EMI CONSULTING

Xcel Energy Colorado Cooling Efficiency Product 2017 Evaluation

January 15, 2018

FINAL REPORT

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Introduction

Xcel Energy contracted with EMI Consulting to evaluate the 2017 Commercial Cooling Efficiency Product in Colorado. The Xcel Energy Cooling Efficiency Product in Colorado provides commercial customers with downstream financial incentives to encourage the purchase of high efficiency cooling equipment such as chillers, direct evaporative pre-coolers, electronically-commutated (EC) motors, heat exchangers, and variable frequency drives (VFDs). This product also features a midstream delivery channel, which was launched in late 2015 and includes packaged and split AC units, water source heat pumps, air-cooled chillers, and PTAC/PTHP units. The Xcel Energy 2017-2018 Demand-Side Management Evaluation Plan included both a process evaluation and impact evaluation for this product. As part of the evaluation, EMI Consulting assessed participant experiences, product influence on customer decisions and the cooling market in general, similarity to peer programs, and opportunities for improving both the downstream and midstream delivery channels. This summary includes the key findings and recommendations from this evaluation.

Methods

- Historical data analysis
- Interviews:
  - Staff (n=5)
  - Distributors (n=8)
  - Trade partners (n=6)
  - Participating customers (n=5)
  - Peer program staff (n=5)
- Peer program research

Fielding:
Sept 2017 – Oct 2017

Key Findings

Overall product satisfaction is high among distributors and contractors, providing a foundation to build on in future years. Maintaining relationships with distributors will continue to be especially critical in the success of the midstream delivery channel.

Following up with customers who recently completed a rebated project may help Xcel Energy increase participation across products. Post-project communications should make sure customers are aware of additional energy saving opportunities offered by Xcel Energy.

Although designed to address availability barriers by changing stocking practices, the midstream product is also having an impact on first cost barriers via price discounting. Knowing how distributors are using the incentive dollars will be important for tracking market transformation over time.

As with many similar programs around the country, the Cooling Efficiency product **faces challenges related to estimating baselines and tracking sales penetration of incented equipment**. Market characterization work may assist in addressing these challenges.

Impact Results

Midstream Delivery Channel

0.89 Recommended NTGR

Drivers of product influence: Distributors use midstream incentives to increase their stock of high efficiency equipment (addressing availability barriers for time-sensitive customers) and/or pass the discount through to their customers (addressing first cost barriers).

Ways to optimize product influence: Make sure that the product stays "ahead of the market" by continuously increasing efficiency requirements.

Downstream Delivery Channel

0.71 Recommended NTGR

Drivers of product influence: Customers indicated the rebates help with first cost and payback considerations, though some indicated they would have installed the same equipment without a rebate.

Ways to optimize product influence: Routine periodic communication with customers will keep them in touch with current product offerings and allow the product to solicit feedback at regular intervals.

Executive Summary

2017 Cooling Efficiency Product (Colorado)

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Process Results

Distributors (Midstream)

Distributors often use midstream incentives to cover stocking costs for smaller equipment, but pass incentives through as price discounts for larger equipment. This has implications for product optimization and how the product is evaluated in the future.

It is critical to **keep the midstream offering dynamic** by updating efficiency tiers. Tracking cost effectiveness of program savings (in terms of $/kWh or $/kW) in addition to tonnage will assist with this effort.

Distributors tend to source equipment from only one manufacturer, showing that these relationships remain important in this market.

Contractors (Midstream/Downstream)

The **website** and **trade partner expo** facilitate contractor engagement with the product, though additional lines of communication with contractors (via email or phone) would be helpful in increasing this engagement.

There may be a need to educate contractors about the purpose of a midstream product offering. Although not publicized, at least some contractors are **aware of the midstream incentives** being paid to distributors. One contractor expressed concerns that customers may not be benefitting from this type of incentive.

Contractors suggest **streamlining the downstream invoice requirements** to be more in line with how contractors typically invoice their customers.

Customers (Downstream)

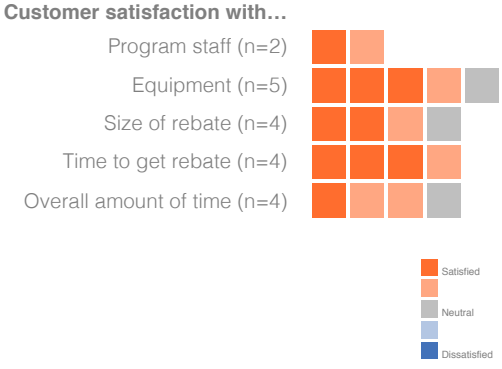
Customers were **likely to recommend the product and Xcel Energy as a provider** (4/5 customers rated both of these a 10/10). This corresponds to a Net Promoter Score of 60 for each category.

Customers sometimes need equipment to match existing "like" equipment. In some cases this may influence their choice of efficiency level.

There were indications that increased communication with customers could benefit the product. One customer interviewee suggested having follow-up meetings with Xcel Energy after completing a rebated project. Such a service may facilitate additional product participation and offer the chance to elicit feedback on past participation.

Product Satisfaction

Overall, all interviewees but one were satisfied with the product. One customer was neutral.



Most downstream customers were satisfied or somewhat satisfied with program staff, equipment, rebate amount, timing, and total program timing. None were dissatisfied.

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Conclusions & Recommendations

[All channels] There is evidence from this research that both the midstream and downstream delivery channels of the Cooling Efficiency Product are having net impacts.

Recommendation 1: The recommended overall prospective midstream NTGR is **0.89** (subject to the midstream product offering staying ahead of the market). The recommended overall prospective downstream NTGR is **0.71**.

[All channels] While customers appear generally satisfied with the downstream rebates, there were several indications that communication with these customers could be improved while improving evaluation data collection at the same time.

Recommendation 2: Conduct periodic surveys with customers immediately after they receive their rebate check. These surveys would serve three purposes: (1) To collect immediate feedback related to net-to-gross estimation, (2) ensure that customers are aware of other related energy efficiency opportunities available through Xcel Energy, and (3) help keep customer contact information up to date.

[Midstream] The midstream delivery channels runs the risk of diminishing net impacts over time if it does not stay ahead of increasingly efficient baselines in the market.

Recommendation 3: Efficiency tiers for the midstream delivery channel should continue to be periodically increased, with plenty of forewarning for distributors.

Recommendation 4: To counter possible contractor concerns that midstream benefits do not accrue to the end-use customer, make sure that contractors understand the rationale behind offering this type of product.

[Midstream] For small equipment, the midstream incentives are used in a variety of ways besides price reductions. For large equipment, the midstream incentives are often being passed through as a price discount, and are thus acting like a rebate.

Recommendation 5: Consider the cost effectiveness ramifications of splitting the existing midstream incentive into: (1) an incentive for small equipment, and (2) a point-of-sale (POS) rebate for large equipment.

[All channels] There is currently limited evaluation-related documentation, particularly for the midstream delivery channel.

Recommendation 6: Develop and document a more detailed strategy for how the midstream and downstream delivery channels should function.

Recommendation 7: Define and begin tracking a set of key performance indicators that can be used to measure market transformation of the Colorado HVAC market over time.

[Research] There is currently very limited information regarding the market penetration of HVAC equipment in Colorado, including what is currently installed (the installed base) and what is currently being sold (sales penetration).

Recommendation 8: Perform a market baseline study to estimate the penetration of energy efficient measures (installed base and sales) in Xcel Energy's service territory in Colorado.

1. INTRODUCTION

Xcel Energy offers a comprehensive array of demand side management (DSM) and other energy services and products to its customers. In evaluating its 2016 products, the utility desired to improve the customer experience, to understand each product's role in changing the marketplace, to analyze product influence on customer choices, and to ensure industry-leading product performance. In 2017, Xcel Energy contracted with EMI Consulting and its partners—Evergreen Economics, Apex Analytics, and Ridge & Associates (hereafter 'the evaluation team')—to undertake evaluations of eight products offered in Colorado and Minnesota, including the Cooling Efficiency Product in Colorado discussed in this report.[1] This introduction includes overviews of the product and our evaluation and describes the organization of this report.

1.1 Product Overview

The Xcel Energy Cooling Efficiency Product in Colorado provides commercial customers with downstream financial incentives to encourage the purchase of high efficiency cooling equipment such as chillers, direct evaporative pre-coolers, electronically-commutated (EC) motors, heat exchangers, and variable frequency drives (VFDs, incented either upon failure of existing drive or as early replacement). This offering also includes a custom project option. In addition, the Cooling Efficiency Product provides midstream incentives to participating distributors to stock and promote high efficiency equipment that is not part of the downstream delivery channel. The midstream delivery channel was launched in late 2015 and includes packaged and split AC units, water source heat pumps, air-cooled chillers, and PTAC/PTHP units. The midstream offering has exhibited substantial growth since its inception in Q4 2015. The offering achieved its stated goal for 2016 (the first full year of operation) of 20,000 tons of various types of cooling equipment incented. Consequently, this goal was increased for 2017 to 25,000 tons.

1.2 Evaluation Overview

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

- Influence on the commercial cooling equipment market
- Influence on the decisions of eligible customers
- Participant experiences with the Cooling Efficiency Product
- Similarity with peer programs
- Opportunities for improving the midstream and downstream delivery channels

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

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

Table 1-1. Cooling Efficiency Product Evaluation Framework

Evaluation objectives	Assess product impacts, influence on market	Understand product delivery	Understand customer and trade partner experiences	Identify opportunities for improvement	Identify market trends	Benchmark performance
Research topics	Net-to-gross ratio Document product logic Effects of midstream incentives Product impact on overall availability of high efficiency equipment	Understand product delivery	Motivations of participants Barriers to participation Experiences with product Influence on engagement and satisfaction with Xcel Energy	Identify opportunities to improve the delivery of downstream and midstream product tracks	Identify market trends that may impact the Cooling Efficiency Product in the future	Savings estimates and estimation methods Net-to-gross ratios Cost of achieved savings Total Resource Test values Program operations and methods used to engage customers and partners
Data sources	Product data review Xcel Energy staff interviews Participant customer interviews Contractor interviews Distributor interviews Interviews of peer utility program managers	Product data review Staff interviews	Participant customer interviews Contractor interviews Distributor interviews	Xcel Energy staff interviews Participating customer interviews Contractor interviews Distributor interviews	Xcel Energy staff interviews Contractor interviews Distributor interviews	Xcel Energy staff interviews Interviews of peer utility program managers

1.3 Report Organization

The following chapters organize the evaluation findings into two components: impact evaluation and process evaluation results. As illustrated in Table 1-1, the data collection activities may have contributed to one or 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 program impacts using a customized net-to-gross ratio (NTGR) analysis. Chapter 3 discusses the process evaluation components, which addressed customer and

trade partner[2] awareness, satisfaction, and motivations. Conclusions and recommendations are presented in Chapter 4. Detailed, descriptive methodology information, evaluation plans, and interview instruments can be accessed in this report's appendices.

[2] In this report, the terms "trade partner" and "contractor" are used interchangeably. Distributors are considered a separate group.

2. IMPACT EVALUATION FINDINGS

A central component of this evaluation was the estimation of the net-to-gross ratio (NTGR) for the Colorado Cooling Efficiency Product. 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 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 developed the NTGR based on data provided by customers, trade partners, and distributors. To assess the plausibility of this NTGR, the evaluation team then compared it to the NTGRs of similar programs sponsored by other peer utilities. Note that, while a NTGR of 1.0 is often seen as desirable, it may not be appropriate for all program designs depending on a variety of factors (including the maturity of the product and the technologies it promotes, program intervention strategies, and cross-program coordination strategies). The evaluation team has taken care to present our NTGR results with this context in mind.

Overall, this chapter presents:

- **Key findings –** The key findings section presents the recommended 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 estimate the recommended NTGR.
- **Net-to-gross ratio inputs –** This section presents qualitative and quantitative data that support the NTGR estimates.

