have still been difficulties for tenants having to go from controlling their lights via a switch to everything being controlled by sensors, multiple tenants who did not like the daylight harvesting, and other tenants who desired dimmer lights.

Who made the decisions?

At the production facility, the senior engineer was the project champion, and engineer of record for the project. He had previously installed networked lighting controls at other facilities, though not in Xcel Energy territory. The senior engineer worked with an energy efficiency services provider he had developed a relationship with through past projects to create the preliminary design and submitted it to a separate corporate division for review and approval. The service provider also led the project implementation and sourced products based on specification requirements provided by the senior engineer. The vendors provided necessary information on performance, cost and energy savings.

The respondent for the distribution center recommended the retrofit project as an energy-saving opportunity and served as an advisor to the project. The distribution center was the first such project for the company, which owns several similar facilities in multiple states. The corporate real estate division led a general bidding process, describing the desired project as installation of LEDs and controls to achieve energy cost savings. The selected vendor, also a specialized commercial energy efficiency services provider, proposed a simple 1-to-1 fixture replacement, and recommended the specific lighting and controls system installed in its bid.

The respondent from the office building indicated that the sole motivation for their project was the city ordinance, and that they likely would not have considered the project for some time without that motivation, even with the assistance of the Xcel rebate.

What did customers see as the benefits and the challenges of installing NLC?

According to the senior engineer, the manufacturing company would have replaced the outdated lighting at the production facility with LEDs regardless of available rebates. The senior engineer considered the controls a valuable addition because of the ability to precision manage lighting to control energy costs, and also to monitor energy usage and energy load at the facility. The major obstacle to the NLC system was cost. The senior engineer has been able to overcome this obstacle only in areas where rebates offset some or all of the NLC cost. Once the company identifies a facility as a candidate for a lighting retrofit, the senior engineer reaches out to his preferred vendor to identify what rebate and grant opportunities are available in the area. If rebates for networked lighting controls are sufficient, he will try to include them in the project.

At the distribution center, the benefit of the controls was the added energy cost savings they provided. The programming flexibility was considered nonessential, and for that reason the control panel – an expensive element of the project that provides no savings directly – was

scrapped during the design phase. However, the company later changed its mind about the value of the control panel. Since this initial retrofit project was completed, the respondent said that the company has completed similar projects at other facilities, and decided to include the control panel, or allow for control through an app. The only obstacle to the NLC system was cost.

The respondent from the office building noted that they had potentially experienced some energy and financial savings, but that she did not have any data to support that assertion. They stated that the lighting quality of the building was improved, but that the challenges experienced by tenants adjusting to the new lights had outweighed any benefits to date. They stated that the most important things for a company to do when planning a project like this is to be confident in the contractor that is selected, and to visit another building that has completed a project like the one that is being scoped for them.

How did Xcel Energy impact the decision?

For the manufacturer, the rebates were a major driver for including the controls in the project. The rebates covered over 25% of the upfront cost of the controls, according to Xcel Energy tracking data. The customer's corporate financial division approved the controls portion of the project strictly based on meeting a three-year payback threshold. The senior engineer relied on the vendors to develop the benefit cost analysis for the project, using the vendors' internal energy savings calculations. He considered some level of rebate essential for the project meeting the payback threshold and expected the controls would have been dropped from the project if no rebates were available. This project, however, easily met the payback criteria. According to the senior engineer, the Xcel Energy rebates are on par with rebates from west coast utilities, and considerably higher than rebates from midwestern utilities.

Although the medical supplies provider had been interested in an LED retrofit project for some time, the existence of rebates for the controls was the trigger for finally implementing the project. According to the respondent, the company became aware of the existence of the rebates through a call from an Xcel Energy representative. They started to seriously pursue the project after that call. Xcel Energy project tracking data indicates that the Lighting Efficiency rebate for the NLC covered about 18% of the cost of the system.

How did controls affect the project?

Once the project was approved, the senior engineer worked closely with the facility production managers, supervisors, and operators to finalize the design and complete the project. Finalizing the lighting design took about two months and included several meetings with facility staff and the vendors. The controls required a 4–6-week lead time for this project, completed in 2021. The lead time was similar to past projects and was built into the initial timeline for the project. The general contractor worked with the controls vendor to program the system. Task tuning was done on a light-by-light basis to achieve a uniform 75 candle feet across production areas. The lights were organized into multiple zones to allow for only necessary lights to operate, based on which part of the facility is in use.

The respondents for the distribution center and the office building recalled no significant implications from including controls in the project, but also reported limited direct involvement in the implementation.

The respondent for the office building indicated that their sole motivation was the City of Boulder's new building performance ordinance requires buildings of a certain square footage to complete a onetime lighting upgrade. They expressed that due to the incentive amount they

likely would have gone ahead with the project regardless of the mandate, just not as soon as they did. What has the customer experience been to date?

