EMI CONSULTING

# Xcel Energy
# Lighting Efficiency Product
# 2018 Evaluation

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FINAL
REPORT



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Executive Summary

# 2018 Lighting Efficiency Product (Colorado)

## Introduction

The Lighting Efficiency Product offers prescriptive and custom rebates to Xcel Energy electric business customers who install qualifying energy-efficient lighting equipment in existing or new buildings. The product has a midstream offering, implemented by a third party, that is evaluated outside of this effort. Rebates are offered to encourage commercial and industrial (C&I) customers to purchase energy-efficient lighting by lowering the upfront premium costs associated with this equipment. The 2018 Demand Side Management Evaluation included both a process evaluation and impact evaluation for this product. As part of this effort, the evaluation team estimated net-to-gross ratios (NTGRs), assessed the application form, explored the adoption of lighting controls, and investigated DLC-qualified and non-DLC-qualified offerings. This summary includes the key findings and recommendations from the evaluation.

### Methods

Participating customer surveys (n=232)

Participating trade partner interviews (n=41)

Peer utility benchmarking (n=6 utilities)

**Fielding:** July 2018 – September 2018

## Key Findings

**The product plays a large role in the business model of many trade partners,** with trade partners mentioning the product/rebates during their first interactions with prospective customers.

**The product has strong relationships with trade partners.** The longevity of the product allows for strong trade partners and industry support. The product takes trade partner relationships and input seriously.

**The product evaluation's recommended NTGR falls within the range of NTGRs reported by peer utilities.** The six peer utilities interviewed reported ratios between 0.60 and 0.99 for their commercial lighting programs.

## Net-to-Gross

**0.74** 2019 Prospective recommended NTGR with recommended changes*

**0.67** 2019 Prospective recommended NTGR without recommended changes

***Recommended Changes to the Product:** Targeting and tracking early replacement of working lighting equipment, expanding trade partner networks, focusing on advanced lighting control strategies, and reassess product influence in 2019.

# 2018 Lighting Efficiency Product (Colorado)

## Impact Results

Participating trade partners and customers alike indicated **high levels of historic product influence and market effects.** 90% of 2017 participants reported at least one product factor as highly influential in their decision to purchase efficient lighting products.

The **lighting market is rapidly transforming toward LED technologies,** the primary measures offered by this product. Participating trade partners expect the majority (85%) of their lighting products to be LEDs in 2020, even without future support from Xcel Energy.

The best opportunity for future attributable product savings is through **promotion of early replacement** of fully functional lighting products ahead of their failure or planned replacements.

## Process Results

### Lighting Control Strategies, Barriers, & Adoption

**Almost half** of participating customers were **not aware that Xcel Energy offers rebates** for indoor LCS

Participating customers identified **cost as the most common barrier of adoption**. Trade partners perceived up-front cost and poor payback as the two biggest barriers.

### Investigation of DLC-Qualified and Non-DLC-Qualified Offerings


**Participating customers are largely unaware of the DLC qualification** and most (65%) do not look for this qualification when purchasing equipment. Those that do look for the DLC qualification, largely do so because it is required to get the rebate.

**Trade partners held a wide variety of views of the value of DLC at indicating quality products.** High performing trade partners were more likely to think the qualification is a good indicator of quality, while low performing trade partners were more likely to view DLC qualifications with skepticism.

### Assessment of Application Form


**Customers and trade partners expressed confusion about the application form due to complexity and the large variety of offerings.** Frequent changes in rebates and DLC qualifications has added to product complexity.

**Online application has very little uptake.** Most of the surveyed participating customers (71%) either emailed or mailed the application to Xcel Energy. Most trade partners complete product applications for their customers, and most submit applications via email.

## Conclusions & Recommendations

The lighting market is rapidly transforming to more efficient technologies. While the retrospective NTGR of 96% indicates a highly effective product, trade partners indicate the lighting market for LEDs will be the predominate technology within the next two to four years. The lighting efficiency product needs to evolve to remain relevant within this new market.

Recommendation 1: Target early replacement of working lighting equipment. While the product has historically targeted early replacement, this focus will be crucial for attributable savings within a transformed marketplace. The product needs to specifically target accelerating purchases beyond scheduled upgrades and replace on burnout measures.

- 1a: Discontinue new construction lighting rebates. While new construction rebates represent a small percent of Lighting Efficiency Product savings, increasingly stringent building codes and improved cost-effectiveness make these likely free-riders and should not be offered going forward.
- 1b: Collect information on reason for replacements. The current product application does not collect information on the working status of replaced equipment. For each replaced product, the retrofit application should ask about the working status and whether it was part of a mandated or predetermined upgrade schedule. This will document product impact on project accelerations.
- 1c: Expand campaigns to encourage early replacement. These campaigns should encourage participant customers to expand projects to go beyond scheduled upgrades and burned out bulbs.
- 1d: Ensure gross savings calculations include a dual baseline for calculating lifetime savings. As the product continues to target these early replacement products, lifetime savings need to account for the shorter remaining useful lifetime of the replaced bulb in the savings calculations. Incremental cost should also be calculated accordingly (e.g., using the full cost of the replacement less a deferred replacement cost credit).

Recommendation 2: Continue to monitor changes to the lighting market. Due to the rapidly transforming lighting market, it is important to re-evaluate this product influence at frequent intervals. This will allow the product to evolve with the market and the NTGR to reflect changing offerings and market potential. This includes additional research in 2019 to feed into the 2020 NTGR and evaluations at regular intervals thereafter.

- 2A: For 2019, apply a NTGR of 74% to the program, upon implementation of the recommendations contained in this report. This NTGR reflects the rapidly-changing nature of the commercial lighting market as well as the historical high influence exerted by the program.

## Conclusions & Recommendations

High performing trade partners more commonly anticipate selling 100% LEDs in 2020 than mid/low performing trades.

**Recommendation 3:** Expand trade partner network and focus efforts on mid/low performing trade partners. There is more opportunity to convert customers to efficient products when the trade partner offers and sells both options. The product should target non-participating and mid/low performing trade partners that are more likely to continue to offer inefficient (e.g., T12 and T8) lamps.

Participating customers indicate significant opportunities for increasing lighting control strategies, citing cost as the most common barrier to installation. Lighting control strategies are not fully utilized among trade partners and participant facilities. Almost half (49%) of participant customers were not aware that Xcel Energy offers rebates for indoor LCS; Three-quarters of trade partners (76%) were aware that Xcel Energy offers rebates for indoor lighting controls.

**Recommendation 4:** Focus product efforts on increasing adoption of lighting control strategies through focused campaigns and trade partner trainings. Peer utilities report having successful campaigns focused on specific facility types, such as classroom and retail spaces; the product should consider that strategy. Trade partners reported challenges making the business case for lighting controls; the Lighting Efficiency Product can focus trade partner trainings on the benefits of controls and strategies to overcome perceived barriers and increase awareness of available incentives. To the extent it is cost-effective, consider increasing incentives on these products to overcome the cost barrier and encourage adoption.

**Recommendation 5:** Consider applying a separate NTGR to lighting control strategy measures. Market adoption for control strategies remains behind LEDs, and represented very few participant customers in the 2017 product (and therefore as part of this study). If lighting control strategies represent an increasing percentage of future product savings and transitions towards more advanced lighting controls (e.g., connected lighting), Xcel Energy should consider researching and applying a separate NTGR specific to controls.

There is a learning curve associated with the application form. Trade partners that complete a large number of applications have higher satisfaction with the application process than those that complete fewer. The most commonly requested capabilities were the ability to save, share with collaborators, upload supporting documents, electronically sign, and submit.

**Recommendation 6:** Assess ways to simplify the application form to make it accessible to more customers and trade partners. This should include reviewing best practices from peer utility applications, updating the visualization of the document, and considering consolidating fields.

The change in product offerings to allow non-DLC-qualified products received mixed reviews from trade partners. While the majority of those interviewed agreed with this change, there were not enough participating customers purchasing non-DLC products in the sample to assess differences in satisfaction between the two offerings.

**Recommendation 7:** Monitor satisfaction with non-DLC-qualified products among participant customers and reassess non-DLC incentives if product satisfaction is substantially less than DLC-qualified products.

# 1. INTRODUCTION

Xcel Energy offers a comprehensive array of demand side management (DSM) and other energy services and products to its customers. For the evaluations of its 2018 products, Xcel Energy sought to improve the customer experience, understand the products' roles in changing the marketplace, analyze the product influences on customer choices, and ensure industry-leading program performance. To accomplish this Xcel Energy contracted with EMI Consulting and its partners: Evergreen Economics, Apex Analytics, and Ridge & Associates (hereafter 'the evaluation team'). This team undertook evaluations of nine products offered in Colorado and Minnesota in 2018, including the Lighting Efficiency Product in Colorado discussed in this report.[1] This introduction includes an overview of the product and the evaluation approach, and describes the organization of this report.

## 1.1 Product Overview

The Lighting Efficiency Product offers prescriptive and custom rebates to Xcel Energy electric business customers who install qualifying energy efficient lighting equipment in existing or new buildings. Rebates are offered to encourage commercial and industrial (C&I) customers to purchase energy efficient lighting by lowering the upfront premium costs associated with this equipment. In 2017, the Lighting Efficiency product claimed over 202 GWh in energy savings from the custom, new construction, and retrofit rebate components (Table 1-1). Since the prescriptive retrofit and custom rebates make up the majority of savings in this product, the team focused efforts on those two components.

Table 1-1. Lighting Efficiency Gross Savings, by Product Channel, 2017

| Product Channel | Savings (kWh) | % of Total |
|---|---|---|
| Retrofit | 59,059,140 | 64% |
| Custom | 28,624,908 | 31% |
| New Construction | 4,784,406 | 5% |
| Total | 92,468,454 | |

*Source: Apex Analysis of Program Tracking Data. Population: PY2017participants . Note survey sample included additional 2016 participants to increase sample size.*

The Lighting Efficiency product offers rebates on a variety of lighting technologies within each product channel. Within these, custom lighting and linear LEDs lighting measures contributed most to overall Product energy savings (Table 1-2). Custom lighting measures are lighting products that

[1] The programs selected for evaluation in 2017 include: Commercial Refrigeration (CO), Cooling Efficiency (CO), Data Center Efficiency (CO), Insulation/Air Sealing (CO), Residential Heating (CO), Data Center Efficiency (MN), Heating Efficiency (MN), and Insulation Rebate (MN). The evaluation team prepared a separate report for each of these evaluations.

do not fit into the prescriptive rebate requirements; often this occurs when a customer is not conducting a 1:1 replacement, or the baseline equipment is not within the prescriptive parameters.

Table 1-2. Lighting Efficiency Savings, by Measure Category

| Measure Category | % of Total Savings (kWh) [a] |
|---|---|
| Custom Lighting | 31% |
| LED Linear | 29% |
| LED Troffer | 9% |
| LED High Bay | 8% |
| LED Interior Fixture | 4% |
| LED Area Lighting | 4% |
| LED Exterior Lighting | 4% |
| LED Parking Garage Lighting | 4% |
| LED Outdoor Canopy or Soffit lighting | 2% |
| LED PL/G base | 1% |
| Linear Fluorescent | 1% |
| Occupancy Sensor | 1% |

[a] Additional measures contributing less than 1% of product savings are LED exit signs, fluorescent high bay LED lamps with HID base, stairwell occupancy sensor, LED street lighting, LED refrigerator and freezer cases, and pin based CFLs.

*Source: Apex Analysis of Program Tracking Data. Population: PY2017 participants*

In 2017, Xcel Energy made several changes to the Product. First, Xcel Energy launched an online application option for this product, in addition to the paper application form. This addition was completed in response to customer demand. Xcel Energy has also recently adjusted product offerings to include products (at a lower incentive level) that are not Design Lights Consortium (DLC) qualified. Previously, only DLC-qualified lights were rebated through the prescriptive product; non-DLC products could be rebated through the custom component if they met the requirements of that pathway.

The Lighting Efficiency product relies heavily on an active trade partner network. While Xcel Energy does not actively endorse or promote individual trade partners, this group plays an integral part in advancing the product. Internally, Xcel Energy relies on account managers and the Business Solutions Center (BSC) to market and facilitate this product. Both account managers and BSC representatives are incentivized to complete efficiency projects with their customers and will inform and assist participants in the application process.

## 1.2 Evaluation Overview

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

- **Estimate the Net-To-Gross Ratio (NTGR):** Estimate the retrospective and prospective NTGR.
- Identify barriers and programmatic adoption strategies for **lighting controls**: What are the most common barriers for adoption and how can Xcel Energy overcome them? How are other utilities encouraging adoption of lighting controls?
- **Investigate DLC and non-DLC offerings**: What qualified product lists (QPL) do other utilities require? How do trade partners and participant customers feel about DLC qualifications?
- **Assess application form:** How satisfied are participants with the online application process? Why are/are not customers using the online application?

Table 1-3 presents an overview of the research topics and data sources used in this evaluation of the Colorado Lighting Efficiency Product.

Table 1-3. Lighting Efficiency Product Evaluation Framework

| Evaluation objectives | Estimate net-to-gross ratio | Lighting Controls | DLC Products | Rebate Application |
|---|---|---|---|---|
| Research topics | Free ridership<br><br>Participant spillover<br><br>Trade partner spillover<br><br>Trade partner market predictions | Adoption and awareness rates<br><br>Barriers to adoption<br><br>Trade partner sales<br><br>Effective program strategies | Customer awareness and satisfaction<br><br>Value of certification<br><br>Opinions on rebating non-DLC-qualified products<br><br>Peer program certification requirements | Satisfaction<br><br>Length to complete<br><br>Recommendations for improvement |
| Data sources | Participant surveys<br><br>Participant trade partner interviews<br><br>Interviews of peer utility program managers | Participant surveys<br><br>Participant trade partner interviews<br><br>Interviews of peer utility program managers | Participant surveys<br><br>Participant trade partner interviews<br><br>Interviews of peer utility program managers | Participant surveys<br><br>Participant trade partner interviews |

*Source: 2017 Xcel Energy Lighting Efficiency Evaluation Plan*

## 1.3 Report Organization

The following chapters organize the evaluation findings into two components: impact and process evaluation results. As illustrated in Table 1-3, each data collection activity contributed to multiple evaluation objectives. Further detail on the evaluation approach is presented in the following chapters. Chapter 2 reviews the approach and results of the impact evaluation and the attribution of product impacts using a customized NTGR analysis. Chapter 3 discusses the process evaluation components, which addressed the lighting control product offering, DLC product offerings, and rebate application research questions. Conclusions and recommendations are presented in Chapter 4. Detailed, descriptive methodology information, evaluation plans, and survey instruments can be accessed in this report's appendices.

# 2. IMPACT FINDINGS

A central component of this evaluation was the estimation of the net-to-gross ratio (NTGR) for the Xcel Energy Lighting Efficiency Product in Colorado. For demand-side management (DSM) programs, the NTGR is a metric that estimates the influence of the program on the target market. It is used to adjust reported gross energy savings to account for energy efficiency that would occur in the absence of a program, and it is also used as a benchmarking indicator of program effectiveness.

NTGR results can indicate opportunities for Xcel Energy to adjust the design and implementation of its products to increase the cost-effectiveness of 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. The evaluation team estimated a retrospective NTGR based on data provided by customers and trade partners, and then recommended a prospective NTGR based on feedback from trade partners relating to the future of the lighting market and potential changes to the product's design. Note that, while a NTGR of 1.0 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 our NTGR results with this context in mind.

This chapter presents:

- **Key findings –** The key findings section presents the recommended prospective NTGR based on the evaluation team's synthesis of findings from market actors and peer utilities.
- **Approach –** The approach section presents an overview of the evaluation team's methods to calculating the recommended NTGR.
- **Net-to-gross ratio inputs –** This section presents qualitative and quantitative data that support the NTGR calculations.

## 2.1 Key Findings: Net-to-Gross Ratio

The participating customer surveys and trade ally interviews found that the Lighting Efficiency Product has played an important role in transforming the C&I lighting market towards LEDs, but the market is also gaining tremendous momentum and expected to be dominated by LEDs over the next few years:

1. Participant trade partners and customers alike indicate high levels of historic product influence and market effects. For example, 90% of 2017 participants reported at least one program factor as highly influential in their decision to purchase efficient lighting products.
2. The lighting market is rapidly transforming toward LED technologies, the primary measures offered by this program. Participating trade partners expect the majority (85%) of their lighting products to be LEDs in 2020, even without future support from Xcel Energy.
3. The best opportunity for future attributable program savings is through promotion of early replacement of fully functional lighting products ahead of their failure or planned replacements.

Based on these findings, the evaluation team provided a number of recommendations to enable the Product to remain impactful, including targeting early replacement of working lighting equipment, expanding trade partner networks, and focusing on advanced lighting control strategies (applying a separate NTGR to that measure).[2] Assuming the Product applies these recommendations, the evaluation team recommends a prospective NTGR of 74% in 2019 for the Lighting Efficiency Product. In absence of the recommended changes the prospective NTGR are estimated to be 67% in 2019. These recommended NTGR should be reassessed should the product team alter the program structure and offerings more significantly.

Table 2-1. Lighting Efficiency Product Recommended Prospective NTGRs

| Prospective NTG Recommendation | 2019 |
|---|---|
| Without Recommended Changes | 67% |
| With Recommended Changes | 74% |

*Source: Apex Analytics Analysis*

Given the unprecedented rapid change of the lighting market and the large contribution to savings of the Lighting Efficiency Product, the evaluation team recommends conducting additional research in 2019 to reduce uncertainty regarding product influence in future calendar years., with the expectation that trade partners will have a clearer view of their anticipated 2020 sales by midyear of 2019. In addition, the evaluation team can re-assess influence on the 2018 program to assess any trends over time in the market. These participating customers from late 2018 will have better recall and more current estimates of program influence to inform future trends. This additional research should include, at a minimum, the following three data collection activities

(1) Participant surveys with Q4 2018 participants,
(2) Trade partner interviews with participant trade partners, non-participant trade partners, and upstream distributers or manufacturers, and
(3) Collecting full category commercial industrial lighting sales data in Colorado, to the extent it is available, support this effort.

Due to the time sensitive nature of these interviews, the evaluation team recommends conducting the participant interviews in Q1/Q2, 2019 and the trade partner interviews in Q2/Q3. The 2019 research should include both trade partner and participants research to mitigate potential bias from the projected and retrospective estimations. These recommended data collection activities will provide additional data points from which to determine 2020 NTGR taking into account the challenges of market effects research. [3, 4]Additional detail on these two activities is provided in the Integration of Results – Recommended Net-to-Gross section.

[2] Chapter 4 contains more details on these recommendations.
[3] The 2019 research can also determine if additional research is needed in 2020 and/or a later year.
[4] For additional information on market transformation, spillover, and free ridership connections, see also "Free ridership and spillover: A Regulatory Dilemma" by William P Saxonis, NYSERDA. *https://www.iepec.org/wp-content/uploads/2018/02/62_1064_ab_585.pdf*

## 2.2 Approach

The final recommended prospective NTGR is based on an estimated retrospective NTGR, input from trade partners' forward-looking view of the lighting market, and potential changes to the product's design. The retrospective estimate utilized a self-report approach (SRA) based on participant survey results in combination with trade partner responses. The projected analysis utilized the trade partner interviews to assess the future market for LEDs and expected market "lift" of the Lighting Efficiency product. Data from the additional sources listed above were then used in constructing a logical narrative of product attribution, and in finalizing the NTGR for the product.

The data inputs to the NTGR analysis included[5]:

- Participant surveys – focused on project-level effects
- Trade partner interviews – focused on overall market effects (project-level effects if relevant)
- Known product changes in upcoming years – factors any known implications for future changes in product design

Table 2-2 outlines the primary data utilized for each NTGR input. These are discussed in more detail below.

Table 2-2. Lighting Efficiency Product NTGR Inputs[6]

| Net-to-Gross Components | Trade Partner Interviews (n=41) | Participant Surveys (n=232) |
|---|---|---|
| Free-ridership | X | X |
| Participant Spillover | | X |
| Non-Participant Spillover | X | |
| Market Effects Indicators | X | |
| Projected NTGR | X | |

*Source: 2017 Xcel Energy Lighting Efficiency Evaluation Plan*

### Free-ridership

Free-ridership is a measure of the amount of a product's claimed savings that would have occurred in the absence of the product. Free-ridership is assessed on a scale from 0 to 10, where 10 indicates that the product had 100% free-ridership and all product savings would have occurred without any of the product's rebates or assistance.

To determine free-ridership, the EMI Consulting evaluation team started with the Core Nonresidential Protocol from the Illinois TRM, using three components of free-ridership, a product components score, a no program score, and a timing adjustment. The SRA methodology used in this

[6] Details on the methodology for the trade partner interviews and participant surveys are offered in Section 3.2

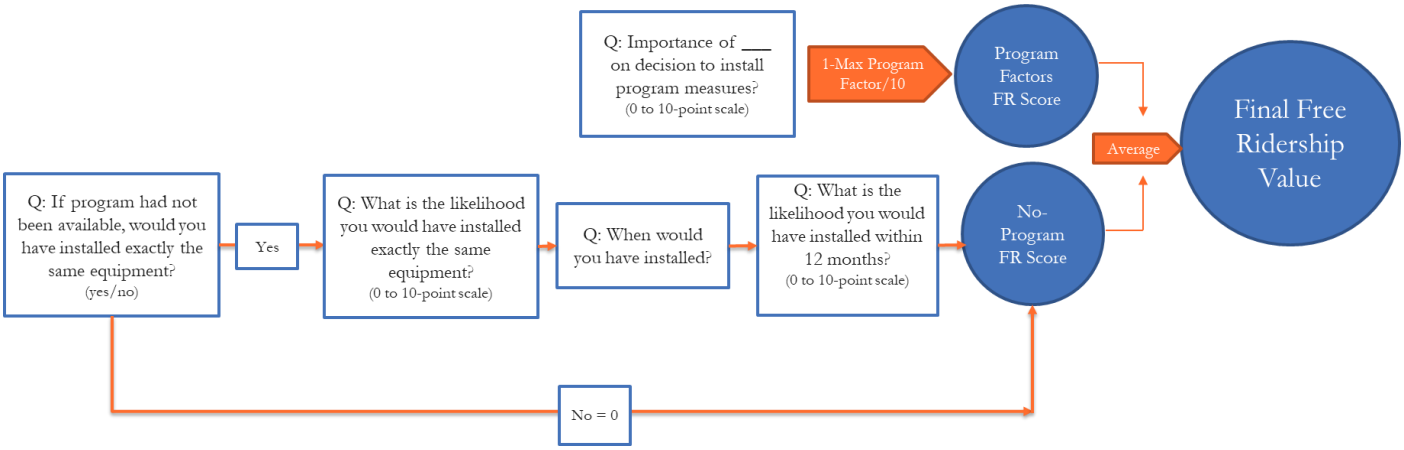
evaluation was built from the Core Nonresidential Protocol in the *2016 Illinois Statewide Technical Reference Manual (TRM) for Energy Efficiency Version 6.0, Attachment A of Volume 4: Cross-Cutting Measures and Attachments*. This methodology was customized to better match the design of the Lighting Efficiency product, plus was modified based on the 2016 Xcel Energy evaluations and 2018 cognitive interviews. The primary changes to the IL TRM algorithm were removing the program influence free-ridership score and setting no program free ridership score to zero if the respondent either (a) first heard about the measure from Xcel Energy, the program, or a program-affiliated trade partner, or (b) if they respond "no" to the binary question asking if they would have installed the exact same measure if the program had not been available (See Appendix G for more details on these changes).

Using this approach, the main three components of free-ridership include:

- A Product Components score, based on the participant's perception of the importance of various product components in their decision to carry out the energy-efficient project;
- A No-Product score, based on the participant's intention to carry out the energy-efficient project without product funds; and
- A Timing Adjustment, based on the participant's perception of when they would have carried out the project in the 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 the timing adjustment applied to create a final free-ridership score.

Figure 2-1. Participating Customer Free-ridership Algorithm for the Efficiency Lighting Product



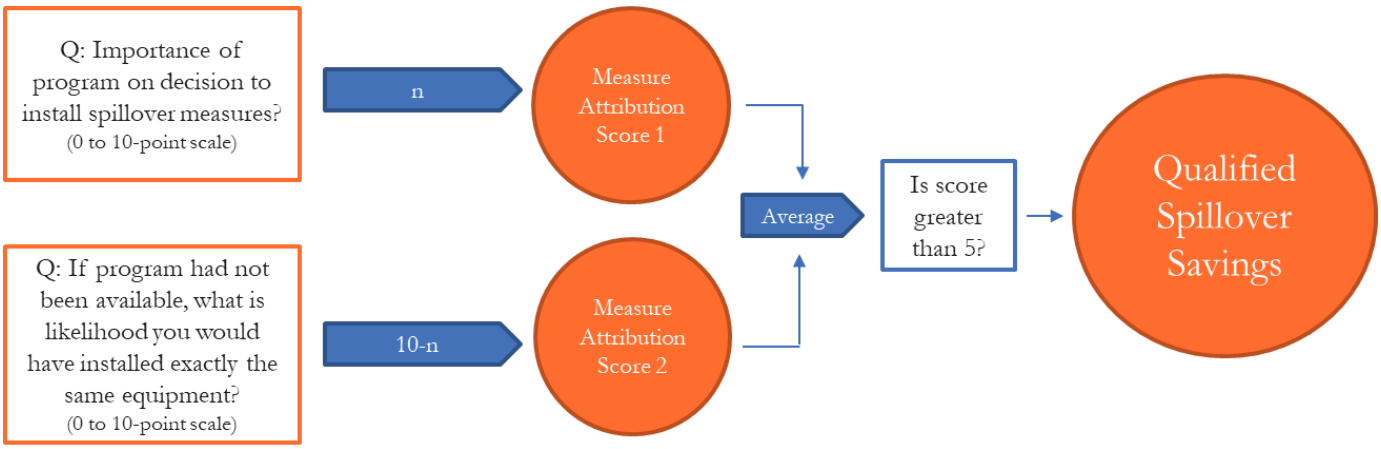

*Source: XCEL ENERGY DSM EVALUATIONS 2017: REVISED C&I NET-TO-GROSS BATTERY (V2)*

## Spillover

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 participant spillover, the evaluation team asked participant customers for information about any additional energy efficient equipment installed outside of the product (for which they did not receive a rebate).[7] The surveys also probed for information on the importance of Lighting Efficiency Product in participant installation decisions and the likelihood that the measures would have been installed if they had not participated in the product. The evaluation team computed savings estimates for all identified spillover equipment following the flowchart reported in Figure 2-2. The product's spillover ratio was calculated by dividing the total spillover savings by the product's total energy savings.

Figure 2-2. Lighting Efficiency Participant Spillover Protocol




*Source: Apex Analytics Analysis*

Because the Product works closely with trade partners, the evaluation team also evaluated trade partner nonparticipant spillover resulting from participant trade partners. Trade Partner nonparticipant spillover, in this instance, is defined as eligible products that did not receive rebates but were influenced by the Product through participant trade partners. This occurs when the trade partner recommends Product eligible products 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 *potential* savings multiplied by the *max program score,* or:

$$\%\ Spillover = (kWh_{potential} * ProgramScore_{max})/kWh_{surveyed}$$

The evaluation team calculated the potential spillover savings input 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. The calculation for this potential spillover savings is:

$$\Delta kWh_{potential} = 2017\ rebated\ kWh\ *\%\ of\ products\ eligible\ *\%\ products\ eligible\ that\ did\ not\ recieve\ rebate$$

[7] Note the evaluation team also conducted site visits as part of the Xcel Energy 2018 Business Lighting Saturation Study to investigate spillover, and determined that no modifications of the telephone survey were warranted. See "Xcel Energy Business Lighting Saturation Spillover Presentation_112718.pdf" for results.

Finally, trade partners assessed the extent the Lighting Efficiency Product influenced the sale of these non-rebated products. Specifically, trade partners assessed the importance of the Product on the following three components

1. Sales of non-rebated products
2. Efficient lighting product recommendations (past and current Product)
3. Efficient lighting product stocking

The evaluation team calculated the maximum Product importance rating from the above components (i.e., the *max program score* in the equation) to assess the influence the Product had on non-rebated lighting product sales. In this instance, the average max program score was 7.5, indicating the program had significant impact on these non-rebated product sales. To create a final spillover estimate, the evaluation team calculates the total kWh of trade partner nonparticipant spillover divided by the total kWh of those trade partners that were surveyed to convert the value into a percentage that is then applied to the population of trade partners.

## Projected Net-to-Gross Indicators

Trade partner interviews also offer important insights into what the market for LED products are expected to be going forward. Participant trade partners were asked to predict market share for LEDs in 2018, 2020, and 2022, under two scenarios: (1) that the Product continues with "business as usual", and (2) that Product ceases support for LEDs. The evaluation team estimated the NTGR as the net increase in LED market share (i.e., the "lift" in share) resulting from the Lighting Efficiency Product.

## Determination of Preliminary Net-to-Gross Ratios

The evaluation team calculated the product's initial retrospective net-to-gross ratio using the following formula:

$$Retrospective\ NTGR = 1 - (Free - ridership\ Ratio) + (Participant\ Spillover\ Ratio) + (Trade\ Partner\ Spillover\ Ratio)$$

The evaluation team calculated the product's initial projected net-to-gross ratio using the following formula:

$$Prospective\ NTGR = \frac{LED\ market\ share\ with\ program - LED\ market\ share\ without\ program}{LED\ market\ share\ with\ program}$$

Using the total LED market share with the program as the denominator, however, provides a conservative NTGR estimate, since not every LED sold through retail channels is submitted for the Product.[8] The *market share with program* metric, therefore, is adjusted to account for products not eligible through the Xcel Energy Lighting Efficiency Product. This adjustment essentially reduces

[8] Products that are not DLC qualified, for example, were not incentivized for the majority of 2017, plus qualifying lamps do not always receive an incentive due to participant preferences.

the denominator by the percent of products ineligible for Product incentives. Based on the survey responses, this was 82% and the evaluation team assumed the same percent going forward

Note that the trade ally market lift approach to estimating a NTGR is conservative for a number of other reasons, including:

- The estimates are based on percent of sales, not total sales, and thus would not pick up a "lift" in the number of sales for trade partners that expect to sell only LEDs. A number of respondents did report that the program would not change their share (since they expected it to be 100% by 2020), but would increase the number of LEDs they sold.
- The NTG estimates do not factor in any potential market effects. As discussed below, the program has influenced the LED stocking, recommendations, and sales for participating trade partners. Thus, the Lighting Efficiency Product has played an important role in transforming the C&I lighting market towards LEDs. The projected market shares asked about the program continuing and discontinuing incentives in 2020, and thus would not capture past influence (i.e., the interview would not capture the extent to which the program helped accelerate the transition to LEDs).

As a result, the evaluation team considers this calculation an indicator of future program influence and not a quantitative estimate.

Finally, the evaluation team utilized all the information collected about the product – through trade partner interviews, participant surveys product benchmarking, and proposed product changes – 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, we developed a final recommended prospective NTGR that is consistent with this narrative.

## 2.3 Net-to-Gross Ratio Inputs

As described in the approach section, the recommended NTGR is based on four primary data inputs: free ridership, spillover (participant and non-participant), market effects indicators, and projected NTGR estimates. This section explores each of these results in more detail, including qualitative data that supports the results. The evaluation found an overall participant free ridership of 8.2%, participant spillover of 2.2%, non-participant spillover of 2.1%, and a retrospective NTGR of 96.1% (Table 2-3).

Table 2-3. Lighting Efficiency Product Retrospective NTGR Findings

| Retrospective Net-to-Gross Components | Xcel Energy Evaluated Estimate |
|---|---|
| Free-ridership | 8.2% |
| Participant Spillover | 2.2% |
| Non-Participant Spillover | 2.1% |
| 2017 Retrospective NTGR | 96.1% |

*Source: Apex Analytics Analysis*

The evaluation also estimated overall trade partner projected NTGR of 9% in 2020 and 4% in 2022. As noted above, however, these estimates do *not* capture increases in sales or the impact of market effects, and thus should be considered directional indicators of a rapidly transforming lighting market.