2.1 Key Findings: Net-to-Gross Ratio

The evaluation team recommends an overall prospective NTGR of 0.80 for the Cooling Efficiency Product based on results from market actor responses and peer programs. This overall NTGR is a weighted value comprising two distinct NTGR values: (1) a value for the midstream delivery channel (0.89), and (2) a value for the downstream delivery channel (0.71).[3] These estimates are supported by the following key findings:

- **Midstream –** The recommended prospective NTGR for the midstream delivery channel is 0.89. This number is supported by substantial evidence from distributors interviewed as part of this evaluation that the midstream incentives had somehow impacted their stocking and/or sales of high efficiency cooling equipment in the Xcel Energy Colorado service territory. Distributor interviewees used the incentives in different ways, with some distributors using them to stock more high efficiency equipment and others using them to

[3] This weighting is based on kWh savings from 2016. If the proportion of savings between the midstream and downstream channels changes, the NTGR value should be reweighted accordingly.

reduce equipment prices for their customers.[4] There was also evidence from interviews with trade partners (i.e., contractors) that the midstream incentives have increased the availability of some types of smaller HVAC measures.

- **Downstream –** The recommended prospective NTGR for the downstream delivery channel is 0.71. Customers interviewed as part of this research generally agreed that the downstream rebate had some effect on their decision to install high efficiency equipment. However, the magnitude of this effect varied by customer, with some customers indicating that they likely would have installed the same equipment even without the rebate. Interviews with trade partners corroborated the finding that the downstream rebates are having some influence on customer decisions around high efficiency cooling equipment in the Xcel Energy service territory in Colorado.

It is important to note that these NTGR estimates are subject to multiple sources of uncertainty, including sampling error and measurement error due to problems of respondent recall, the challenge of answering hypothetical questions about actions they might have taken in the absence of the program, and the assumption that a 0-10 influence score is linear and accurately reflects the impact of the program on the customer's decision. The evaluation team has taken multiple steps to mitigate this uncertainty by adhering to best practices in the design of representative samples, the use of the self-report approach in estimating NTGRs, the use of effective strategies to minimize non-response, and the testing of NTGR questions to ensure construct validity.

2.2 Approach

An important consideration for this evaluation was the structure of the Cooling Efficiency Product, which includes both prescriptive and custom options for customers (the "downstream" delivery channel) and incentives for distributors (the "midstream" delivery channel). The evaluation team reflected the multi-faceted nature of the product in the use of a complex NTGR analysis approach in this evaluation. To estimate the NTGR[5] for the Colorado Cooling Efficiency Product, the evaluation team used a hybrid approach comprising two components:

1. A standard self-report approach (SRA) based on interview results with participating customers for the downstream delivery channel (both prescriptive and custom), and
2. A modified self-report approach aimed at understanding how distributors are influenced by the midstream offering.

The overall Colorado Cooling Efficiency Product NTGR was calculated by summing net savings across the two delivery channels (midstream and prescriptive/custom), and dividing by the product's total gross savings, as shown below:

$$Product\ NTGR = \Sigma\ Net\ savings\ /\ \Sigma\ Gross\ savings$$

[4] This was in some ways divergent from the evaluation team's initial understanding of the product objectives, which emphasized that price reduction was not a critical element for a midstream design.

[5] The NTGR is a factor representing the portion of gross savings that are attributable to the program. The product of the gross savings and the NTGR equal the net savings of the program. The NTGR may be composed of a variety of factors that create differences between gross and net savings, commonly including free riders, participant spillover and nonparticipant spillover (NTGR = (1 – Free Ridership) + Participant Spillover + Nonparticipant Spillover)). The factor can be estimated and applied separately to either gross energy or demand savings.

It is important to note that a design like the midstream Cooling Efficiency Product may have longer-term impacts that may not be immediately measurable in the short-term. Such longer-term impacts manifest as "market effects," which signify an impact on the overall functioning of the market. The evaluation emphasized data collection that would help uncover these longer-term impacts so that they could be reflected in the NTGR.

The evaluation team developed the NTGR for the Colorado Cooling Efficiency Product by first developing NTGR estimates for the downstream and the midstream products separately and then combining these estimates for the overall product NTGR. Peer utility program NTGR estimates were used to add context to these estimates.

Product Data Review

The evaluation team performed a thorough review of product data provided by Xcel Energy as one of the first steps in this research. This task informed all subsequent aspects of the evaluation approach. It was particularly important for designing the net-to-gross algorithms, given the comparatively small number of participating customers and trade partners from whom the interview samples were drawn.

The evaluation team began with two data extracts: (1) a Salesforce extract from Xcel Energy containing data on both the midstream and downstream product offerings, and (2) a data extract from the midstream implementer's proprietary tracking system containing data on the midstream product offering. Evaluation team analysts used the data visualization software Tableau to examine these datasets in detail, creating tables and graphs shown in the results section below.

Downstream NTGR Approach

The evaluation team developed the downstream product NTGR using a self-report approach (SRA) based on participating customer interview results in combination with an analysis of sales data and additional inputs from contractors. The methodology used in this evaluation was built from the Core Nonresidential Protocol in the *2016 Illinois Statewide Technical Reference Manual for Energy Efficiency Version 6.0*. In *Attachment A of Volume 4: Cross-Cutting Measures and Attachments*.

Downstream 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 1, where 1 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 evaluation team started with the Core Nonresidential Protocol from the Illinois TRM, and wrote specific questions to assess four free ridership components:

- 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 Product Influence score, based on the participant's perception of the product's influence on the decision to carry out the energy-efficient project versus non-product factors;

- 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, the first three components assess the likelihood of free ridership on a scale of 0 to 10, with the three scores averaged and the timing adjustment applied to create a final free ridership score. Additional detail on sensitivity analyses and linkages between interview questions and score development for each free ridership component can be found in the full NTG methodology description in Appendix A.4.

Downstream 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. For the purposes of this evaluation, only participant spillover was estimated due to the infeasibility of obtaining additional data to estimate non-participant spillover effects and the likelihood of double-counting savings reported as part of the midstream component.

To capture participant spillover, the evaluation team asked participants for information about any additional energy efficient equipment installed outside of the product (for which they did not receive a rebate). The interviews also probed for information on the importance of the Cooling Efficiency Product in installation decisions and on the likelihood that the measures would have been installed if the participant had not participated in the product. The evaluation team computed savings estimates for all identified spillover equipment, and the product's spillover ratio was calculated by dividing the total spillover savings by the product's total energy savings.

Within each of the two downstream offerings (prescriptive and custom), the gross-savings-weighted Core NTGR was calculated and adjusted upwards for any participant spillover and then applied to the gross savings for all respondents to yield net savings. The evaluation team then applied this NTGR to the gross savings for any non-respondents.

Midstream NTGR Approach

The evaluation team developed a customized approach for assessing the midstream product NTGR using a self-report approach based on interviews with participating distributors. As with the downstream approach, the midstream methodology used in this evaluation was adapted from the Core Nonresidential Protocol in the *2016 Illinois Statewide Technical Reference Manual for Energy Efficiency Version 6.0*. In *Attachment A of Volume 4: Cross-Cutting Measures and Attachments.*

To ensure that our NTGR approach covered all avenues of program influence, the evaluation team created a simplified logic model based on discussions with Xcel Energy product staff, implementer staff, and a general review of midstream programs. The resulting logic model is shown below in Figure 2-1. The midstream NTGR approach was designed to be flexible, as the midstream incentives may be impacting distributors' businesses in one of many ways—including via changes in stocking, upselling, price reduction, etc. Ultimately, the midstream product was given credit for influence via any one of these pathways. The simplified logic in this model can be summarized as follows:

- Incentives are paid directly to distributors for the sale of high efficiency units (A1).

- Distributors receive these payments and can choose to spend them in one of many ways (O1).
- Knowing that they will receive an incentive for selling high efficiency units, distributors may choose to increase their stocking (DO1) of high efficiency units or upselling high efficiency units (DO2) to contractors. Distributors are better able to maximize sales of high efficiency units by adjusting pricing (DO3), and may also choose to start offering training sessions or marketing campaigns aimed at engineers, architects, and contractors (DO4) or reaching out to design professionals to make them more aware of these high efficiency units (DO5).
- Because of these decisions made by distributors, there are several potential outcomes associated with contractors and customers:
    - Contractors/customers may be more likely to purchase high efficiency units because they are in stock (CO1).
    - Contractors may be more likely to purchase high efficiency equipment because the distributor upsold these units (CO2).
    - Contractors/customers may be more likely to purchase high efficiency units because the incremental cost is lower than it would have been without the incentive (CO3).
    - Design professionals and contractors may be more likely to specify or recommend high efficiency units because they are more aware or more familiar with these options (CO4).
- The expected overall outcome is that a greater proportion of customer purchases will be high efficiency units (PO1).
- As distributors sell more high efficiency units, manufacturers will respond to this signal by producing more high efficiency equipment (PO2).
- Ultimately, this will cause the HVAC market in Xcel's territory in CO to become more efficient than it otherwise would have been, or to help achieve this efficiency faster than if no intervention had been applied (PO3).

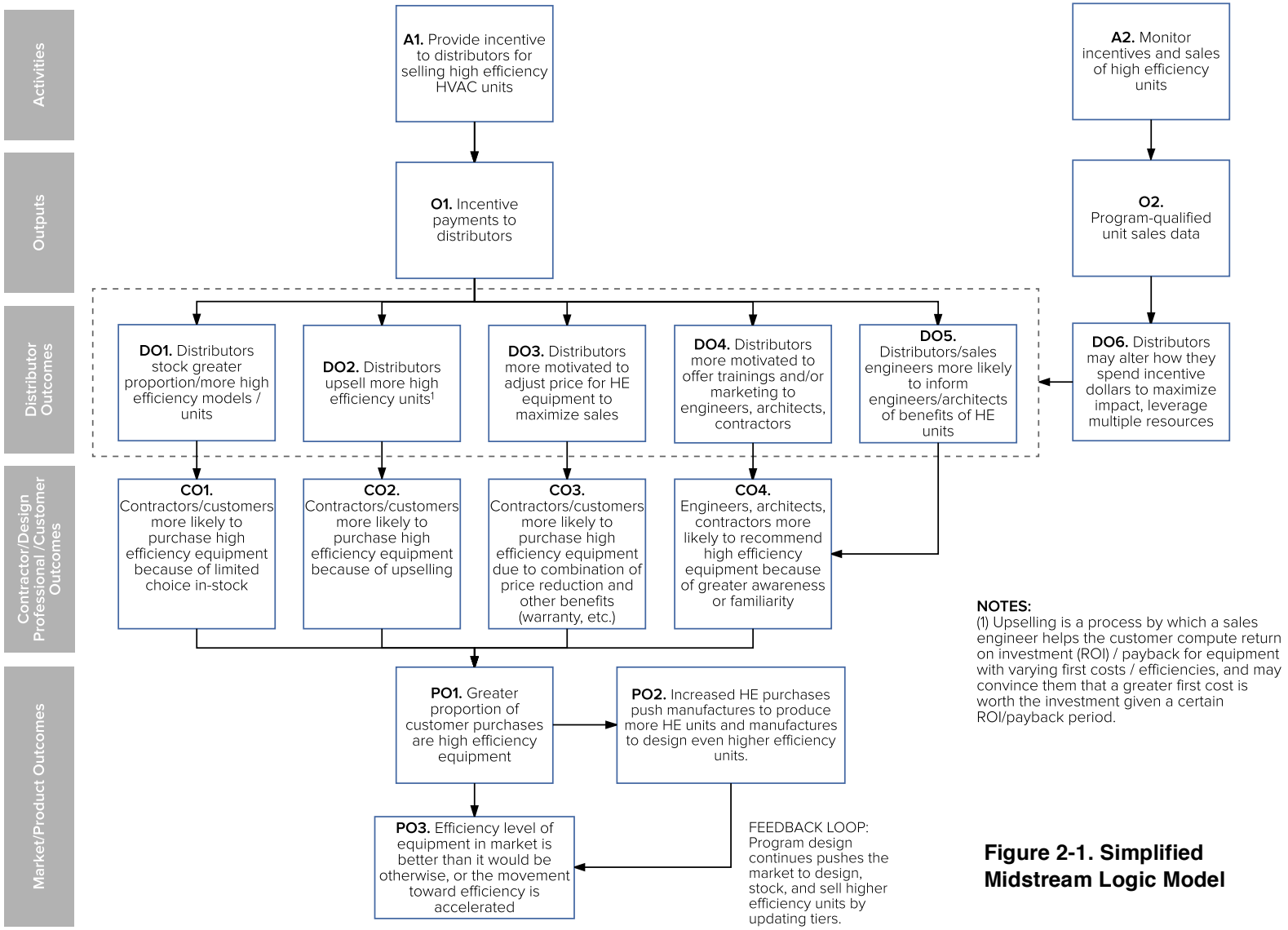


Figure 2-1. Simplified Midstream Logic Model

Midstream Free Ridership

The evaluation team calculated the distributor free ridership score as follows:

- Calculate the No Program Score, the Program Influence Score, and Spillover for each distributor.
- Compute an overall value by averaging the No Program score and Program Influence score, subtracting this value from 1.
- Calculate the gross-savings-weighted core NTGR (defined as [1 – Free Ridership ratio]).
- Apply the weighted core NTGR to the gross savings for all respondents to yield net savings.
- Apply this NTGR to the gross savings for any non-respondents.