At the production facility, the on-site plant manager and at least two other staff attended an on-line training course provided by the manufacturer in how to operate the lighting, through an app. The plant manager has primary control of the lighting and adjusts the programming about once a month to account for changes in production. The senior engineer is very happy with the quality of the fixtures and the controls. The facility experienced a 10% fixture failure rate, which the senior engineer considered normal, and noted the vendor was able to replace the fixtures quickly. The senior engineer was particularly pleased with the dimming capability of the fixtures. He noted that he has received several comments about how much better the lighting is following the retrofit. The senior engineer monitors energy usage at the facility, and compares it to both previous usage, and energy usage at other facilities.

At the distribution center, the customer requests a site visit by the installer if the system programming needs to be adjusted. The facility has requested one adjustment since the lights were installed, to extend the period before the occupancy sensors shut off the fixtures. The respondent said that he had not received any feedback from the on-site staff but didn't expect any since the prior lighting had been adequate. The new lights are task tuned to 80% and not noticeably different from the prior lights except for the occupancy sensor shut-off. The most notable outcome of the project has been significant energy savings. While the respondent had not precisely measured the savings and does not have access to usage data other than through the electricity bill, the facility had registered significant savings when the system first went online and continues to have reduced energy consumption compared to before the retrofit.

The tenants of the office building have had some difficulty adjusting to the new lighting configurations. The property manager indicated that they have an extra device to control the lights (Samsung phone) and they change the setting for tenants on an as needed basis. The phone has a Phillips app that only works on specific models of phones (it doesn't work on an iPhone because it doesn't have an IR sensor). The respondent indicated this is problematic because "when you have 20 tenants, you don't want to be running over there every day". She stated that the company informed tenants that if they want to change things themselves, they can order their own phone, but that none of them have done that yet. Overall, it's just challenging for tenants to go from having control via a switch to turn things on/off, to having everything be on motion/occupancy sensors.

Approach

The evaluation team contacted a census of lighting customers installing networked lighting controls in 2020, 2021 or 2022. Table C.6-1 shows the number of customers, the target number of interviews and final number of interviews.

Table C.6-1. Networked Lighting Controls Population, Target and Completed Interviews

Contacts	Target Interviews	Completed Interviews
14	4	3

The team called all contacts with phone numbers and emailed all contacts with available email. The team offered potential respondents a $50 honorarium for completing an interview. Of the 14

unique contacts, 5 customers were no longer in business, and six did not respond to outreach. Three customers completed interviews.

Lighting Efficiency Evaluation

2022 Program Evaluation: Recommendations and Responses

The Xcel Energy Lighting Efficiency product in Colorado offers prescriptive and custom rebates to Xcel Energy electric business customers who install qualifying energy-efficient lighting equipment. The rebates or incentives are used to help buy down first costs associated with the purchase of energy efficient equipment. These rebates encourage customers to purchase higher energy-efficient lighting versus baseline efficient equipment that is typically higher in cost.

Xcel Energy (The Company) engaged a team of researchers led by TRC to conduct a process and impact evaluation of the Lighting Efficiency product. The evaluation team was asked to assess the following:

- Product Influence (NTGR including free-ridership, spillover, and market effects)
- Assess Product Experience and Opportunities for More Comprehensive Retrofits
- Understand Customer Attitudes Towards Capital Improvements and Energy Efficiency
- Identify Barriers and Opportunities to Increase Network Lighting Controls
- Opportunities to increase product participation and general awarness

Based on the results of this research, the evaluation team developed key findings and recommendations for Xcel Energy.

Recommendation	Response
1) The evaluation team estimated a retrospective NTGR of .81 for retrofit rebates.	The Company will implement the recommendations made in the evaluation and apply a prospective NTGR of 0.81 for Equipment Rebates.
2) Provide additional trade partner training and opportunities for engaging with Xcel Energy staff.	The Company hosted the customer trade partner exp on April 4, 2023. The expo provided both customers and trade partners information about lighting as well as the programs and products available.
3) Assess the feasibility of measures suggested by trade partners for inclusion in prescriptive rebates.	The ideas and suggestions are being evaluated by the The Company to determine the feasibility of these ideas and suggestions for the 2024 / 2025 filing.
4) Promote information about new and emerging measures to customers and trade partners.	The Company will share Information regarding new products and or technologies will be promoted to customers and trade partners as they become available.
5) Look for ways to simplify the application process for customers and trade partners. Consider the differences among program specifics as an opportunity to investigate whether program design changes could be beneficial.	The Company is reviewing the current hard-copy or PDF application to determine if there are opportunities for improvement. Customers and trade partners may also use th digital application application or DAP to submit their rebte applications.
6) Develop an understanding of which business segments are lagging in LED installations and target the Product to encourage laggard's participation.	The Company is looking into this recommendation to determine strategies to communicate the benefits of LED lighting equipment.

7) Understand that these impacts have made program participation more challenging. Consider higher incentives or continued bonuses, simplification, and more communication.	The Company understands the issues customers are facing with increase equipment and installation costs due to supply chain and inflation. The customer bonuses from 2022 were carried over into 2023. The Company is also investigating increasing baseline rebates as well as continuing the 2023 rebate bonuses into 2024.
8) Increase marketing emphasis on network lighting controls.	The Company into this recommendation to determine strategies to communicate the benefits of network lighting controls.