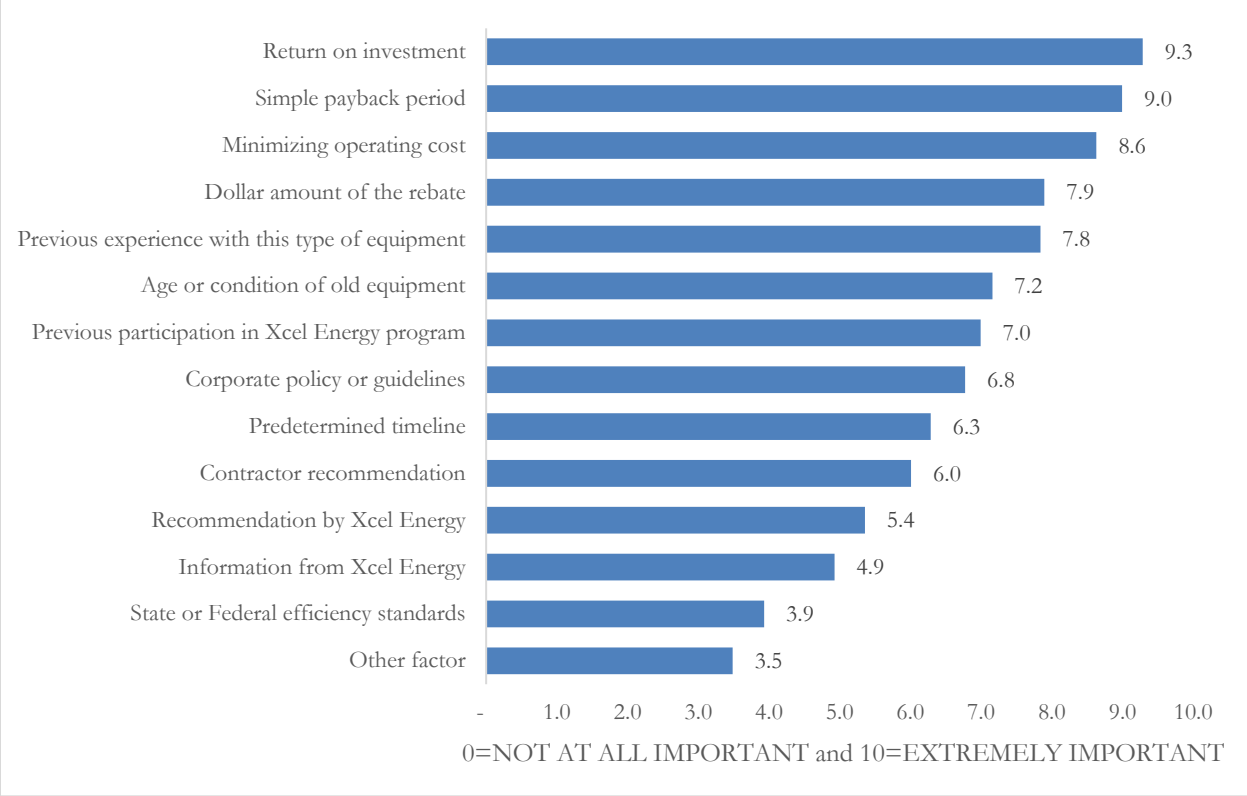
### Retrospective Free-Ridership Results

As mentioned above, there are three components of the participant free-ridership score: a product component score, no-product score, and timing adjustment. For the product component score, the three most important program factors on a participant's decision to install a measure were rated in the following order: 1) the return on investment, 2) the payback period, and 3) the dollar amount of the rebate (Figure 2-3). The two factors "return on investment" and "payback period" were only considered a product factor if the respondent reported that the program either increased the return on investment or shortened the payback period. Similarly, the "contractor recommendation" factor was only considered a product factor if the referenced contractor indicated the product influenced their recommendations. There were nine participant customers that rated the contractor recommendation as more important than any other factor. The evaluation team conducted follow-

up interviews with six of these contractors and learned that all six vendors are considered a product factor since the product influenced their recommendation to implement the project.[9]

The three most important non-product factors on a participant's decision to install a measure were rated in the following order: 1) minimizing operating cost, 2) previous experience with the equipment, and 3) the age or condition of the old equipment (Figure 2-3).

Figure 2-3. Average Importance Scores of Program and Non-Program Factors




*Source: Participant Customer Survey Results. Population=All responding participant customers. N=232 (sites)*

For the no-product score, almost half of the participant customers (46%) reported that they would not have installed the exact same type, quantity, model and efficiency of equipment in absence of the program. Approximately a third (36%) said that they would have installed the measures had the program not been available. For the timing adjustment, almost half (48%) of the respondents that said they would have installed the measures in absence of the program said they would have done so within 12 months of installation.

[9] The six contractor or trade partners were considered a program factor based on the qualifications reported in section 3.1.1.3 in the IL TRM Cross-Cutting Measures protocol: http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_6/Final/IL-TRM_Effective_010118_v6.0_Vol_4_X-Cutting_Measures_and_Attach_020817_Final.pdf

The evaluation team weighted the average free-ridership estimate for each measure by the proportion of savings represented in the 2017 program, for an overall program free-ridership estimate. Individual measure level average free-ridership values are offered in Table 2-4.[10]

Table 2-4. Lighting Efficiency Product Retrospective Free-ridership Estimates by Survey Strata

| Strata | Average FR | Contribution to Savings | N = (sites) |
|---|---|---|---|
| Custom Lighting | 10.7% | 31% | 66 |
| Linear LEDs and Troffers | 7.6% | 38% | 108 |
| Lighting Control Strategies | 19.2% | 1% | 5 |
| Other Measures | 6.0% | 30% | 53 |
| Combined | 8.2% | | 232 |

*Source: Apex Analysis of Participant Customer Survey Results and participant database. Population=All responding participant customers. N=232 (sites)*

## Retrospective Participant Spillover Results

The evaluation team found an overall participant spillover of 2.2%. There were seven participant customers that reported qualified spillover measures. Qualified spillover measures reported were: LED tubes, LED lamps, T5 LEDs, motion sensors, troffers, down-lights, LED exterior lights, and Linear LEDs. Participant customers gave the following responses when asked why they did not apply for a rebate on these lighting products:

*"It wasn't worth the trouble of filling out the paper work"*

*"It can sometimes be cumbersome to go through the rebate process"*

*"We should be (applying), but haven't gotten around to it"*

## Retrospective Trade Partner Nonparticipant Spillover Results

The evaluation team found evidence of 2.1% non-participant spillover through trade partners. This spillover was corroborated through interviews; When asked why they did not apply for a rebate on these eligible lighting products, trade partners provided the following response:

*"Project too small for time/paperwork"*

*"Sometimes the lighting efficiency rebate forms are a pain to get in, in time; forms are time consuming"*

*"Customer didn't pursue it and I didn't have time to deal with it myself; we are a smaller company without much office support"*

[10] Note the free-ridership estimates are not statistically valid at the measure level; they are provided for qualitative purposes.

## Retrospective Market Effects Indicators

The evaluation team assessed market effects indicators through the trade partner interviews. The results indicate a high degree of market effects from the lighting efficiency product. Specifically, trade partners assessed the importance of the product on efficient lighting product recommendations and stocking practices. Additionally, trade partners provided the likelihood they would recommend energy efficient products if the program had not been available. On a zero to ten scale, where ten was very important, trade partners reported the Lighting Efficiency Product was highly influential on their product recommendations (7.8 and 8.0 average scores) and stocking practices (7.3 average score, Table 2-5).

However, they also indicated that they were likely to continue recommending energy efficient products if the Lighting Efficiency Product was not available (7.7, Table 2-5), indicating that the program would have less influence on their recommendation practices in the future than it had in the past (i.e., while the program was important for getting trade partners to recommend efficient lighting, many respondents would continue to do without future program interventions).

**Table 2-5. Importance of Lighting Efficiency Product on Market Effects Indicators**

| | Average Score [0-10 Scale] |
|---|---|
| Product recommendations (past participation) | 7.8 |
| Product recommendations (current product) | 8.0 |
| Product stocking | 7.3 |
| Likelihood of recommending energy efficient products if Lighting Efficiency program was not available | 7.7 |

*Source: Trade Partner Survey. Population=All responding trade partner participants. N=41*

## Projected Net-to-Gross Indicators

Interviewed participant trade partners indicated that the market share of LEDs is increasing, both with and without program intervention. Seventy-one percent of respondents expect to sell at least 90% LEDs in 2020 without Lighting Efficiency Product offerings. They estimated 82% of the products they sell were LEDs in 2017 but expect that share to grow in 2020 and 2022 regardless of product support (Table 2-6). However, several respondents indicated that while their LED market share would likely increase, the quantity of sales would be negatively impacted if the product were discontinued in 2020.

Table 2-6. LED Market Share With and Without Lighting Efficiency Product

| | Percent LEDs w/ Product | Percent LEDs w/out Product |
|---|---|---|
| 2017 | 82% | n/a |
| 2020 | 90% | 85% |
| 2022 | 94% | 89% |

*Source: Apex Analysis of Trade Partner Survey Results. Population=All responding trade partner participants. N=35*

The evaluation team used these responses to calculate a projected NTGR (Table 2-7). High and mid/low performing trade partners indicated similar levels of projected NTGRs. As discussed above, we consider these values indicators of future program performance and as a such, have used these data points as part of our triangulation to recommend a 2019 value.

Table 2-7. Lighting Efficiency Product Projected NTGR Findings, by High and Mid/Low Performing trade partners

| | NTGR High Performers | NTGR Mid/Low Performers | Overall NTGR (weighted) |
|---|---|---|---|
| 2020 | 10% | 8% | 9% |
| 2022 | 5% | 5% | 4% |

*Source: Apex Analysis of Trade Partner Survey Results. Population=All responding trade partner participants. N=33*

## Peer Program Net-to-Gross Ratios

Comparable peer utility NTGRs vary between 71% and 85% (Table 2-8). Two of the four peer utilities (Utilities 1 and 2, shaded below) are subject to retrospective evaluation, as such, their NTGR will be updated and applied to the evaluated retrospective program years; these NTGR policies are incongruous with the Colorado policy of evaluating and locking in a prospective NTGR. Utility 1 is moving their baseline to an LED bulb and are likely discontinuing any prescriptive lighting offerings going forward. In addition to the identified peer program NTGRs, the evaluation team also researched other commercial/industrial lighting programs applying prospective NTGRs; ComEd and Ameren Illinois recently posted the following prospectively applied NTG ratios. Note the Illinois NTGR estimates are based on research conducted one to two years prior.

Table 2-8. Peer Program C&I Lighting NTGR Findings, by Product Type [b]

| | Utility 1 | Utility 2 | Utility 3 | Utility 4 | ComEd [d] | Ameren [e] |
|---|---|---|---|---|---|---|
| Years Applied | 2018[c] | 2018[c] | 2018 | 2018-2019 | 2019 | 2019 |
| Custom | | 98% | 90% | 85% | | |
| Prescriptive | 91%[a] / 60% | | | 71% | 83% | 78% |

[a] 91% NTGR is applicable to high bay and outdoor lighting, 60% to all other measures

[b] The fifth interviewed utility claims only gross savings; no NTGR applied

[c] These values are used as a placeholder by their respective utilities; net savings are adjusted through evaluation and NTG is applied retrospectively

[d] Source:
http://ilsagfiles.org/SAG_files/NTG/2019_NTG_Meetings/Final_Values/ComEd_NTG_History_and_CY2019_Recommendations_2018-10-01.pdf
[e] Source:
http://ilsagfiles.org/SAG_files/NTG/2019_NTG_Meetings/Final_Values/AIC_2019_NTGR_Recommendations_Summary_FINAL_2018-09-25.pdf
*Source: Apex Analysis of Peer Utility research*

## Integration of Results – Recommended Net-to-Gross

The evaluation team used data from participant customers and trade partners to develop two initial NTGRs, then confirmed that they aligned with a logical narrative of program attribution to create our recommended, prospective NTGR based on our informed forecast of product influence in an evolving market. Details of that narrative are provided below.

As previously stated, applying the retrospective estimate would overstate future program attribution for the following reasons:

- **LED prices are dropping.** Payback and ROI for efficient lighting products, the primary motivators reported by participants, look more attractive to customers even without program interventions as LED prices continue to drop.
- **LED market share is increasing.** Trade partners reported that market share for LEDs is increasing rapidly, with and without program support, with LEDs becoming the predominate lighting technology over the next few years. Lighting purchasers will experience considerably fewer barriers to adopting energy efficient lighting products, and customer retrospective NTGR does not account for these changing market conditions.

Similarly, applying the initial trade partner projected estimates would understate the NTGR for the following reasons:

- **Product influence on accelerated replacements.** These estimates do not account for an increase in quantity associated with any accelerated replacement induced by the Product.
- **Historical influence of product in market.** Nor do these estimates capture the market effects influence the Product has had on the stocking, recommendations, and sales of efficient lighting products.

To develop a final recommended prospective NTGR, the evaluation team conducted the following analysis to create our informed forecast:

- The evaluation team started with a midpoint of these two values for the initial 2020 NTGR estimate (53%). The evaluation team considered using a weighted average of the two values, but there was insufficient evidence to weight one value more than another (i.e., to consider the validity or biases greater or lower in either of the estimates). Past participants will have a bias for over-reporting influence as their perception is based on a snap-shot in time and does not reflect the changing market landscape. Similarly, while market actors can report on market trends (given their continuous involvement), they may under-report program influence on accelerated replacements. Therefore, the evaluation team determined that midpoint is the best approach and in-line with best practices in NTG forecasting.
- Next, the evaluation team adjusted the midpoint value to account for recommendations Xcel Energy can implement to increase its influence in the market over time. The evaluation team

made a number of recommendations to increase product attribution including targeting early replacement of working lighting equipment, expanding trade partner networks, focusing on lighting control strategies, and re-evaluating the NTG in 2019.[11]

- Next, the evaluation team assumed a linear decline in attribution between the 2017 value (96.1%) and 2020 estimates results in a recommended NTGR of 74% in 2019 with recommendations adopted and 67% without adopting recommendations (Table 2-9).
- Finally, for comparison purposes, the evaluation team researched results of other utilities that are subject to and have locked in prospective NTGR values. The evaluation team found that the recommended prospective NTGR was slightly lower than the prospective (2019) C&I prescriptive lighting values for both ComEd (83%) and Ameren (78%) in Illinois. The one peer utility included in our evaluation that does apply a prospective NTGR, uses an 85% for custom and a 71% for prescriptive C&I lighting measures for 2019. When weighted to the Xcel Energy custom lighting and prescriptive lighting measure distribution, these values translate to an aggregate prospective NTG of .76 in 2019. Figure 2-4. depicts how these values align across time.[12]

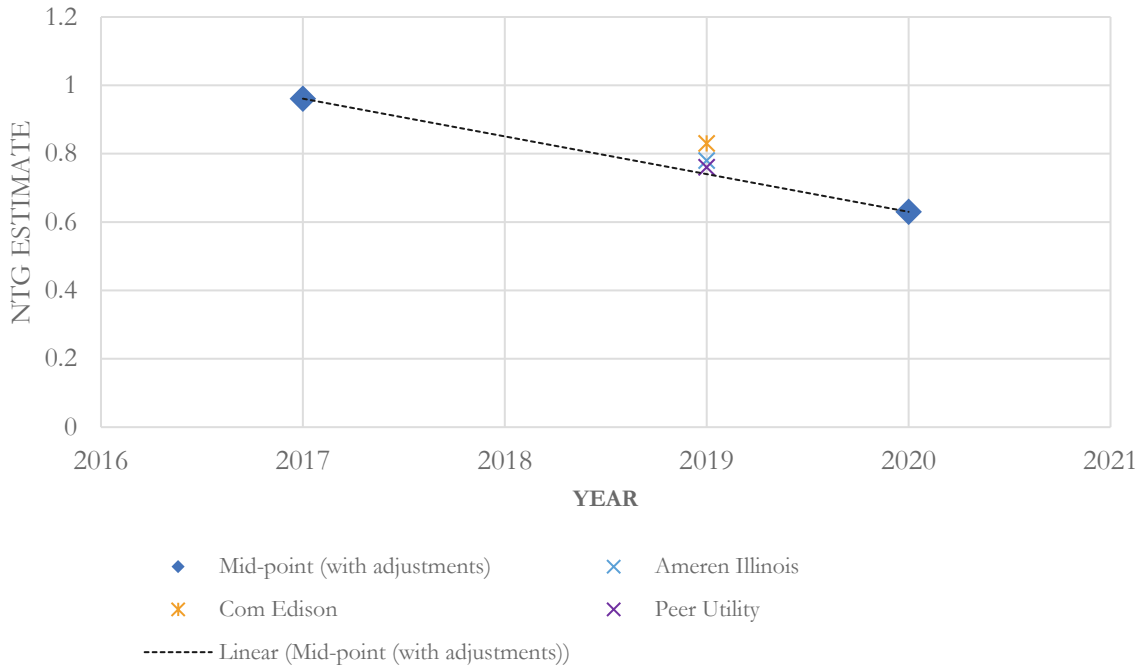
Table 2-9. Lighting Efficiency Product Recommended Prospective NTGRs

| Prospective NTG Recommendation | 2019 |
|---|---|
| Without Recommended Changes | 67% |
| With Recommended Changes | 74% |

*Source: Apex Analytics Analysis*

[11] Chapter 4 contains more details on these recommendations.
[12] Note that figure 2-4 does not included values that are subject to retrospective evaluation.

Figure 2-4. Prospective NTGR Comparison



Given the unprecedented rapid change of the lighting market, the evaluation team recommends conducting additional research in 2019 to reduce uncertainty regarding product influence in future calendar years., with the expectation that trade partners will have a clearer view of their anticipated 2020 sales by midyear of 2019. In addition, the evaluation team can re-assess influence on the 2018 program to assess any trends over time in the market. These participating customers from late 2018 will have better recall and more current estimates of program influence to inform future trends. This additional research should include, at a minimum, the following three data collection activities

(1) Participant surveys with Q4 2018 participants,
(2) Trade partner interviews with participant trade partners, non-participant trade partners, and upstream distributers or manufacturers, and
(3) Collecting full category commercial industrial lighting sales data in Colorado, to the extent it is available, support this effort.

Due to the time sensitive nature of these interviews, the evaluation team recommends conducting the participant interviews in Q1/Q2, 2019 and the trade partner interviews in Q2/Q3. The 2019 research should include both trade partner and participants research to mitigate potential bias from the projected and retrospective estimations:

**Participant customer surveys.** The evaluation team recommends surveying a statistical sample of October – December, 2018, Lighting Efficiency participant customers. These surveys should include a NTGR battery of questions, with additional probes to assess potential quantity increases and reasons for replacing equipment (early replacement vs. replace on burnout). To maximize participant recall, the surveys should be conducted no later than Q2, 2018.[13] To the extent Xcel Energy plans to change program offerings, the sample should focus on participants receiving newly offered measures.

**Trade partner surveys.** The evaluation team recommends updating the 2018 trade partner interviews through 2019 research. The interview guide should include the projected NTGR battery conducted in 2018, explore potential increases in sales (quantity) attributed to the Lighting Efficiency program, plus consider exploring attribution for different types of products (e.g., kits vs lamps). In addition to the participant trade partners interviewed in 2018, the evaluation team recommends interviewing non-participant trade partners and upstream actors, such as lighting distributers and/or manufacturers active in Xcel Energy's Colorado service territory.

With these data, the evaluation team would then have four data points (2017 and 2018 participants, plus trade partners in 2018 and 2019) reflecting program influence at different periods in time to develop a "best fit" estimate for the 2020 prospective number. Starting with the 2017 retrospective estimate, the evaluation team recommends plotting the 2018 updated retrospective estimate and the average projected estimate from Trade Partners to estimate market influence in 2020.[14]

[13] To meet this timeframe the evaluation team will need clean 2018 participant contact information by March 2019.
[14] The 2019 research can also determine if additional research is needed in 2020 and/or a later year.

# 3. PROCESS EVALUATION

In addition to calculating a recommended NTGR, the evaluation team conducted a process evaluation to determine whether Xcel Energy can optimize the design and delivery of the Lighting Efficiency Product to its customers. Specific research objectives of the process evaluation are listed in the bullets below:

- Identify barriers and programmatic adoption strategies for lighting controls: What are the most common barriers for adoption and how can Xcel Energy overcome them? How are other utilities encouraging the adoption lighting controls?
- Investigate DLC and non-DLC offerings: What qualified product lists (QPL) do other utilities require? How do participant trade partners and customers view the DLC certification?
- Assess application form: How satisfied are participants with the online application process? Why are/are not participants using the online application? What do participant trade partners and customers see as ways to improve the application?

To accomplish these objectives, the evaluation team elicited feedback from product staff, participant trade partners, participating customers, and program managers of similar programs. 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. These findings, along with findings from the impact evaluation, inform the conclusions and recommendations presented in the next chapter.

## 3.1 Key Findings

The evaluation team found valuable insights from each of our three primary research objectives. On lighting control strategies, the evaluation team found that lighting controls are not fully implemented among participant customers and trade partners, and there is limited awareness of Xcel Energy rebates for these products. Similarly, participant customers and trade partners report cost as a primary barrier to adoption for lighting controls, indicating opportunities for the Lighting Efficiency Product to increase adoption by further lowering the up-front cost of these technologies. Peer utilities offered examples of their successful lighting control strategies campaigns, such as targeting specific facility types, as options for Xcel Energy to consider in their implementation strategies.

During our investigation of DLC-qualified products, the evaluation team found that trade partners have a high level of awareness of the qualifications, and most sell at least some DLC-qualified products. High performing trades were more likely to be enthusiastic about the DLC-qualifications, both as an indication of quality, and because of the higher rebate. However, mid/low performing trades tend to be more skeptical of the DLC-qualifications. Participant customers were largely unaware that the incentivized product they purchased was DLC-qualified. Those that are aware of the qualifications most commonly looked for the qualifications due to the Lighting Efficiency Product rebate requirements. A slight majority of trade partners agreed with the decision to rebate non-DLC-qualified products, but there were strong opinions on both sides of the discussion.

In general, trade partners more commonly submit online applications, while participant customers are mailing in paper applications. Trade partners' suggestions for improving the application process were mostly centered around the online application. They expressed concerns that the online application is a fillable PDF form rather than a true online application; The evaluation team believes that surveyed trade partners may not be aware of the true online application already offered through Xcel Energy. The most common suggested improvements on the applications were the options to save unfinished work and complete later, submit signatures electronically, and auto-populate fields where applicable. Additionally, there were specific requests to "reduce the need for labor invoices," and "combine old and new equipment fields into the same section." Participant customers widely suggested to "reduce the length" of the application as a recommendation for improvement.

## 3.2 Approach

To accomplish the evaluation objectives for the Lighting Efficiency product, the evaluation team completed a suite of intersecting and complementary research activities in 2018. Detailed information on the sampling approach used for the research can be accessed in Appendix A. The following discussion highlights the research topic coverage contributed by each research activity: the staff interviews, participant surveys, trade partner interviews, and benchmarking interviews.

### Staff Interviews

The evaluation team conducted in-depth interviews of Xcel Energy personnel involved with the CO Lighting Efficiency product early in the course of this evaluation. The staff interviews covered the following topics:

- Assess the extent to which the product design supports product objectives and participant service/satisfaction objectives.
- 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 inclusions to the evaluation plan

Appendix B presents the interview guide used for these discussions.

### Participant Surveys

The evaluation team conducted telephone surveys with participant customers using customer records from Xcel Energy for the sample frames. The evaluation plan used for this project can be found in Appendix A. Sample sizes for the participant surveys were set at levels adequate to provide a 90% level of confidence with a minimum of +/- 10% relative precision for each survey strata; custom lighting and linear LED achieved surveys exceeded that precision, however the other measures and lighting control strategies fell short (Table 3-1). Overall, the survey achieved 5.2% precision at the 90% confidence level, and an 18% response rate.

For the purposes of this evaluation, a participating customer was defined as any customer that closed a lighting efficiency product in 2017. During the sample selection, the evaluation team discovered a significant proportion of participant contacts managed more than one participant sites.

When the evaluation team surveyed a participant that managed more than one participant site, the team assessed through the survey whether the decision-making process was uniform throughout the sites, or if it differed. If the process differed, the survey responses would apply to a single site, when it was uniform, their responses applied to all relevant sites on record. Table 3-1 provides the target surveys, achieved surveys, and achieved precision for each survey strata.

Table 3-1. Lighting Efficiency Participant Surveys (Sites), by Strata

| Strata | Target Surveys | Achieved Surveys | Achieved Precision @ 90% Confidence |
|---|---|---|---|
| Custom Lighting | 40 | 66 | 7.5% |
| Linear LEDs and Troffers | 62 | 108 | 9.2% |
| Lighting Control Strategies | 34 | 5 | 35.9% |
| Other Measures | 68 | 53 | 11.1% |
| Total | 204 | 232 | 5.2% |

*Source: Participant Customer Survey.*

The participant survey was also designed to address the following:

- Lighting control strategies; motivations and barriers
- DLC products; awareness of DLC requirement, and satisfaction with their product
- Application Experience; the application process, including awareness of the online application
- Level of free-ridership
- Product-induced spillover effects

The participant survey is presented in Appendix B.

## Trade Partner Interviews

The evaluation team conducted in-depth interviews with participating trade partners (i.e., installing contractors and vendors). Participating trade partners were defined as trade partners with identified participation in the product, based on Xcel Energy participation records. These interviews were conducted by professional evaluators familiar with the lighting market. The evaluation team completed surveys with 41 randomly sampled trade partners as part of this effort, stratified between active and less active trade partner participants to ensure a representative group (Table 3-2). The evaluation team defines high performers as trade partners that return more than 1% of total product rebate dollars, mid performers less than 1% of rebate dollars. Response rates for this effort were remarkable, achieving a 36% response rate. In total, respondent trade partners represent 30% of 2017 Product claimed savings. The 41 surveys provide 12% precision at the 90% confidence level.

Table 3-2. Lighting Efficiency Trade Partner Interviews, by Strata

| Strata | Population | Percent of Rebate ($)[b] | Achieved Surveys |
|---|---|---|---|
| High Performers | 38 | 57% | 16 |
| Mid/low Performers | 256 | 25% | 25 |
| Total | 274 | 82% | 41 |

*Source: Trade Partner Survey and participant database.*

Data collected in the trade partner research included:

- Satisfaction and awareness; experience with the Lighting Efficiency product
- Perspective on lighting control strategies, including barriers
- Application experience
- Market share of high efficiency equipment

Appendix B presents the interview guides used for the trade partner research.

## Benchmarking Interviews

This evaluation team examined five peer utilities to benchmark the Xcel Energy product against others in the industry, assessing product design and delivery and key performance indicators (e.g., participation levels, free-ridership). The evaluation team conducted in-depth interviews with program managers to address the following topics:

- Target segments and program design
- Savings goals and participant incentives
- Qualified products, offerings for advanced lighting controls
- Net-to-gross methodology
- Net-to-gross ratios values
- Cost per kWh saved

To provide important contextual information, additional descriptive program information was collected, including eligible measures, product implementation strategies and engagement practices.

Appendix B contains the interview guide used for the benchmarking interviews.

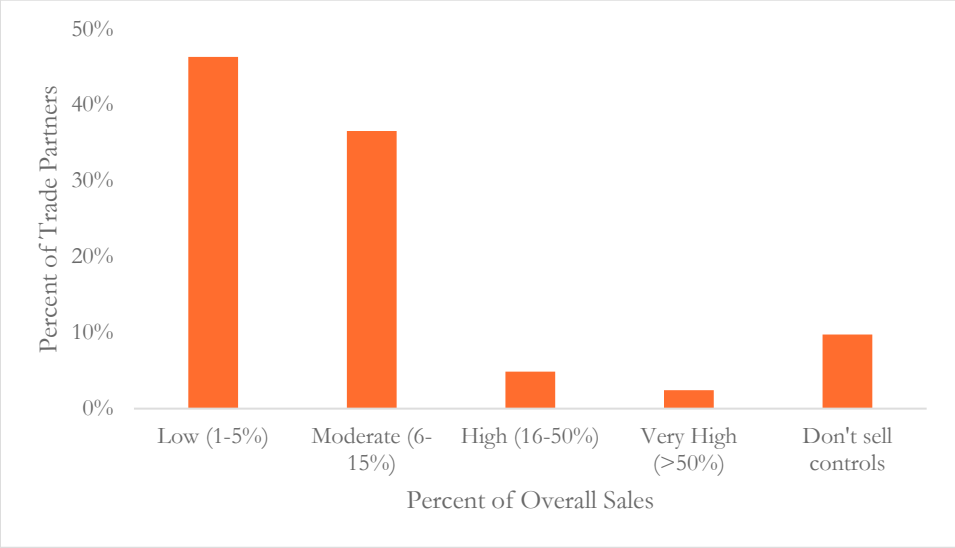
Data on the process evaluation topics are presented below. Because the sample frames were not stratified, no data weighting was applied in the analysis. The synthesis of findings places an emphasis on helping Xcel Energy interpret participant and trade partner perspectives and identifying actionable opportunities for improving product operations and marketing.

## 3.3 Lighting Control Strategies, Barriers and Adoption (Research Objective 1)

The aim of this research objective was to identify barriers and programmatic adoption strategies for lighting controls, as Xcel Energy staff viewed these technologies as opportunities for increased program support in the future.

Nearly all the trade partners we spoke with (37 of 41) sold lighting controls, but as a small part of their overall business, with 83% of respondents saying controls comprises 15% or less of their sales (Figure 3-1).

Figure 3-1. Lighting Controls: Percent of Overall Trade Partner Sales




*Source: Trade Partner Survey. Population=All responding trade partner participants. N=41*

Almost half (49%) of participant customers were not aware that Xcel Energy offers rebates for indoor LCS; Three-quarters of trade partners (76%) were aware that Xcel Energy offers rebates for indoor lighting controls.

Among participant customers, 62% of respondents reported having at least one lighting control strategy (LCS) installed at their facility, however, LCS did not cover all the lights at the facilities. LCS covered an average of 28% of facility lighting among all participant respondents, indicating there is remaining saturation potential of these technologies.[15]

Among participant customers that purchased LCS through the Lighting Efficiency Product, cost was the most common barrier to adoption, with 33% indicating cost as a barrier. Among participant

[15] Chapter 4 contains more details on these recommendations.
[15] Note the forthcoming Xcel Energy C&I Lighting Saturation study will provide onsite estimates of load control strategies.

customers with LCS installed outside the program, the most common barrier to further installations were that there wasn't a need for more LCS (23%), there is a need for lights to be on all of the time (16%), and that cost is prohibitive in installing more LCS (16%).

Similar to participants, when asked to describe the barriers participant trade partners face in selling lighting controls to their customers, the most common response was the cost of the equipment, with 18 of 40 (45%) giving this response. When asked to expand on the cost issue, three respondents talked about return on investment, and the difficulty in making the case to customers that LCS equipment are worth the cost, especially with more lighting being more energy efficient than in the past. One said, "In the past when lights consumed a lot of energy, they were worth it. Now, maybe only a huge office building."

We also asked trade partners what would encourage customers install lighting controls. Respondents thought customers responded well to a good value proposition, whereby the contractor can show the energy and cost savings potential of controls, as well as the convenience and "control" they can provide over energy use. One respondent said controls are more attractive in certain applications, such as classrooms, where a teacher may want bright light for testing, but more subdued lighting for other times.

All five of the benchmarked utilities offered incentives for advanced lighting controls through either their prescriptive or custom programs. Several respondents noted challenges related to offering controls – namely that they exceed code requirements, which can be particularly challenging in some states like California. These managers noted it is difficult to encourage the average non-residential customer to install controls and that participation to date has been largely limited to early adopters of the technology.

However, two respondents shared control-related tactics that have proved successful:

- The program manager for Utility #3 described an advanced lighting control program that has "really taken off." The utility pays $0.75/square foot for classrooms and retail space. The program identified a dozen or so different attributes, of which the control must possess at least three to qualify for the incentive. The program also offers training for trade allies on advanced lighting and network lighting systems. While early, the manager said they are "seeing some good success stories".
- A second program manager (for Utility #5) said their prescriptive daylighting and occupancy "really resonates with a number of segments", specifically citing hospitality and retail. The manager noted their program design allow flexibility (e.g., customers they can control by remote or an integrated sensor).

## 3.4 Investigation of DLC-Rated and Non-DLC-Rated Offerings (Research Objective 2)

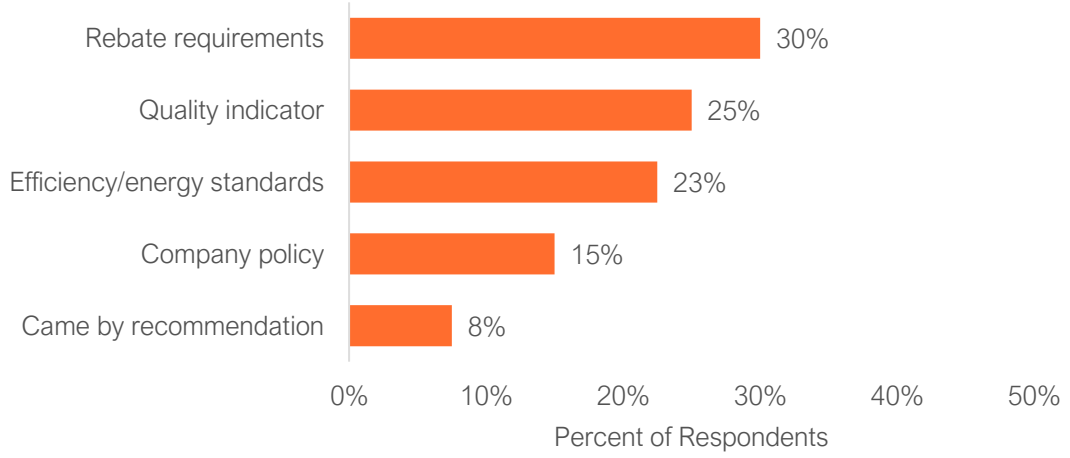
DLC is a non-profit organization that creates and maintains quality specifications for commercial lighting products.[16] In order to be qualified by DLC, lighting products must meet a variety of technical requirements and undergo product testing at an accredited laboratory. While product

[16] https://www.designlights.org/

qualifications create a baseline for quality, they are also time consuming and potentially expensive for the manufacturers. This research objective aimed to assess trade partner and participant views on DLC-qualified products, particularly in response to the recent programmatic change to allow non-DLC-qualified products to be incentivized. Participating customers and trade partners were asked about their general awareness of the DLC qualifications and their attitudes and actions towards purchasing and/or recommending DLC-qualified products.

Awareness of DLC qualifications was low among participants. While all participating customer respondents, except for one, submitted a rebate on a DLC-qualified product, only 35% of these participant customers were aware that the product was DLC-qualified. Similarly, only 33% of these participant customers look for the DLC qualifications when purchasing lighting products. The participant customers that look for the DLC qualifications reported the top two reasons for doing so were rebate requirements (30%) and indicator of quality (25%). Figure 3-2 reports participant customer reasons for seeking DLC-qualified products.

Figure 3-2. Reasons Participating Customers Consider DLC Rating




*Source: Participant Customer Survey Results. Population=Participant customers that look for DLC qualifications. N=40*

Participant customers that reported they do not look for the DLC qualifications when choosing lighting products most often reported the reason for not doing so was that they were not aware of the DLC qualifications system (9 of 27). Another third reported that the decision is not up to them since they rely on recommendations from others such as vendors, contractors, architects, etc. to select products.

Nearly all trade partners interviewed sell DLC-qualified lighting products and were aware of the qualifications system (97% sell DLC products). Secondly, 74% of trade partners said they take the DLC qualifications into account when recommending products to their customers, many of them explaining they do so because they believe DLC-qualified products are higher quality. Some trade partners cited the higher rebate amount for DLC-qualified products as a reason for recommending them.