Midstream Spillover

In the context of a midstream incentive, spillover manifests as an increase in the sales of energy efficient units to customers outside of the Xcel Energy service territory in Colorado. This is most likely to occur because distributors within the Xcel Energy territory change their stocking practices to include more energy efficient units or models, and then sell these units to customers outside of the Xcel Energy territory.

The evaluation team asked distributors a series of questions to assess spillover from the midstream offering. However, spillover was not factored into the NTG ratio for the midstream product offering since the benefits of spillover from this program do not accrue to Xcel Energy ratepayers. This impact was only estimated to show that the benefits of Cooling Efficiency Product extend beyond its service territory.

Capturing Midstream Market Effects

A design like the midstream Cooling Efficiency Product may have longer-term impacts that are not immediately measurable in the short-term. Such longer-term impacts manifest as "market effects," which signify a transformation in the underlying structure and functioning of the market. To the extent possible, the evaluation team collected information that may be helpful in understanding these longer-term impacts resulting from the midstream product offering.

Determination of Final NTGR

The evaluation team calculated a net-to-gross ratio for each delivery channel (downstream and midstream) using the following formula:

$$Product\ NTGR = 1 - (Free\ Ridership\ Ratio) + (Participant\ Spillover\ Ratio)$$

The next section discusses how information obtained from speaking with customers, contractors, and distributors was used to calculate a NTG score for the Cooling Efficiency Product.

2.3 Product Data Review Overview

Prior to formulating the research approach used to determine the product's NTGR, the evaluation team performed a detailed review of two types of product data: (1) data on both the downstream and midstream product offerings provided by Xcel Energy, and (2) product data tracked by the midstream implementer. In reviewing this data, the evaluation team aimed to characterize the overall level of activity in each of the product offerings, as well as to note trends that may help explain findings from other research activities.

During the analysis of the product data, the evaluation team made the following observations regarding the Xcel Energy tracking data:

- The midstream and downstream delivery channels account for nearly equal proportions of total kWh savings in the data; however, the midstream savings are spread across a much larger number of unique premises (420) compared to the downstream savings (57 unique premises).
- The measures that are driving savings in the downstream delivery channel vary from quarter to quarter. For example, plate and frame heat exchangers accounted for 87% of total savings in Q1 2016 but never exceeded 5% in any other quarter.

The evaluation team also made observations regarding the implementer data from 2015/2016:

- Total midstream savings are highly concentrated among a few distributors, with one distributor accounting for approximately 43% of the total kWh savings.
- Most distributors tend to collect midstream incentives for 1-2 measure types. The larger distributors may have 3-4 measure types for which they received incentives.
- The flow of equipment from manufacturer to distributor is highly "channelized," with the vast majority of distributors procuring equipment from one manufacturer (and sometimes two).

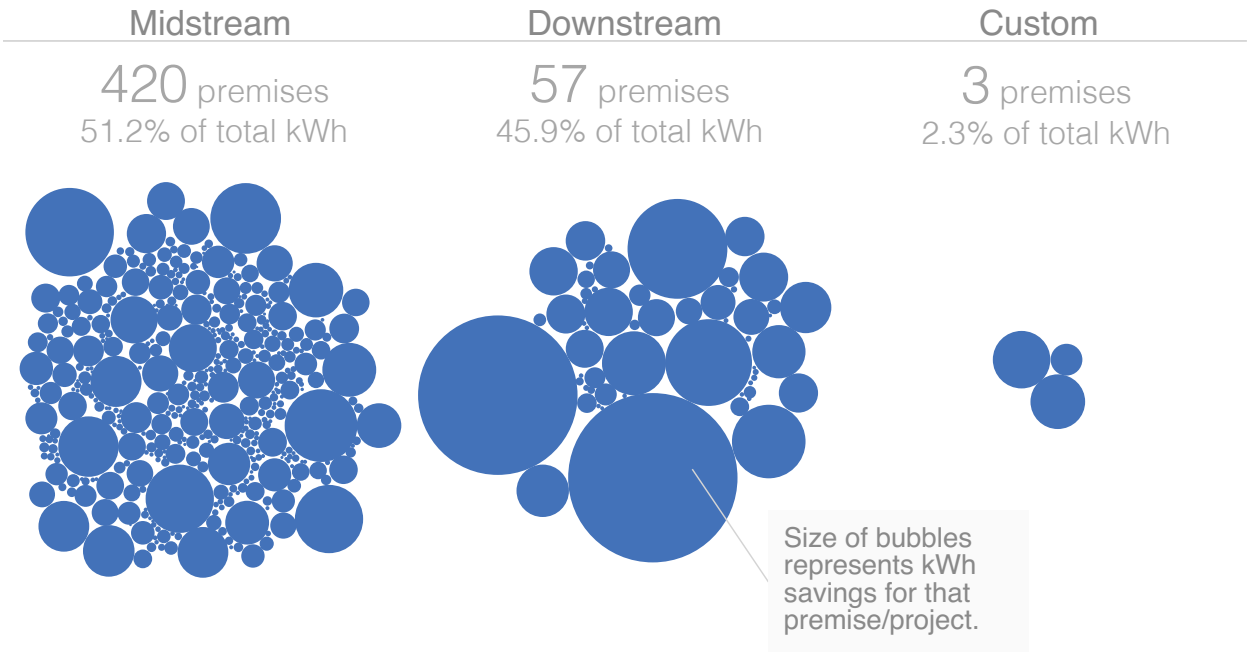
We discuss the analysis of these datasets in more detail below, focusing first on the Xcel Energy data and then on the implementer data.

Xcel Energy Downstream and Midstream Data Review

Xcel Energy provided a data extract from Salesforce containing information on both downstream and midstream activities. This data extract initially contained 518 unique opportunity premise IDs with details on invoicing, savings, and equipment information. After filtering the data to include only those records invoiced in 2015 or 2016, and excluding records with an "Opportunity – Lost" designation, there remained 467 unique opportunity premise IDs. Savings by delivery channel for these cases is shown in Figure 2-2. The midstream delivery channel accounted for just over half of total kWh savings (51.2%) during this period, spread out across 420 unique premises. The downstream (prescriptive) rebate delivery channel accounted for just under half (45.9%) of total kWh savings, but was concentrated in many fewer unique premises (57). The custom channel accounted for 2.3% of total savings which were concentrated in three premises. This relationship

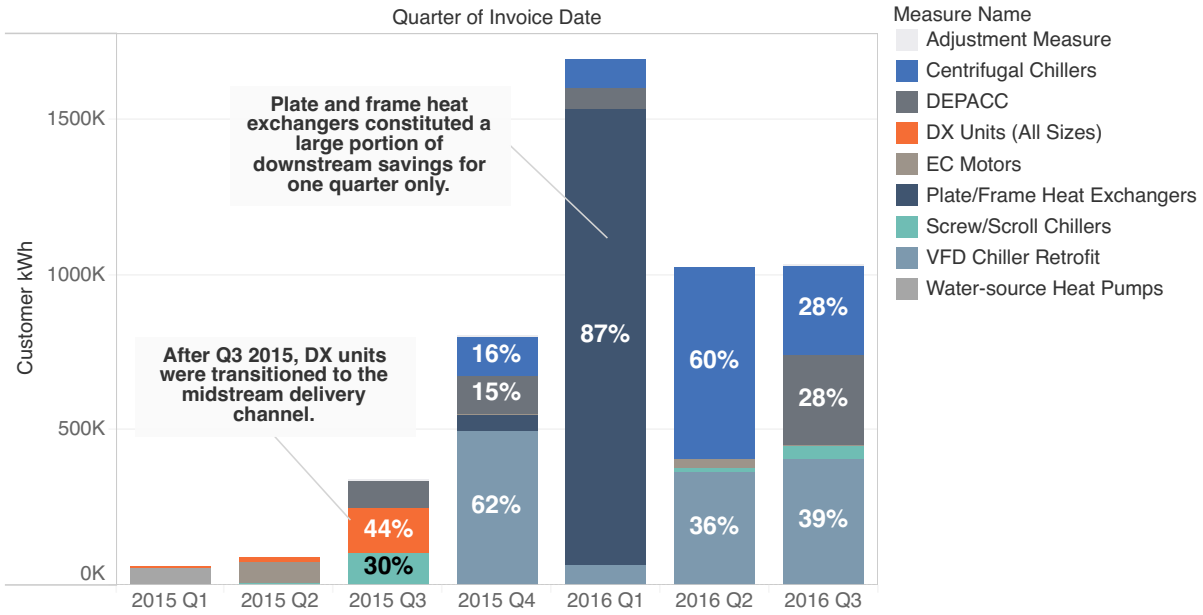
has implications for the product's NTGR, as the downstream and midstream channels carry substantially more weight than the custom channel.

Figure 2-2. Cooling Efficiency Product Gross Savings by Delivery Channel (kWh)



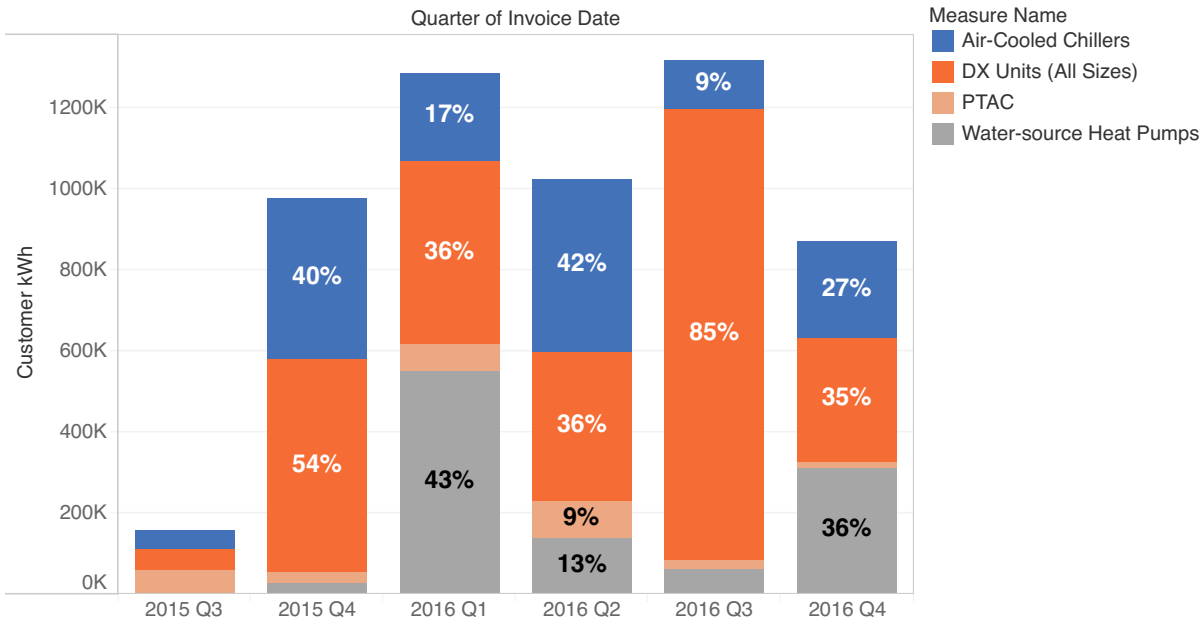
As shown in Figure 2-3, the specific types of measures that account for downstream savings change from quarter to quarter, with no one measure type dominating the total savings.