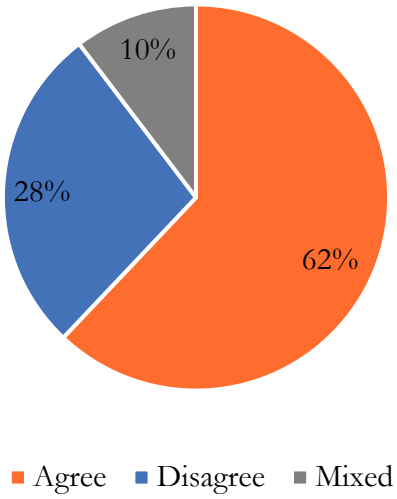
Trade partners held varying views on the value of the DLC qualifications at indicating LED quality. The evaluation team found that high performing trade partners were more likely to hold a positive

opinion of the value of the DLC qualifications, giving an average rating of 7.7 on a scale of 0-10. Mid-low performing trade partners were more likely to be skeptical of the value of the DLC qualifications, in some cases also questioning its legitimacy. One mid-low performing trade partner said, "If the companies are willing to pay for the [DLC] rating, they will get it." Mid-low performing trade partners gave the value of the DLC qualifications system a 5 on average.

Xcel Energy recently (November 2017) made a change to its incentive requirements to allow non-DLC-qualified products to receive incentives, although at a lower rate than DLC-qualified products. As Figure 3-3 shows, trade partners mostly agreed with this change – with 62% (18 of 29) agreeing with the change vs. 28% disagreeing (8 of 29). Three respondents had mixed feelings about the change. Those who agreed with the change cited the following reasons:

- Appreciate the flexibility in choosing the right product for customers
- Can buy a non-DLC bulb that is just as good as a DLC

Figure 3-3. Trade Partner Opinion of Adding Non-DLC Rebate




*Source: Trade Partner Survey. Population=All responding trade partner participants, excluding "Don't know". N=29*

Those participant trade partners who disagreed with the addition of non-DLC-qualified products expressed concern about lower quality products in the market. Three respondents offered mixed opinions of the change, with one saying "You're opening the door to products that are less quality. But you're also including low quality stuff that comes straight from China. But at the same time, you give start-up lighting companies an opportunity to sell non-DLC products because it's expensive to get DLC rating."

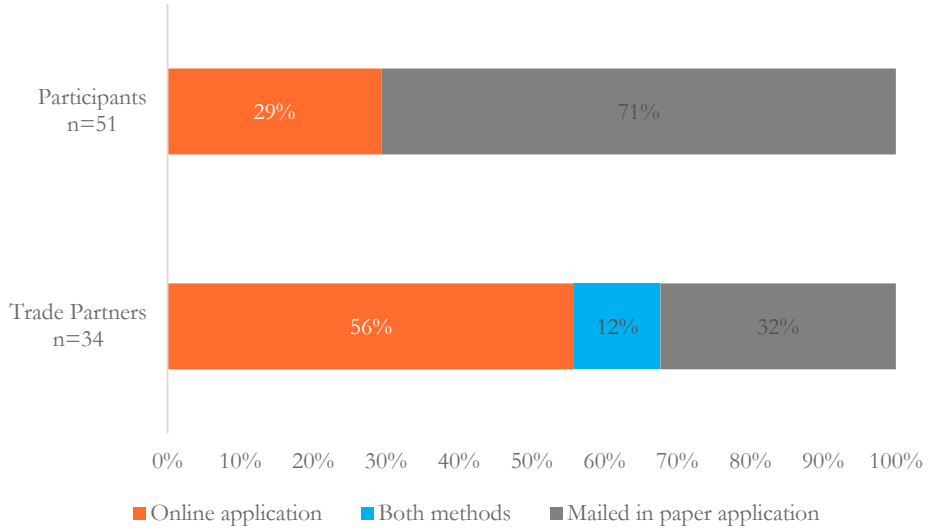
Two of five peer utility program managers reported their program requires rebated products be either DLC or ENERGY STAR certified, two utilities require their rebated products be DLC-qualified, while the remaining one utility offers a reduced incentive for non-DLC-qualified products.

## 3.5 Assessment of Application Form (Research Objective 3)

The final process evaluation topic addressed the Lighting Efficiency Product application form and views regarding the online application.[17] Most trade partners (78%) interviewed said they filled out the program applications for their customers. Similarly, the majority of participating customers (52%) surveyed said their contractors filled out the application for them. Many trade partners described the Xcel Energy Lighting Efficiency program as an integral part of their business model, so filling out the application is included in the services they provide.

In general, trade partners are submitting online applications, while customers are mailing in paper applications. Figure 3-4 shows that only 29% of participant customer respondents submitted their application online, whereas 68% of trade partners used the online application option for at least some of their submittals (56% exclusively online, 12% both methods).

Figure 3-4. Application Submittal Method by Respondent Type

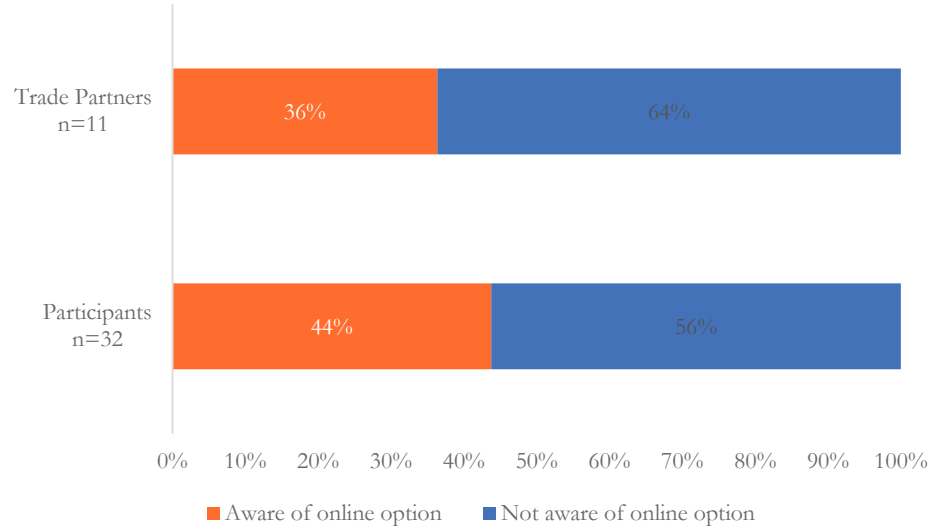



*Customer response rate is low since 52% of customer respondents do not fill out the application.*
*Source: Trade Partner Survey Results. Population=All responding trade partner participants who submitted applications. N=34. Participant Customer Survey Results. Population=All responding participant customers who submitted applications. N=51.*

The simple explanation as to why respondents (participant customers and trade partners) are not submitting applications online is awareness. Most participant customers and trade partners that did not submit online were not aware of the option (56% and 64%, respectively) as reflected in Figure 3-5.

[17] Product staff identified numerous customer complaints regarding the application form, calling it long and arduous.

Figure 3-5. Awareness of Online Application By Respondent type

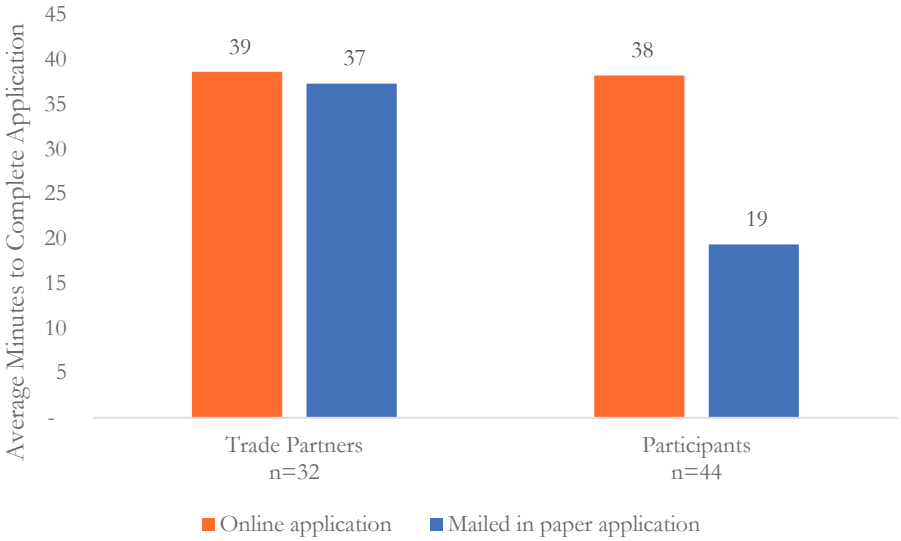



*Source: Trade Partner Survey Results. Population=All responding trade partner participants who submit paper applications. N=11. Participant Customer Survey Results. Population=All responding participant customers who submit paper applications. N=32.*

Participant customers provided additional explanations as to why the online option was not preferred: out of habit [to fill out a paper form], convenience, and easier to collaborate (i.e., when obtaining required signatures or components kept by other people).

When looking at the average time it took to fill out an application among trade partners, there was no difference in online submissions versus paper submissions (39 minutes versus 37 minutes, on average, Figure 3-6). Unlike customers, trade partners tend to fill out multiple applications annually. Customer respondents reportedly take half the amount of time to fill out a paper application than an online application (18 minutes versus 39 minutes, on average), indicating that the online application has a learning curve to complete. Participant customer respondents widely suggested to "reduce the length" of the application as a recommendation for improvement.

Figure 3-6. Average time to complete application By Respondent type and By Submittal method




*Source: Trade Partner Survey Results. Population=All responding trade partner participants who submitted applications, excluding "Don't know". N=32. Participant Customer Survey Results. Population=All responding participant customers who submitted applications, excluding "Don't know." N=44.*

Other participating customer suggestions on improving the application included:

- Broaden the categories
- Require less detail
- Simplify the list of approved fixtures
- Eliminate the picture upload requirement and remove any paper document upload requirement [for online application]
- Improve the clarity of questions and terminology
- Reduce the number of signatures required and allow electronic signatures [for online application]

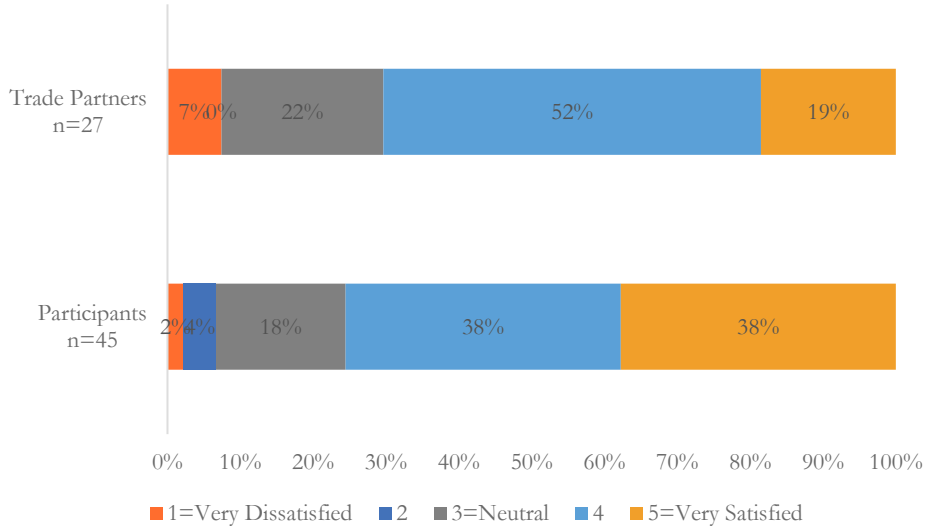
Trade partners' suggestions for improving the application were mostly centered around the online application. Most notably, they pointed out that the online application is more of a fillable PDF form than a true online application; the evaluation team believes these trade partners are unaware of the truly online application offered through Xcel Energy. The most common requests were the abilities to save unfinished work and complete later, submit signatures electronically, and auto-populate fields where applicable. Additionally, there were specific requests to "reduce the need for labor invoices," and "combine old and new equipment fields into the same section."

Figure 3-7. shows the ratings to overall satisfaction with the application. Participant customers rated their satisfaction with the application process relatively high: on average, participant customers gave a satisfaction rating of 4.1 on a 1 to 5-point scale. The top three reasons participant customers rated their application satisfaction low were explained by the application being 1) a confusing application (in general and in knowing which answer to select), 2) a time-consuming process, and 3) too-detailed of a process.

Overall, trade partners were relatively satisfied with the application process, with 70% of respondents giving a 4 or 5 rating (Figure 3-7.). High-performing trade partners rated their

satisfaction higher than low-to-mid performers. High-performing trade partners tend to fill out a lot of applications and find it easy. Those trade partners that only fill out a few applications a year expressed lower satisfaction.

Figure 3-7. Overall Satisfaction with application by Respondent type




*Source: Trade Partner Survey Results. Population=All responding trade partner participants who submitted applications, excluding "Don't know". N=27. Participant Customer Survey Results. Population=All responding participant customers who submitted applications, excluding "Don't know." N=45.*

# 4. CONCLUSIONS AND RECOMMENDATIONS

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

The research team found the Lighting Efficiency Product has been effective in the past; however, the product needs to evolve to remain impactful within the rapidly changing lighting market. Specific findings and recommendations follow.

- **The lighting market is rapidly transforming to more efficient technologies.** While the retrospective NTGR of 96% indicates a highly effective product, trade partners indicate the lighting market for LEDs will be the predominate technology within the next two to four years**.** The lighting efficiency product needs to evolve to remain relevant within this new market.
    - **Recommendation 1: Target early replacement of working lighting equipment.** While the product has historically targeted early replacement, this focus will be crucial for attributable savings within a transformed marketplace. The product needs to specifically target accelerating purchases beyond scheduled upgrades and replace on burnout measures.
        - **Recommendation 1a: Discontinue new construction lighting rebates.** While new construction rebates represent a small percent of Lighting Efficiency Product savings, increasingly stringent building codes and improved cost-effectiveness make these likely free-riders and should not be offered going forward.[18]
        - **Recommendation 1b: Collect information on reason for replacements.** The current program application does not collect information on the working status of replaced equipment. For each replaced product, the retrofit application should ask about the working status and whether it was part of a mandated or predetermined upgrade schedule. This will document program impact on project accelerations.
        - **Recommendation 1c: Expand campaigns to encourage early replacement.** These campaigns should encourage participant customers to expand projects to go beyond scheduled upgrades and burned out bulbs.
        - **Recommendation 1d: Ensure gross savings calculations include a dual baseline for calculating lifetime savings.** As the program continues to target these early replacement products, lifetime savings need to account for the shorter remaining useful lifetime of the replaced bulb in the savings calculations. Incremental cost should also be calculated accordingly (e.g., using the full cost of the replacement less a deferred replacement cost credit).
    - **Recommendation 2: Continue to monitor changes to the Lighting Market.** Due to the rapidly transforming lighting market, it is important to re-evaluate this product influence at frequent intervals. This will allow the product to evolve with the market and the NTGR to

[18] The separate New Construction Product, however, may consider offering incentives for efficient lighting strategies that exceed building code and standard building practices (e.g., strategic lighting design to reduce the lighting power density, advanced lighting controls)

reflect changing offerings and market potential. This includes additional research in 2019 to feed into the 2020 NTGR and evaluations at regular intervals thereafter.

- **Recommendation 2a:** For 2019, apply a NTGR of 74% to the program, upon implementation of the recommendations contained in this report. This NTGR reflects the rapidly-changing nature of the commercial lighting market as well as the historical high influence exerted by the program.

- **High performing trade partners more commonly anticipate selling 100% LEDs in 2020 than mid/low performing trades.**
  - **Recommendation 3: Expand trade partner network and focus efforts on mid/low performing trade partners.** There is more opportunity to convert customers to efficient products when the trade partner offers and sells both options. The product should target non-participant and mid/low performing trade partners that are more likely to continue to offer inefficient (e.g., T12 and T8) lamps.

- **Participant customers indicate significant opportunities for increasing lighting control strategies, citing cost as the most common barrier to installation.** Lighting control strategies are not fully utilized among trade partners and participant facilities. Almost half (49%) of participant customers were not aware that Xcel Energy offers rebates for indoor LCS; Three-quarters of trade partners (76%) were aware that Xcel Energy offers rebates for indoor lighting controls.
  - **Recommendation 4: Focus product efforts on increasing adoption of lighting control strategies through focused campaigns and trade partner trainings.** Peer utilities report having successful campaigns focused on specific facility types, such as classroom and retail spaces; the product should consider that strategy. Trade partners reported challenges making the business case for lighting controls; the Lighting Efficiency Product can focus trade partner trainings on the benefits of controls and strategies to overcome perceived barriers and increase awareness of available incentives. To the extent it is cost-effective, consider increasing incentives on these products to overcome the cost barrier and encourage adoption.
  - **Recommendation 5: Consider applying a separate NTGR to lighting control strategy measures.** Market adoption for control strategies remains behind LEDs, and represented very few participant customers in the 2017 program (and therefore as part of this study). If lighting control strategies represent an increasing percentage of future program savings and transitions towards more advanced lighting controls (e.g., connected lighting), Xcel Energy should consider researching and applying a separate NTGR specific to controls.[19]

- **There is a learning curve associated with the application form.** Trade partners that complete a large number of applications have higher satisfaction with the application process than those that complete fewer. Trade partners commonly noted the need for a truly online application, with additional capabilities; these trade partners may not be aware of the fully online option. The most commonly requested capabilities were the ability to save, share with collaborators, upload supporting documents, electronically sign, and submit.
  - **Recommendation 6: Assess ways to simplify application form to make accessible to more customers and trade partners.** This should include reviewing best practices from

[19] The evaluation team cannot provide a recommended NTGR value for lighting control strategies alone as part of this evaluation due to the limited sample size obtained during the participant telephone survey.

peer utility applications, updating the visualization of the document, and considering consolidating fields.

- **Changes to product offerings allowing non-DLC-qualified products received mixed reviews from trade partners.** While the majority of those interviewed agreed with this change, there were not enough participant customers purchasing non-DLC products in the sample to assess differences in satisfaction between the two offerings.
    - **Recommendation 7: Monitor satisfaction with non-DLC-qualified products among participant customers and reassess non-DLC incentives if product satisfaction is substantially less than DLC-qualified products.**

EMI CONSULTING

# Xcel Energy
# Colorado Lighting Efficiency

January 21, 2019

## APPENDICES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# Appendix A: EVALUATION PLANNING DOCUMENTS

## A.1 Evaluation Plan

The 2018 evaluation will consist of a process evaluation and an impact evaluation. The process evaluation will focus on market actor experiences with the product, while the impact evaluation will focus on estimating a net-to-gross (NTG) ratio. This section presents the objectives of the two components of the evaluation. It is followed by a more detailed description of the evaluation activities.

### Process Evaluation

The evaluation team discussed process evaluation priorities during the lighting kickoff meeting[1] and staff interviews that followed.[2] During those conversations, several themes emerged, primarily around lighting controls and Design Lights Consortium (DLC) products:

- The first topic, **lighting controls**, is seen as an opportunity for deeper energy savings. However, Xcel Energy is experiencing challenges to widespread customer adoption. The evaluation team will address this topic through the benchmarking process, participant surveys and trade ally surveys.

- The second topic, **DLC products**, is in response to the program now rebating non-DLC listed lighting products, at a lower dollar amount. The evaluation team will research what other utilities are offering with respect to DLC products, and what documentation others require to approve a DLC bulb. Additionally, the EMI team will talk to participants and trade partners to learn about their satisfaction with DLC and non-DLC listed products.

- The third topic relayed was the desire to simplify the **rebate application**. Several Xcel Energy staff noted the long and complicated nature of the current rebate application; the Xcel Energy evaluation team plans to redesign the current application, using insights from the utility benchmarking activity and from Xcel Energy staff.

Secondary evaluation priorities include learning more about customer decision making processes, experiences with the online application process, and when to sunset the rebates for linear fluorescent products. To summarize, **objectives of the process evaluation** are to:

- Identify barriers and programmatic adoption strategies for lighting controls: What are the most common barriers for adoption and how can Xcel Energy overcome them? How are other utilities encouraging the adoption lighting controls?
- Investigate DLC and non-DLC offerings: What product qualified product lists (QPL) do other utilities require? Are there differences in program or product satisfaction between these product types?

[1] Held at the Xcel Energy Denver office on November 9, 2017
[2] Staff interviews took place in December, 2017.

- Assess application form: How can the application form be simplified? What information is necessary to accept a rebate and claim accurate savings? What data do other utilities require on their applications?
- Assess experiences with the online application: How satisfied are participants with the online application process? Why are/are not customers using the online application?

### Impact Evaluation

The objective of the impact evaluation of the Lighting Efficiency product is to develop a net-to-gross (NTG) ratio documenting the extent to which program activities influenced customer lighting purchasing decisions. Due to the evolving lighting market, the evaluation team will attempt to stratify the NTG estimates to allow Xcel Energy staff to target measures with the highest NTG values (e.g. stratify custom and prescriptive measures, and where possible, by technology). The evaluation team proposes to use participant self-report surveys to estimate Lighting Efficiency product NTG. To summarize, **objectives of the impact evaluation** include:

- Develop a NTG ratio documenting the program's influence on customer's decisions.
- Assess market effects of the Colorado Lighting Efficiency Program
- If sample sizes allow, assess NTG for delivery channel (custom vs. prescriptive), and product types.

## A.2 Data Collection Activities and Sampling Plans

To meet the above objectives, we will conduct a variety of data collection activities. These are listed in Table 1 and explored more in remaining section. the evaluation team will (1) conduct surveys with participating customers and (2) trade partners. These surveys will inform prospective and retrospective NTG estimates, as well as research questions around lighting controls, DLC vs. non-DLC product, customer decision making, and online applications. Finally, the evaluation team will (3) benchmark the program against six peer utilities, assessing plans for future program designs and NTG estimates. Table 1 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 marked as "enhanced scope" in the table below.

Table 1. Lighting Efficiency Research Summary

| Research Task | Sample Size | Enhanced Scope | Research Objective(s) |
|---|---|---|---|
| Staff Interviews | 5 | | Inform evaluation plan, NTG |
| Participant Surveys | 204 (sites) | ✓ | Lighting controls, DLC and non-DLC product, customer decision making, application experience, NTG |
| Trade Partner Interviews | 40 | ✓ | Lighting controls, DLC and non-DLC product, customer decision making, application experience, NTG |
| Peer Utility Benchmarking | 6 utilities | | Lighting controls, DLC and non-DLC product, linear fluorescent product. |

## Staff Interviews

In December, 2017, the evaluation team interviewed five Xcel Energy staff to inform this evaluation plan, discuss program goals, and review program processes, challenges, and successes.[3] Those interviewed included the current product manager, one team lead, one engineer, one trade partner coordinator, and one key account manager. They were conducted either in person or over the telephone, and took between one and one and a half hours to complete. These meetings, combined with the kickoff meeting, allowed the evaluation team to create a focused evaluation plan and data collection activities.

## Participant Surveys

The evaluation team will utilize participant surveys to meet both process and impact objectives. These surveys will focus on the following five topics: lighting controls, DLC product, the application process, and NTG.

- Lighting Controls: Questions on lighting controls will be different between lighting controls participants and those that installed lighting products other than lighting controls. The evaluation team will discuss awareness of lighting controls, barriers to adoption, and potential ways to overcome these barriers.
- DLC Product: For participants that purchased DLC product, the evaluation team will ask about the decision to purchase DLC product, awareness of DLC requirement, and satisfaction with their product. Parallel questions will be asked of participants that purchased non-DLC product, such as decision to purchase non-DLC product, awareness of DLC certification, and satisfaction with the product. The differences in responses can advise Xcel Energy on future DLC certification rebate requirements.
- Application Experience: The evaluation team will discuss the application process, including awareness of the online application and, for those that utilized it, their experience with the process.
- NTG: The team will ask questions on program attribution, or the impact the program had on their decision to purchase high efficient lighting and potential non-program measures installed because of the Xcel Energy Lighting Efficiency program (spillover).

[3] One additional Xcel staff will be interviewed in 2018.

The evaluation team will stratify the survey sample by the measure groups that contribute most to product savings. The results, therefore, can be statistically significant (at 90% confidence and 10% precision) for each of following four groups, linear LEDs (including troffers), custom lighting, occupancy sensors, and other measures (Table 2). The evaluation team also plans to stratify the custom lighting projects by savings to ensure some of the largest sites are surveyed. While occupancy sensors contributed only 1% of the product savings in 2017, the evaluation team plans to over-sample this group because of the high interest in expanding this product adoption.

Table 2. Lighting Efficiency Participant Population, by Survey Strata

| Strata | Savings (kWh) | Population[a] | Target Surveys |
|---|---|---|---|
| Linear LEDs and Troffers | 32,209,903 | 767 | 62 |
| Custom Lighting | 27,592,928 | 262 | 40 |
| Occupancy Sensor | 826,499 | 67 | 34 |
| Other Measures | 24,300,959 | 1,015 | 68 |
| Total | 84,930,289 | 2,111 | 204 |

[a] This is the population of participants receiving rebates between January and October, 2017.Data through the end of 2017 were not available at the time of this plan. Targets may be adjusted based on full year tracking data.

## Trade Partner Interviews

The evaluation team will utilize trade partner interviews to meet both process and impact objectives. These interviews are integral for the following five evaluation objectives: lighting controls, DLC product, customer decision making, the application process, and NTG.

- Lighting Controls: The evaluation team would like to receive the trade partner perspective of lighting controls, including barriers to adoption, and potential ways to overcome these barriers.
- DLC Product: The evaluation team will also ask trade partners their opinion on DLC certification, and the inclusion of non-DLC product in the Xcel Energy rebate program. The differences in responses can advise Xcel Energy on future DLC rebate requirements.
- Application Experience: The evaluation team will discuss the application process, including awareness of the online application and, for those that utilized it, their experience with the process.
- NTG: Finally, the team will ask questions on 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 (spillover). The evaluation team will discuss how the program impacts their product recommendations as a whole.

The evaluation team plans to interview a minimum of 25 randomly sampled trade partners as part of this effort, and stratify between large and small trade partner participants to ensure a representative group. The evaluation team defines high performers as trade partners that return more than 1% of total product rebate dollars, mid performers less than 1% of rebate dollars. However, due to the nature of the NTG methodology, requiring evaluators to survey trade partners that have a high influence on the customer decision, the evaluation team added an additional 15 interviews to contribute to the NTG estimation. This sample is intended capture any additional trade partners that are highlighted as highly influential in the participant

surveys. [4] The population of 274 partners should be sufficient to reach the targeted number of interviews (Table 3). This number of target interviews is 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 expected influence on customer decisions (contributing to NTG), and potential spillover attributable to the program. The evaluation team requires sufficient interviews to confidently assess these metrics.

Table 3. Lighting Efficiency Trade Partner Population, by Interview Strata

| Strata | Population[a] | Percent of Rebate ($)[b] | Target Interviews |
|---|---|---|---|
| High Performers | 18 | 55% | 10 |
| Mid/low Performers | 256 | 27% | 15 |
| NTG Surveys | NA | NA | 15 |
| Total | 274 | 82% | 40 |

[a] This is the population of trade partners indicated on rebates between January and October, 2017. Population may change based on full year tracking data.
[b] 18% of rebates did not indicate a trade partner.

### Peer Utility Benchmarking

The objective of the peer utility benchmarking task is to understand how C&I lighting programs are approaching key issues by comparing the Xcel Energy Lighting efficiency program with six similar peer utility programs. The evaluation team will select a comparable cohort so that Xcel Energy has an "apples-to-apples" comparison, and evaluate the set of circumstances (such as regulation, retail channels, demographics) that impact program plans at the peer utilities. The interviews will discuss lighting controls, stance on DLC qualified products, and the future of linear fluorescent product for achieving energy savings.

Based on our recent experience with utility benchmarking, we will first work with Xcel Energy to identify an appropriate peer cohort of six utilities for the benchmarking study, as well as the critical program components to be compared. We will then develop a peer utility interview guide that is customized to the desired benchmarking components, to be provided to Xcel Energy for approval prior to beginning any data collection. Finally, we will summarize the results of our benchmarking analysis in a summary within the final evaluation report. The summary will include a description of the comparability of each utility, based on the factors identified during the planning task.

## A.3 Net-to-Gross Approach

The NTG assessment aims to estimate the percent of savings achieved that can be attributed to program actions, or a NTG ratio. The NTG value includes multiple metrics, which are described in sections below. To do so, the evaluation team will primarily use participant self-report surveys and trade partner interviews to assess program attribution, including free ridership, spillover and market effects metrics. The team will base

[4] Note that there will be a cap on the number of trade partners the team will interview, due to budget constraints. The current proposed budget supports a total of 40 trade partner interviews.

its methodology on the most recent Illinois Technical Reference Manual (TRM)[5] as this type of approach is used extensively in other jurisdictions both by our team and outside industry experts, and it was the basis of the NTG approach for the evaluations of the 2017 Xcel Energy product evaluations. Based on the 2017 evaluation experience with the Illinois NTG protocols, the evaluation team plans to conduct cognitive interviews with participants, prior to launching any surveys, to assess whether the evaluation team needs to adjust the NTG approach presented in this memo and/or specific wording of survey questions. Additionally, the evaluation team will conduct a sensitivity analysis on the scoring to see which questions drove the NTG in a particular direction.

Following the cognitive interviews, the evaluation team will develop the survey and interview instruments to stratify the NTG estimate by technology type, where possible. We expect this to be possible for linear LEDs, custom lighting, occupancy sensors, and other lighting measures.

The evaluation team will estimate a retrospective and prospective NTG value. Using multiple sources of information, including surveys with participating customers and interviews with trade partners, and will synthesize available data to develop recommended NTG ratios to ensure that we provide the most accurate and reliable estimate of NTG.

This section presents the evaluation teams method to estimate retrospective and prospective NTG ratio and concludes by describing how the evaluation team will synthesize data to estimate the NTG ratio for this product.

## Retrospective NTG

The evaluation team will estimate a retrospective NTG by examining free ridership, spillover, and market effects. The evaluation team will rely on data collected from customers and trade partners. It will then synthesize these results, along with data from peer utilities, to estimate NTG ratios for measure types within the product.

## Prospective NTG

Given the fast-changing conditions of the lighting market, the team will review and adjust the retrospective NTG estimate to provide a forward-looking, or prospective value. While there is always uncertainty, the team will assess trends provided by trade partners and adjust the retrospective NTG as needed to reflect expectations for the future. Specifically, trade partners will be asked to predict when LEDs will dominate the linear market. Additionally, we will ask their prediction of market share by major technology for 2020 and 2024 under two scenarios: 1) that the program continues with "business as usual", and 2) that program ceases support for LEDs in 2016. This will provide the evaluation team with a program and no-program baseline that can inform a prospective NTG value. We will use input from the staff interviews to inform potential future changes to the product, and incorporate those into the final NTG estimate. For example, if the program is planning to sunset a rebate on a particular product with a low NTG, we could remove that product from the prospective NTG estimate. We will also conduct benchmarking into prospective NTG values used in other states to inform the estimate. In the event that no clear picture emerges from the prospective research, the retrospective NTG value will be recommended.

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[5] Illinois Energy Efficiency Stakeholder Advisory Group. Illinois Statewide Technical Reference Manual, Version 6.0, Volume 4, Attachment A: IL-NET-TO-GROSS Methodologies, Section 4. February 8, 2017. http://www.ilsag.info/il_trm_version_6.html

**Estimating NTG Ratio.** By design, our final NTG estimate recommendation includes data from mixed methods research – both quantitative data and qualitative data. The initial NTG estimates will be calculated through self-reported participant responses and trade partner reported NTG interview responses. After the initial NTG estimate is calculated, we will then utilize the quantitative and qualitative data to construct a logical, internally consistent, and coherent narrative of program attribution that attempts to identify all possible pathways of Xcel Energy influence. We will rely on the following data sources to construct the NTGR:

- Trade partner interviews
- Participant surveys
- Program benchmarking data for points of comparison
- Prospective NTG

Based on these results, we then may adjust the NTG to create a final recommended NTGR that is consistent with this narrative that should be applied to the program subsequent to the completion of this report. The final NTG recommendation is based on the professional judgement of our team after considering all available quantitative and qualitative data.

# Appendix B: DATA COLLECTION DOCUMENTS

## B.1 Staff Interview Guide

### Introduction

This guide is to be used to interview staff associated with Xcel Energy's DSM programs as part of the EMI Consulting 2018 evaluation of the Xcel Energy DSM programs. The interviews will be semi-structured, with these questions serving as a basic guide for experienced EMI Consulting staff during one-on-one phone interviews.[6] 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

- Assess the extent to which the program design supports program objectives and customer service/satisfaction objectives.
- Assess the degree to which program resources are sufficient to conduct program activities with fidelity to the implementation plan
- Collect staff feedback on implementation successes and challenges
- Identify themes and issues to incorporate into the evaluation plan

### Interview

#### Section A: Introduction

**[If staff was not included in kick-off meetings:]** First we would like to give you some background about who we are and why we want to talk with you today. EMI Consulting is an independent consulting firm that works with electric and gas utilities to review and improve program operations and delivery. EMI Consulting is sub-contracting with other leading national firms to perform this evaluation- including Evergreen Economics, Rick Ridge and Associates, and Apex Analytics. Xcel Energy contracted with us to perform an evaluation of their portfolio of energy efficiency programs and we're currently in the process of conducting interviews with product managers and key staff involved in designing and delivering the portfolio to improve our understanding of Xcel Energy's DSM programs and its' influence on customers. We also want to understand what will be useful for you as Xcel Energy program staff because of our research. We want to incorporate your priorities into our study so that the results are as useful as possible.

[6] Some interviews may be conducted jointly. This would most likely occure if someone's role recently changed or if more than one person performs the role.

**[ALL]** Thank you for taking the time to speak with me today. My objective for this meeting today is to gain a deeper understanding of this program, what Xcel hopes to achieve through implementing this program how it operates, and a bit about your experiences with the Lighting Efficency Program. We are interested in asking you some questions about Lighting Efficiency Program so we can benefit from your knowledge and experience to improve our understanding of the program. I have a set of questions that should take approximately 45 - 60 minutes, depending upon your experiences and involvement with the program. All the information provided is anonymous, we will be weaving it together with information gleaned from other interviews.

Before I begin, is it alright if I record the conversation for note taking purposes? [RECORD IF ALLOWED]

**A1**. [If needed] First, can you take a moment and explain your role and scope of responsibilities with respect to <PROGRAM NAME>?

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?
- Do you have any direct reports?

**A2**. What role do third party implementers play in program implementation, if any?

## Section B: Program Goals

I'd like to be sure I understand the goals of this program, both overall and specific.

[TAILOR BASED ON WHAT IS ALREADY KNOWN]

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

**B1a.** Can you describe any savings goals? Do you have specific goals for individual components of the program (e.g., custom, prescriptive, new construction, sector or bulb type focus)?

**B1b.** Any other, non-energy goals?

**B1b1.** Any more immediate goals? For example, participation goals, customer engagement goals, improving customer satisfaction? Changing customer awareness of or attitudes about energy efficiency measures?

**B1b2.** Any longer-term goals? For example, reducing greenhouse gas emissions? Altering market behaviors?

**B2.** What are "indicators of success"?

B2a. What are interim indicators that the program is or is not meetings its objectives or goals?

**B3.** Have any of these goals changed in the last few years?

**B3a.** What was the rationale for changing them?

**B3b.** In your opinion, how have these changes affected the program's operations or its outcomes?

**B4.** What influences do you think this program has had on the market?

## Section C: Program Activities

I would like to make sure I have a solid understanding of how this program operates. If there is any formal documentation that you can refer me to as we walk through these next questions, I'd appreciate getting copies.

[TAILOR BASED ON WHAT IS ALREADY KNOWN]

**C1.** What are the different components of the program?

**C1a.** What, if any, incentives and/or tools does the program use to achieve its goals?

**C1b.** What activities do program and implementer staff engage in to achieve program goals?

- Marketing?
- Financial assistance?
- Applications?
- Technical assistance?
- Education?
- Contractor/Trade Partner support?
- Drop ship/direct install?

**C1c.** What tools are used to reach out to customers and/or market partners?

**C1d.** What are the participation steps from a customer perspective? Is this process different for trade partners?

**C1e.** I understand the trade partner network is very active in this program, can you tell me a little about how they contribute to the program?

- How large is this network?
- How do they participate? (meetings? Other?)
- How does this partnership function? What are the strengths and challenges of this network?

**C2.** Are these program activities modeled on another program or set of programs?

**C3.** Have any of these incentives changed in the last few years? Any new product offerings? What was the rationale for changing them?

**C4.** Have any of these activities changed in the last few years?

**C4a.** What was the rationale for changing them?

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

**C4c.** Have you measured how these changes impacted savings or participation?

**C5**. I understand there has been an online application component added to this program. When was this added?

**C5a.** What was the rationale for adding this?

**C5b.** How has this new method been received? (are many people using it? Have you received any feedback on it?)

**C5c.** Have you measured how these changes impacted participation?

**C6**. How is the paper application form working, in your opinion?

**C6a.** Are there areas that you feel could be improved with that form? What are they?

**C6b.** Have you received any feedback on it? What was the feedback?

## Section D: Resources

**D1.** What resources do you rely on to implement the program?

**D1a.** Program, implementer, sales staff? (e.g. account managers and business services group)

**D1b.** Management and program direction?

**D1c.** IT tools and data tracking tools?

**D1d.** Rebate fulfillment?

**D1e.** Other resources?

**D2.** Are these resources sufficient to implement the program as designed?

D2a. [IF NO] How could the program design/implementation change to be more efficient? What additional resources would help you implement the program as designed?

**D3.** Have any of these program resources changed in the last few years?

**D3a.** What was the rationale for changing them?

**D3b.** In your opinion, how have these changes affected the program's operations or its outcomes?

## Section E: Program Tracking and Reporting

I understand that you are using Salesforce as your primary program tracking tool. I'd like to understand how program activities are tracked to understand what data might be available to us in our evaluation.

[TAILOR BASED ON WHAT IS ALREADY KNOWN]

**E1.** What kind of documentation is available for the program? Implementation plans? Program manuals? Process maps?

**E2.** What kinds of data are collected for Lighting Efficiency?

**E3.** Are there any data that you would like to collect for Lighting Efficiency, but haven't been able to?

**E4.** Are there any data/documentation not tracked in Salesforce that might be helpful for the evaluation?

**E5**. As part of our evaluation, we will likely want to speak to "near-participants," customers/distributors that were eligible to participate in the program, showed some interested in program participation, but didn't participate for whatever reason. Would these customers all be tracked in Salesforce?

## Section F: Strengths and Challenges

Next, I'd like to get your feedback on how the program is running.
[TAILOR BASED ON WHAT IS ALREADY KNOWN]

**F1.** In your opinion, what are the strengths of Lighting Efficiency as it is currently being run?

**F1a.** What would you say is working well in terms of program design or implementation?

**F2.** What are the most significant challenges for this program at this point?

**F3.** What feedback, if any, do you receive from customers and/or market partners on the program? (PROBE FOR CUSTOMER ENGAGEMENT/ CUSTOMER SATISFACTION)

**F4.** What do you believe are the biggest barriers to getting customers and/or market partners to participate in this program?

**F5.** Are there any specific opportunities for improvement in the design or implementation of the program? Please describe.

**F6.** What would you like to see changed in how the program is designed or run, if anything?

**F6a.** Do you think there are any roadblocks preventing these changes from happening?

## Section G: Closing

**G1.** Xcel staff expressed a number of evaluation priorities during kickoff meeting. Which do you think are the highest and lowest priority reseach objectives for this program? Do you have anything you would like to add to these priorities, remove from this set of priorities, or change about these priorities?

- Lighting controls (what would you like to know?)
- When to sunset fluorescent bulbs? What are other utilities planning?
- What are driving customer decisions?
- How do bonuses impact trade ally decisions?
- Experiences with online application process (just launched)
    - UX, best practices, etc
- What could we do to simplify the applications?

**G2.** Do you have particular questions that you would like to see answered by the evaluation? Why are these questions important?

**G3.** Do you have any other comments, concerns or suggestions about the program that we didn't discuss that you would like to make sure I know about?

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? I will also follow up with you shortly to identify peer utilities and performance indicators to kick-of the benchmarking task.

## B.2 Participant Survey Guide

### Introduction

To support the process and impact evaluation of the 2017 Xcel Energy efficiency programs, the EMI Consulting evaluation team will conduct telephone surveys with participants. The evaluation team defined a participating customer as any customer that closed a project in 2017. The research will be conducted to assess key process and impact evaluation objectives, including DLC products, lighting controls, online application process, free-ridership, and spillover.

The remainder of the introduction provides the research questions which the participant survey is designed to address, a description of the sample variables to support programming the survey, and fielding instructions for the survey house.

#### Evaluation Objectives

The objectives for the CO Lighting Efficiency product evaluation are to:

- Identify barriers and programmatic adoption strategies for lighting controls: What are the most common barriers for adoption and how can Xcel Energy overcome them? How are other utilities encouraging the adoption lighting controls?
- Investigate DLC and non-DLC offerings: What product qualified product lists (QPL) do other utilities require? Are there differences in program or product satisfaction between these product types?
- Assess application form: How can the application form be simplified? What information is necessary to accept a rebate and claim accurate savings? What data do other utilities require on their applications?
- Assess experiences with the online application: How satisfied are participants with the online application process? Why are/are not customers using the online application?
- Develop a NTG ratio documenting the program's influence on customer's decisions.
- Assess market effects of the Colorado Lighting Efficiency Program

The participant survey does not address every evaluation objective. For reference, the following table provides the evaluation efforts used for each objective.

| Research Task | Sample Size | Research Objective(s) |
|---|---|---|
| Staff Interviews | 5 | Inform evaluation plan, NTG |
| Participant Cognitive Interviews | 10 | Testing survey questions, assessing comprehension, evaluating NTG methodology |
| Participant Surveys | 204 | Lighting controls, DLC and non-DLC product, online application experience, NTG |
| Trade Partner Surveys | 40 | Lighting controls, DLC and non-DLC product, application experience, NTG |
| Peer Utility Benchmarking | 6 utilities | Lighting controls, DLC and non-DLC product. |
| Application Redesign | na | Application simplification |
| Spillover/ Saturation Study (optional) | 100 | NTG, deeper retrofit opportunities |

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

- What are the most common barriers for adoption of lighting controls and how can Xcel Energy overcome them?
- Are there differences in program or product satisfaction between these product types DLC and non-DLC offerings?
- How satisfied are participants with the online application process? Why are/are not customers using the online application?
- What level of free ridership exists in the program?
- Does the program influence additional energy savings outside of what is captured through the program (spillover)?

The following table presents the link between each evaluation objective, research question, and survey question.

| Evaluation Objective | Research Question | Survey Question Number(s) |
|---|---|---|
| Identify barriers and programmatic adoption strategies for lighting controls. | What are the most common barriers for adoption and how can Xcel Energy overcome them? | D1-D13 |
| Investigate DLC and non-DLC offerings. | What product qualified product lists (QPL) do other utilities require? Are there differences in program or product satisfaction between these product types? | C1-C9 |
| Develop a NTG ratio documenting the program's influence on customer's decisions. | What level of free ridership exists in the program? Does the program influence additional energy savings outside of what is captured through the program (spillover)? | A1-A7; B1-B11 |
| Assess experiences with application. | How satisfied are participants with the online application process? Why are/are not customers using the online application? | Gen4-Gen12 |

## Sample Variables

The following table includes 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 | Potential Codes |
|---|---|---|
| Interviewer Name | Name of interviewer from Ewald and Wasserman | e.g. Donna Whitsett |
| Program | Name of Program we are evaluating | Lighting Efficiency Program |
| Organization | Organization name | e.g. Apex Analytics |
| Contact | Contact at organization | e.g. Katie Cary |
| Month | Month customer completed project through program | e.g. May |
| Year | Year customer completed project through program | e.g. 2016 |
| Phone | Phone number for contact at organization | e.g. 555-555-5555 |
| Measure1 | Measure installed through program; first to be asked about for free-ridership battery | e.g. "TLED" |
| Measure2 | Measure installed through program; second to be asked about for free-ridership battery | e.g. "High Bay Lighting" |
| Measure1_Stratum | The stratum for measure 1 (in some cases collapsed across different types of measures) | e.g. "Linear LEDs and Troffers" |
| Measure2_Stratum | The stratum for measure 2 (in some cases collapsed across different types of measures) | e.g. "Other Measures" |
| Location | Address or name of premise where lighting product was installed | E.g. "Baden Street" |
| Measure_DLC_1 | Indicator of whether Organization purchased a DLC product through program | 2= Lighting Control Measure<br>1 = DLC Product<br>0 = Not DLC Rated Project |
| Measure_Control_1 | Indicator of whether Organization purchased lighting control measures through Lighting Efficiency program | 1 = Lighting Controls purchased<br>0 = No Lighting Controls |

| Sample Variable | Variable Description | Potential Codes |
|---|---|---|
| Number_of_Sites | The total number of sites for which a contact is responsible for an identical set of measures | e.g. "4" |
| Measure_Group | For contacts with more than one location, an identifier of the locations which had the same set of measures installed. | (numbered within each contact) |

## 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.

## Stratification and Target Completes

| Stratum | Target # Sites | Minimum # Contacts Interviewed |
|---|---|---|
| Custom Lighting | 40 | 27 |
| Linear LEDs and Troffers | 62 | 43 |
| Occupancy Sensor | 34 | 23 |
| Other Measures | 68 | 47 |
| **TOTAL** | **204** | **140** |

- Note that the "Target # Sites" is based on the variable "Number_of_Sites" for each interviewee. If an interviewee is responsible for three sites and indicates that the decision was identical for all three sites, this single interview will count toward a total of three sites for the appropriate measure strata.
- Each interview only counts as one interview in the "Minimum # Contacts Interviewed" quota.

- Where a contact/site includes two measures, that interview may be counted toward the quotas in both strata.
- While every effort should be made to achieve the target number of sites for each stratum, it is expected that at a minimum, 140 interviews will be conducted, with the allocation as close as possible the quotas provided above by stratum.

## Survey Sections

- **Intro.** Introduction and Screening
- **Gen.** Firmographics, Operations, Participation
- **A.** Free-ridership and market effects
- **B.** Spillover
- **C.** DLC Bulbs
- **D.** Lighting Controls

## Survey

**SAMPLESITES:** variable by E&W (check sample printout prior to dialing):
1. No, name appears only one time
2. Yes, name is on list more than once
3. THIS IS A SECOND+ SURVEY WITH A RESPONDENT - ALREADY COMPLETED ONE FOR OTHER LOCATION, skips over Intro section, multiple sites questions, and recruitment

### Section Intro: Introduction and Screening

**Intro1.** 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 Efficiency program in **<MONTH> <YEAR>.** Our records show that you received a rebate from this program for **lighting products in 2017.** 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>; REPEAT QUESTION INTRO1 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]**

**[ASK IF INTRO1=1, 4, OR 5]**
**Intro2.** Are you the person at **<ORGANIZATION>** who is most familiar with your participation in the Xcel Energy Lighting Efficiency program, or at least as familiar as anyone else there?

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 – this organization did not participate in any such program. **[TERMINATE]**
DK **[TERMINATE]**
REF **[TERMINATE]**

**[ASK IF INTRO2=4]**
**Intro3.** Is there someone else that is knowledgeable about your participation in the Lighting Efficiency program?
1. Yes.
2. No **[TERMINATE]**
DK **[TERMINATE]**
REF **[TERMINATE]**

**[ASK IF INTRO2=2-3 OR INTRO3=1]**
**Intro4.** What is this person's name?
1. [RECORD CORRECT PERSON'S NAME AS **<CONTACT>**]
DK **[TERMINATE]**
REF **[TERMINATE]**

**[ASK IF INTRO4=1]**
**Intro4.** 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 HERE AS **<PHONE>**) **[THANK AND TERMINATE; REDIAL NEW SAMPLE CASE]**
DK **[TERMINATE]**
REF **[TERMINATE]**

PROGRAMMER NOTE: Only those for whom Intro1=1 or Intro2=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 INTRO1=1 OR INTRO2=1]**
**Intro6.** Great! (IF NEEDED: Again, we're Ewald and Wasserman, a national research firm calling on behalf of Xcel Energy). I would like to 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 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 AND RESCREEN AS NECESSARY]**
REF **[TERMINATE]**

## Section Gen: Operations, Participation

**Gen1.** Did an outside contractor install the lighting equipment you had rebated as part of the Xcel Energy Lighting Efficiency program, or did you install the equipment with in-house staff?

1. Used a contractor
2. Installed equipment with in-house staff
88. DK
99. REF

**[If Gen1 = 1]**
**Gen1a.** What was the name of the contractor/company?

1. **Name**
DK

**[If Gen1 = 1]**
**(Gen1b).** Who was your primary contact at the contractor/company?

1. **Name**
DK

**Gen2.** Thinking about your experience from start to finish, how would you rate your satisfaction with the Xcel Energy Lighting Efficiency 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]
77. Not applicable
88. DK
99. REF

**[ASK IF Gen2 < 4]**
**Gen2a.** Why weren't you satisfied with your experience with the Lighting Efficiency program?

1. [OPEN END]
DK
REF

**Gen3.** Did you fill out the Xcel Energy Lighting Efficiency rebate application, or did your contractor/sales person fill it out for you?

1. I filled it out
2. Someone else in my organization filled it out [SKIP TO NEXT SECTION]
3. Contractor filled it out for me [SKIP TO NEXT SECTION]

88. DK [SKIP TO NEXT SECTION]
99. REF [SKIP TO NEXT SECTION]

**Gen3a.** Did you submit the rebate application online or did you mail in a paper form?

1. Submit application online
2. Mailed in a paper application [skp Gen8]
3. Emailed application to Xcel representative [skp Gen8]

4. Other: _____ [ [SKIP TO NEXT SECTION]
88. DK [SKIP TO NEXT SECTION]
99. REF

**[IF GEN3a = 2 or 3, SKIP TO Gen8]**

**Gen4.** The online application form is a relatively new component of the Lighting Efficiency program, as such, we'd like to hear about your experience with it. First of all, approximately how long did it take you to fill out the online application? Your best guess is fine.

1. 0-15 minutes
2. 16-30 minutes
3. 31 minutes to 1 hour
4. over 1 hour but less than 2 hours
5. More than 2 hours
88. DK
99. REF

**Gen5.** How would you rate your satisfaction with the time it took you to fill out the online application? (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]
77. Not applicable
88. DK
99. REF

**Gen6.** How would you rate your satisfaction with the online application 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]
77. Not applicable
88. DK
99. REF

**[ASK IF Gen6 < 4]**

**Gen6a.** Why weren't you satisfied with your experience?

1. [OPEN END]
DK
REF

**Gen7.** Do you have any suggestions for Xcel Energy on how they could improve the online application?

1. [OPEN END]
DK
REF

**[IF GEN3a = 1, SKIP TO NEXT SECTION]**

**Gen8.** As part of our evaluation, we are looking to re organize the Lighting Efficiency application form, as such, we'd like to hear about your experience with it. First of all, approximately how long did it take you to fill out the application form? Your best guess is fine.

1. 0-15 minutes
2. 16-30 minutes

3. 31 minutes to 1 hour
4. over 1 hour but less than 2 hours
5. More than 2 hours
88. DK
99. REF

**Gen9.** How would you rate your satisfaction with the time it took you to fill out the application? (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]
77. Not applicable
88. DK
99. REF

**Gen10.** How would you rate your satisfaction with the application 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]
77. Not applicable
88. DK
99. REF

**[ASK IF Gen10 < 4]**
**Gen10a.** Why weren't you satisfied with your experience?

1. [OPEN END]
DK
REF

**Gen11.** Do you have any suggestions for Xcel Energy on how they could improve the application?

1. [OPEN END]
DK
REF

**Gen12.** Were you aware that the Lighting Efficiency program offers an online rebate application, as an alternative to the paper form?

1. Yes
2. No
88. DK
99. REF

**[ASK IF Gen12 = 1]**
**Gen12a.** Why did you choose to use the paper form rather than the online version?

1. [OPEN END]
DK

## Section A: Free-ridership

[If number_of_sites = 1 SKP A1]
[If samplesites = 3] SKP A1

A0a. I understand you received rebates from Xcel Energy for lighting products at several locations in 2017. I show [Number_of_Sites] locations receiving Xcel Energy rebated lighting products. Was there a single decision maker for all [Number_of_Sites] locations or were there multiple decision makers in the decision to purchase these lighting products?

1. Single decision maker
2. Multiple decision makers [SKIP TO A1, SET [LOCATION] TO [ADDRESS] FOR THIS SECTION]

88. DK [SKIP TO A1, [LOCATION] TO [ADDRESS] FOR THIS SECTION]

99. REF

A0b. Did the decision making process differ between the sites or was it the same for all locations? [IF NEEDED: STATED ANOTHER WAY, DID YOU MAKE ONE DECISION THAT APPLIED TO ALL SITES, OR DID EACH SITE REQUIRE INDIVIDUAL ASSESSMENT?]

1. Decision process was the same for all sites
   [REFERENCE ALL LOCATIONs FOR THIS CONTACT IN THIS MEASURE GROUP FOR THIS SECTION: SET [LOCATION] to "these [number of sites] locations"]

2. Decision process varied from site to site
   [SKIP TO A1, REFERENCE ONLY [ADDRESS] FOR THIS SECTION]: SET [LOCATION] to "[ADDRESS]"]

   88. DK [SKIP TO A1, REFERENCE ONLY [ADDRESS] FOR THIS SECTION: ]: SET [LOCATION] to [ADDRESS]

99. REF

**A1.** Making decisions can sometimes be relatively simple involving one major factor, like price. Or, they can be relatively complex involving multiple factors.

As part of the project at [LOCATION], Xcel Energy provided you with:

1. An incentive of [INSERT <DOLLAR_AMOUNT>]
2. Information through marketing materials
3. An endorsement or recommendation by Xcel Energy staff
4. Engineering or other technical assistance

There might be other things, not related to the program that might also have influenced your decision to install <MEASURE_1> at [LOCATION]. For example, maybe high electric bills or previous experience with energy efficient equipment.

Please rate the importance of each of the following factors on your decision to install **<MEASURE _1>]** using a scale from 0 to 10, where 0 means "not at all important" and 10 means "extremely important". The bigger the number, the greater the influence; if a particular factor is not applicable for this project, just say "not applicable". If you don't know, just say "I don't know". Now, how important was…

**(REPEAT SCALE AS NECESSARY)**

1. [NUMERIC OPEN END, 0 - 10]
77=Not applicable
88 = DK
99 = REF

**A1a.** Contractor recommendation
**A1b.** The dollar amount of the rebate
**A1c.** Endorsement or recommendation by your Xcel Energy account manager or other Xcel Energy staff
**A1d.** Information from Xcel Energy marketing or informational materials
**A1e.** Simple payback period, which is the amount of time until equipment has paid for itself

**A1e1. <ASK IF A1e> 5>** Did the Xcel Energy rebate impact your calculations on the payback period?

1. Yes
2. No
88. DK
99. REF

**A1e2. <ASK IF A1e1= YES>** Did the Xcel Energy rebate shorten the payback period?

1. Yes, by how much?:
2. No
88. DK
99. REF

**A1e3. <ASK IF A1e> 5>** Typically, what is the simple payback threshold that your company uses for such capital investments?
[OPEN END]

**A1f.** Total amount of money saved over lifetime of the equipment, otherwise known as the return on investment or "ROI"

**A1f1. <ASK IF A1f> 5>** Did the Xcel Energy rebate increase the return on investment?

1. Yes, by how much?: [DK]
2. No
88. DK
99. REF

**A1g.** Your previous participation in an Xcel Energy program

A1g1. [IF A1g <> NA, 88, 99]: How long ago in years did you participate in the Xcel Energy program? _____ years ] DK REF

**A1h.** The age or condition of the old equipment
**A1i.** Previous experience with this type of equipment
**A1j.** Corporate policy or guidelines

**A1j1 <ASK IF A1j>5>**Does your company have any corporate policies related to energy efficiency standards that you need to consider when purchasing new equipment or making improvements to this facility?

1. Yes, what is that policy?:
2. No
88. DK
99. REF

IF (A1j1 > 1) skip to A1k

**A1j2.** Does the corporate policy specifically cover lighting?

1. Yes
2. No
88. DK
99. REF

**A1j3**How did this corporate policy influence your decision to install the **<MEASURE _1>**?

[OPEN END] - [DK]

**A1j4** Did Xcel Energy influence your decision to develop this corporate policy?

**1. Yes, how did it influence your decision?: [DK]**
**2. No**
**88. DK**
**99. REF**

**A1k.** Minimizing operating cost
**A1l. Predetermined timeline or** schedule for replacing equipment
**A1m.** State or Federal efficiency standards
**A1n.** Are there any other factors that were important in your decision to install %Measure_1%?

1. Yes, please specify:
2. No
88. Don't know
99. Refused

Skip to A6a if A1n>1

A1n1. How would you rate the importance of that factor on your decision to install MEASURE_1

**A6a.** If the Xcel Energy Lighting Efficiency Program was not available, would you have installed the *exact same type, quantity, model, and efficiency* of the <MEASURE> at [LOCATION] you installed through the lighting efficiency program?

[NOTE TO INTERVIEWER: If respondent indicates they would have installed a lesser quantity, the answer to this question is 'no'.]

1. Yes
2. Maybe / not sure
3. No / Would not have installed <MEASURE_1> at all [SKIP TO A8]
88. DK [skp A8]

99. REF [skp A8]

[IF A6a = 1 or 2]

**A6b.** Using a scale from 0 to 10, where 0 means "not at all likely" and 10 means "extremely likely", please rate the likelihood that you would have installed the *exact same* **<MEASURE_1 > at [LOCATION]** if the Xcel Energy , Lighting efficiency program incentive was not available.

When I say "the exact same <MEASURE_1>", I mean the *exact same model, quantity, and efficiency* of the lighting products you installed through the Lighting Efficiency Program.

[NUMERIC OPEN END, 0 - 10]
88. DK
99. REF

**[ASK IF A6b > 7 and Maximum of (A1a to A1g > 7]**
**[ONLY ASK MAXIMUM OF ONE TIME]**

**A6c.** You just indicated you would still have installed **<MEASURE_1>** without any incentive from the Lighting Efficiency Program, suggesting that the program was not very important. Earlier, when I asked you to rate the importance of each program factor on your decision, the highest rating you gave was a **<RESTORE HIGHEST RATING FROM A1a to A1g>** out of 10, suggesting that the program was very important. Should I go back and change one of your answers?

1. Correct - Leave answers as is [SKIP A7] [OPTIONAL EXPLANATION]
2. Change the likelihood of installing %MEASURE_1% without the program (<-SKIP BACK TO A6a)
3. Change the influence of the program factors
88. DK
99. REF

**[ASK IF A6b < 3 and Maximum of (A1a to A1g < 3]**
**[ONLY ASK MAXIMUM OF ONE TIME]**

**A6d.** You just rated your likelihood to <**MEASURE_ACTION_1>** without any incentive from the Lighting Efficiency Program as a(n) <**RESTORE RESPONSE FROM A6b>** out of 10, suggesting that the program was very important. Earlier, when I asked you to rate the importance of each program factor on your decision, the highest rating you gave was a **<RESTORE HIGHEST RATING FROM A1a to A1g>** out of 10, suggesting that the program was not very important. Should I go back and change one of your answers?

1. Correct - Leave answers as is [SKIP A7] [OPTIONAL EXPLANATION]
2. Change the likelihood of installing %MEASURE_1% without the program (<-SKIP BACK TO A6a)
3. Change the influence of the program factors
88. DK
99. REF

A7. In the absence of the Xcel Energy rebate program, when would you have installed the *exact same type, model, and efficiency* of the lights you installed at [LOCATION] through the Lighting Efficiency Program? Would it have been… [READ CODES 1-77]

1. Within one year of installation?
2. Between 1 and 2 years later
3. Between 2 years and 3 years later
4. Between 3 years and 4 years later
5. Greater than 4 years later
77. Or would you not have installed the equipment at all
88. DK
99. REF

[IF A6a = 1 or 2 or 3 or DK]

A8. Asking this same question in a different way -- using a scale from 0 to 10, where 0 means "not at all likely" and 10 means "extremely likely", what is the likelihood that you would have installed the *exact same model, quantity, and efficiency* of the <MEASURE_1> you installed through the Lighting Efficiency Program within 12 months of <MONTH> <YEAR> if the Xcel Energy <PROGRAM> was not available at [LOCATION].

[NUMERIC OPEN END, 0 - 10]
88. DK
99. REF

A0c. In your own words, how would you describe the influence that the Xcel Energy Lighting Efficiency Program had on your decision to purchase/install this <MEASURE_1> at [LOCATION].

[RECORD VERBATIM]
[DK/REF]

## Section B: Spillover

[NOTE: Questions B1 through B6 measure 'like' spillover. Questions B7 through B12 measure 'unlike' spillover.]

**B1.** Since your participation in the Lighting Efficiency program in <INSERT MONTH AND YEAR OF PARTICIPATION>, has your company installed any efficient lighting products at this facility without a rebate from Xcel Energy? When I say "efficient lighting products", I mean LEDs, T5s, and lighting controls.

1. Yes
2. No [SKIP TO B7]
88. DK [SKIP TO B7]
99. REF [SKIP TO B7]

**B1a.** Why did you not apply for an Xcel Energy rebate for purchasing these efficient lighting products?

1. OPEN END
DK
REF

**B2.** Did your experience with the efficient lighting products you installed through the Xcel Efficient Lighting Program influence your decision to install some or all of the additional efficient lighting (and controls) on your own?

1. Yes
2. No [SKIP TO B7]
88. DK [SKIP TO B7]
99. REF [SKIP TO B7]

**B3.** What type of lighting was it? For example, screw in LEDs, Linear LEDs, lighting controls. (LIST ALL TYPES)

B3_1. Lighting type 1:
B3_2. Lighting type 2:
B3_3. Lighting type 3:
B4_4. Lighting type 4:
88. DK [SKIP TO B7]
99. REF [SKIP TO B7]

LOOP OF B4-B6 for each light type mentioned in B3

**B4.** Approximately how many of each type did you install? (READ TYPES LISTED IN B3 For controls, ask for approximate number of lamps or fixtures controlled)

B4_1. Lighting type 1:
B4_2. Lighting type 2:
B4_3. Lighting type 3:
B4_4. Lighting type 4:
8888. DK [SKIP TO next light type]
9999. REF [SKIP TO next light type]

**B5.** How important was your experience in the Lighting Efficiency program and products in your decision to install these lighting products on your own, using a scale from 0 to 10, where 0 is "not at all important" and 10 is "extremely important"?

B5_1. Lighting type 1:
B5_2. Lighting type 2:
B5_3. Lighting type 3:
B5_4. Lighting type 4:
88. DK
99. REF

**B6.** Using a 0 to 10 scale, where 0 means you definitely WOULD NOT have installed these products and 10 means you definitely WOULD have installed these lighting products, if you had not participated in the Lighting Efficiency program, how likely is it that your organization would have installed these additional efficient lighting products?

B6_1. Lighting type 1:
B6_2. Lighting type 2:
B6_3. Lighting type 3:
B6_4. Lighting type 4:
88. DK
99. REF

**B7.** Since your participation in the Lighting Efficiency program, have you installed any additional energy efficient equipment, other than lighting, at this or other facilities in Xcel Energy's territory?

1. Yes
2. No [skp C1]
88. DK [Skp C1]
99. REF [Skp C1]

**[ASK IF B7=1]**

**B8.** Did your experience with the Xcel Energy rebated lighting influence your decision to install some or all of these efficient products?

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

**B9.** What equipment did you install? Please provide as much detail as you can. **(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]
88. DK [SKIP TO NEXT SECTION]
99. REF [SKIP TO NEXT SECTION]

[PROGRAMMING NOTE: CREATE LOOP B9-B11 FOR EACH MEMBER OF B8, MAX 5 LOOPS]
**[ASK B10-B12 FOR INDIVIDUALLY FOR EACH EQUIPMENT METIONED IN B9**

**B10.** Did you receive a rebate for [EQUIPMENT X] through Xcel Energy or any other energy efficiency program?

1. Yes
2. No
88. DK
99. REF

**[ASK IF B10=1]**

**B11.** How important was your experience in the Lighting Efficiency program in your decision to install this [EQUIPMENTX], using a scale from 0 to 10, where 0 is "not at all important" and 10 is "extremely important"?

1. [NUMERIC OPEN END, 0 – 10]
88. DK
99. REF

**Skip to the next loop or C1 If B10= 1**

**[ASK IF B10=2]**

**B12.** If you had not participated in the Lighting Efficiency program, how likely is it that your organization would still have installed [EQUIPMENTX], using a 0 to 10 scale, where 0 means you definitely WOULD NOT have implemented this measure and 10 means you definitely WOULD have implemented this measure?

1. [NUMERIC OPEN END, 0 – 10]
88. DK
99. REF

## Section C: DLC Bulbs

**[IF MEASURE_DLC_1 = 0, SKIP TO C6. IF MEASURE_CONTROLS_1=1 SKIP TO NEXT SECTION]**

**C1.** According to our records, MEASURE_1 is a DLC (Design Lights Consortium) rated product. Were you aware of this DLC rating?

1. Yes
2. No
88. DK
99. REF

**C2.** Do you generally look for the DLC rating when choosing lighting products for your facility?

1. Yes
2. No
88. DK
99. REF

[IF C2 =1, ask C3]

**C3.** Why do you look for this rating when choosing lighting products?

1. OPEN END
DK
REF

[IF C2 =2, ask C3a]

**C3a.** Why do you not use this rating when choosing lighting products?

1. OPEN END

DK
REF

C4, On a scale from 0 to 10, where 0 is "not at all likely" and 10 is "very likely", how likely is it that you would purchase a NON-DLC rated product for use at your facility?
1. [NUMERIC OPEN END, 0 - 10]
88. DK
99. REF

C5. Why do you give that rating?
1. [OPEN END]
DK

C5a. On a scale from 0 to 10, where 0 is "not at all satisfied" and 10 is "very satisfied", how satisfied have you been with the performance of the <MEASURE_1>?
1. [NUMERIC OPEN END, 0 - 10]
DK

**[IF MEASURE_DLC_1 = 1, SKIP TO NEXT SECTION ]**
**C6.** According to our records, MEASURE_1 is not rated by the Design Lights Consortium, DLC. Were you aware that this product is not DLC rated?
1. Yes
2. No
88. DK
99. REF

**C7.** Do you generally look for the DLC rating when choosing lighting products for your facility?
1. Yes
2. No
88. DK
99. REF

[IF C7=1, ASK C8]
**C8.** Why do you look for this rating when choosing lighting products?
1. OPEN END
DK
REF

[IF C7=2, ASK C8a]
**C8a.** Why do you not use this rating when choosing lighting products?
1. OPEN END
DK
REF

**C9.** Why did you choose a non-DLC rated product in this instance?
1. OPEN END
DK
REF

## Section D: Lighting Controls

[IF MEASURE_CONTROLS = 0, SKIP TO D6]

**D1.** Xcel Energy is interested in expanding the adoption of lighting controls strategies in commercial and industrial facilities. We'd like to know a little bit about your experience with them. Where did you learn about the lighting control strategies you purchased as part of this program? [DO NOT READ, ACCEPT MULTIPLE ANSWERS]

1. Contractor
2. Word of Mouth
3. Advertisement
4. Xcel Energy advertisement or account manager
5. Other; {OPEN END}
88. DK
99. REF

D1a. Had you heard of lighting control strategies, prior to participating in the program?