Figure 2-3. Downstream Gross kWh Savings by Measure Type Over Time



Trends in the midstream data reveal similar fluctuations in the types of measures driving savings each quarter. Overall, savings are dominated by DX units (50% of the total kWh savings) and air-cooled chillers (26% of total kWh savings).

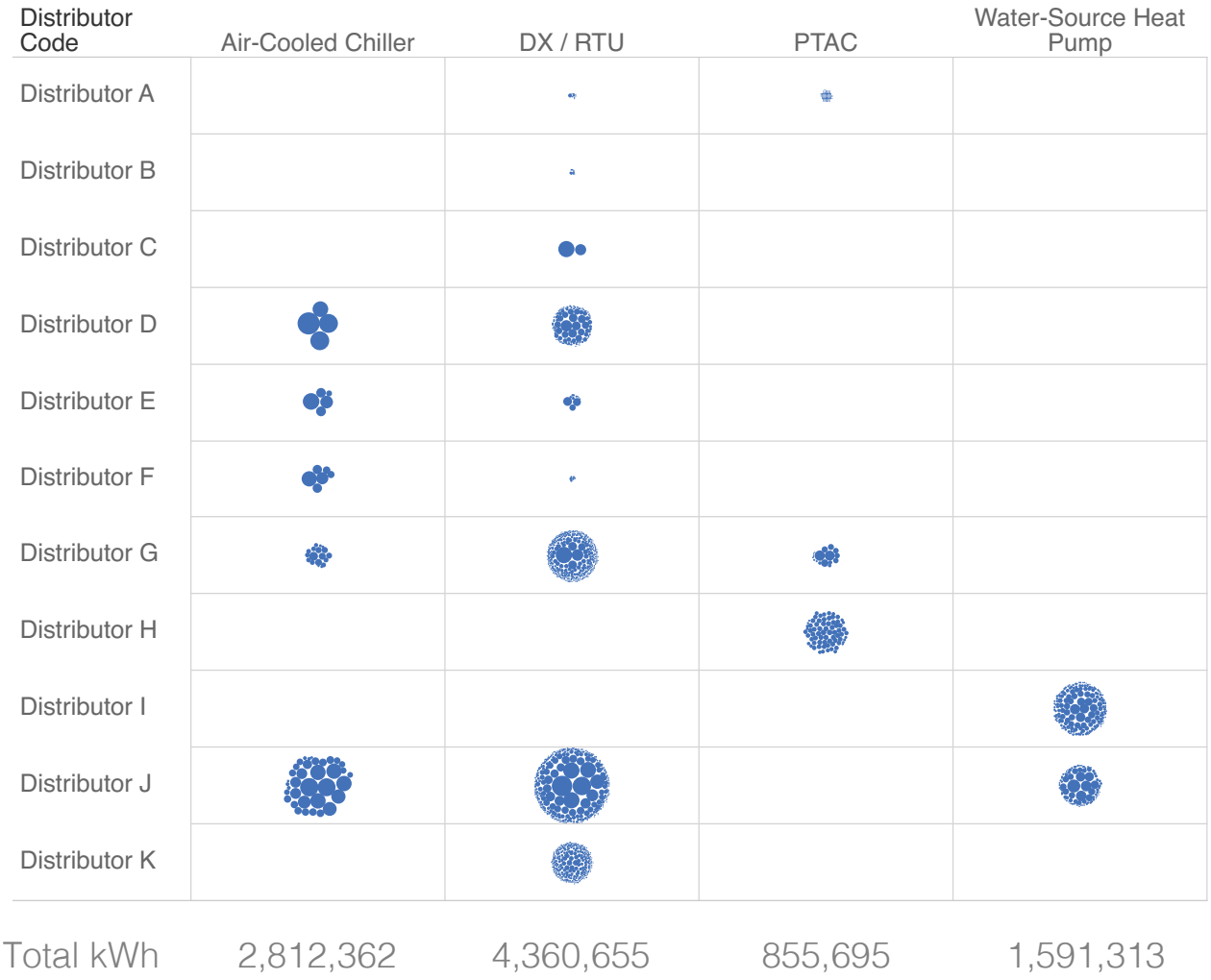
Figure 2-4. Midstream Gross kWh Savings by Measure Type Over Time



Implementer Data Review

Xcel Energy provided a data extract from the midstream implementer's tracking data (Energy Solutions), with detailed information on the distributors, customers, and equipment type. This data extract contained data on 12 distributors representing 7,279 incentive payments from Q3 2015 through Q1 2017. Figure 2-5 depicts how most distributors focus on only one or two measure types in the product, while a handful receive incentives for three measure types. This graphic also shows that the distribution of savings is highly concentrated in a small number of distributors.

Figure 2-5. Gross kWh Savings by Distributor and Measure Type (Q3 2015 – Q1 2017)

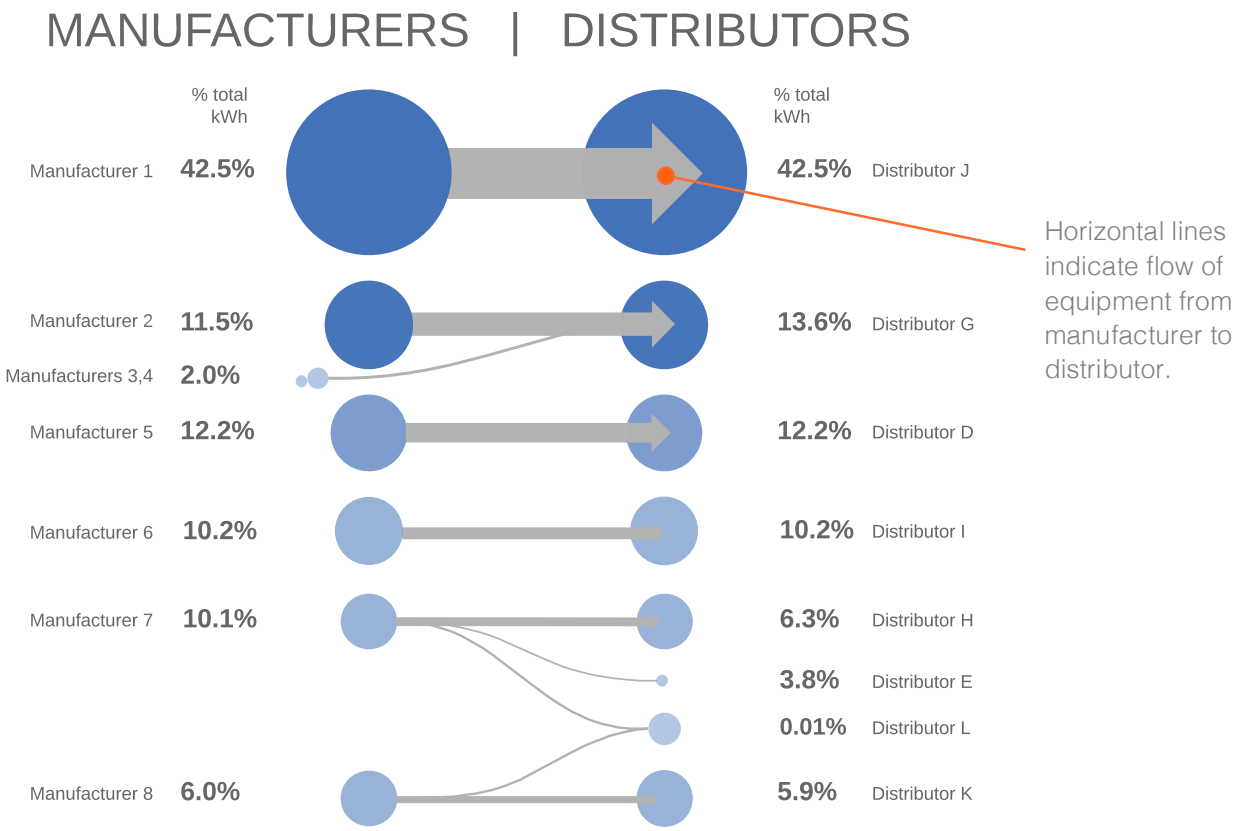


Note: Size of each bubble represents kWh savings.

To better understand how equipment moves through the supply chain, the evaluation team mapped the flow of kWh savings by each distributor in the data to the manufacturer from which the equipment came (shown in Figure 2-6). The straight horizontal lines in this graphic illustrate the extent to which distributors will typically source their equipment from only a single manufacturer. Such "channelization" reinforces the notion that the HVAC commercial supply chain is relatively rigid, and that manufacturer/distributor relationships are important. It also suggests that future

evaluations could include manufacturers in an assessment of the NTGR, as they may be able to provide additional insight into changes induced by the product.

Figure 2-6. Midstream Market Flow Diagram Showing Distributor/Manufacturer Relationships



2.4 Impact Findings: NTGR and Product Effects

As described in the approach section, the NTGR is comprised of data input from participating customers, contractors, and distributors. Specifically, the evaluation team used data collected from participating customers to estimate a NTGR for the downstream delivery channel, with additional context added from interviews with trade partners. The evaluation team used data collected from participating distributors to estimate a NTGR for the midstream delivery channel.

Table 2-1. Data Sources Used to Assess the Downstream and Midstream Net-to-Gross Ratios

Research Topics	Data Source					
	Product Data	Staff Interviews	Customer interviews	Contractor interviews	Distributor Interviews	Peer Program Review
Downstream free ridership, spillover, and market effects/trade partner impacts			X	X		X
Midstream free ridership, spillover, and market effects/trade partner impacts			X			X

Downstream NTGR Results

The evaluation team estimated downstream free ridership from interviews with five customers who had participated in the downstream product. The recommended final NTGR value for the downstream delivery channel is 0.71. The sections below provide additional detail on free ridership, spillover, and market effects for the downstream delivery channel.

Downstream Free Ridership

The overall unweighted free ridership score computed from interviews with customers was 0.32, which corresponds to an unweighted NTGR of 0.68. After weighting by kWh savings, this resulted in a weighted overall NTGR of 0.71. These details are shown below in Table 2-2.[6]

Table 2-2. Downstream Free-ridership Detailed Results

Interviewee	Program Components Score	Program Influence Score	Adjusted No Program Score	Free Ridership (FR)	Unweighted NTGR	Weighted NTGR [a]
	[PC]	[PI]	[NP]	Avg[PC,PI,NP]	1-FR	(based on % total kWh)
A	0.10	0.60	0.00	0.23	0.77	61%
B	0.10	0.80	0.90	0.60	0.40	4%
C	0.10	0.60	0.80	0.50	0.50	19%
D	0.00	0.70	0.00	0.23	0.77	12%
E	0.00	0.05	0.00	0.02	0.98	4%
Overall	**0.06**	**0.55**	**0.34**	**0.32**	**0.68**	**0.71**

[a] Using kW instead of kWh to weight the final value results in a NTGR of 0.73.

[6] Suggestions for how this value may be improved moving forward are provided in the section "Final Recommend NTGR Values" on page 23.

Downstream Spillover

Customer interviewees did not report any spillover-eligible measures that were installed subsequent to their participation in the Cooling Efficiency Product. One interviewee mentioned that they had installed LED lighting after participating in the downstream product; however, the evaluation team considered this to be "unlike spillover" and was unable to quantify it using the current approach.

Downstream Market Effects and Trade Partner Impacts

Results from interviews with trade partners provided evidence that the downstream rebates are having an impact on customers' energy efficiency purchase decisions. There was also an indication from these interviews that *midstream* incentives have begun to induce market effects (via changes in stocking of small DX units and water-source heat pumps).