1. Yes
2. No
88. DK
99. REF

**D2.** What challenges, if any, did you experience when deciding whether or not to install lighting controls? [DO NOT READ, ACCEPT MULTIPLE ANSWERS]

1. Cost
2. Compatibility with existing fixtures
3. Hassle of rewiring
4. Other [OPEN END]
5. None, there were no challenges with this decision
88. DK
99. REF

[IF D2 ≠ 5, DK, or REF, ask D3]

**D3.** What encouraged you to install lighting controls, despite the challenges you just noted?

1. OPEN END
DK
REF

D4. On a scale from 0 to 10, where 0 is "not at all satisfied" and 10 is "very satisfied", how satisfied have you been with the performance of the rebated lighting controls?

1. [NUMERIC OPEN END, 0 - 10]
88. DK
99. REF

D5. Why do you give that rating?

1. [OPEN END]
DK

[IF MEASURE_CONTROLS = 1, SKIP TO NEXT SECTION]

D6. Our records indicate that you did not purchase lighting controls, such as photocell or occupancy sensors, through the Xcel Energy lighting efficiency program. Do you have lighting control strategies currently installed on the interior of your facility?

1. Yes
2. No [SKIP TO D10]
88. DK [SKIP TO D10]
99. REF [SKIP TO D10]

D7. What lighting control strategies are currently installed at your facility? [ACCEPT MULTIPLE]

1. Occupancy sensors
2. Photocell or daylight harvesting
3. Scheduled run times
4. Advanced or network controlled lighting
5. OTHER [SPECIFY]
88. DK
99. REF

D8. Approximately what percent of the indoor lighting at your facility is controlled by lighting control strategies?

1. [NUM 1-100]
888. DK

[IF D8 <90%, ASK D9]

D9. Why isn't all of your indoor lighting managed through these lighting control strategies? [DO NOT READ, ACCEPT MULTIPLE ANSWERS]

1. Cost
2. Compatibility with existing fixtures
3. Hassle of rewiring
4. Other [OPEN END]
88. DK
99. REF

[IF D6=1, SKIP TO D11]

D10. Have you heard of lighting control strategies, prior to today?

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

D11. Did you know Xcel Energy offers rebates for indoor lighting controls through the Lighting Efficiency program?

1. Yes
2. No

88. DK
99. REF

[IF D6=1, SKIP TO NEXT SECTION]
D12. Why have you not installed lighting controls at your facility to date? [DO NOT READ, ACCEPT MULTIPLE ANSWERS]
1. Cost
2. Bad experience with lighting controls
3. I don't know enough about them
4. Our facility runs constantly and lighting controls would not be feasible. [SKIP TO NEXT SECTION]
5. Other [OPEN END]
88. DK
99. REF

D13. What would motivate you to install lighting sensors at your facility in the future? [DO NOT READ, ACCEPT MULTIPLE ANSWERS]
1. Lower cost of equipment
2. Lower cost/free installation
3. Greater energy savings
4. Other [OPEN END]
5. Nothing would motivate us.
6. Our facility runs constantly and lighting controls would not be feasible at this facility.
88. DK
99. REF

## Section Gen: Firmographics

Finally, I'd like to gather some information about your involvement with the Xcel Energy Lighting Efficiency program and your role at your organization.

Gen1x. How would you describe the primary business activity at this location? **[Refer to definitions if needed.]**

1. Administrative and Support Services
2. Ambulatory Health Care
3. Educational Services
4. Fabricated Metal Product Manufacturing
5. Food and Beverage Stores
6. Food Services and Drinking Places
7. Merchant Wholesalers, Durable Goods
8. Professional, Scientific, and Technical Services
9. Real Estate
10. Religious, Grantmaking, Civic, Professional, and Similar Organizations
11. Other (Specify: _____)
88. DK
99. REF

Gen2x. How many buildings are at this address? 888. DK 999. Ref

Gen3x. What is the approximate total square footage of all the occupied space for all buildings at this address? 888. DK 999. Ref

**Gen4x.** 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 ____

88.DK
99.REF

**Gen5x.** 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
88. DK
99. REF / Prefer not to say

**Gen6x.** Does your organization own, lease, or rent your facility?

1. Own
2. Lease / Rent
3. Other _____
88. DK
99. REF

**[ASK IF Gen6x <> 1]**

**Gen7x.** Do you 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
88. DK
99. REF

**Gen8x.** Has your organization previously participated in this or any other Xcel Energy energy efficiency program for your business?

1. Yes
2. No
88. DK
99. REF

**Gen9x.** Aside from your rebate for **<PARTICIPATION DESCRIPTION>** through the Lighting Efficiency program, have you ever received any other rebates from a utility other than Xcel Energy for installing energy efficiency Lighting equipment, having equipment optimized, or performing maintenance?

1. Yes
2. No
88. DK
99. REF

**[ASK IF Gen9x=1]**

Gen10x. Which utility did you receive rebates from?

1. [OPEN END]
DK
REF

## Closing

**CLOSE1**. These are all the questions I have. As a thank you for your input, we'd like to send you $25. Let me ask the information we need to mail your check to the intended recipient—this could be you, personally, or anyone else of your choosing:

**[COLLECT CONTACT INFORMATION]**

**[IF SAMPLESITES = 3] SKP END**RECRUITMENT1. Xcel Energy is conducting a study to gather information that will be used to evaluate and improve their energy efficiency programs. 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
88. DK
99. REF

**[ASK IF RECRUITMENT1. = Yes]**

RECRUITMENT2. Mad Dash, a national research firm, is conducting this study on behalf of Xcel Energy, and a representative from Mad Dash 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 Kim Sherman at (612) 337-2360.

*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 Trade Partner Interview Guide

### Introduction

To support the process and impact evaluation of the 2016 Xcel Energy efficiency programs, members of the EMI 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 for the Xcel Energy Colorado Lighting Efficiency program. We will interview participating trade partners. The participating sample for these interviews may include trade partners a mix of both high and low performing trade partners.
The remainder of the introduction provides the research questions which this guide is designed to address and fielding instructions for the interviewees.

#### Evaluation Objectives

The objectives for the CO Lighting Efficiency product evaluation are to:

- Identify barriers and programmatic adoption strategies for lighting controls: What are the most common barriers for adoption and how can Xcel Energy overcome them? How are other utilities encouraging the adoption lighting controls?
- Investigate DLC and non-DLC offerings: What product qualified product lists (QPL) do other utilities require? Are there differences in program or product satisfaction between these product types?
- Assess application form: How can the application form be simplified? What information is necessary to accept a rebate and claim accurate savings? What data do other utilities require on their applications?

- Assess experiences with the online application: How satisfied are participants with the online application process? Why are/are not customers using the online application?
- Assess longevity of linear fluorescent product offerings: When should Xcel Energy stop offering rebates on linear fluorescent product? When should the market for these product be considered transformed? What are other utilities planning?
- Develop a NTG ratio documenting the program's influence on customer's decisions.
- Assess market effects of the Colorado Lighting Efficiency Program

The trade partner survey does not address every evaluation objective. For reference, the following table provides the evaluation efforts used for each objective.

| Research Task | Sample Size | Research Objective(s) |
|---|---|---|
| Staff Interviews | 5 | Inform evaluation plan, NTG |
| Participant Cognitive Interviews | 10 | Testing survey questions, assessing comprehension, evaluating NTG methodology |
| Participant Surveys | 204 | Lighting controls, DLC and non-DLC product, online application experience, NTG |
| Trade Partner Interviews | 40 | Lighting controls, DLC and non-DLC product, application experience, NTG |
| Peer Utility Benchmarking | 6 utilities | Lighting controls, DLC and non-DLC product, linear fluorescent product. |
| Application Redesign | na | Application simplification |
| Spillover/ Saturation Study (optional) | 100 | NTG, deeper retrofit opportunities |

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

- What are the most common barriers for adoption of lighting controls and how can Xcel Energy overcome them?
- Are there differences in program or product satisfaction between these product types DLC and non-DLC offerings?
- How satisfied are participants with the online application process? Why are/are not customers using the online application?
- Does the program influence additional energy savings outside of what is captured through the program (spillover)?

The following table presents the link between each evaluation objective, research question, and survey question.

| Evaluation Objective | Research Question | Survey Question Number(s) |
|---|---|---|
| Identify barriers and programmatic adoption strategies for lighting controls. | What are the most common barriers for adoption and how can Xcel Energy overcome them? | D1-D6 |
| Investigate DLC and non-DLC offerings. | Are there differences in program or product satisfaction between these product types? Why do trade partners prefer one or the other? | C1-C7 |
| Develop a NTG ratio documenting the program's influence on customer's decisions. | 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? | B5-B22 |
| Assess experiences with application. | How satisfied are participants with the online application process? Why are/are not customers using the online application? | G4-G14 |

## Sample Variables

The following table include the sample variables that will be used to conduct this interview, as well as descriptions of these variables and potential codes.

| Sample Variable | Variable Description | 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. Katie Cary |
| Phone | Phone number for contact at organization | e.g. 555-555-5555 |

## Fielding Instructions

We will attempt to schedule interviews via email if email addresses are available. We will supplement email recruiting efforts with telephone calls as needed. The following fielding guidelines should be used for trade partner/contractor recruiting and interviews:

- Attempt to reach each trade partner/contractor 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.
- Calling hours are 7 AM to 5 PM MT.
- Record interviews
- Definitions: COMPANY NAME = Update COMPANY NAME with Trade Partner's/Contractor's company name

### Telephone Recruiting Dialog/Message Script

[INTRO:] Hi, this is **NAME** from Apex Analytics, calling on behalf of Xcel Energy. We're contacting professionals that have worked on projects in the Xcel Energy Lighting Efficiency Program to learn how Xcel Energy can improve their program. May I please speak with <CONTACT> or the person most familiar with your company's participation in Xcel's Lighting Efficiency Program?

[ONCE CONTACT IS ON THE PHONE, REPEAT INTRO AS NEEDED:] Apex Analytics is an independent third-party contractor hired by Xcel Energy to evaluate their Lighting Efficiency Program. I'd appreciate the opportunity to schedule a quick half-hour interview with you to discuss your experience. We are offering a $50 incentive as a thank you for your time.

[MESSAGE SCRIPT:] Please give me a call back to schedule a time to talk. My name is **NAME** and my phone number is **PHONE NUMBER**. If I don't hear back in a few days, I will give you a try back. Thank you! Goodbye.

### Email Recruiting Text

Hello _____,
I work for Apex Analytics, an independent third-party contractor hired by Xcel Energy to evaluate their Lighting Efficiency Program. I am contacting professionals that have worked on projects in the Xcel Energy Lighting Efficiency Program to learn how Xcel Energy can improve their program. Regardless of whether you've completed many Lighting Efficiency projects, just a few, or even none in recent memory – I'd appreciate the opportunity to schedule a quick half-hour interview with you to discuss your experience. We are offering a $25 incentive as a thank you for your time.

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, I can schedule the interview for another time that is more convenient for you.

## Interview

### Section A: Introduction/Background Information

Thank you for agreeing to talk with me today. I expect this conversation to take about half an hour. 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?

A3. Can you briefly describe your company's work? [**PROBE FOR SPECIFIC SPECIALTIES**.]

A4. What of the following types of lighting products does your company sell in Colorado?

Approximately what percent of your sales are each of these types?

| ***Type*** | ***Sell? (Y/N)*** | ***% of sales*** |
|---|---|---|
| Linear LEDs [t-LEDs] | | |
| T-12 bulbs | | |
| T-8 bulbs | | |
| T-4 bulbs | | |
| Linear LED retrofit kits | | |
| High bay lighting | | |
| HID lighting | | |
| Troffers | | |
| Lighting controls | | |
| Screw based lightbulbs | | |
| CFLs? | | |
| LEDs? | | |
| Incandescent / Halogens | | |
| Other [specify] | | |
| *SUM TO 100%* | | *100%* |

A6. What types of customers does COMPANY NAME typically serve? [**PROBE:** In general, do you serve commercial, residential, multifamily?]

1. [**IF YES:**] Has your company's participation in the Lighting Efficiency program influenced any changes in the services you deliver, products you provide or the customers you serve? How so?

## Section B: Trade Partner Marketing, Freeridership, & Spillover

B1. What sales techniques do you use to attract new Lighting customers? [**PROBE:** brochures, cold calls, ads, door to door]

B2. At what point in a project do you talk to your customers about the Lighting Efficiency program?

B3. What aspects of the Lighting Efficiency program do you discuss with customers?

1. What do you think motivates customers to participate?

B4. Do rebates/incentives ever come up in sales discussions with customers?

[**IF YES**:]

1. When in the conversation are rebates/incentives typically mentioned [**PROBE:** introduction, discussion of costs, etc.]?

    a. Who typically brings up rebates/incentives [**PROBE:** customer or contractor]?

2. How big of a factor are the Lighting Efficiency program rebates/incentives when customers are choosing their lighting products? On a scale of 0-5 where 0 is not at all influential and 5 is extremely influential, how influential are the Lighting Efficiency program rebates when customers are choosing their lighting products?

    a. To what extent does discussing rebates/incentives help sales?

B5. About what percent of the lighting products you sell are eligible for rebates in the Xcel Energy Lighting program?

B6. In 2017, did you sell any program eligible products that you or your customer did not submit for an Xcel Energy rebate?

    a. Approximately what percent of Xcel Energy program eligible lighting products you sell do not receive rebate?

        1. To confirm, of all the program eligible lighting products you sold in 2017, [ANSWER FROM D9A%] received a rebate and [100 - ANSWER FROM D9A] were not rebated. Does that sound about right?

    b. Why did you or your customer not apply for a rebate?

    c. Thinking about these program eligible products that 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?

B7. 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 your decision to recommend program eligible lighting products to your customers?

B8 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 energy efficient lighting equipment?

B9. And using 0 to 10 likelihood scale, where 0 is not at all likely and 10 is extremely likely, if the Lighting Efficiency program had not been available, what is the likelihood you would have recommended energy efficient lighting products to your customers?

B10. On a scale of 0 to 10 where 0 is not at all important and 10 is extremely important, how important is the Lighting Efficiency program, including the rebates and program information, in deciding which lighting products you stock and recommend as a whole?

B11 Do you sell lighting products outside of the Xcel Energy service territory?

1. YES
   NO [SKIP TO B16]
   DK [SKIP TO B16]
   REFUSED/PREFER NOT TO STATE [SKIP TO B16]

B12 Do you stock the same lighting technologies in Xcel Energy's service territory as you do outside of it?

1. YES

2. NO

a. How does your stocking differ? [PROBE FOR DIFFERENCES IN ENERGY EFFICIENT TECHNOLOGIES, DLC RATED PRODUCTS, ETC]
   DK
   REFUSED/PREFER NOT TO STATE

B13 Does the distribution of energy efficient and standard efficient lighting products differ in Xcel Energy's service territory compared with outside of it?

1. YES

   What percent of your lighting products are energy efficient technologies within Xcel Energy's territory?

   What percent of your lighting products are energy efficient technologies outside of Xcel Energy's territory?

2. NO
   DK
   REFUSED/PREFER NOT TO STATE

B14 Approximately, what percent of projects did you recommend energy efficient lighting technologies to customers outside of the Xcel Energy service territory?

B15 And approximately, in what percent of projects do you recommend energy efficient lighting technologies to customers within the Xcel Energy service territory?

B16 Excluding medium screw based bulbs, what percent of the lamps you sell are LEDs? We are asking about the percent of lamps, not dollars.

B17 Assuming Xcel Energy continues to rebate LEDs for the foreseeable future, what percent of lamps you sell do you expect to be LEDs in 2020? (Again, excluding medium screw based bulbs.)

B18 Again, assuming Xcel Energy continues to rebate LEDs, what percent of the lamps you sell do you expect to be LEDs in 2022?

B19 Let's consider a second scenario, which assumes LED rebates were not offered by Xcel Energy in 2020 and 2022. What percent of the lamps you sell would you expect to be LEDs in 2020, under this scenario?

B20 What percent of the lamps you sell would you expect to be LEDs in 2022, if LED rebates were not offered by Xcel Energy in 2020 and 2022?

[ASK B21 IF Δ BETWEEN B17 AND B19 IS ≤25%]
B21 Why do you believe the availability of Xcel Energy rebates would cause only a slight impact in your LED sales in 2020?

[ASK B22 IF Δ BETWEEN B18 AND B20 IS ≤25%]
B22 Why do you believe the availability of Xcel Energy rebates would cause only a slight impact in your LED sales in 2022?

## Section F: Evolving Market Place

F1. What do you see as new/emerging energy efficiency opportunities for Lighting Efficiency program customers?

## Section G: Satisfaction and Application Experience

G1. What is the Lighting Efficiency program doing well that they should keep doing?

G2. What recommendations do you have for improving the program?

G3. Have you had any feedback from your customers about their experiences with the Lighting Efficiency program that you think Xcel Energy should know?

G4. Did you fill out the Xcel Energy Lighting Efficiency lighting retrofit rebate application in 2017, or did the customer fill it out?

1. I filled it out
2. Someone else in my organization filled it out [SKIP TO NEXT SECTION]
3. Customer filled it out for me [SKIP TO NEXT SECTION]

DK
REF

G4a. Did you submit the lighting retrofit rebate application online or did you mail in a paper form?

5. Submit application online
6. Mailed in a paper application
7. I've submitted applications both online and on paper
8. Other: _____ [ [SKIP TO NEXT SECTION]

DK [SKIP TO NEXT SECTION]

**[IF G4a = 2, SKIP TO G9]**

G5. The online application form is a relatively new component of the Lighting Efficiency program, as such, we'd like to hear about your experience with it. First of all, approximately how long did it take you to fill out the online application? Your best guess is fine.

6. 0-15 minutes
7. 16-30 minutes
8. 31 minutes to 1 hour
9. over 1 hour but less than 2 hours
10. More than 2 hours

DK

G6. How would you rate your satisfaction with the time it took you to fill out the online application? (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]
99. Not applicable
DK
REF

G7. How would you rate your satisfaction with the online application 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]
99. Not applicable
DK
REF

**[ASK IF G7 < 4]**

G7a. Why weren't you satisfied with your experience?

1. [OPEN END]
DK
REF

G8. Do you have any suggestions for Xcel Energy on how they could improve the online application?

1. [OPEN END]
DK
REF

**[IF G3a = 1, SKIP TO NEXT SECTION]**

G9. As part of our evaluation, we are looking to re organize the Lighting Efficiency Retrofit application form, as such, we'd like to hear about your experience with it. First of all, approximately how long did it take you to fill out the application form? Your best guess is fine.

1. 0-5 minutes
2. 6-10 minutes
3. 11-15 minutes
4. 16-20 minutes
5. More than 20 minutes

DK

G10. How would you rate your satisfaction with the time it took you to fill out the lighting retrofit application? (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]
99. Not applicable
DK
REF

G11. How would you rate your satisfaction with the application 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]
99. Not applicable
DK
REF

**[ASK IF G11 < 4]**

G11a. Why weren't you satisfied with your experience?

1. [OPEN END]
DK
REF

G12. Do you have any suggestions for Xcel Energy on how they could improve the lighting retrofit application?

1. [OPEN END]
DK
REF

G13. Were you aware that the Lighting Efficiency program offers an online rebate application, as an alternative to the paper form?

3. Yes
4. No
DK

[ASK IF G13 = 1]

G14. Why did you choose to use the paper form rather than the online version for the lighting retrofit application?

2. [OPEN END]
DK

## Section C: DLC Products

C1. Does your company sell both DLC and non-DLC rated products?

1. Yes, we sell both DLC and non-DLC products
2. No, we sell only DLC rated products
3. No, we sell only non-DLC products
DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

C1a. How valuable do you see the DLC rating at indicating quality products? Please use a scale from 0 to 10 where 0 is not at all valuable and 10 is extremely valuable.
Why do you give this rating?

C1b. In November of 2017, Xcel Energy began offering rebates at a reduced incentive on non-DLC lighting products. What is your opinion on this programmatic change?

[IF C1 = 3, skip to C7 ; if C1 =2 skip to C6]

C2. Do you generally take into account the DLC rating when recommending lighting products to your customers?

1. Yes
2. No
DK
REF

[IF C2 =1, ask C3]

C3. Why do you look for this rating when choosing lighting products?

1. OPEN END
DK
REF

[IF C2 =2, ask C3a]

C3a. Why do you not use this rating when choosing lighting products?

1. OPEN END
DK
REF

C4, On a scale from 0 to 10, where 0 is "not at all likely" and 10 is "very likely", how likely is it that you would recommend a NON-DLC rated product for your customers?

1. [NUMERIC OPEN END, 0 - 10]
DK

C4a. Why do you give that rating?

1. [OPEN END]

DK

C5. On a scale from 0 to 10, where 0 is "not at all satisfied" and 10 is "very satisfied", how satisfied have you been with the performance of the non-DLC lighting products?

1. [NUMERIC OPEN END, 0 - 10]
DK

C5a. On a scale from 0 to 10, where 0 is "not at all satisfied" and 10 is "very satisfied", how satisfied have you been with the performance of the DLC rated lighting products?

1. [NUMERIC OPEN END, 0 - 10]
DK

[IF C1=1, SKIP TO NEXT SECTION]

[ASK C6 IF C1=2]

C6. Why do you only sell DLC rated products?

1. [OPEN END]
DK
REF

[ASK C7 IF C1=3]

C7. Why do you only sell products that are not DLC rated?

1. [OPEN END]
DK
REF

## Section D: Lighting Controls

D1. Xcel Energy is interested in expanding the adoption of lighting controls strategies in commercial and industrial facilities. We'd like to know a little bit about your experience with them. Does your company sell lighting control products, such as photocell or occupancy sensors?

1. Yes
2. No [SKIP TO D4]
DK [SKIP TO NEXT SECTION]
REF [SKIP TO NEXT SECTION]

D2. What barriers, if any, do you experience when selling lighting controls? [DO NOT READ, ACCEPT MULTIPLE ANSWERS]

1. Cost
2. Compatibility with existing fixtures
3. Hassle of rewiring
4. Other [OPEN END]
5. None, there were no challenges with this decision
DK
REF

[IF D2 ≠ 5, DK, or REF, ask D3]

D3. What encourages customers to install lighting controls, despite the challenges you noted above?

1. OPEN END
DK
REF

D4. Did you know Xcel Energy offers rebates for indoor lighting controls through the Lighting Efficiency program?

1. Yes
2. No
DK
REF

[D1=1, SKIP TO NEXT SECTION]

D5. Why does your company not sell lighting control technologies? [DO NOT READ, ACCEPT MULTIPLE ANSWERS]

1. Cost
2. Compatibility with existing fixtures
3. Hassle of rewiring
4. Other [OPEN END]
DK
REF

D6. What would motivate you to sell lighting controls at your company in the future? [DO NOT READ, ACCEPT MULTIPLE ANSWERS]

1. Lower cost of equipment
2. Lower cost/free installation
3. Greater energy savings
4. Manufacturer and Xcel Energy training opportunities
4. Other [OPEN END]
5. Nothing would motivate us.
DK
REF

## Section E: Motivations/Barriers to Install EE through Xcel Energy

E1. Can you describe how much involvement you typically have with the program? This would include interaction with Xcel Energy staff, filling out program paperwork, providing invoices, or fulfilling other requirements.

1. How much do you do versus how much does the customer do?

2. Do the rebates go directly to customers or are they sent to you?

E2. About how many projects do you submit per year for rebates, on average?

1. What, if anything, about the program keeps you from participating more?

2. What can Xcel Energy do to increase your participation?

E3. Are there (other) challenges related to selling energy efficient lighting products?

### Section Gen: Firmographics

Finally, I'd like to gather some information about your involvement with the Xcel Energy Lighting Efficiency program and your role at your organization.

Gen1. 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

Gen2. Approximately what was your gross lighting sales in 2017 (in dollars)?

1. [OPEN END]

DK
REF / Prefer not to say

### Section H: Closing

H1. 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?

H2. Thank you. Those are all the questions I have today.

[THANK AND TERMINATE]

## B.4 Peer Utility Benchmarking Guide

### Introduction

To support the process and impact evaluation of the 2017 Xcel Energy energy efficiency programs, the EMI Consulting 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 product. Table 4 identifies the interview questions related to each contextual theme. This interview is being conducted with a set of approximately 6 of Xcel Energy's peer utilities. Target respondents are managers of commercial lighting energy efficiency programs.

**Table 4: Mapping of interview questions to indicators**

| Key Performance Indicator | Data Needed | Interview Question |
|---|---|---|
| **Program Structure** | • Prescriptive, custom, direct install<br>• Types of products offered<br>• Target markets<br>• Advanced lighting controls | A1, A2, A3, |
| **Budgets and savings** | • Target savings and spending | B1, B2 |
| **Savings calculations** | • Baseline bulb types/ wattage<br>• Savings and incentives calculations | A4, A5 |
| **Forward Looking Programs** | • Plans for program structure, products going forward<br>• Expectations regarding EISA backstop and expanded GSL definition | C1, C2, C3 |
| **Net-to-gross ratios (NTGRs)** | • NTG values estimated at program level or measure level | A6 |

### Recruiting Instructions

The research team plans to send advance emails to any program managers with available emails. The email will contain an explanation of the research, as well as both an Xcel Energy and EMI Consulting contact person the utility can reach out to if they have additional questions or would like to schedule an interview at their convenience.

Potential respondents will be recruited by consultants on the research team who will be conducting interviews and have been trained on the purpose and goals of the Lighting Efficiency product qualitative research. The research team will be as flexible as possible in scheduling these interviews, including scheduling early morning or evening interviews when possible to accommodate busy utility schedules. The research team will leave a voicemail or receptionist message on the first attempt whenever possible, and then use discretion to determine any additional messages left on subsequent attempts. The research team will strive to attempt to contact each peer utility a minimum of 4 times before giving up on that particular contact, but depending on each unique situation, the research team may need to attempt some contacts more times to ultimately reach the correct person.

## Interview

### Introduction/Recruitment

INTRO 1 Hello, this is INTERVIEWER NAME, calling from Apex Analytics on behalf of Xcel Energy. Is CONTACT NAME available?

INTRO 2 We are working with Xcel Energy on a benchmarking and best practices study for their commercial lighting energy efficiency programs. As part of this study, we are reaching out to leaders of lighting programs to learn about innovative programs and best practices in the field.

We would like to include UTILITY in this study, as your lighting program has been identified as an [innovative/peer] program. We would like to spend some time talking with you about your lighting program's design and implementation, as well as your plans for future lighting programs.

**[IF NEEDED:]** We will not be requesting any customer or participant data.

INTRO 3 Can we include your utility in the study?

a. Yes **[RECORD CONTACT INFORMATION; SETUP INTERVIEW TIME; EMAIL INTERVIEW TOPICS]**
b. No **[DISCUSS CONCERNS; ANSWER QUESTIONS]**

## Section A: KPIs/Program Design

A1. First, we'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]**

Can you describe your lighting program at a high level?

a. Is your program run by utility staff or a third-party implementer?

b. How are your lighting incentives offered? (Midstream? Downstream? Direct install? Which lighting equipment is offered midstream vs downstream, etc?)

c. 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?

A2. Next, I'd like to talk about your commercial lighting offerings. **[ASK/CONFIRM BASED ON HOLES IN BACKGROUND RESEARCH ON PROGRAM]**

a. What types of measures do you offer? [**PROBE:** Perscriptive/downstream, custom, new construction]

b. What specific products are offered for each type?

c. Do you require rebated lighting products to be certified or listed by DLC or other third party organization?

d. Do you offer incentives on advanced lighting controls?

e. [IF YES] What control strategies do you require for customers to earn the rebate? (i.e. occupancy sensing, daylight harvesting, scheduling?) What have strategies have you found successful in promoting the offering?

A3. When was the last time you had a significant redesign of your commercial lighting program? This could be redesigning incentive structures, target markets, lighting technologies…

a. What did you change?

b. Why did the redesign occur?

A4. Next, I'd like to talk about your program's savings and incentive calculations.

a. Are the measure savings custom calculated per project, deemed or some combination?

a. What measures have deemed vs. custom calculated savings?

b. How are incentives determined for each measure type? [**PROBE:** Based on watts saved, $/kw, $/kWh, based on incremental cost of the project, or some custom methodology?]

a. What is the average $/kw or $/kwh incentive in your commercial lighting program including admin and rebate costs?

A5. What baseline did you use for the 2018 program year? (halogen? CFL? Blended?)

a. Does the baseline vary by measure type? (Direct install, custom, prescriptive offerings)

b. Does the baseline vary by lighting equipment or fixture type? (For example- do you have rebates for replacing fluorescent and HID fixtures with LED fixtures or just HID replacements only? Do you collect what technology the customer is removing and base the rebate on this information? A6. What net-to-gross ratio is your program currently claiming for 2018?

a. Does this ratio vary by implementation type (midstream vs downstream) or product (Customer vs. prescriptive)?

b. What program year(s) is that net-to gross ratio applied?

c. Do you have a different, prospectively applied net-to-gross ratio?

## Section B: Savings Goals and Costs

Next, I'd like to talk about the participation and energy savings achieved through the program in 2016. **[ASK/CONFIRM BASED ON HOLES IN BACKGROUND RESEARCH ON PROGRAM]**

B1. What were the program's energy savings goals and actual achievement in 2017? (MWh and MW)?

a. If sub-programs exist, how does this break down between sub-programs?

B2. We'd like to know more about the budget or total operating costs of your program to get a sense of the utility cost of energy savings. Ideally, this includes program incentives, salaries of program staff (including support staff who may not work on the project full-time), marketing, consulting, engineering, and other overhead.

a. What was the program's total operating budget in 2017?

b. If sub-programs exist, how does this break down between sub-programs?

## Section C: Program Plans

Next, I'd like to talk about the future of your lighting program, particularly with respect to the changing lighting standard potentially occurring in 2020.

C1. Are you planning to make changes to your commercial lighting programs in 2020 and beyond? What changes are you planning?

a. Any changes to types of products offered? (fixtures/LEDs/controls)

b. Changes to goals?

c. Changes to baseline/savings?

d. Changes to incentives?

e. When will these program changes come into effect? (Is there a gradual phase in for these updates?)

f. Changes to target segments?

g. Changes to implementation method? (upstream to DI, prescriptive to custom)

C2. Why are you making these changes?

C3. [IF NOT MENTIONED ABOVE] How is your program impacted by the pending lighting standards, such as the EISA 2020 backstop or the DOE expanded general service bulb definition, if at all?

## Section D: Closing

D1. Great! Thank you so much for your time. 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?

# Appendix C: STAFF INTERVIEW RESULTS

This memo provides summative notes from discussions with program staff as part of the 2018 evaluation cycle. To support the process and impact evaluation of the 2017 Xcel Energy efficiency programs, members of the EMI Consulting evaluation team from Apex Analytics interviewed key staffing managing and implementing the Colorado Lighting Efficiency. These interviews include the following staff:

- Product Manager
- Lighting Team Lead
- Lighting Engineer
- Key Account Manager
- Channel Manager

This memo 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.

## Key Takeaways

The following bullets present key takeaways from staff experiences with the Colorado Lighting Efficiency. These key takeaways provide a summary of the program context and feedback received during both the kick-off meeting and the subsequent staff interviews.

- The program is running well, has met its large savings goals, has an engaged trade partner network, and offers rebates on a wide variety of lighting products.
- The large variety of rebate offerings has led to a long and complicated application form and some confusion by customers and trade partners. Frequent changes in rebates and DLC certification has added to program complexity.
- Xcel Energy has a cross-functional lighting team which has helped staff to keep up with the rapidly changing lighting market and changes in incremental costs, technologies, and legislation.

## Product Description

The following bullets present the evaluation team's understanding of the product based on staff interview results and review of available program documentation.

- The program aims to increase adoption of high efficiency lighting products in commercial and industrial customers through prescriptive, custom, and new construction lighting offerings. The program has a midstream offering implemented by ECOVA which is evaluated outside of this effort.
- Starting in 2017, the program expanded measure offerings to include non-DLC certified lighting products, at a decreased incentive level than the DLC certified counterparts.
- The program works to move custom measures to prescriptive offerings to reduce administrative burden. Currently, prescriptive measures make up two-thirds of the program savings. Custom projects tend to take significantly more time for program staff.

- The program is rethinking how to set goals. Traditionally, goals are focused on kW and kWh savings on a portfolio-level; Xcel Energy is moving toward the overarching goal of maximizing net societal benefits. Goals have increased for many years and then were reduced last year due to code changes.
- Key contributors to the Lighting Efficiency Product are the business services center (BSC), key account managers, product managers, the engineering team, and the trade partner channel manager. Program resources are reported to be sufficient for the program.
- The program is trade partner driven. The trade allies are very engaged, and the rebate programs are a large component of their business model. Key trade partners are those that produce the highest level of achievement in the lighting program (rebates, kWh, customers). Trade partners include manufacturers, stocking distributors, installers, and full-service sales companies. Co-branding program is available to top-performers. Advisory board discusses program changes. Quarterly newsletter is sent to trade partners. When there are large changes in the program, there are formal training workshops.
- Marketing includes:
  - Digital, including emails directly to customers and trade partners.
  - Direct mail
  - Broncos sponsorship
  - Hosts events such as the IES CO Rocky Mtn lights, customer expo and other community events
  - Trade partner workshops
- If customers require assistance with participation, they can call their account manager or work directly with trade partners. Customers can also submit application without trade partner or Xcel Energy support.
- Rebate amounts have changed a few times in the past year; change on an as-needed basis. The application is both paper and online; Xcel staff believe few customers use the online version, but it is not being tracked.

## Product Strengths and Barriers

During interviews, staff identified the following strengths and barriers to implementing this product in 2017 and at the time of the interview. Strengths include factors that product staff identified as supporting the success of the product; barriers include factors that product staff identified as preventing the product from reaching its goals.

### Strengths

- Achievement is high, and when state regulation increased energy savings requirements, the lighting program was identified to increase achievement to meet new requirements. The business upstream / midstream model is particularly successful. This program has the largest group of trade groups/community. The program implements a lot of volume, a lot of participation, a lot of achievement.
- Formation of the lighting team has made the increased pressure on lighting programs more manageable. It also led to consistency in technology assumptions and program designs.
- Program has strong relationships with trade partners. Longevity of the program allows for strong trade partners and industry support. Program takes trade partner relationships and input seriously.
- Rebates levels are lucrative, which helps the trade partners and customers. It helps buy down the incremental cost, helps the customer save.