- Overall, trade partner interviewees agreed that sales of high efficiency units would be less if the program did not exist. One interviewee noted: "Plan and spec without rebate will go with lowest cost option." Another mentioned: "[RTUs] would be much lower; this is a commodity equipment so the low bid is typically taken." One trade partner noted that for certain property owners, first cost remains an important barrier, as they only want the lowest cost option. Without the rebate, these customers would choose lower efficiency equipment. Five of the six trade partners indicated that the downstream rebate was influential in the project moving forward. One contractor indicated it wasn't the primary motivator, but could sometimes push the customer to choose a higher efficiency unit.
- Only a few of the contractors could provide a percentage estimate related to the proportion of sales of high efficiency units. Three contractors mentioned that the percentage of sales of high efficiency equipment was lower in 2015 than it is currently. Two of these contractors explicitly said that the downstream rebates appear to be helping increase sales. Interestingly, contractors also indicated that current sales of some non-rebated high efficiency equipment are high. One interviewee mentioned that 100% of DX units ≤5.4 tons are high efficiency, while another interviewee mentioned that 100% of water-source heat pumps are high efficiency. This corroborates findings from the interviews with midstream distributors, which indicated that the midstream incentives have caused them to stock a much greater proportion of high efficiency models for these measure types.
- Results from the interviews with trade partners suggest that selling program-eligible equipment without applying for a rebate is uncommon. Only one contractor reported selling eligible equipment in which they didn't apply for the rebate. This contractor said: "There were a couple of times where the customer needed it for capacity problems…not energy efficiency…so went forward with it without rebate. This would have been a good time to assign rebate to ourselves...maybe 5% of the time this happens."

Midstream NTGR Results

The evaluation team estimated midstream free ridership from interviews with eight distributors who had participated in the midstream product. Based on these results, the recommended final NTGR value for the midstream delivery channel is 0.89. This recommendation is based primarily on findings from the distributor interviews, in which distributors indicated the midstream incentives are having an impact on their sales and/or stocking of high efficiency equipment. This recommendation is supported by trends in the product data, which show an increase in the quantity of program-

qualified DX units when moved from the downstream delivery channel to the midstream delivery channel.

The sections below provide additional detail on free ridership, spillover, and market effects for this delivery channel.

Midstream Free Ridership

The overall unweighted free ridership score computed from interviews with distributors was 0.27, which corresponds to an unweighted NTGR of 0.73. After weighting by kWh savings, this resulted in a weighted overall NTGR of 0.89. These details are shown below in Table 2-3.

Table 2-3. Midstream Free Ridership Detailed Results[a]

Interviewee	Program Components Score	Program Influence Score	Adjusted No Program Score	Free Ridership (FR)	Unweighted NTGR	Weighted NTGR [b]
	[PC]	[PI]	[NP]	Avg[PC,PI,NP]	1-FR	(based on % total kWh)
A	0.40	1.00	1.00	0.80	0.20	1%
C	0.10	0.00	0.20	0.10	0.90	2%
D	0.00	0.95	0.00	0.32	0.68	14%
E	0.20	0.45	0.00	0.22	0.78	4%
G	0.00	0.50	0.20	0.23	0.77	16%
I	0.00	0.65	0.00	0.22	0.78	12%
J	0.00	0.00	0.00	0.00	1.00	50%
Overall	**0.10**	**0.51**	**0.20**	**0.27**	**0.73**	**0.89**

[a] One distributor interviewee did not provide specific numerical answers to interview questions and thus is not included in this table. However, this distributor's answers were qualitatively in line with answers from other distributors.
[b] Using kW instead of kWh to weight the final value results in a NTGR of 0.86.

Midstream Spillover

In the context of a midstream incentive, spillover manifests as an increase in the sales of energy efficient units to customers outside of Xcel Energy service territory in Colorado. This is most likely to occur because distributors within Xcel Energy territory change their stocking practices to include more energy efficient units or models, and then sell these units to customers outside of Xcel Energy territory. Distributor interviewees were generally not able to provide good estimates around the proportion of their sales going to non-Xcel Energy customers.

Midstream Market Effects and Distributor Impacts

An understanding of how midstream incentives are being used is important, not only because it is helpful to understand where the product may be influential, but it is also critical to consider when optimizing the product going forward—in particular, this means being able to target specific market barriers in different situations. As described in the most recent Xcel Energy regulatory filing, *"…the logic that underscores [the midstream incentive approach] is that a small number of midstream market actors are in a position to impact hundreds of thousands of customers and influence their choice of equipment by increasing the stocking*

and promotion of high efficiency HVAC equipment." Results of this evaluation support the notion that the midstream incentives have had an impact on stocking patterns as described in the logic above; however, results also show that the midstream incentives are being used in many cases to reduce prices on high efficiency equipment. Overall, these findings provide solid evidence of market effects due to the midstream incentives, which are reflected in the estimated NTGR.

The following two figures illustrate how the midstream product may be influencing the market in a manner that is slightly different than what has been assumed by current product theory. In the first figure (Figure 2-7), the strength of the "stocking pathway of influence" as part of the program theory is shown in orange. The second figure (Figure 2-2) illustrates product influence based on data collected for the evaluation. It indicates that, while the stocking pathway is important, the incentives are also being used in other ways (i.e., to discount the price of equipment or to support discussions with engineers and architects). Knowing how distributors are using the incentives is important because it provides information on which market barriers are preventing greater uptake of high efficiency equipment, and may allow for more targeted product optimization going forward.

Figure 2-7. Theoretical Relative Importance of Product Influence Pathways.

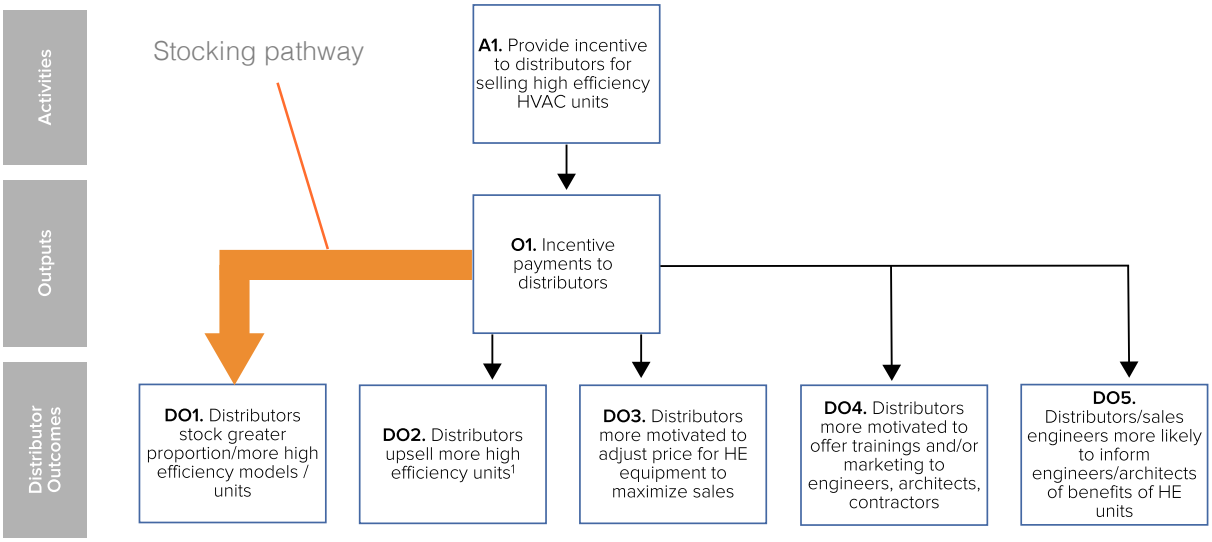
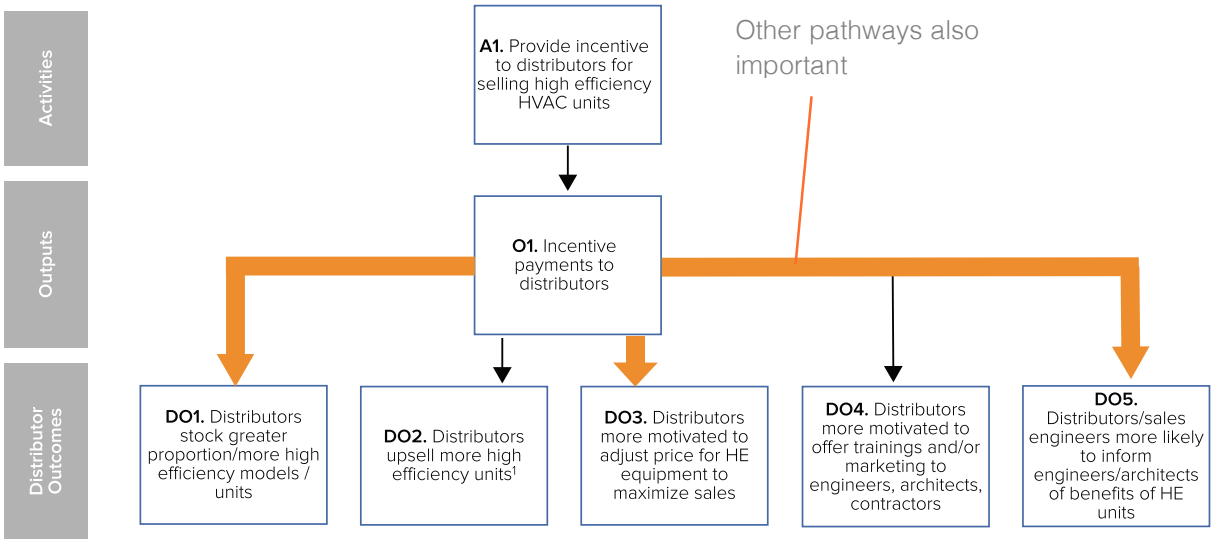


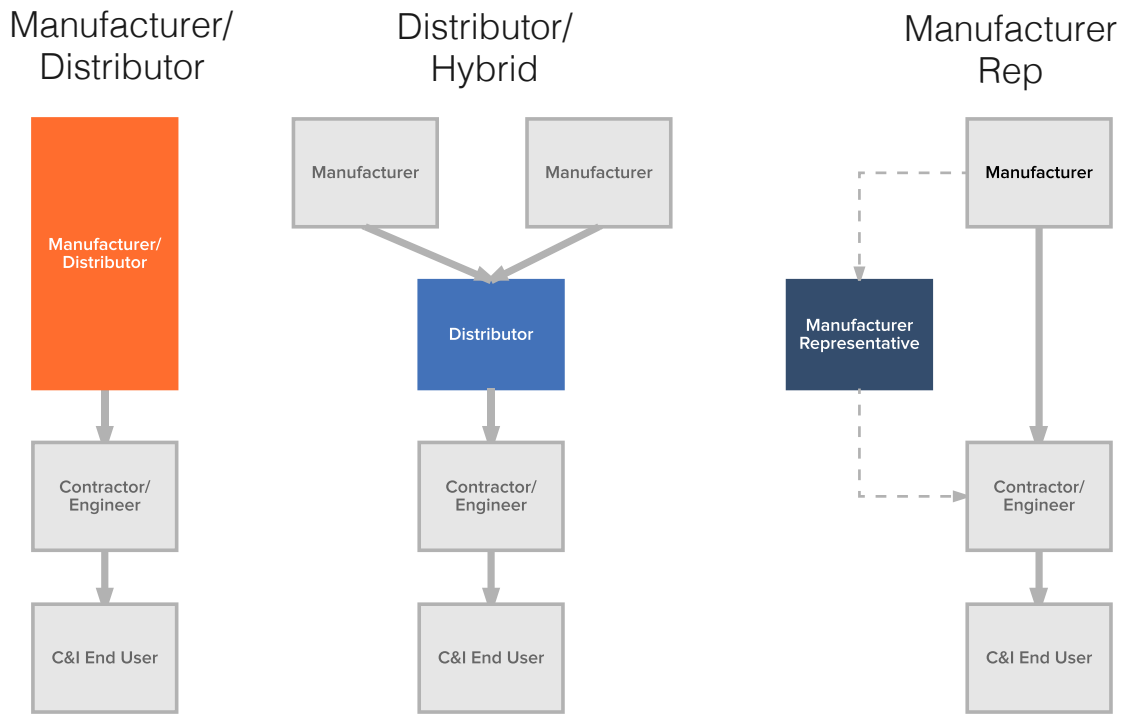
Figure 2-8. Empirical Relative Importance of Product Influence Pathways.



These evaluation results show that the midstream incentives are not being used solely to increase the stocking of high efficiency equipment, but instead are being used to address a variety of market barriers (e.g., first cost, lack of awareness on behalf of architecture/engineering/consulting (A/E/C) firms).

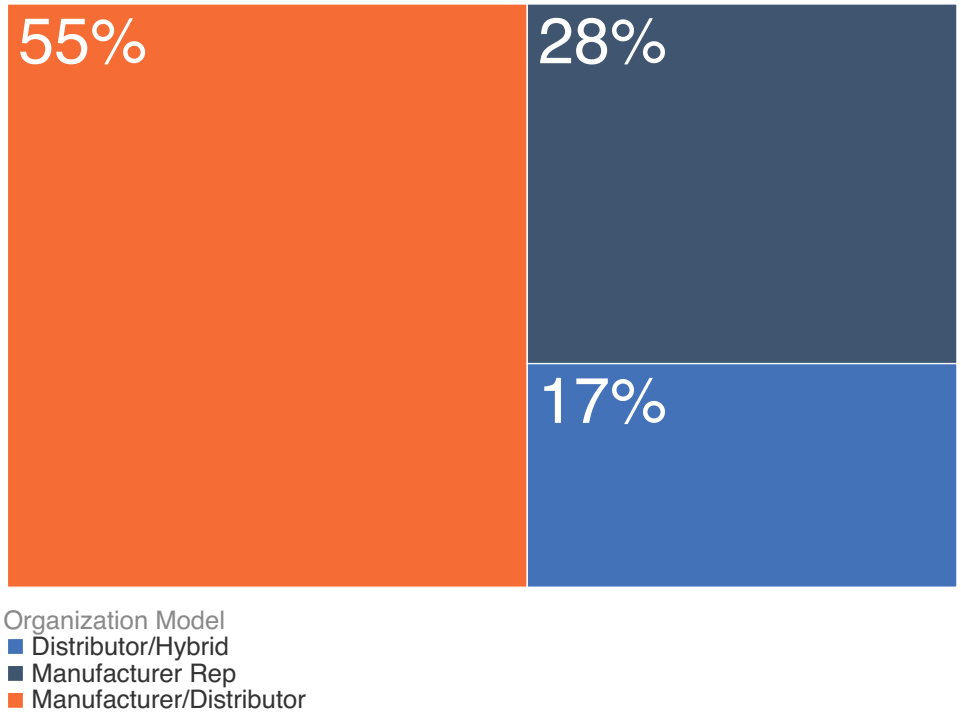
To further understand the relationship of the midstream product to the market, the evaluation team classified distributors into one of the three categories shown in Figure 2-9. The first type of business model—the manufacturer/distributor—represents those distributors that are vertically integrated with a manufacturer. The second type of model—the distributor/hybrid model—represents a traditional distribution model in which a single distributor sells equipment manufactured by several different manufacturers (this is typically dependent on the equipment type). The last business model is the manufacturer rep model. This final model differs from the first two in that manufacturer reps typically do not "stock" equipment, but instead tend to work on larger, more sophisticated projects where the equipment is shipped directly from a manufacturer.

Figure 2-9. Distributor Business Models



Because manufacturer representatives do not stock equipment, this means that the midstream incentives must work differently for this business model. In speaking with several manufacturer reps involved in the Cooling Efficiency Product midstream delivery, it became clear that these distributors typically use the incentive to reduce their prices on high efficiency equipment. For plan/spec projects, this enables them to offer high efficiency equipment at a price that falls within acceptable budgetary requirements for the project (i.e., payback period). To illustrate the extent to which this business model structure may affect the product, the evaluation team assigned a classification to each distributor within the implementer product data and graphed the total savings by type. As shown in Figure 2-10, over half (55%) of the kWh savings achieved through the midstream product are classified under the distributor/manufacturer model. Just over one-quarter are classified under the manufacturer rep model, and only 17% are classified as the traditional distributor/hybrid model. The finding that over a quarter of the kWh savings achieved through the product are routed through the manufacturer rep model (i.e., no stocking) implies that the product is targeting first cost barriers—not stocking practices.

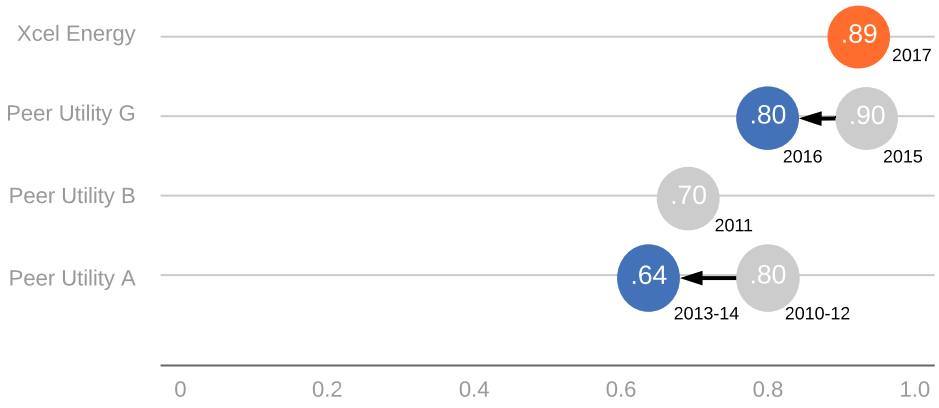
Figure 2-10. Percent Midstream KWH by Distributor Business Model



Peer Program NTGRs

The recommended midstream NTGR of 0.89 is closely in line with NTGR estimates for other midstream/upstream HVAC programs from around the country. As shown in Figure 2-11, there appears to be a downward trend among NTGR values from other upstream/midstream programs, with programs starting out in the range of 0.80 to 0.90 and decreasing to the range of 0.60 to 0.70 in this limited sample. While it is not reasonable to assume this trend is universal, it does suggest there is a risk for upstream/midstream programs to encounter diminishing returns over time (i.e., increasing free ridership).

Figure 2-11. Peer Upstream/Midstream HVAC Program NTG Ratios Over Time



Final Recommended NTGR

Table 2-4 shows the individual net-to-gross components, as well as the final net-to-gross scores for electric and gas. The NTGR for both the midstream and downstream savings is less than 1.0, indicating that some free ridership exists and that the product cannot claim savings for all the measures incented.

Table 2-4. Final Net-to-Gross Ratios by Delivery Channel

Delivery Channel	Constant		Weighted Free Ridership		Spillover		Market Effects Adjustment		Final Net-to-gross Ratio
Midstream	1.00	-	0.11	+	0.00	+	(included)	=	**0.89**
Downstream	1.00	-	0.29	+	0.00	+	0.00	=	**0.71**

The midstream NTGR value of 0.89 is well-aligned with other upstream/midstream HVAC programs early in their lifecycles. The downstream NTGR of 0.71 is also in step with traditional rebate HVAC programs. The evaluation team notes that moving forward, the downstream NTGR can be improved in one of several ways:

- Conducting periodic surveys with customers immediately after they receive their rebate check. These surveys would serve three purposes: (1) To collect immediate feedback related to net-to-gross estimation, (2) ensure that customers are aware of other related energy efficiency opportunities available through Xcel Energy, and (3) help keep customer contact information up to date.
- Adjusting the types of measures offered through the downstream delivery channel to ensure that rebated measures are considerably more efficient than baseline measures.
- To the degree possible, consider that many customers may be constrained in the type of equipment they are able to install (e.g., because they are attempting to match existing equipment). In these cases, it is important to make sure that customers are aware of the custom delivery channel.

3. PROCESS EVALUATION FINDINGS

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

- Understand product delivery and clearly document desired outcomes of each intervention and what data the product is tracking to inform continuous improvement.
- Understand motivation for product participation.
- Explore trade partners' and customers' experiences with the product.
- Understand how the product may influence customer engagement and satisfaction with Xcel Energy.
- Identify opportunities for improving delivery of both product tracks.
- Identify market trends that may impact the Cooling Efficiency Product in the future.

To accomplish these objectives, the evaluation team elicited feedback from product staff, participating customers, contractors, and distributors in the Xcel Energy Colorado territory, and managers of similar products at other utilities. This chapter presents key findings from the process evaluation, the evaluation team's approach to conducting the process evaluation, and specific findings relating to each evaluation objective. These findings, along with findings from the impact evaluation, inform the conclusions and recommendations presented in the next and final chapter.

3.1 Key Findings

The evaluation team found that, overall, the downstream and midstream delivery channels are operating smoothly, resulting in high satisfaction levels among distributors, trade partners, and customers. Key findings from the process evaluation include the following:

- **Downstream**: Trade partners and customers are generally satisfied with the downstream rebate offering, though there may be room for improvement in communication with both these groups. More frequent communication with customers could improve Xcel Energy's ability to assess product influence on their purchase decisions and help them identify additional energy savings opportunities. More frequent communication with trade partners would help keep contractors informed of new product offerings and allow Xcel Energy to collect routine feedback on current offerings.
- **Downstream:** Contact data for customers contained in the Xcel Energy product tracking data was often missing or out of date. Better or more complete information was available from paper tracking forms in some instances, suggesting an opportunity to streamline the contact data collection process and "sync up" these different sources. Doing so may result in administrative efficiencies and facilitate later contact with these customers.
- **Midstream**: As the midstream delivery channel matures, it will be important to keep the product dynamic in terms of efficiency levels. As increasing efficiency levels will likely result in less qualifying tonnage (at least initially), it will be instructive to track the cost effectiveness of program savings (in terms of $/kWh or $/kW) in addition to tonnage.

- **Midstream**: Contractors are generally aware of the fact that distributors are receiving midstream incentives for high efficiency equipment. While only one contractor expressed a slightly negative view of this delivery channel, this may represent an important marketing and branding need for the midstream product offering going forward, as it has the potential to affect contractor view of Xcel Energy.
- **Midstream**: Midstream incentives are being used by distributors in a number of ways, and are not limited to changing stocking practices. Overall, distributors are very pleased with the midstream incentives, expressing a desire for the product to expand in breadth (by adding more products). Distributors were consistently impressed by the simplicity and speed of the incentive payment mechanism.

In Section 3.2, we describe the overall approach used for the process evaluation research activities, and in Section 3.3, we provide detailed results from each of these activities.

3.2 Approach

To accomplish the evaluation objectives for the Cooling Efficiency Product, the evaluation team completed a suite of intersecting and complementary research activities in 2017. Detailed information on the evaluation and sampling approaches used for the research can be accessed in Appendix A.1 and Appendix A.2 respectively. The following discussion highlights the research topic coverage contributed by each research activity: interviews with Xcel Energy staff, participating customer interviews, contractor interviews, distributor interviews and benchmarking interviews with other utilities.

Staff Interviews

The evaluation team conducted in-depth interviews of Xcel Energy personnel involved with the Colorado Cooling Efficiency Product early in the evaluation. The staff interviews covered the following objectives:

- Assess the extent to which the product design supports product objectives and customer 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 revisions to the evaluation plan.

Appendix B.1 presents the interview guide used for these discussions.

Participant Interviews

The evaluation team conducted telephone interviews with participants using customer records from Xcel Energy for the sample frames. For the purposes of this evaluation, a participating customer was defined as any customer that closed a Cooling Efficiency project in 2016 or the first quarter of 2017. The evaluation team followed a sampling plan which targeted all participating customers. Ultimately, five were interviewed. The evaluation plan and sampling plan used for this product evaluation can be found in Appendix A.1 and Appendix A.2.