- Team has been flexible and has managed the rapid pace of change in the lighting industry. Team has done a good job of bringing a lot of measures that used to be custom into the prescriptive program.

### Barriers

- The application form is long and complex, especially on the DLC screening component. Online application has very little uptake and concern was raised about the website. The program is working to simplify the application, hoping to move the process to digital modalities.
- Multiple interviewees noted the complexity of the program as a barrier, noting the variety of technologies and installation, the DLC certifications, various rules around different measures and need for a calculator for rebate amounts. Multiple interviewees noted the need to simplify the program.
- The frequent changing of lighting requirements, offerings, and rebate amounts can cause confusion among the internal Xcel Energy sales staff. With the lighting market changing rapidly, the team must constantly pay attention to keeping the program cost-effective and ensure product quality is sufficient.

## Feedback on Evaluation Priorities

During interviews, staff identified research topics they would like the evaluation to address. The following bullets compile these topics. The evaluation team has considered these research topics when prioritizing portfolio-wide evaluation needs and as able, incorporated them into the final evaluation plan for the 2017 Colorado Lighting Efficiency Product, delivered in February. In general, interviewees agreed with the defined evaluation priorities below:

- Explore customer decision making, with particular interest in lighting controls (i.e., understanding drivers for customer and trade adoption of lighting controls).
- Evaluate the program complexity for opportunities to simplify DLC complexity and determine if it is worth it to remain a component of the program.
- Explore opportunities to simplify the rebate application.
- Assess longevity of linear fluorescent bulb offerings.
- Assess experiences with the online application process.

# Appendix D: PARTICIPANT SURVEY RESULTS

To support the process and impact evaluation of the 2017 Xcel Energy efficiency programs, the EMI Consulting evaluation team conducted telephone interviews with participants of the CO Lighting Efficiency program. The evaluation team defined a participating customer as any customer that closed a project in 2017. The interview objectives were to collect participant feedback on product experiences and evaluation priorities including DLC products, lighting controls, online application process, free-ridership, and spillover.

This memo contains our summary of the key takeaways, a look into participant feedback on lighting control strategies and DLC-qualified products, issues with the application process, an overview of the free ridership analysis, and feedback on evaluation priorities.

## Key Takeaways

Below are key takeaways from participant experiences with the CO Lighting Efficiency program. These key takeaways provide a summary of the program context and feedback received during the phone interviews.

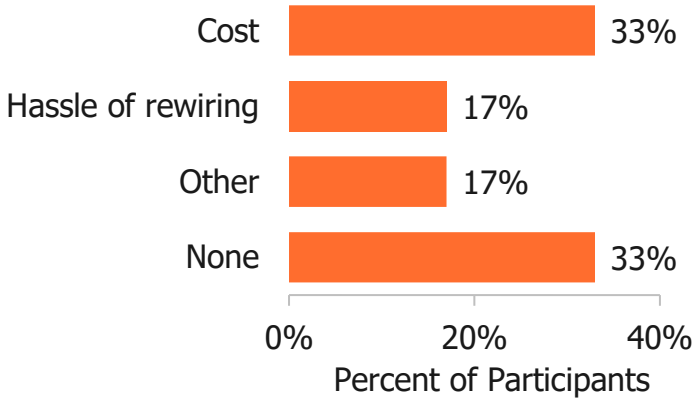
- Majority of participants have at least some LCS installed, although not throughout the properties.
- An average of 28% of lighting is managed by LCS (among all respondents).
- Participants report limited awareness of the Xcel Energy rebates on LCS (49%).
- Participants are largely unaware of the DLC rating and most (65%) do not look for the rating when purchasing bulbs. Those that do look for the DLC rating, largely do so because it is required to get the rebate.
- Among the participants that look for the DLC rating, the top two reasons for why the DLC rating is considered when choosing lighting products are rebate requirements (30%) and the DLC rating serves as a quality indicator (25%).
- Most of the participants (71%) either emailed or mailed the application to Xcel Energy. Only 29% of participants submitted an online application.
- Only a quarter (28%) of the participants that did not submit an online application were aware of the option.
- The top three reasons participants rated their satisfaction low with the application were: a confusing application (in general and in knowing which answer to select), time-consuming process, and too-detailed of a process.

## Lighting Control Strategies

The following bullets present the evaluation team's understanding of the barriers and programmatic adoption strategies for lighting controls based on participant interview results.

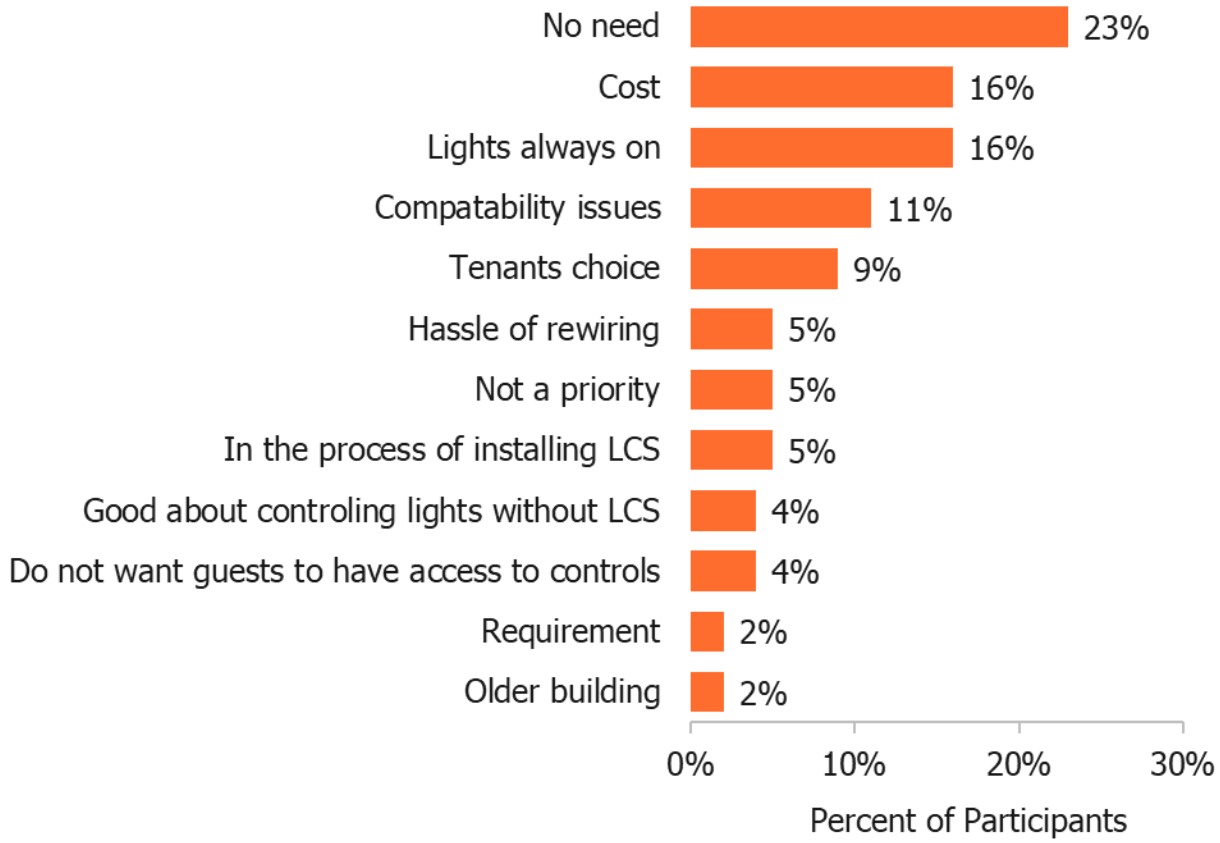
- The majority of the participants interviewed did not purchase a lighting control strategy (LCS) as part of the program. However, of the participants interviewed that did purchase an LCS through the program, 63% of sites learned about the LCS from a contractor. The satisfaction reported with the performance of the rebated LCS was very high among these participants, with an overall average of 9.3.
- The most common barrier for adoption of LCS among participants that purchased an LCS is cost-related.

Figure 1. Barriers for LCS Adoption (n=6)




- Among the participants that did not purchase an LCS, 38% said that there wasn't a need for an LCS, while another 19% reported that cost is a barrier. Similarly, the top two motivators to installing LCS were lowering the cost of equipment/increased rebate (38%) and lowering the cost of installation (36%).
- Despite not purchasing an LCS through the program, 62% of sites already had an LCS installed prior to the program, with over half (52%) of the LCS being occupancy sensors and 25% being photocell or daylight harvesting controls. Almost one-fifth (17%) of these sites have 90% or more lighting managed by LCS.
- Looking at sites with less than 90% of lighting managed by LCS, the most common explanations as to why 90% or more of lighting was not managed by LCS was that there wasn't a need for LCS in the building (23%), there is a need for lights to be on all of the time (16%), and that cost is prohibitive in installing more LCS (16%) as shown in Figure 2.

Figure 2. Reasons LCS is not Installed 100% at Site (n=57)



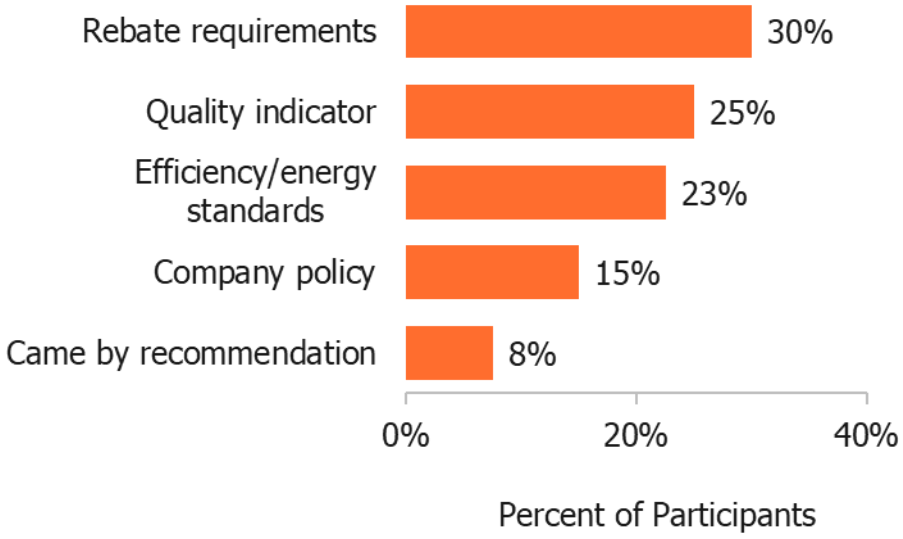

- Almost half (49%) of respondents were not aware that Xcel Energy offers rebates for indoor LCS.

## DLC and non-DLC Offerings

The following bullets present the evaluation team's investigation into any differences among DLC and non-DLC offerings. While the interview guide intended to ask specific questions to those that purchased a DLC product through the program and to those that purchased a non-DLC product, the participant sample was largely made up of those that purchased a DLC-qualified product. For the sake of this analysis, the evaluation team focused only on those that purchased a DLC-qualified product due to inadequate sample size (n=1) of the other group.

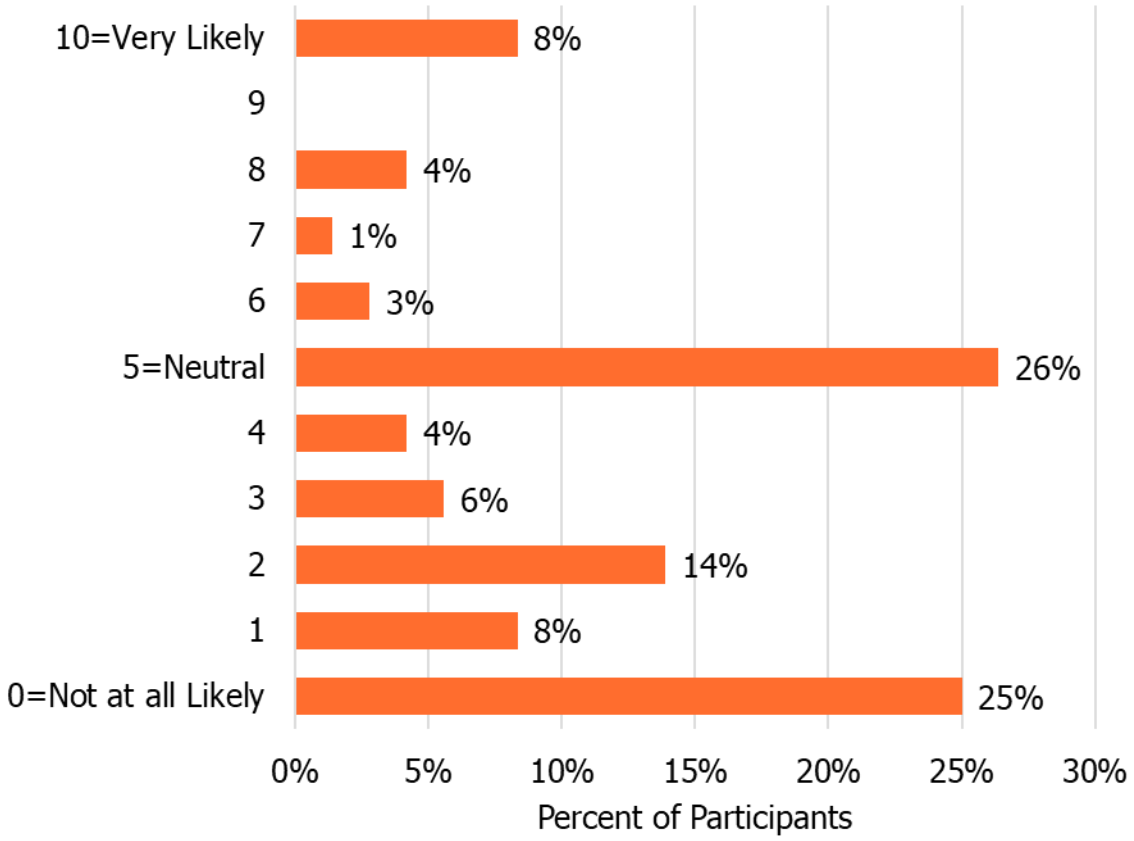
- Only a third of participants (35%) were aware the product purchased through the program was DLC-qualified, and the other participants (65%) were not aware.
- One-third of the participants (33%) look for the DLC rating when choosing lighting products. Among these participants, the top two reasons for why the DLC rating is considered when choosing lighting products are rebate requirements (30%) and the DLC rating serves as a quality indicator (25%). Additional open-ended responses to "Why do you look for this rating" are summarized in Figure 3.

Figure 3. Reasons for Why DLC Rating is Considered When Choosing Lighting Products (n=40)




- Respondents that reported they do not look for the DLC rating when choosing lighting products most often reported the reason for not doing so was that they were not aware of the DLC rating system (33%). Another third reported that the decision is not up to them since they rely on recommendations from others such as vendors, contractors, architects, etc. to select products.

Figure 4. Likelihood of Purchasing a non-DLC Qualified Product (n=72)




- Among the participants, there was high satisfaction with the DLC-qualified products purchased through the program. Eighty-seven percent (87%) of participants rated their satisfaction a 9 or a 10 (on a 0 to 10-point scale).

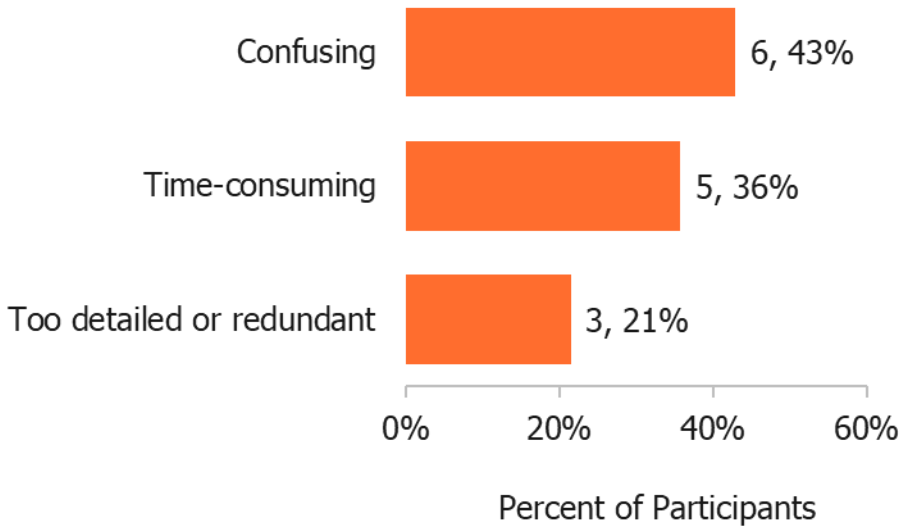
## Application Process

The following bullets present the evaluation team's assessment on the application experience, with a focus on participant satisfaction with the application process and an exploration as to why participants are not submitting the application online.

- Most of the participants (71%) either emailed or mailed the application to Xcel Energy. Only 29% of participants submitted an online application.
- Only a quarter (28%) of the participants that did not submit an online application were aware of the option. Explanations as to why a paper application was chosen over an online application were: issues with online application, more convenient, out of habit, preference of paper, signature required, and easier to collaborate.
- On average, it took 39 minutes to fill out the online application compared to only 18 minutes to complete the paper application (n=14 and n=30, respectively).

- The recommendations for improvement were slightly disjointed with the following themes emerging: reduce length, broaden the categories and require less detail, eliminate the picture requirements, and improve clarity of questions/terminology.
- On average, satisfaction with the time it took to fill out the application among participants was 4.0 on a 1 to 5-point scale (n=45).
- On average, satisfaction with the application (as a whole) was rated high among 44 participants (4.1 on a 1 to 5-point scale).
- The top three reasons participants rated their satisfaction low were: a confusing application (in general and in knowing which answer to select), time-consuming process, and too-detailed of a process as shown in Figure 5.

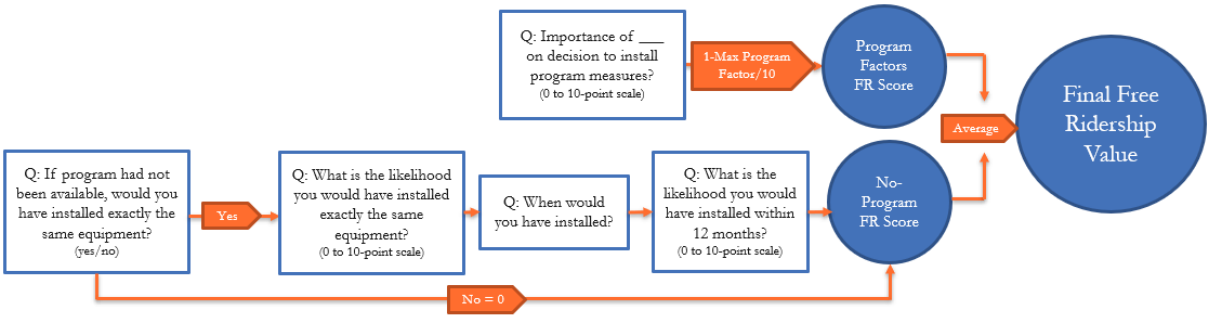
Figure 5. Explanations to Low Satisfaction Rating with Application as a Whole (n=11)




## NTG Analysis

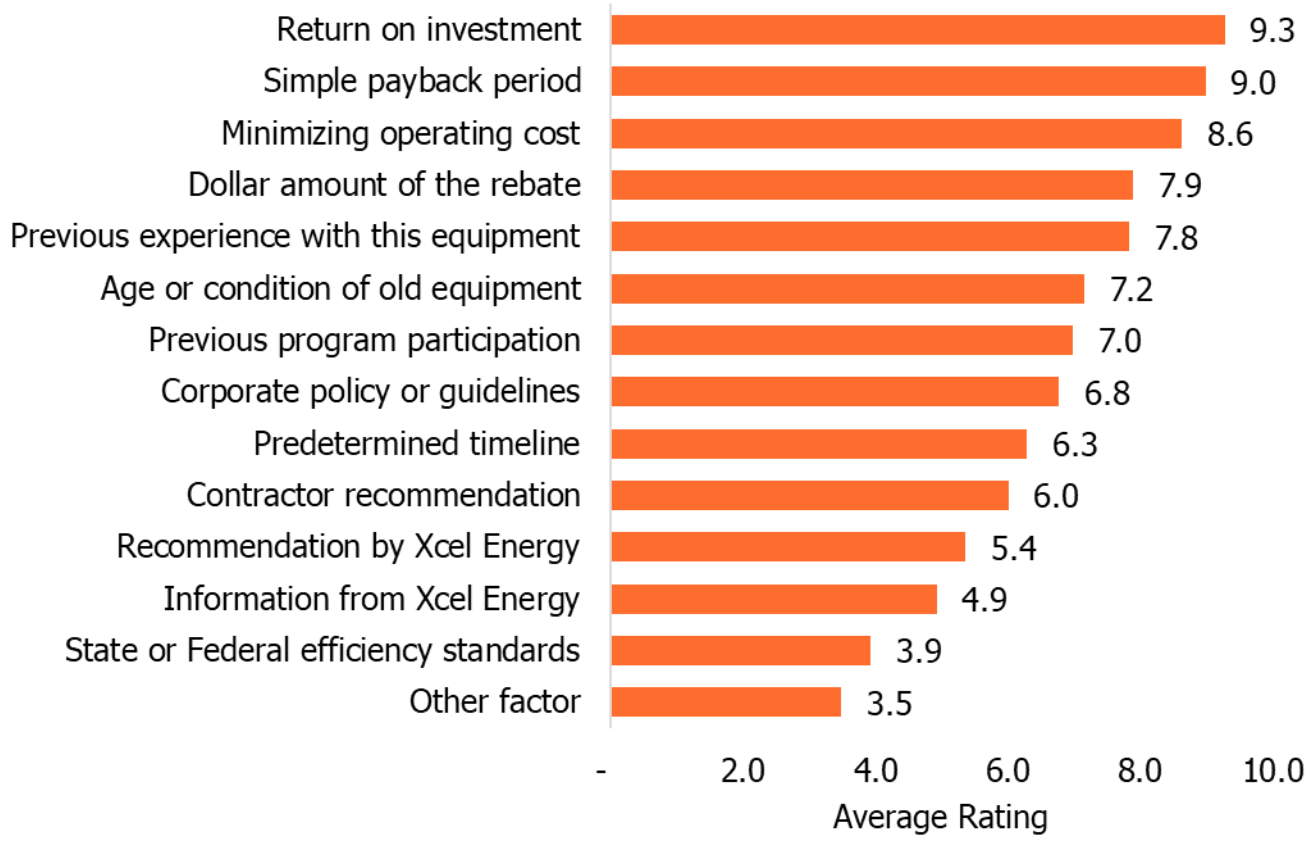
The following bullets present the evaluation team's analysis of existing free ridership in the program and Figure 6 shows the approach used for evaluating free ridership.

Figure 6. Flowchart Showing the Calculation of the NTG Score




- The three most important program factors on a participant's decision to install a measure were rated in the following order: 1) the return on investment, 2) the payback period, and 3) the dollar amount of the rebate. The two factors return on investment and payback period were only considered a program factor if the respondent reported that the program either increased the return on investment or shortened the payback period.
- The three most important non-program factors on a participant's decision to install a measure were rated in the following order: 1) minimizing operating cost, 2) previous experience with the equipment, and 3) the age or condition of the old equipment.

Figure 7. Average Importance Scores of Program Factors (n=232)



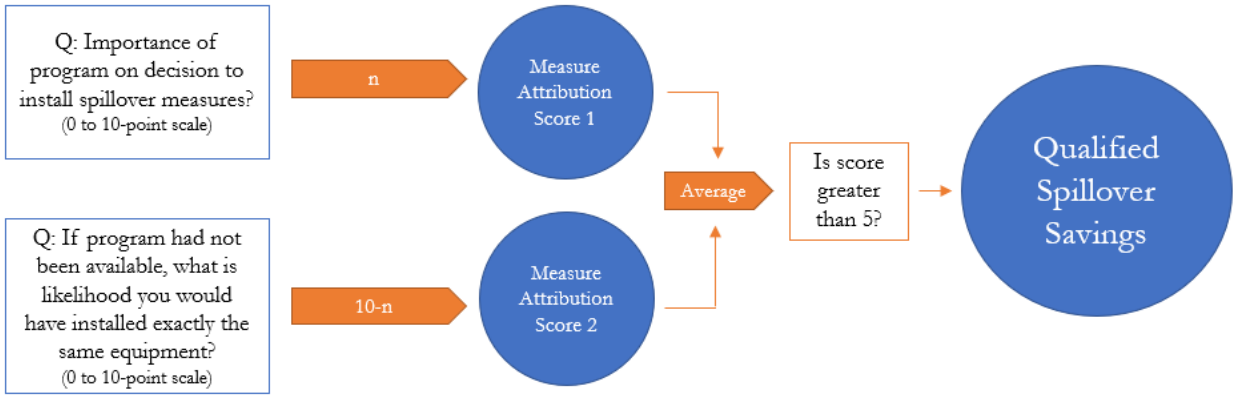

- There were nine participants that rated the contractor recommendation as more important than any other factor. The evaluation team conducted follow-up interviews with six of these contractors and learned that all six vendors are considered a program factor since the program influenced their recommendation to implement the project.[7]
- Almost half of the participants (46%) reported that they would not have installed the exact same type, quantity, model and efficiency of the measure installed through the program in absence of the program. Approximately a third (36%) said that they would have installed the measures had the program not been available.
- Almost half (48%) of the respondents that said they would have installed the measures in absence of the program said they would have done so within 12 months of installation.
- The evaluation found an overall free ridership 8.2% when weighted by measure contribution to program savings.

[7] The six contractor or trade partners were considered a program factor based on the qualifications reported in section 3.1.1.3 in the IL TRM Cross-Cutting Measures protocol: http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_6/Final/IL-TRM_Effective_010118_v6.0_Vol_4_X-Cutting_Measures_and_Attach_020817_Final.pdf

| Strata | Average FR | Contribution to Savings | N= (sites) |
|---|---|---|---|
| Custom Lighting | 10.7% | 31% | 66 |
| Linear LEDs and Troffers | 7.6% | 38% | 108 |
| Lighting Control Strategies | 19.2% | 1% | 5 |
| Other Measures | 6.0% | 30% | 53 |
| Combined | 8.2% | | 232 |

- The evaluation found an overall participant spillover of 2.2%. In other words, total spillover savings was 2.2% of total participant program savings. There were seven participants that reported the following spillover measures: LED tubes, LED lamps, T5 LEDs, motion sensors, troffers, down-lights, LED exterior lights, and Linear LEDs.

Figure 8. Flowchart showing the Calculation of Spillover



# Appendix E: TRADE PARTNER INTERVIEW RESULTS

## Key Takeaways

- The Xcel Energy Lighting Efficiency program plays a large role in the business model of many trade partners, with trades mentioning the program/rebates during the first interaction with prospective customers
- Most trade partners fill out program application for their customers, and most submit applications via email (online option)
    - Most trade partners were relatively satisfied with the application overall, but many would like to see a more fully automated electronic process, including electronic signatures and a "save and continue" option
- Almost all trade partners sold DLC-qualified products, with most selling *both* DLC and non-DLC products
    - Trade partners held a wide variety of views of the value of DLC at indicating quality products. High performing trade partners were more likely to think the rating is a good indicator of quality, while low performing trade partners were more likely to view the DLC rating system with skepticism.
- Almost all trade partners sold lighting controls, but as a small portion of their overall business
    - Trade partners perceived up-front cost and poor payback as the biggest barrier to selling lighting controls
- Word-of-mouth was a highly valued marketing strategy, with most trades relying on a strong reputation to obtain future customers

## Approach

The EMI Consulting evaluation team conducted in-depth interviews with 41 Xcel Energy trade partners to learn about their experiences with both Xcel's Commercial Lighting Efficiency program as well as the larger commercial lighting market. The objective of the trade partner interviews was to hear trade partner perspectives on:

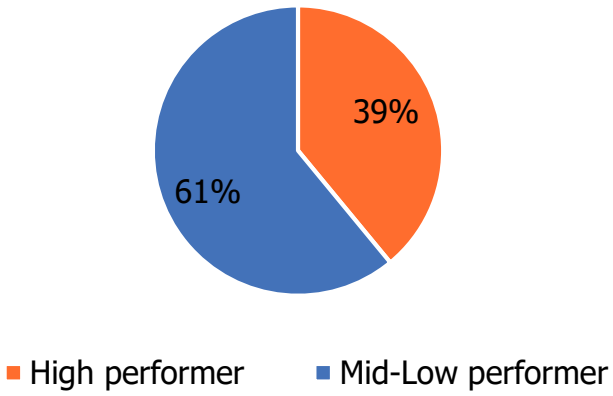
- **Program Application Experience**, including who most commonly fills out the application, submittal mode, time to fill out application, and satisfaction with the application;
- **DesignLights Consortium® (DLC)** rating, including whether they think the rating is valuable and whether it indicated quality;
- **Lighting controls**, such as whether they sell controls, and their experience with barriers to selling controls;
- **Sales Practices**, including how to attract new customers, and the role of rebates in making efficient lighting sales;
- **LED sales**, both now and projected into 2020 and 2022. We asked Trade Partners to estimate sales under two scenarios – 1) assuming Xcel Energy continues to offer rebates on LEDs and 2) assuming Xcel Energy does not continue to offer rebates on LEDs.

In the following sections, we provide a description of our Trade Partner sample, followed by a summary of interview findings by the topics listed above.

## Description of Interviewed Trade Partners

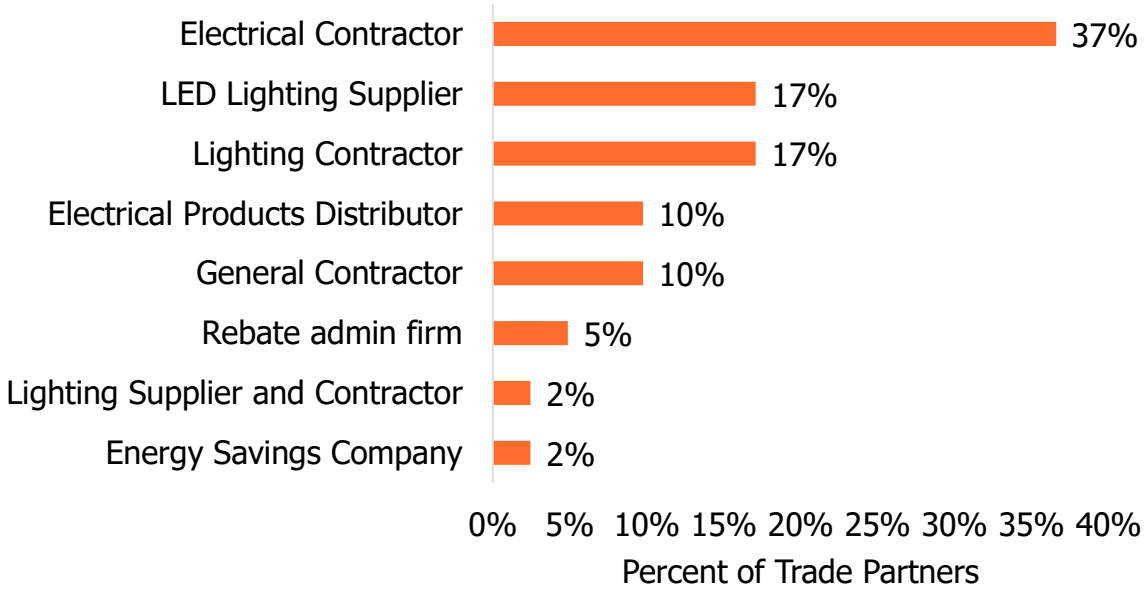
We interviewed 41 of Xcel Energy's registered trade partners, including 16 (39%) "high performers" and 25 (61) "mid-low performers." The breakdown of interview respondents by program performance is shown in Figure 9. The evaluation team defines high performers as trade partners that return more than 1% of total product rebate dollars, mid and low performers return less than 1% of rebate dollars.

Figure 9. Trade Partner Program Performance (n=41)



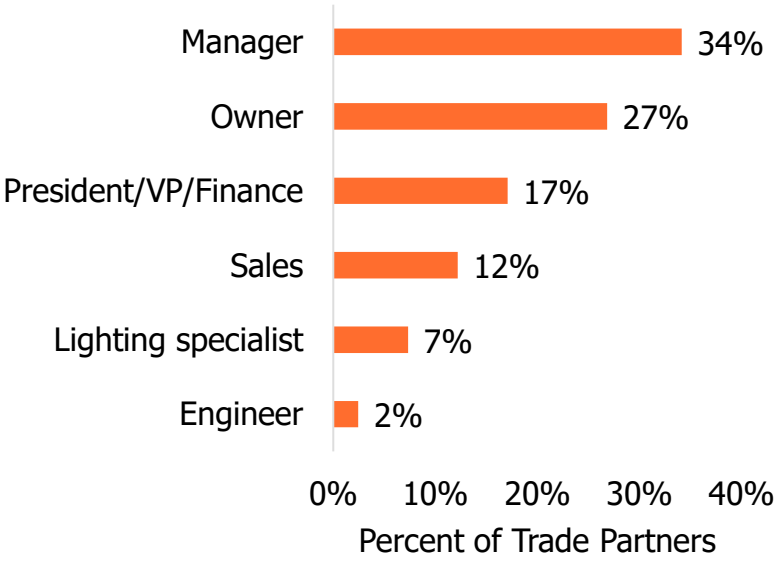

Interview respondents represented a variety of electrical, lighting, and contracting companies. Respondents most commonly (37%) worked at electrical contracting firms, which included, but were not limited to, commercial lighting work. Another third of respondents (36%) represented firms specializing in lighting, with 7 respondents (17%) working exclusively with LED lighting (Figure 10).

Figure 10. Company Type (n=41)




The majority of respondents (78%) were in senior positions as either owners, executives, or managers at their companies, and thus very familiar with their business (Figure 11). In a minority of cases, respondents' primary responsibility was installation; some of these technicians were not able to comment on every topic we asked about. For each topic discussed, number of respondents will be noted.

Figure 11. Role of Interviewed Trade Partners (n=41)

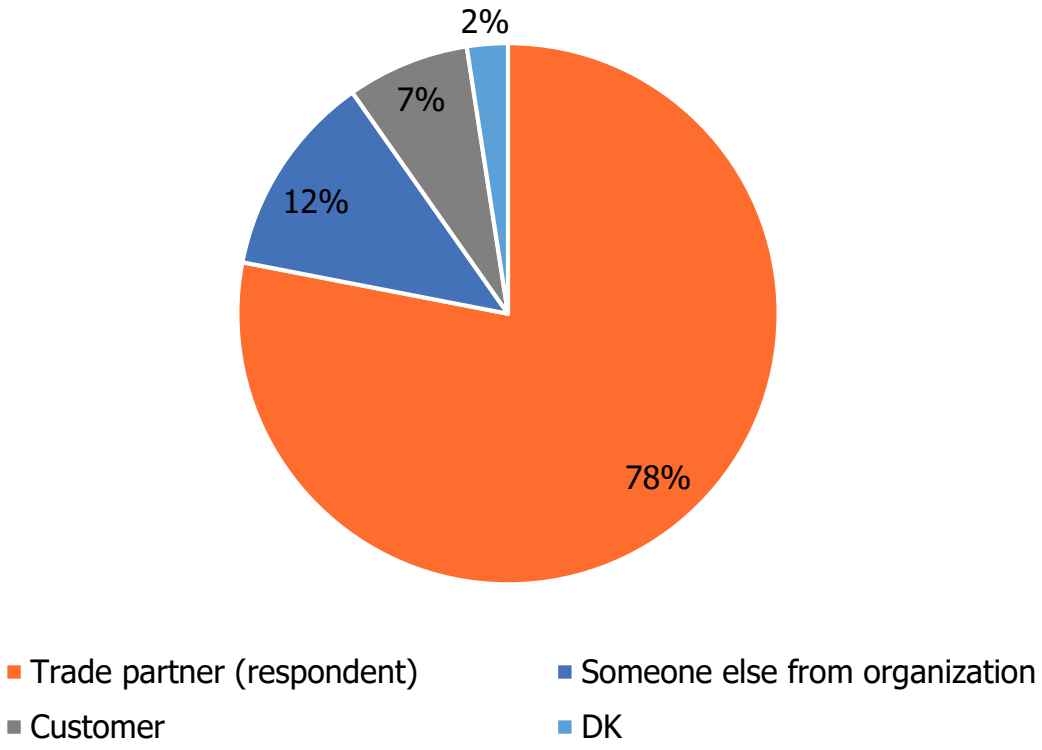



## Program Application Experience

We asked trade partners who typically fills out program incentive applications – the respondents themselves, someone else from their organization, or the customer. Most trade partners we spoke with (32 or 78%) said

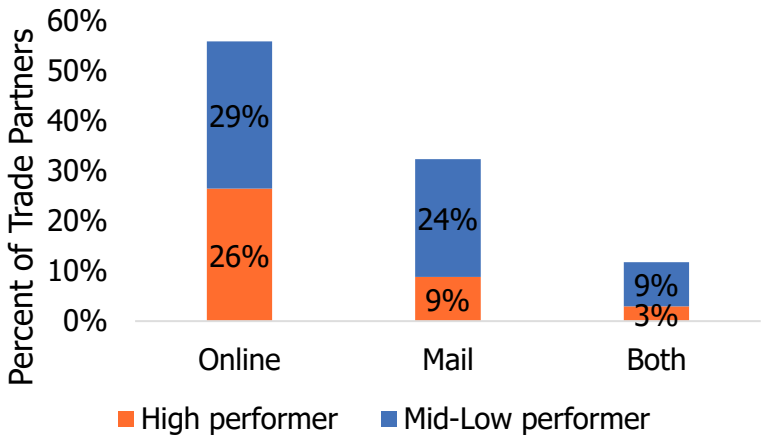
they filled out program applications themselves, and another five (12%) said someone else from their organization filled it out (Figure 12). Only three respondents said the customer typically fills out the application. Many trade allies described the Xcel Energy commercial lighting program as an integral part of their business model, with almost every respondent saying they mention the program as part of their initial discussions, and sales pitch, with customers. Therefore, trade partners see filling out and submitting the application as part of the service they provide.

Figure 12. Who Filled Out the Application? (n=41)




In 2017, Xcel Energy began offering an online application submittal option. As shown in Figure 13, most respondents, 68%, had used it (56% used online only, and 12% used both online and mail submittal methods). Approximately one third of respondents had not yet submitted an application online, instead opting for paper applications submitted via mail.

Figure 13. Application Submittal Method by Performance (n=34)




Several respondents noted that the online application was not entirely electronic; it was a fillable PDF, which they printed, filled out, obtained signatures, uploaded and emailed to Xcel Energy. Of the 11 respondents who submitted applications exclusively by mail, seven were unaware of the online option. Those who were aware of the online option but had not used it, offered the following reasons:

- Fills out applications rarely
- Hasn't had a project since learning of the online form
- Never had a problem with the paper form
- Doesn't know how to obtain Trade Partner ID

We asked the 32 trade partners who completed program applications on behalf of their customers to estimate how long the application process typically takes. Figure 14 and Figure 15 show the distribution of time for the online and paper submittal methods, respectively. Although the distribution looks different between the two groups, the average time to complete was similar, with the online group taking an average of 39 minutes, and the mail group taking 37 minutes.

Figure 14. Time to Fill Out Application – Online Submittal (n=20)

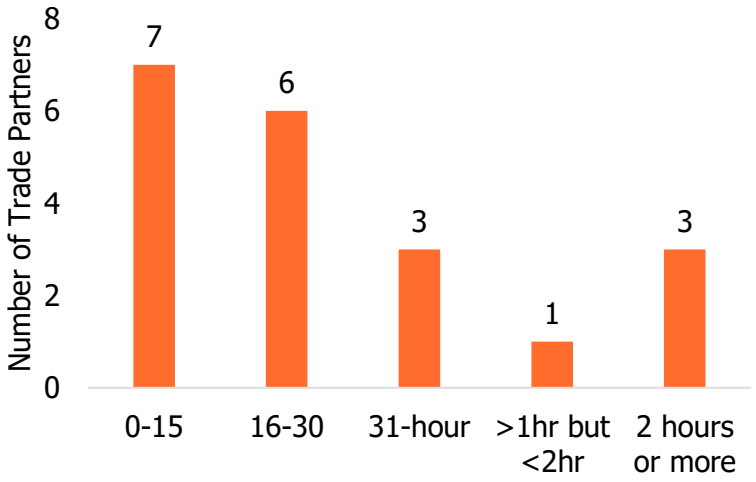
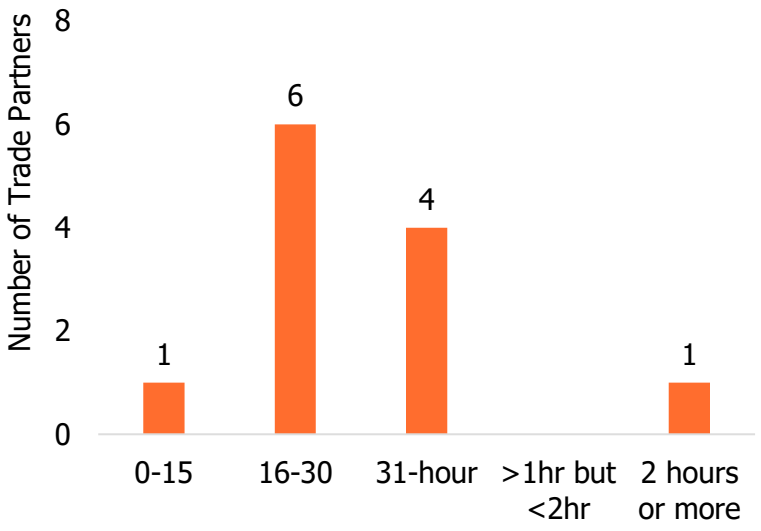


Figure 15. Time to Fill out Application - Mail Submittal (n=12)

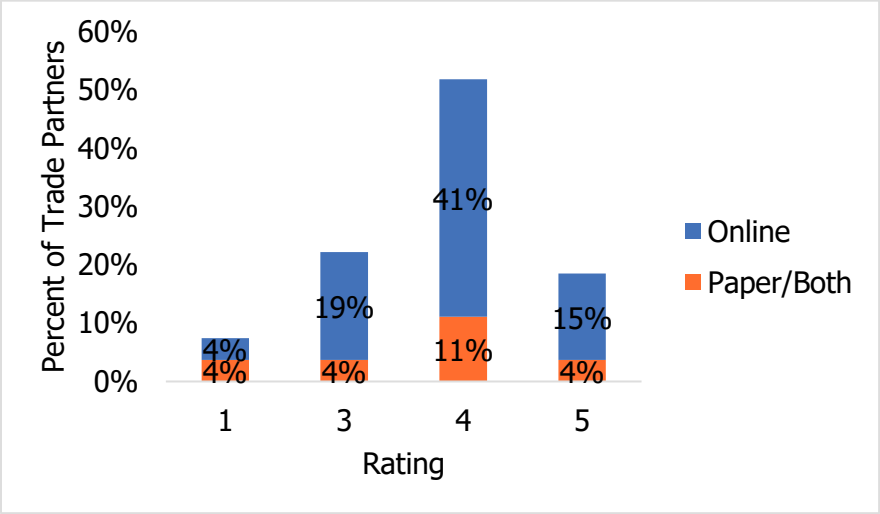



We asked trade partners to rate their satisfaction with the application as a whole, using a scale of 1-5 where 1 is "very dissatisfied" and 5 is "very satisfied." Overall, most respondents were relatively satisfied with the application process, with 70% of respondents giving a 4 or 5 rating (Figure 16). One satisfied respondent commented that the application process has improved greatly recently, saying "Xcel Energy has done an excellent job in updating [the application] and making it easier and streamlined; a 5 for improving the process." Approximately 30% were less satisfied with the application and gave a 1 or 3 rating. Respondents offered several suggestions for improvement, including:

- Save and continue feature
- Fully electronic submittal, including electronic signatures
- Reduce the need for labor invoices
- Combine the old and new equipment fields into the same section
- Allow auto-populate

One respondent said, "It's not easy to decipher. I'm an electrician first, I'm not a lighting guy."

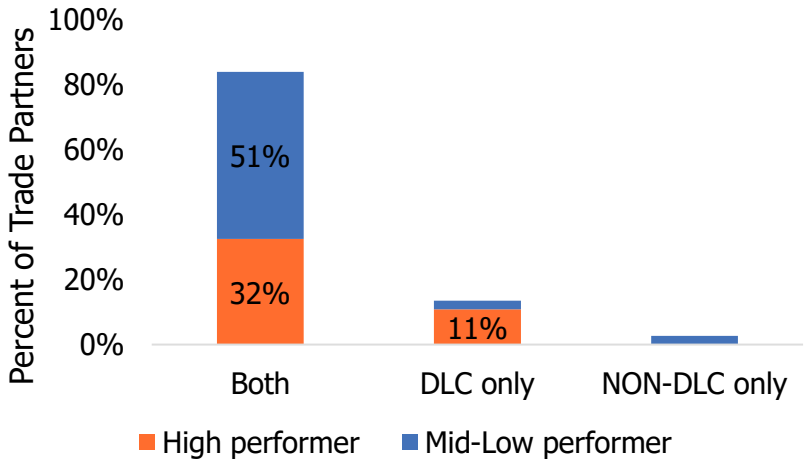
Figure 16. Satisfaction with Application as a Whole (n=21 online; n=6 paper/both)




## DesignLights Consortium® (DLC)

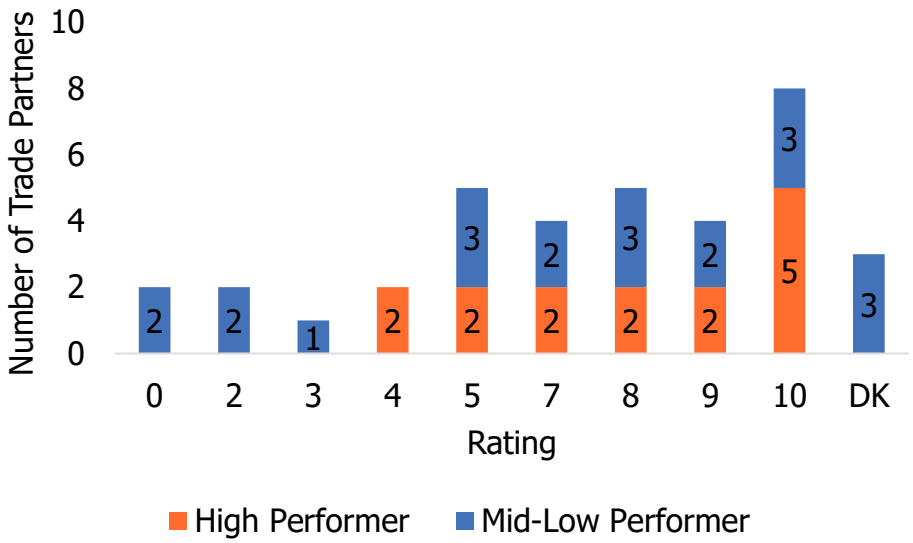
Nearly all the trade partners we spoke with (36 of 37) sold LED lighting products certified by the DesignLights Consortium® (DLC), as shown in Figure 25. Most of these (31) sold both DLC and non-DLC qualified lighting.

Figure 17. Sales of DLC vs. Non-DLC LEDs (n=37)



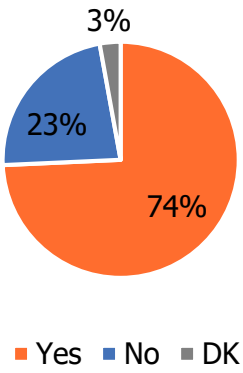

Trade partners held varying views on the value of the DLC rating at indicating LED quality (We found that high performing trade partners were more likely to hold a positive opinion of DLC, giving an average rating of 7.7 on a scale of 0-10. Mid-low performing trade partners were more likely to be skeptical of DLC's value, in some cases also questioning its legitimacy. One mid-low performing trade partner said, "If the companies are willing to pay for the [DLC] rating, they will get it." Mid-low performing trade partners gave an average DLC value rating of 5.

Figure 18. Rating of DLC Value [0-10 scale] (n=36)




Although several trade partners had mixed or negative views about DLC's value, 74% of respondents said they did take the DLC rating into account when recommending products to their customers, many of them because they believe DLC qualified LEDs are higher quality products (Figure 19). Some respondents cited the higher rebate amount for DLC-qualified products as a reason for recommending them.

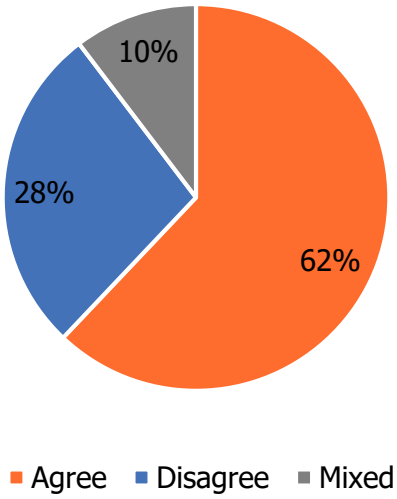
Figure 19. Do You Take the DLC Rating Into Account When Recommending Products? (n=35)




Xcel Energy recently made a change to its incentive requirements, allowing non-DLC qualified LEDs to receive a lower incentive. As Figure 20 shows, trade partners mostly agreed with this change – with 62% (18 of 29) agreeing with the change vs. 28% disagreeing (8 of 29). Three respondents had mixed feelings about the change. Those who agreed with the change cited the following reasons:

- Appreciate the flexibility in choosing the right product for customers
- Can buy a non-DLC bulb that is just as good as a DLC
- It's still good to be able to get a [non-DLC] LED incentive

Figure 20. Opinion of Adding Non-DLC Rebate (n=29)

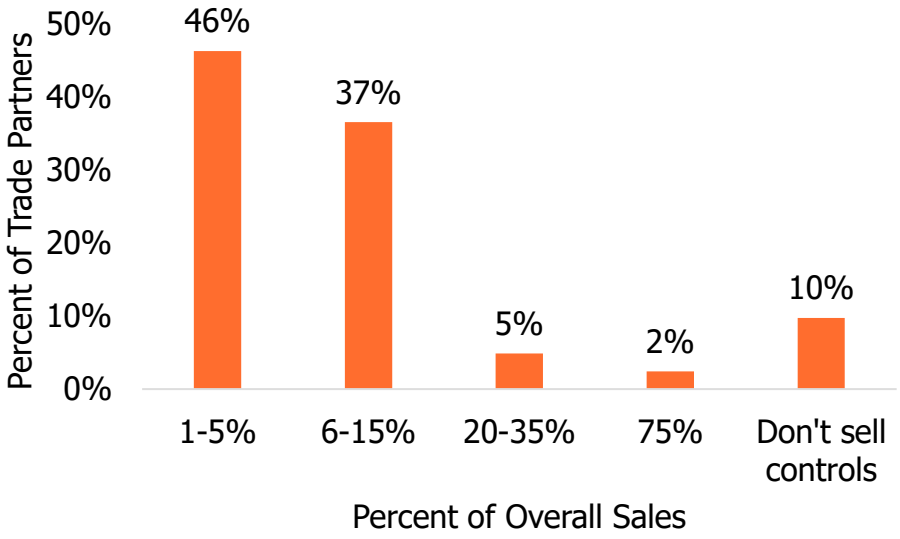



Those who disagreed expressed concern about lower quality products in the market. Three respondents offered mixed opinions of the change, with one saying "You're opening the door to products that are less quality. But you're also including low quality stuff that comes straight from China. But at the same time, you give start-up lighting companies an opportunity to sell non-DLC products because it's expensive to get DLC rating."

## Lighting Controls

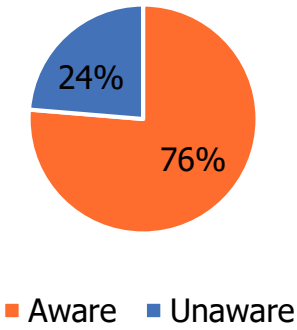
Nearly all the trade partners we spoke with (37 of 41) sold lighting controls, but as a small part of their overall business, with 83% of respondents saying controls comprises 15% or less of their sales (Figure 21).

Figure 21. Lighting Controls: Percent of Overall Sales (n=41)



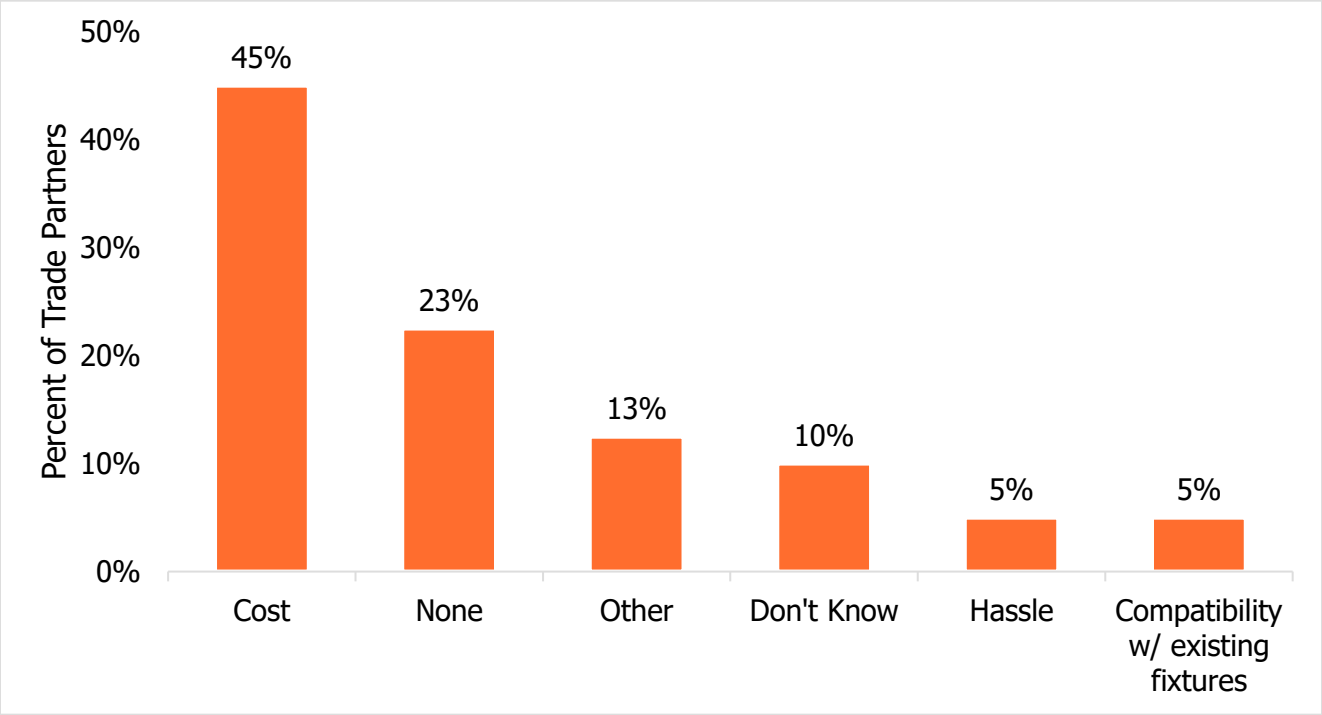

About three-quarters of trade partners (76%) were aware that Xcel Energy offers rebates for indoor lighting controls, as shown in Figure 22**Error! Reference source not found.**. Of the nine respondents who were not aware, seven were mid-low performers and two were high performing trade partners.

Figure 22. Trade Partners Awareness of Rebate for Lighting Controls (n=38)




When asked to describe the barriers they face in selling lighting controls to their customers, the most common response was the cost of the equipment, with 18 of 40 (45%) giving this response.

Figure 23. Barriers to Installing Lighting Controls (n=40)




When asked to expand on the cost issue, three respondents talked about return on investment, and the difficulty in making the case to customers that they are worth the cost, especially with more lighting being more energy efficient than in the past. One said, "In the past when lights consumed a lot of energy, they were worth it. Now, maybe only a HUGE office building."

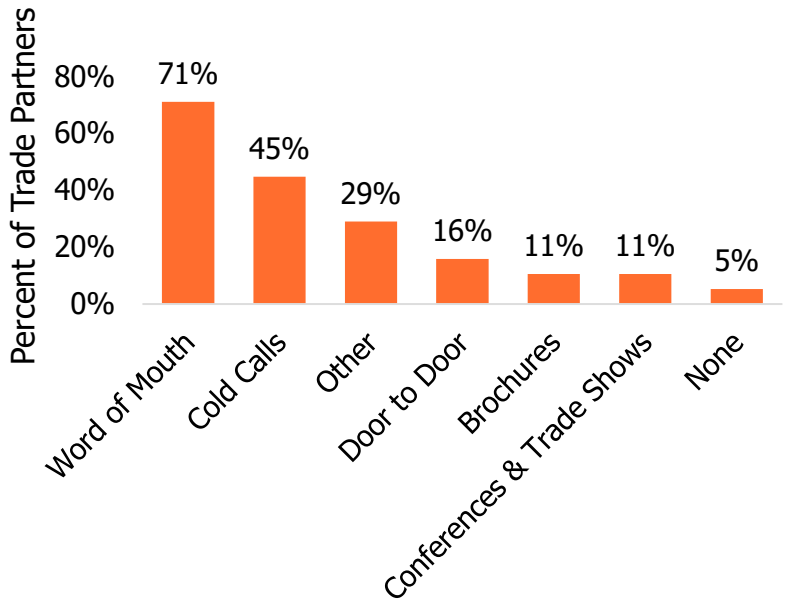
We also asked trade partners what would encourage customers install lighting controls. Respondents thought customers responded well to a good value proposition, whereby the contractor can show the energy and cost savings potential of controls, as well as the convenience and "control" they can provide over energy use. One respondent said controls are more attractive in certain applications, such as classrooms, where a teacher may want bright light for testing, but more subdued lighting for other times.

Finally, we asked trade partners what they see as new and emerging opportunities for program participants. Respondents offered a variety of thoughts, but lighting controls was the most commonly stated opportunity, with 39% mentioning it. Other ideas included outdoor lighting, holiday string lighting, lighting that mimics sunlight, lasers, LED troffers, skylights, and wireless centers on LEDs that enable dimming.

## Sales Practices

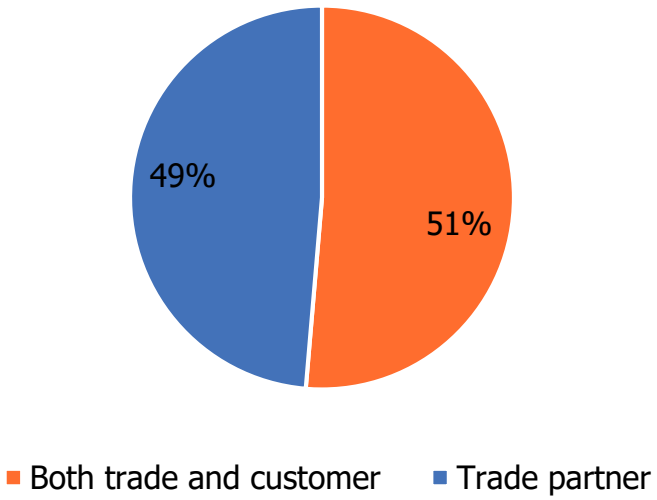
In general, trade partners drew upon a wide variety of sales and marketing techniques to attract customers, as shown in Figure 24. Most (71%) respondents were particularly reliant upon their reputation and said that word-of-mouth referrals was their most valuable marketing strategy. Cold calling was also a common strategy, with nearly half (45%) of respondents using this tactic.

Figure 24. Sales Techniques Used, multiple responses allowed (n=38)




Trade partners appear to have aligned their business practices with Xcel Energy's commercial lighting program offerings. We asked trade partners, "Who typically brings up the rebates?" approximately half of respondents (49%) said they typically bring up the rebate with customers. The other half said either the customer or trade partner brings it up.

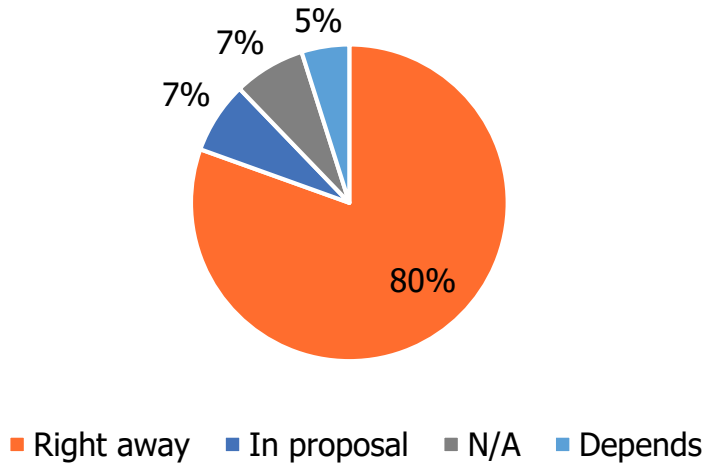
Figure 25. Who Typically Brings Up the Rebate? (n=37)




When asked *when* in the project they talk about the program with customers, the vast majority of respondents (80%) said they talk about the program with prospective customers during the first conversation (Figure

26**Error! Reference source not found.**).Respondents often discussed rebate details and included rebate amounts in their bids and proposals.

Figure 26. When in Project Trade Partners Mention Xcel Energy Program (n=41)




## LED Sales

One objective of this research was to understand what portion of trade partners' bulb sales are currently LEDs, and to hear how trade partners predict that portion will change in 2020 and 2022, both with and without the Xcel Energy program. The evaluation team asked trade partners the following series of questions:

- Excluding medium screw based bulbs, what percent of the lamps you sell are LEDs? We are asking about the percent of lamps, not dollars.
- Assuming Xcel Energy continues to rebate LEDs for the foreseeable future, what percent of lamps you sell do you expect to be LEDs in 2020? (Again, excluding medium screw based bulbs.)
- Assuming Xcel Energy continues to rebate LEDs for the foreseeable future, what percent of lamps you sell do you expect to be LEDs in 2020? (Again, excluding medium screw based bulbs.)
- Let's consider a second scenario, which assumes LED rebates were not offered by Xcel Energy in 2020 and 2022. What percent of the lamps you sell would you expect to be LEDs in 2020, under this scenario?
- Let's consider a second scenario, which assumes LED rebates were not offered by Xcel Energy in 2020 and 2022. What percent of the lamps you sell would you expect to be LEDs in 2022, under this scenario?

The average responses to these questions are presented in Table 5.

Table 5. Trade Partner-Estimated Portion of Bulb Sales that are LEDs, With and Without Program

| | Trade Partner-Estimated Percent of Bulb Sales that are LEDs with Xcel Energy Program | Trade Partner-Estimated Percent of Bulb Sales that are LEDs without Xcel Energy Program |
|---|---|---|
| 2018 | 82% | n/a |
| 2020 | 90% | 85% |
| 2022 | 94% | 89% |

# Appendix F: PEER UTILITY BENCHMARKING RESULTS

## Key Takeaways

- The bulk of program activity occurs via the downstream channel
- All utilities currently offer advanced lighting controls and foresee controls playing an increasingly important role in their C&I lighting portfolio
- To keep pace with decreasing incremental costs and changing baseline assumptions, utilities are regularly updating their list of eligible products and associated incentives
- Because of the program changes they've already made, none of the utilities expect EISA 2020 to have a significant impact on their C&I lighting programs
- Net-to-gross values vary by product and use-case (replace-on-fail versus early retirement), which makes program-level comparisons impractical

## Approach

To support the process and impact evaluation of the 2018 Xcel Energy Lighting Efficiency program, the EMI Consulting evaluation team benchmarked the Xcel Energy C&I lighting program against five peer utilities. The objective of benchmarking was to identify opportunities to improve the Xcel Energy programs based on a comparison of peer utility programs' design, delivery, and processes.

In addition, benchmarking allowed the evaluation team to hear directly from peer utilities regarding key topics of interest, such as the DesignLights Consortium® (DLC) rating, advanced lighting controls, savings goals and calculations, baselines, future program plans, and anticipated impact of Energy Independence and Security Act (EISA) 2020 legislation on programs. To conduct this benchmarking exercise, the evaluation team spoke at length with C&I program managers at five peer utilities that Xcel Energy identified based on their comparable program structure.

In the following sections, we compare Xcel with the C&I lighting programs of five peers across several dimensions:

- Comparison of Program Design Elements
- Recent Program Changes
- Comparison of Key Program Performance Indicators
- Utility Predictions for EISA Legislations
- Looking Forward: 2020 and Beyond

## Comparison of Program Design Elements

In this section, we discuss each program in more detail, and compare programs in terms of program design.[8]

[8] These utility names have been anonymized throughout the report.

## High-Level Program Descriptions

Xcel Energy internally administers their C&I lighting program. Only one of the five benchmarked C&I lighting programs were run exclusively by third-party implementer. The other four were either utility staff run (2) or run by a combination of staff & implementers (2), depending on the offering.

Most of the benchmarked programs (4 of 5) offered downstream lighting incentives (i.e., direct to customer/contractor) for their C&I programs. Four of five program managers also mentioned offering a direct install element in their C&I lighting portfolio, typically aimed at small and medium-sized commercial businesses. One also offers a midstream component – a distributor partnership – but the trade ally ends up getting the rebate, so it functions, from an incentive payment perspective, as a downstream model (e.g. the trade ally can mark the discount on their invoice, thus passing on the rebate to the customer).

## Program Design Elements

In this section we provide a brief discussion on the types of measures offered by each program, their incentive structures, the specific customer segments they target (when applicable), and their product eligibility requirements.

Table 6. Description of Program Elements

| Program Element | Xcel Energy | Utility #1 | Utility #2 | Utility #3 | Utility #4 | Utility #5 |
|---|---|---|---|---|---|---|
| Program Design | Midstream and Downstream | Downstream, including Direct Install | Downstream | Downstream, including Direct Install | Downstream | Direct Install and Midstream |
| Targeted Segments | Yes (rotating focus) | Yes (Schools and Grocery) | No | No | Yes (Small/Medium Businesses) | Yes (Schools, along with rotating focus) |
| DLC required? | Yes, for some. Also reduced incentive on some products for non-DLC | Yes (or ENERGY STAR) | Yes (or ENERGY STAR) | Yes (or ENERGY STAR) | Yes | Yes |
| Incentive for Advanced Controls? | Yes | Yes | Yes | Yes | Yes | Yes |
| Savings Approach | Deemed for Prescriptive, Calculated for Custom | Deemed for Prescriptive, Calculated for Custom | Calculated Only (No Deemed) | Deemed for Prescriptive, Calculated for Custom | Deemed for Prescriptive, Calculated for Custom | Deemed for Prescriptive, Calculated for Custom |
| Incentive Approach | Incremental cost for prescriptive, watts saved for custom | Incremental Cost | Watts Saved | Watts Saved | Watts Saved | Watts Saved |

The following subsections expand upon some of the information summarized in the table above.

## Measures Offered

Like Xcel Energy, interviewed program managers described promoting a wide variety of C&I lighting products through their programs. All the programs focused on LED/TLED lamps and fixtures, but some incentivize reduced wattage linear fluorescent lamps , high efficiency fluorescent troffers and high bay fixtures, as well as the replacement of inefficient fluorescent ballasts. One interviewed manager noted they offer for an incentive for every product that's DLC-qualified.

Two managers noted they had previously offered incentives through a midstream channel but no longer do. One of the two managers explained that midstream incentives ended because many of the previously eligible lamps were phased out due to increases in the program's baseline wattage assumptions. The one interviewee operating a midstream option, besides Xcel Energy, elaborated that the program "partners with hardware and lighting distributors (like Grainger) to offer point-of-purchase incentives" on every lighting product the distributor carries that is covered by the program. While this program design engages midstream market actors, the design operates more like a typical downstream program.