The participant interviews addressed the following topics in detail:

- Characteristics of participants, including prior participation in company energy efficiency products
- Customer motivations; perceptions of incentive levels; participation barriers
- Product awareness and satisfaction, and influences on satisfaction with Xcel Energy
- Experiences with the product; opportunities for product improvement
- Level of free ridership
- Product-induced spillover effects

The interview guide used in the participant research is presented in Appendix B.2.

Contractor Interviews

The evaluation team conducted in-depth interviews with contractors who had recently participated in the downstream or custom product offering. The sample for these interviews was drawn from Xcel Energy records for the prescriptive/custom offerings. It is important to note that interviews with these contractors only covered topics related to the downstream product offering. The evaluation team initially intended to also discuss the midstream product offering with these contractors, but did not do so at the request of the third-party midstream implementer.[7]

Data collected in the contractor interviews included:

- Motivation for participation
- Experiences with the downstream Cooling Efficiency Product offering
- Influence on satisfaction with Xcel Energy
- Opportunities for product improvement
- Market trends

Appendix B.3 presents the interview guides used for the contractor interviews.

Distributor Interviews

The evaluation team conducted in-depth interviews with distributors who were participating in the midstream product offering. The sample for these interviews was drawn from information provided by Energy Solutions on participating distributors.

Data collected in the contractor interviews included:

- Motivation for participation
- Experiences with the midstream Cooling Efficiency Product offering
- Influence on satisfaction with Xcel Energy
- Opportunities for product improvement

[7] The third-party implementer of the midstream product indicated that contractors were unaware of the midstream incentives being provided to distributors, and informing them of these incentives would create an adversarial relationship between distributors and contractors, possibly threatening midstream product effectiveness. As discussed elsewhere in this report, the evaluation team discovered that at least some contractors were already aware of the midstream incentives.

- Market trends

Appendix B.4 presents the interview guides used for the distributor interviews.

Benchmarking Review and Interviews

The evaluation team researched six 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:

- Savings impacts estimation methodologies, by measure type
- Savings goals
- Net-to-gross methodology
- Net-to-gross ratios values
- TRC values

To provide important contextual information, additional descriptive program information was collected, including eligible measures and customers, incentives, product implementation strategies and engagement practices, market size, participation levels, and natural gas costs.
Appendix B.5 contains the interview guide used for the benchmarking interviews.

Findings for each of the process evaluation topics are presented below. The synthesis of findings places an emphasis on helping Xcel Energy interpret customer and trade partner perspectives and identifying actionable opportunities for improving product operations and marketing.

3.3 Product Delivery

An objective of the process evaluation was to assess how the Cooling Efficiency Product is currently being delivered from an operational perspective. The evaluation team found that overall, Xcel Energy staff believe that the midstream delivery channel is particularly well-positioned to address barriers to greater energy efficiency in the commercial HVAC market. In addition, based on staff interviews, product resources are sufficient to run the product as designed. However, there remain several challenges related to keeping the product offerings ahead of increasingly stringent codes and standards and keeping distributors engaged (discussed in more detail below). Together, this suggests that keeping the offering dynamic will be important over the next few years. The remainder of this section presents a more detailed discussion of product delivery. Table 3-1 summarizes the data sources used to develop these findings.

Table 3-1. Data Sources Used to Assess Product Delivery

Research Topics	Data Source					
	Product Data	Staff Interviews	Customer interviews	Contractor interviews	Distributor Interviews	Peer Program Review
Assess the extent to which the product design supports product objectives and customer service/satisfaction objectives	X	X			X	X
Assess the degree to which product resources are sufficient to conduct product activities with fidelity to the implementation plan		X				
Collect staff feedback on implementation successes and challenges	X	X				

Specific findings related to product delivery include the following:

- **Product design:** The two delivery channels (midstream and downstream) are designed to impact the market in different ways. The downstream rebate channel primarily targets first cost barriers associated with the purchase of high efficiency equipment by end users. In contrast, the midstream channel is primarily focused on changing stocking and upselling practices by distributors and contractors in the middle of the supply chain. Staff involved with the product felt that the midstream delivery channel in particular was effective at targeting these barriers.
- **Product resources and fidelity to implementation plan:** Staff involved with the administration of the midstream offering explained that this channel has a number of administrative efficiencies: (1) it is easy for distributors to participate, as the amount of additional administrative work is minimal, (2) it is easy for contractors to participate, as they do not have to fill out additional paperwork that might be required for a downstream rebate, and (3) it is easy for Xcel Energy program staff to administer, as the processing of incentive applications and savings reporting are largely automated. Staff did not indicate experiencing any major issues with the downstream product offering.
- **Product successes:** The midstream offering has exhibited substantial growth since its inception in Q4 2015. The offering achieved its stated goal for 2016 (the first full year of operation) of 20,000 tons of various types of cooling equipment incented. The offering was so successful that this goal was increased for 2017 to 25,000 tons. Additionally, program staff reported that a majority of distributors in the Xcel Energy service territory are participating in the midstream cooling offering—approximately 18 or 19 out of a total of 24 distributors—and that this participation level means most of the market is likely covered by the product. According to an analysis of product data, there was a similar upward trend in the volume of downstream rebates over this time period.

- **Product challenges:** Product staff mentioned several challenges with product implementation:
    - As more stringent codes and standards continue to be adopted, it becomes increasingly difficult for the Cooling Efficiency Product to offer cost-effective measures. Additional information on what type of equipment currently exists in the market (i.e., the installed base) would be helpful for program staff to understand the types of equipment being replaced, and may help them calculate baselines.
    - Product staff also mentioned that it is sometimes necessary to re-motivate distributors to push sales of high efficiency equipment, but that engagement with distributors is facilitated by having a relationship with an upper-level manager at the distributor organization.

3.4 Downstream: Trade Partner and Customer Experiences

The evaluation team interviewed customers and contractors to assess both groups' experiences with the downstream delivery channel.[8] Overall, both trade partners and customers are satisfied with the downstream delivery channel, and these experiences correspond to positive views of Xcel Energy. None of the trade partner or customer interviewees reported any serious complaints with the downstream product offering. Trade partners praised the offering website and the quick turnaround time on rebate applications, while customers appreciated the fact that they were getting a rebate for high efficiency equipment. While trade partners and customers did provide several recommendations for how the offering might be improved in terms of communication, overall these findings suggest that the downstream product offering is operating effectively from a trade partner/customer perspective.

Information from the following sources informed the findings related to this research objective, which are discussed in more detail below.

[8] Distributors are not involved with the downstream product offering and thus not included in this section.

Table 3-2. Data Sources Used to Assess Contractor and Customer Experiences with the Downstream Delivery Channel

Research Topics	Data Source					
	Product Data	Staff Interviews	Customer interviews	Contractor interviews	Distributor Interviews	Peer Program Review
Understand motivation for product participation.			X	X		
Explore trade partners' and customers' experiences with the product.			X	X		
Understand how the product may influence trade partner/customer engagement and satisfaction with Xcel Energy.			X	X		
Identify opportunities to improve the delivery of downstream and midstream product tracks.			X	X		

In the following sections, we provide more detailed information from trade partners/customers on their motivations for participating in the downstream product offering, their experiences with the it, the offering's influence on their engagement, and their satisfaction with Xcel Energy.

Motivations for Downstream Product Participation

The evaluation team asked trade partners and customers about their motivations to participate in the downstream product offering. Responses from trade partners were consistent ("rebates"); responses from customers were more varied.

Trade Partners

Trade partners expressed that they are primarily motivated to participate in order to take advantage of the rebates and services to benefit their customers. As one contractor noted: "Rebates help make you more competitive. We need to stay involved as it is a big deal to [the] end-user." Two trade partners mentioned changes in the offering over time. The first trade partner noted that he didn't have to process rebates anymore for rooftop units, as there was a program to support distributors.[9] The other contractor decided to assign rebates more often to themselves to lower the upfront cost to customers.

[9] This trade partner did not view the fact that these incentives were now being given to distributors as a negative development.

Customers

Customer reasons for participating in the product offering varied, with two participants mentioning the rebate as their primary motivation. One customer indicated their equipment was at end of its useful life. The other two responses were "energy efficiency gains" and "employing best practices" at their facilities. Note that with a small sample size, it was challenging to determine if these responses fit a broader pattern.

Trade Partners' and Customers' Experiences with the Downstream Delivery Channel

Trade partners and customers both reported having good experiences with the downstream delivery channel, praising several elements of it, including the website and the rebate turnaround time. Trade partners and customers did not report encountering any significant challenges to participation.

Trade Partners

Throughout the interview process, trade partner interviewees provided positive feedback, and comments regarding the downstream delivery channel were most often favorable. For example, one interviewee said: "We love the program and rebates open opportunities for us in Colorado." Trade partner interviewees mentioned a number of things they thought the product should continue to do:

- The information provided, including a strong website, is useful and timely.
- The rebate turnaround time is very quick.
- The expo is "really good outreach" and is helpful for trade partners to promote equipment.
- In reference to the *midstream* product offering, one contractor also indicated he thought it was a good idea to provide incentives to distributors to stock higher efficiency units.

Trade partner interviewees indicated that their involvement stayed about the same in 2016 compared to previous years, though they did indicate the number of projects might vary on a year-to-year basis. Details illustrative of trade partner involvement included:

- One trade partner believed there was an upward trend in his involvement, but it was difficult to be sure because there was so much fluctuation in the type and size of his projects.
- Another trade partner echoed this sentiment, indicating that the number of chillers they install varies from year to year.

While trade partners reported a good product experience overall, they indicated there were various challenges in completing additional projects through the product offering:

- One trade partner interviewee noted that, in some retrofit situations, only certain equipment (which may not be high efficiency) will fit into the existing space without major renovations.
- One trade partner interviewee noted that some chillers that make sense for customers do not qualify for the product due to their part-load values or full-load values.
- One trade partner observed that because his firm only has four employees, there often exists a lack of manpower within his company to focus on qualifying projects.

With respect to their sales processes, all trade partner interviewees mentioned that they talk about the rebates early in the sales process and that they are the ones who typically bring it up. One trade partner noted that he typically mentions the rebates after determining that a project will qualify financially. Another trade partner indicated that he brings the rebate up during the first meeting with the customer to better understand what the customer's priorities are.

- When discussing the product with customers, trade partner interviewees indicated that they mention the rebates and highlight the associated energy savings and lower bills.
- One trade partner indicated that he also shares information regarding other Xcel Energy products.
- Another contractor noted: "We give the customer two options; [we] give an option for rebate and give another option that might not have rebate to see the payback comparisons between the two... this will show the benefits of lower bills..."
- Trade partners reported they typically do not receive any specific feedback from customers other than that they like receiving the rebate and that they are generally satisfied with the product offering.

There was some variability in how trade partners completed rebate paperwork, and to whom they gave the actual rebate money. Most trade partners (n = 5) indicated that they were responsible for the paperwork while one trade partner said paperwork responsibilities were split between the trade partner and the customer. The ultimate recipient of the rebate varied: three trade partner interviewees indicated it went to the customer; two interviewees said it went to both equally, and one said it went only to the trade partner.

Customers

Customers were pleased with their overall product offering experience, with four of five respondents rating it a 5 out of 5. One customer, who rated their experience a 3, indicated the rating was lower because equipment they believed would be rebated did not actually qualify under the offering (i.e., flat blades). Four customer interviewees rated their level of satisfaction with the rebate itself: two interviewees gave it a 5, one gave it a 4 and one a 3. One interviewee mentioned they would like to see Xcel Energy continue in the same direction with its products as it has done for the past 5 to 7 years.