## Targeted Segments

Xcel Energy targets some customer segments with marketing efforts offered for a limited time. In addition, they have other lighting programs beyond Lighting Efficiency for small business, low-income business, and new construction. Of the five program managers we spoke with, three said their C&I lighting program targets specific markets. One of these three managers said their program targets schools and grocery stores. The second manager cited schools as a target segment. The third manager, however, offered a broader definition of their C&I target market: small and medium-sized businesses.

Like Xcel Energy, one of these managers also noted their program has employed a rotating targeting approach where the program focuses on and markets to a different C&I customer segment for a month or two at a time. The manager cited wastewater plants, institutional buildings (e.g., government, healthcare and schools), and manufacturing facilities as example of their rotating focus. The manager indicated the program's temporary but focused efforts had been successful in driving program savings while diversifying as program participation.

## Advanced Lightings Controls

All five of the benchmarked utilities – as with Xcel Energy – offered incentives for advanced lighting controls through either their prescriptive or custom programs. One respondent offered the following details regarding their handling of advanced controls: "We require the network lighting controls meet all of DLC's attributes: daylighting, occupancy sensing, tuning. We also have a list of optional measures. And we require them to have the ability to do DR and an energy monitoring dashboard and a GUI."

Several respondents noted challenges related to offering controls – namely that they exceed code requirements, which can be particularly challenging in some states like California. These managers noted it is difficult to encourage the average non-residential customer to do controls and that participation to date has been largely limited to early adopters of the technology.

However, two respondents shared control-related tactics that have proved successful:

- The program manager for Utility #3 described an advanced lighting control program that has "really taken off." The utility pays $0.75/square foot for classrooms and retail space. The program identified a dozen or so different attributes, of which the control must possess at least three to qualify for the incentive. The program also offers training for trade allies on advanced lighting and network lighting systems. While early, the manager said they are "seeing some good success stories".
- A second program manager (for Utility #5) said their prescriptive daylighting and occupancy "really resonates with a number of segments", specifically citing hospitality and retail. The manager noted their program design allow flexibility (e.g., customers they can control by remote or an integrated sensor). The same manager indicated they'd also had some traction is niche applications like theaters.

## Recent Program Changes

Xcel Energy described the Lighting Efficiency program as "constantly going through program changes," including adding new measures to both custom and prescriptive, and adjusting rebate levels. Xcel Energy also noted that new LED technologies, and regulatory changes, have resulted in program changes.

> "Market pricing nosedived so much that it wreaked a little bit of havoc on our program. We don't often change pricing that often – maybe once or twice a year. But [when prices] across the board came down by 50% or more it was a problem."

We asked each of the four program managers when their utility had last made changes to how they delivered their C&I lighting program. All five respondents said they frequently make programmatic adjustments; most commonly citing updates to incentives necessary to keep pace with the rapidly evolving lighting market.

Other noted changes include:

- Reacting to changes in baseline assumption
- Changing incentive approaches (e.g., from a wattage-based to tiered incentives)
- Adding new measures, such as:
    - Bi-level stairwell lighting
    - Surface mounted downlight fixtures and wall sconces
    - Network controls
- Removing existing measures (e.g., T12s and T8s)

The sentiments of all five respondents were perhaps best captured by one manager who explained that their utility was "looking for remaining savings potential [that] we can find in the market and how we can claim those."

Responses were mixed when we asked about more significant changes (beyond incentive tweaks and qualifying product updates). One manager noted they are going through a major overhaul now in anticipation of continuing changes to the lighting landscape. Another indicated they had not changed the current structure of their lighting offer since 2014.

# Comparison of Key Program Performance Indicators

In this section we provide a brief description of three types of program performance metrics: Savings goals, savings achieved, and net-to-gross ratios (NTGRs).

Table 7. Program Performance Indicators by Utility

| Indicators | Xcel Energy | Utility #1 | Utility #2 | Utility #3 | Utility #4 | Utility #5 |
|---|---|---|---|---|---|---|
| 2017 Savings Goal (GWh) | 83 | Unable to Answer | Unable to Answer | 105 | 31 | 411 |
| 2017 Savings Achieved (GWh) | 121 | Unable to Answer | Unable to Answer | 150 | Unable to Answer | 393 |
| 2018 Net-to-Gross Ratio | 0.99 (prescriptive and custom) and 0.92 (midstream) | 0.60 (everything else) – 0.91 (high bay and outdoor) | 0.90 | n/a (gross savings only) | 0.98 | 0.71 (prescriptive) – 0.85 (custom) |

## Net-to-gross ratios

Respondents generally struggled to provide definitive information about net-to-gross ratios. Several cited differences by measure, participation type (prescriptive vs. custom), or by replacement scenario (early replacement vs. replace-on-fail). Others noted their programs were currently going through evaluations – or would be soon – so the stated net-to-gross ratios could change soon. Peer utility NTGRs vary between 60% and 98%. Utility 5 applies the 0.85 (custom ) and 0.71 (prescriptive) retrospective NTGR for program years

2018-2020. Utility 1 is also applying their NTGR prospectively for 2018-2020, however, their baseline is moving to an LED bulb, so they are likely discontinuing any prescriptive lighting offerings going forward.

## Savings Goals

Xcel Energy's 2017 savings goal for lighting efficiency product was 83 GWh. This is in the middle of the three utilities that were able to provide responses regarding their lighting-specific goals. The two that did not provide a response indicated it was difficult to confidently break out their lighting-specific goals and achievements from their larger C&I portfolio.[9]

Xcel Energy uses different baselines depending on measure installed, and whether the retrofit (i.e. technology replaced) was cost effective.

Utilities reported the following baselines:

- LED and linear fluorescent blend (no incandescent, no HID). Varies if measure is replace on burnout or early replacement.
- Fixtures = fluorescent; Lamps = T-8; Exterior & High Bay = mix of metal halide and high bay fluorescent. Don't use code, use existing systems as baseline.
- If existing is T-12 we use T-8
- If retrofit, baseline is what's replaced. NC = Title 24
- Linear = T8; screw-in = CFL; Custom = code

## Program Budgets

Similar to lighting-specific savings goals, the responding program managers has a difficult time providing budget amounts – overall and especially specific to lighting. In fact, 3 of 5 were unable to provide overall or lighting-specific estimates. Two were able to provide some information though:

- **Utility #3**. Noted their annual budget for the prescriptive program (which is mostly lighting) was $13M. They noted this included incentives, labor, administrative costs and marketing.
- **Utility #4.** The utility's overall C&I budget of $10.9M was distributed across their programs as follows:
    - Custom - $2.5M
    - Prescriptive -$2.4M
    - Direct Install - $6M

# Utility Predictions for EISA Legislation

None of the five respondents expect EISA 2020 to have a significant impact on their C&I lighting programs, with the exception of one utility who expected it to affect new construction, noting, "If it is harder to meet code, then that would reduce program participation."

The two California utilities we interviewed noted that their programs are also California Energy Commission requirements as well as Title 20, which they pointed out was "basically the federal standard a year in advance." One of the non-California utility respondents though there would be a lag in customers changing

[9] In the instances, the team asked the respondent to follow-up via e-mail following the interview. As evident in the table, the respondent did not provide this information at a later time.

out their equipment and therefore expects their program will more gradually phase out of certain lighting products.

# Looking Forward: 2020 and Beyond

We asked each responding utility program manager to speculate regarding the changes like to occur after 2020. Specifically, we asked them to offer their expectation regarding to changes in:

- Products Offered
- Program Savings Goals
- Incentive Level
- Target Segments
- Implementation Methods

We also asked each manager "how" these changes would be made. Most anticipated annual changes moving forward regarding products offered and incentives, as well as allowing phase-in periods to ease their program's transitions. They noted that savings goals are often set through recurring multi-year processes and therefore likely to change on a less frequent schedule. The same was true for changes in implementation method (e.g., program delivery).

## Changes to Products

Responses were mixed regarding anticipated changes to product offerings.

One utility noted that "most of our savings come from panels or tubes," so they aren't expecting huge changes for C&I lighting as a result of EISA 2020. The same utility indicated they expect A-line type bulbs subject to EISA 2020 requirements to shift to inefficient LED baseline, which would cause them to drop that product. However, given their current–and anticipated future product mix–they felt their C&I portfolio would not be overly impacted saying "Some measures will go away completely, but it'll be 5 out of 200."

Several utilities, including both based in California, said they expect to increasingly focus on network lighting controls. One of the utilities said that they, by focusing on DLC 5.0 and controls, estimated they could run a viable C&I lighting program for another 7-8 years.

## Changes to Goals

> "The fruit is getting higher up the tree."

Two of the five interviews said they anticipate their C&I lighting goals will decrease, commensurate with increasing baseline assumptions and lower per-unit savings. The three others were either unable to speculate. One program manager in California said they expect to shift metrics away from kWh to tons of carbon in coming years.

## Changes to Incentives and Target Segments

Respondents, across the board, agreed that lighting costs are likely to continue declining, which, in turn, result in smaller program incentives.

Most (3 of 5) program manager said they did not anticipate shifting their attention to different target segments after EISA 2020. The other two managers felt it was too early to say and could not confidently provide an answer.

## Changes to Implementation Method

Like continuing to focus on the same customer segments, most (again 3 of 5) of the interviewed managers expect to continue use the same implementation method to deliver their C&I lighting program after 2020.

Two of the respondents are anticipated changes through. Utility #1 indicated they expect to shift from a utility staff run program to a third-party implementer. Another utility suspected they may add (or shift to) a mid- or upstream program delivery model.

# Appendix G: XCEL ENERGY DSM EVALUATIONS 2017: REVISED C&I NET-TO-GROSS BATTERY (V2)

## Background

EMI Consulting conducted a series of cognitive interviews to better understand how commercial and industrial (C&I) respondents are able to answer a standard battery of questions designed to assess free ridership. As a result of conducting these interviews, and based on additional experiences conducting evaluations for Xcel Energy in previous years, EMI Consulting recommends making changes to the wording of questions used in the NTG battery, as well as making modifications to the way the NTG score is calculated.

## Summary of Changes

There are two types of modifications we recommend making to the standard NTG battery. The first set involves the addition of clarifying language in the questions themselves to ensure respondents understand the intent. The second set involves modifying how the responses to the questions are used to generate a final NTG value. We summarize both of these below.

### Wording and Question Order Adjustments

Throughout the course of the cognitive interviews, we noted where respondents seem confused or did not seem to understand the line of questioning. The following table details the variables referenced in this battery. The question battery, including suggested modifications, are shown in the next subsection.

| Variable | Description |
|---|---|
| <PROGRAM> | The name of the Xcel Energy product/program |
| <MEASURE_1> | The specific measure installed through the product/program |
| <MONTH><YEAR> | The month and year the measure was installed/implemented |
| <MEASURE_TYPE> | The general family of the measure type (e.g., "lighting") |
| <EQUIPMENT_X> | Other types of equipment (not the same measure type as <MEASURE_1>) – used for unlike spillover |
| <DOLLAR_AMOUNT> | The dollar amount of the rebate |

**Section A: Free-ridership**

**A0.** In your own words, how would you describe the influence that the Xcel Energy <PROGRAM> had on your decision to purchase/install this <MEASURE_1>.

[RECORD VERBATIM]

**A1.** Making decisions can sometimes be relatively simple involving one major factor, like price. Or, they can be relatively complex involving multiple factors such as price, information provided by your contractor or utility, and concerns about high electricity or gas bills.

As part of this project, Xcel Energy provided you with:

5. An incentive of [INSERT <DOLLAR_AMOUNT>]
6. Information through marketing or informational and educational materials about the benefits of installing <MEASURE_1>
7. An endorsement or recommendation by your Xcel Energy account representative or other Xcel Energy staff
8. Engineering or other technical assistance provided by Xcel Energy or by a third party that was funded through Xcel Energy

In addition, you may have received support from prior participation in an Xcel Energy program.

There might be other things, not related to the program that might also have influenced your decision to install <MEASURE_1> For example, maybe

1. High electric bills
2. Company policies
3. Your own experiences with energy efficient equipment
4. Your own research on energy efficiency equipment
5. Recommendations from a contractor or vendor

There are of course many other possible reasons. Next, I'm going to ask a few questions about your decision to install <MEASURE_1>. Please rate the importance of each of the following factors on your decision to install <MEASURE_1> using a scale from 0 to 10, where 0 means "not at all important" and 10 means "extremely important". The bigger the number, the greater the influence. If you don't know, just say "I don't know. Now, how important was…

(RANDOMIZE, REPEAT SCALE AS NECESSARY)

1. [NUMERIC OPEN END, 0 - 10]
DK
REF

**A1a.** Contractor recommendation[10]

**A1b.** The dollar amount of the rebate

**A1c.** Endorsement or recommendation by your Xcel Energy account manager or other Xcel Energy staff

[10] The contractor or trade partner will in some cases be considered a program factor and in some cases be considered a non-program factor. Please refer to section 3.1.1.3 in the IL TRM Cross-Cutting Measures protocol for guidance on this determination: http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_6/Final/IL-TRM_Effective_010118_v6.0_Vol_4_X-Cutting_Measures_and_Attach_020817_Final.pdf

**A1d.** Information from Xcel Energy marketing or informational materials
**A1e.** The simple payback period, which is the amount of time until equipment has paid for itself
**A1f.** Total amount of money saved over lifetime of the equipment, otherwise known as the return on investment or "ROI"
**A1g.** The age or condition of the old equipment
**A1h.** Previous experience with this type of equipment
**A1i.** Corporate policy or guidelines
**A1j.** Minimizing operating cost
**A1k.** Predetermined timeline or schedule for replacing equipment
**A1l.** Your previous participation in an Xcel Energy program [IF APPLICABLE: How long ago in years did you participate in the Xcel Energy program?_____ years ]
**A1m.** State or Federal efficiency standards
**A1n.** Other factor [SPECIFY]

A2. Thinking about this differently, I would like you to compare which of those factors were most important in your decision to install <MEASURE_1>. We have two groups: the first group is the program factors, which are all of the things related to the program. For instance, you just told me…

**[READ BACK ANY PROGRAM FACTORS >7, OR IF NO ITEMS GREATER THAN 7, READ TOP 3 RATED PROGRAM FACTORS]**

(were/was) the most important program factor(s). And the second group is the *non*-program factors, which are those things we just discussed that were *not* part of the program. You just told me…

**[READ BACK ANY NONPROGRAM FACTORS >7, OR IF NO ITEMS GREATER THAN 7, READ TOP 3 RATED NONPROGRAM FACTORS]**

…(were/was) the most important non-program factor(s).

A3a. I'm going to ask you to split 100 points between the overall influence of program factors and the overall influence of non-program factors on your decision to install <MEASURE_1>. So there are two groups here – the first group is the program factors and the second group is the non-program factors. Thinking about that decision, how many of those 100 points would you assign to the overall influence of program factors, considered *as a group*?

1. [NUMERIC OPEN END, 0 - 100]
DK
REF

A3b. And how many of those 100 points would you assign the overall influence of non-program factors, considered as a group? Your answers should sum to 100. [PROGRAMMING NOTE: the total of A3a + A3b should equal 100]

1. [NUMERIC OPEN END, 0 - 100]
DK
REF

**[ASK IF A3a > 70 and Maximum of (A1a to A1f, A1m < 3]**
**[ONLY ASK A4b and A4c A MAXIMUM OF ONE TIME]**

**A4b.** You just assigned program factors **<RESTORE RESPONSE FROM A3a>** points out of 100, suggesting that the program was very important in your decision. However, when I asked you earlier to rate the importance of each program factor, the highest rating you gave was a **<RESTORE HIGHEST RATING FROM A1a to A1f, A1m >** out of 10, suggesting that the program was not very important. Should I go back and change one of your answers?

1. Change the points assigned to program factors **[RETURN TO A3]**
2. Change the influence of the program factors **[RETURN TO A1]**
3. No

**[ASK IF A3a < 30 and Maximum of (A1a to A1f, A1m > 7]**
**[ONLY ASK A4b and A4c A MAXIMUM OF ONE TIME]**

**A4c.** You just assigned program factors <RESTORE RESPONSE FROM A3a> points out of 100, suggesting that the program was not very important. However, when I asked you earlier to rate the importance of each program factor, the highest rating you gave was a <RESTORE HIGHEST RATING FROM A1a to A1f, A1m > out of 10, suggesting that the program was very important. Should I go back and change one of your answers?

1. Change the points assigned to program factors [RETURN TO A3]
2. Change the influence of the program factors [RETURN TO A1]
3. No

**A5.** Where did you first learn about **<MEASURE_1 >?**

[SINGLE RESPONSE ONLY]

1. Xcel Energy (including marketing or information materials) / the program
2. A contractor affiliated with the program[11]
3. Something else [SPECIFY]

DK
REF

**A6a.** If the Xcel Energy <PROGRAM> was not available, would you have installed the *exact same type, model, and efficiency* of the <MEASURE> you installed through the <PROGRAM>**?**

[NOTE TO INTERVIEWER: If respondent indicates they would have installed a lesser quantity, the answer to this question is 'no'.]

3. Yes
4. Maybe / not sure

[11] The contractor or trade partner will in some cases be considered a program factor and in some cases be considered a non-program factor. Please refer to section 3.1.1.3 in the IL TRM Cross-Cutting Measures protocol for guidance on this determination: http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_6/Final/IL-TRM_Effective_010118_v6.0_Vol_4_X-Cutting_Measures_and_Attach_020817_Final.pdf

3. No / Would not have installed <MEASURE_1> at all [SKIP TO A8]
REF

[IF A6a = 1 or 2]

**A6b.** Using a scale from 0 to 10, where 0 means "not at all likely" and 10 means "extremely likely", please rate the likelihood that you would have installed the *exact same* **<MEASURE_1 >** if the Xcel Energy , <PROGRAM> incentive was not available.

When I say "the exact same <MEASURE_1>", I mean the *exact same model, quantity, and efficiency* of the lighting products you installed through the Lighting Efficiency Program.

[NUMERIC OPEN END, 0 - 10]
DK
REF

**[ASK IF A6b > 7 and Maximum of (A1a to A1f, A1m > 7]**
**[ONLY ASK MAXIMUM OF ONE TIME]**

**A6c.** You just indicated you would still have installed **<MEASURE_1>** without any incentive from the <PROGRAM>, suggesting that the program was not very important. Earlier, when I asked you to rate the importance of each program factor on your decision, the highest rating you gave was a **<RESTORE HIGHEST RATING FROM A1a to A1f, A1m>** out of 10, suggesting that the program was very important. Should I go back and change one of your answers?

1. Change the answer to installing **<MEASURE_1>** without the program **[RETURN TO A6a]**
2. Change the influence of the program factors **[RETURN TO A1]**
3. No

**[ASK IF A6a < 3 and Maximum of (A1a to A1f, A1m < 3]**
**[ONLY ASK MAXIMUM OF ONE TIME]**

**A6d.** You just rated your likelihood to <**MEASURE_ACTION_1>** without any incentive from the <PROGRAM> as a(n) <**RESTORE RESPONSE FROM A5>** out of 10, suggesting that the program was very important. Earlier, when I asked you to rate the importance of each program factor on your decision, the highest rating you gave was a **<RESTORE HIGHEST RATING FROM A1a to A1f, A1m>** out of 10, suggesting that the program was not very important. Should I go back and change one of your answers?

1. Change the likelihood of **<MEASURE_ACTION_1>** without the program **[RETURN TO A5]**
2. Change the influence of the program factors **[RETURN TO A1]**
3. No

[IF A6a = 1 or 2]

A7. In the absence of the Xcel Energy rebate program, when would you have installed the *exact same type, model, and efficiency* of the lights you installed through the <PROGRAM>? Would it have been… [READ CODES 1-99]

1. Within one year of installation?
2. Between 1 and 2 years later
3. Between 2 years and 3 years later
4. Between 3 years and 4 years later
5. Greater than 4 years later
99. Or would you not have installed the equipment at all
DK
REF

[IF A6a = 1 or 2]

A8. Asking this same question in a different way -- using a scale from 0 to 10, where 0 means "not at all likely" and 10 means "extremely likely", what is the likelihood that you would have installed the *exact same model, quantity, and efficiency* of the <MEASURE_1> you installed through the <PROGRAM> within 12 months of <MONTH> <YEAR> if the Xcel Energy <PROGRAM> was not available.

[NUMERIC OPEN END, 0 - 10]
DK
REF

## Section B: Spillover

[NOTE: Questions B1 through B6 measure 'like' spillover. Questions B7 through B12 measure 'unlike' spillover.]

B1. Since your participation in the <PROGRAM> in <INSERT MONTH AND YEAR OF PARTICIPATION>, has your company installed any efficient <MEASURE_TYPE> products at this facility without a rebate from Xcel Energy? When I say "efficient <MEASURE_TYPE> products", I mean equipment that is eligible for an Xcel Energy discount.

1. Yes
2. No [SKIP TO B7]
DK [SKIP TO B7]
REF [SKIP TO B7]

B1a. Why did you not apply for an Xcel Energy rebate for purchasing these efficient <MEASURE_TYPE> products?

[RECORD VERBATIM]
DK
REF

B2. Did your experience with the efficient <MEASURE_TYPE> products you installed through the Xcel Efficient <PROGRAM> influence your decision to install some or all of the additional efficient <MEASURE_TYPE> on your own?

1. Yes

2. No [SKIP TO B7]
DK [SKIP TO B7]
REF [SKIP TO B7]

**B3.** What type of <MEASURE_TYPE> was it? For example, [PROVIDE EXAMPLES RELEVANT TO EQUIPMENT TYPE, e.g. "screw in LEDs, Linear LEDs, controls"]. [LIST ALL TYPES]

1. TYPE 1
2. TYPE 2
3. TYPE 3
4. TYPE 4
DK [SKIP TO B7]
REF [SKIP TO B7]

**B4.** Approximately how many of each type did you install? [READ TYPES LISTED IN B3]

1. TYPE 1
2. TYPE 2
3. TYPE 3
4. TYPE 4
DK [SKIP TO B7]
REF [SKIP TO B7]

**B5.** How important was your experience in the <PROGRAM> and products in your decision to install these <MEASURE_TYPE> products on your own, using a scale from 0 to 10, where 0 is "not at all important" and 10 is "extremely important"?

1. TYPE 1
2. TYPE 2
3. TYPE 3
4. TYPE 4
DK
REF

**B6.** Using a 0 to 10 scale, where 0 means you definitely WOULD NOT have installed these products and 10 means you definitely WOULD have installed these <MEASURE_TYPE> products, if you had not participated in the <PROGRAM>, how likely is it that your organization would have installed these additional efficient <MEASURE_TYPE> products?

1. TYPE 1
2. TYPE 2
3. TYPE 3
4. TYPE 4
DK
REF

[NOTE: Questions B7 through B12 measure 'unlike' spillover.]

**B7.** Since your participation in the <PROGRAM>, have you installed any additional energy efficient equipment, other than <MEASURE_TYPE>, at this or other facilities in Xcel Energy's territory?

1. Yes
2. No
DK
REF

**[ASK IF B7=1]**

**B8.** Did your experience with the Xcel Energy-rebated <MEASURE_1> influence 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]

**B9.** What equipment did you install? Please provide as much detail as you can. (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]

**[ASK B10-B12 FOR INDIVIDUALLY FOR EACH EQUIPMENT MENTIONED IN B9]**

**B10.** Did you receive a rebate for <EQUIPMENT_X> through Xcel Energy or any other energy efficiency program?

1. Yes
2. No
DK
REF

**[ASK IF B9=1]**

**B11.** How important was your experience in the <PROGRAM> in your decision to install this <EQUIPMENT_X> using a scale from 0 to 10, where 0 is "not at all important" and 10 is "extremely important"?

[NUMERIC OPEN END, 0 – 10]
DK
REF

**[ASK IF B10=2 "no"]**

**B12.** If you had not participated in the <PROGRAM>, how likely is it that your organization would still have installed <EQUIPMENT_X>, using a 0 to 10 scale, where 0 means you definitely WOULD NOT have implemented this measure and 10 means you definitely WOULD have implemented this measure?

[NUMERIC OPEN END, 0 – 10]
DK
REF

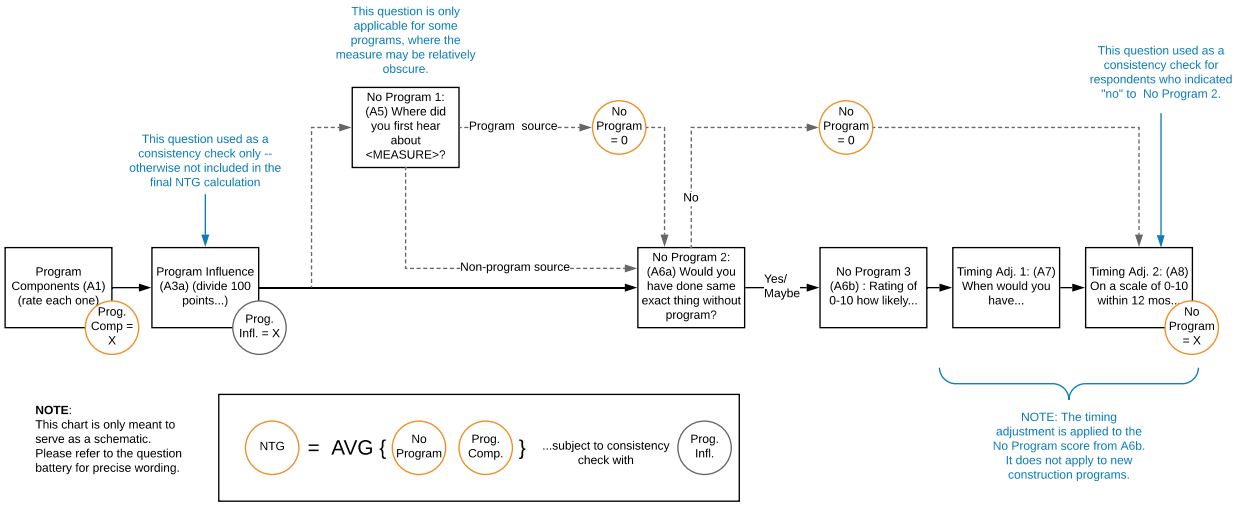
## Algorithm Adjustments

In addition to the wording changes recommended above, we recommend making the following modifications to the existing NTG battery as follows:

- Adjustment #1: Do not use the Program Influence free ridership score as a direct input into the NTG algorithm. In our analysis of cognitive interview data, and based on our experience in previous evaluations, we find that this question leads to lower-than-expected NTG values on a consistent basis. Rather than use this question as a direct input, we recommend continuing to ask it, but only use the results as a consistency check on other questions.
- Adjustment #2: Set the No Program free ridership score to zero if the respondent either (a) first heard about the measure from Xcel Energy, the program, or a program-affiliated trade partner, or (b) if they respond "no" to the binary question asking if they would have installed the exact same measure if the program had not been available. In other words, if a respondent indicates that they would not have installed the same measure without the program, they are assigned a free ridership value of zero for the No Program score. If they respond "maybe" or "yes," the respondent is then routed through the standard battery of questions. This answer then becomes their No Program score.

These adjustments are shown graphically in Figure 27 below. Where it is shown that a free ridership value is set to zero for the No Program score, this value will carry through (despite the fact that the remaining questions will be asked).

## Figure 27. Flowchart Showing the Calculation of the NTG Score



**Lighting Efficiency Evaluation**

2018 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 in existing or new buildings. Rebates are offered to encourage commercial and industrial (C&I) customers to purchase energy efficient lighting by lowering the upfront premium costs associated with this equipment.

Xcel Energy (The Company) engaged a team of researchers led by EMI Consulting to conduct a process and impact evaluation of the Lighting Efficiency product. The evaluation team was asked to assess the following:

- **Estimate the Net-To-Gross Ratio (NTGR):** Estimate the retrospective and prospective NTGR.
- Identify barriers and programmatic adoption strategies for **lighting controls**: What are the most common barriers for adoption and how can Xcel Energy overcome them? How are other utilities encouraging adoption of lighting controls?
- **Investigate DLC and non-DLC offerings**: What qualified product lists (QPL) do other utilities require? How do trade partners and participant customers feel about DLC qualifications?
- **Assess application form:** How satisfied are participants with the online application process? Why are/are not customers using the online application?

Based on the results of this research, the evaluation team developed key findings and recommendations for Xcel Energy.

| Recommendation | Response |
|---|---|
| 1) **Target early replacement of working lighting equipment.** While the product has historically targeted early replacement, this focus will be crucial for attributable savings within a transformed marketplace. The product needs to specifically target accelerating purchases beyond scheduled upgrades and replace on burnout measures. | The product will adopt the targeted approach of encouraging customers to accelerate replacement of working lighting equipment verses customers replacing equipment on burnout. |
| 2) **Discontinue new construction lighting rebates.** While new construction rebates represent a small percent of Lighting Efficiency Product savings, increasingly stringent building codes and improved cost-effectiveness make these likely free-riders and should not be offered going forward.[1] | The Company will discontinue the Lighting Efficiency new construction lighting product in 2019 through a subsequent notice outlining the product close-out timeline. Customers and trade partners that are currently participating and or interested in participating in the program will be given advance notice of this change.<br><br>The Company will honor projects invoiced in 2019 that are submitted within two years from invoice date to account for the new construction project lifecycle. |
| 3) **Collect information on reason** | The current program rebate application will be |

[1] The separate New Construction Product, however, may consider offering incentives for efficient lighting strategies that exceed building code and standard building practices (e.g., strategic lighting design to reduce the lighting power density, advanced lighting controls)

| | |
|---|---|
| **for replacements.** The current program application does not collect information on the working status of replaced equipment. For each replaced product, the retrofit application should ask about the working status and whether it was part of a mandated or predetermined upgrade schedule. This will document program impact on project accelerations. | updated to collect information on the working status of replaced equipment. In addition to the working status of the equipment, the rebate application will ask if the retrofit was part of a mandated or a predetermined upgrade to document impact of project accelerations. |
| 4) **Expand campaigns to encourage early replacement.** These campaigns should encourage participant customers to expand projects to go beyond scheduled upgrades and burned out bulbs. | The Company will expand marketing and communication plans to all product stakeholders encouraging customers to accelerate and or expand retrofit projects to go beyond scheduled upgrades and equipment burnout. |
| 5) **Ensure gross savings calculations include a dual baseline for calculating lifetime savings.** As the program continues to target these early replacement products, lifetime savings need to account for the shorter remaining useful lifetime of the replaced bulb in the savings calculations. Incremental cost should also be calculated accordingly (e.g., using the full cost of the replacement less a deferred replacement cost credit). | The Company will ensure the product includes a dual baseline to calculate equipment lifetime savings that reflect whether project is replacing working or burned out equipment. |
| 6) **Continue to monitor the Changes to the Lighting Market.** Due to the rapidly transforming lighting market, it is important to re-evaluate this product influence at frequent intervals. This will allow the product to evolve with the market and the NTGR to reflect changing offerings and market potential. This includes additional research in 2019 to feed into the 2020 NTGR and evaluations at regular intervals thereafter. | The Company will continue to monitor the changes to the lighting market by conducting additional market research in 2019 to feed into the 2020 NTGR recommendation. |

| | |
|---|---|
| 7) For 2019, apply a NTGR of 74% to the program, upon implementation of the recommendations contained in this report. This NTGR reflects the rapidly-changing nature of the commercial lighting market as well as the historical high influence exerted by the program. | The Company will apply a NTGR of 74% to the program starting January 1, 2019 and will be implementing all recommendations contained in the report. |
| 8) **Expand trade partner network and focus efforts on mid/low performing trade partners.** There is more opportunity to convert customers to efficient products when the trade partner offers and sells both options. The product should target non-participant and mid/low performing trade partners that are more likely to continue to offer inefficient (e.g., T12 and T8) lamps. | The Company will work to expand the trade partner network and focus on converting mid to low performing trade partners that continue to sell fluorescent equipment. |
| 9) **Focus product efforts on increasing adoption of lighting control strategies through focused campaigns and trade partner trainings.** Peer utilities report having successful campaigns focused on specific facility types, such as classroom and retail spaces; the product should consider that strategy. Trade partners reported challenges making the business case for lighting controls; the Lighting Efficiency Product can focus trade partner trainings on the benefits of controls and strategies to overcome perceived barriers and increase awareness of available incentives. To the extent it is cost-effective, consider increasing incentives on these products to overcome the cost barrier and encourage adoption. | The Company will continue to focus on increasing the adoption of lighting controls through focused marketing campaigns and trade partner trainings throughout 2019.<br><br>The product released new prescriptive control rebates fall of 2018, which should aid in the increase of market adoption. As part of the new rebates, the Company has partnered and co-hosted four manufacture trainings for local trade partners. |

| | |
|---|---|
| 10) **Consider applying a separate NTGR to lighting control strategy measures.** Market adoption for control strategies remains behind LEDs, and represented very few participant customers in the 2017 program (and therefore as part of this study). If lighting control strategies represent an increasing percentage of future program savings and transitions towards more advanced lighting controls (e.g., connected lighting), Xcel Energy should consider researching and applying a separate NTGR specific to controls[2]. | The Company will apply a separate NTGR for networked lighting controls and continue to monitor the changes to the lighting market by conducting additional market research. |
| 11) **Assess ways to simplify the application form to make it accessible to more customers and trade partners.** This should include reviewing best practices from peer utility applications, updating the visualization of the document, and considering consolidating fields. | The Company will assess ways to simplify the application form to make it more accessible to more customers and trade partners. This effort is underway with the support and expert insight from the product's third-party consultants and various stakeholders. |
| 12) **Monitor satisfaction with non-DLC-qualified products among participant customers and reassess non-DLC incentives if product satisfaction is substantially less than DLC-qualified products.** | The Company will continue to monitor stakeholder satisfaction with non-DLC- qualified products through various feedback channels and reassess offering non-DLC rebates based on the product satisfaction. |

[2] The evaluation team cannot provide a recommended NTGR value for lighting control strategies alone as part of this evaluation due to the limited sample size obtained during the participant telephone survey.