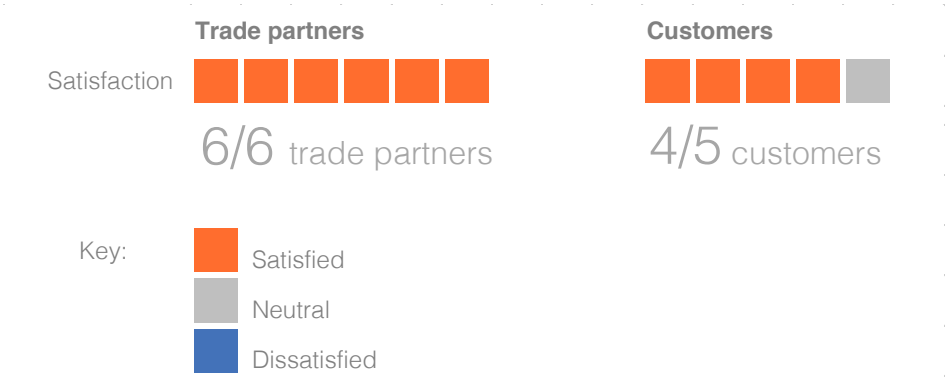
Customers also indicated they were very satisfied with the individual components of the product offering, such as the rebate forms and getting in touch with an Xcel Energy representative, with most customers rating each component as a 4 or higher. Customers who provided a rating of 3 or lower provided additional information on their reasons for doing so:

- **Completing the rebate form:** "a bit intricate for compliance… [we went] back and forth with Xcel on whether it qualifies."
- **Getting in touch with an Xcel Energy rep:** "…[rep name] is very loaded up and can't always get her right when we need her, but she is great."
- **Rebate application process:** "…middle of the road; challenge is coming up with all the data… the forms aren't that hard once [we] get [the] data."

Downstream Delivery Channel Influence on Trade Partner/Customer Engagement and Satisfaction with Xcel Energy

As shown in Figure 3-1, both trade partners and customers expressed overall satisfaction with the downstream delivery channel of the Cooling Efficiency Product.

Figure 3-1. Trade Partner and Customer Satisfaction with Downstream Delivery Channel



Trade Partners

Trade partners expressed favorable views of Xcel Energy staff. As one contractor noted: "[We have] good personal relationships with staff involved…" One of the reasons they do not engage often with Xcel Energy is that they indicated it is easy to participate in the product offering. For example, two contractors noted:

- "Time spent is a pretty low percentage of any sales cycle…don't talk too often to Xcel Energy staff as program is easy to do."
- "Not much interaction with Xcel Energy staff unless it is a new technology or something we haven't done before."

When asked about communications preferences, trade partners indicated their first preference for communication was email, as this allows them to look at it whenever they have the time. However, trade partners also indicated they appreciate direct contact with an Xcel Energy representative.

- This aligns with responses from customers, who indicated they either communicate directly with Xcel Energy representatives or contractors regarding program opportunities.

Customers

Overall customer satisfaction with the downstream delivery channel was high, as four of five customers rated their satisfaction as 5 out of 5. One customer interviewee who rated it a 3 expressed their dissatisfaction by saying: "Xcel Energy is hard to deal with as they are not responsive. Results are slow even though our account rep is good. For example, new service for one of our buildings took over a year for Xcel Energy to provide service… Xcel would be in trouble if we had energy choice."

Customers were similar to trade partners in terms of communications preferences, indicating that they saw email as a useful communications tool but also expressed a need for direct interaction with Xcel Energy staff.

Opportunities for Improvement

When asked about how they thought the downstream delivery channel might be improved, both trade partners and customers recommended additional interaction with Xcel Energy staff.[10] Feedback from interviewees also suggests that providing additional decision-making tools (e.g., technical materials or calculators) would be helpful. Below we provide more detail about specific opportunities for improvement mentioned by trade partners and customers interviewed for this evaluation.

Trade partners and customers provided several suggestions for what would motivate their organizations and customers to include additional projects within the downstream product offering. The following common themes emerged from their responses:

- Customers expressed a need for more direct communication with Xcel Energy. Similarly, trade partners expressed a need to streamline the communications process by having a single point of contact at Xcel Energy. The following sentiments illustrate this point:
  - One trade partner interviewee recommended providing one point of contact for all questions about the rebates.
  - One customer interviewee indicated they wished an Xcel Energy Representative could have come and talked to them as they trust them as a neutral source of energy efficiency information.
- Trade partners discussed the need to reduce administrative burden and develop a more streamlined paperwork process. More specifically:
  - One trade partner suggested creating more automated forms that are easy to fill out.
  - One trade partner interviewee explained that aligning invoicing requirements with what trade partners typically use for customers would make it easier to participate.
- Trade partners indicated that customers would benefit from being provided additional technical materials to aid in the energy efficiency decision-making process. This aligned with responses from customers, who indicated that, more specifically:
  - One trade partner interviewee said that providing an official tool to calculate chiller savings and providing loggers for measuring chiller energy use would be helpful.
  - Another trade partner interviewee indicated a need for easy-to-understand technical information to guide customer decision-making.
- Some trade partners suggested that the downstream product offering might be improved by expanding the range of eligible equipment options for their customers, while others thought the offering would benefit from taking more of a "systems" approach.
  - Trade partner interviewees mentioned that economizer controls and low-load DX compressors were good candidates to add to the downstream delivery channel.

[10] Specifically, one customer interviewee said that it would be great if they could have a regular follow-up meeting with their account manager to discuss existing projects and additional services.

- One trade partner noted that the product should take more of a systems approach instead of focusing only on individual measures, as the equipment must operate properly before any savings can be realized.[11] This sentiment fits with the notion that controls and automation are an important element to achieving savings.

3.5 Midstream: Distributor Experiences

The evaluation team interviewed distributors to assess their experiences with the midstream delivery channel. Overall, distributors are very pleased with the midstream product offering, citing benefits related to the flexibility and ease of incentive payments. Distributor interviewees indicated that their decision to join the product was not a difficult one, as it offered clear benefits and required little additional effort on their part. Distributors reported *staying* involved in the product because the incentives afforded them a competitive advantage in the marketplace, and they gave the product high marks for satisfaction.

Information from the following sources informed the findings related to this research objective, which are discussed in more detail below.

[11] Quote from contractor recommending a systems approach: "A customer can have a great efficient machine, but if not operating it properly no better than a standard machine…really need to look at a building's cooling design and how it operates…need good automation systems…automation is the key to energy efficiency."

Table 3-2. Data Sources Used to Assess Distributor Experiences with the Midstream Delivery Channel

Research Topics	Data Source					
	Product Data	Staff Interviews	Customer interviews	Contractor interviews	Distributor Interviews	Peer Program Review
Understand motivation for product participation.					X	
Explore trade partners' and customers' experiences with the product.					X	
Understand how the product may influence trade engagement and satisfaction with Xcel Energy.					X	
Identify opportunities to improve the delivery of downstream and midstream product tracks.					X	

Each of these research objectives is discussed in more detail below.

Motivations for Midstream Delivery Channel Participation by Distributors

Distributor interviewees reported that the decision to join the midstream channel of the Cooling Efficiency Product was straightforward, as the benefits seemed clear and participation did not require a large amount of effort or expense. Interviewees indicated that they had heard about the product from either Xcel Energy or from the third-party implementer.

Several data points provide additional context around distributor motivations to become involved with the midstream delivery channel of the Cooling Efficiency Product:

- Three distributor interviewees indicated this decision was a "no-brainer."
- Two interviewees noted that the midstream incentive aligned with their business focus on high efficiency equipment.
- One interviewee described participation as necessary from a competitive standpoint: "We see it as essential to participate if we want to be competitive. We figured everyone else is doing it."
- One interviewee stated that he appreciated the "certainty" that goes along with midstream incentives, as he is often worrying about what will happen with projects six months or more in the future.

Distributors' Experiences with the Midstream Delivery Channel

Distributor interviewees reported varying levels of participation with the product, a finding that was also borne out in the product data analysis section (p. 6). Several interviewees said they like the simplicity of the program design.

- One interviewee indicated it has had a substantial impact on how they go to market with their sales.
- Four interviewees indicated they participate in at least one other Xcel Energy product, though they weren't very specific on which ones. Specific mentions included:
  - "evaporative coolers" (n=1)
  - "custom" (n=1)
  - "prescriptive program for motors, VFDs" (n=1)
  - "controls" (n=1)

Distributor interviewees reported *staying* in the program because of the incentive dollars and because there was minimal effort required on their part.

- One interviewee noted that the program aligns well with how their business operates.
- One distributor interviewee summed up his experience by saying: "They've been very good taking input from myself and other. When the program started, it was mostly focused on [rooftop units] and they 've been able to add other products that I think are real good opportunities..."
- Overall, interviewees indicated that the incentives allowed them to be more competitive in the market.

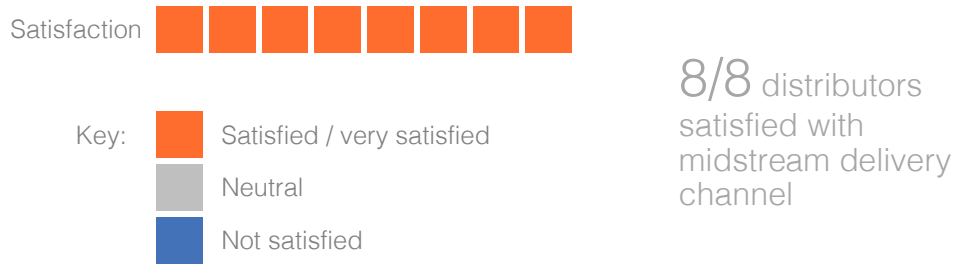
Interviewees reported a variety of reasons why the midstream Cooling Efficiency Product helps them sell efficient equipment. Generally, these reasons revolved around the incentive allowing them to be more competitive in the market.

Midstream Delivery Channel Influence on Distributor Engagement and Satisfaction with Xcel Energy

All distributor interviewees (n=8) reported high satisfaction levels with the midstream delivery channel (Figure 3-2). None of the interviewees reported any negative experiences, and several indicated a desire for the midstream channel to grow in breadth. Several specific results further illustrate these points:

- Five of eight distributor interviewees indicated they would like to see additional products added to the midstream program.
- One interviewee wished he could integrate the custom program into the existing midstream model.

Figure 3-2. Distributor Interviewee Satisfaction with Midstream Delivery Channel



Although the midstream delivery channel was only discussed with distributors, the evaluation team received some indirect feedback on this channel from trade partner interviewees (i.e., contractors). There was only one comment from the trade partner interviewees indicating potential resentment at being cut out of the midstream incentives. This trade partner noted that rebates that go directly to the distributor selling the equipment might not result in savings to the customer.[12]

Midstream Delivery Channel Opportunities for Improvement

Distributors indicated that the midstream delivery channel was working well and had few ideas for improvement beyond adding more measures. One distributor interviewee indicated he wished the midstream product was also available for residential equipment. Another interviewee indicated he thought the product could be improved by allowing him to do larger batch uploads of equipment information to the tracking system, as occasionally he had difficulty uploading large amounts of information at one time. Interviewees did have suggestions for measures that could be added to the midstream delivery channel, including:

- Large tonnage water-cooled chillers (n=1)
- Occupancy sensors (n=1)
- Variable refrigerant flow (VRF) systems (n=1)
- Integrated hydronic heating/cooling systems using existing domestic water piping (n=1)
- Evaporative cooled condensers (n=1)
- Production line equipment for cannabis production (n=1)

3.6 Market Trends

Distributor interviewees, contractor interviewees, and peer program interviewees mentioned several market trends that may affect the Cooling Efficiency Product future, though none of these trends appeared poised to have a drastic impact on the product in the short-term. In the section below, we describe these trends in more detail. As shown in Table 3-2, information from the following sources informed the findings related to this research objective.

[12] This comment was from a smaller contractor interviewed for this evaluation.

Table 3-2. Data Sources Used to Assess Market Trends

Research Objectives	Data Source					
	Product Data	Staff Interviews	Customer interviews	Contractor interviews	Distributor Interviews	Peer Program Review
Identify market trends that may impact product in the future				X	X	X

Trends mentioned by interviewees included:

- **A shift in the market from housing to institutional work.** One distributor interviewee mentioned that he has noticed a shift in his work from housing facilities to institutional work related to hospitals and education. This shift appears to be related to the massive population boom in the Denver/Boulder area and represents a second phase to this growth pattern, in which new institutions must be built to accommodate a burgeoning population.
- **The conversion of empty retail space to cannabis production facilities.** Parallel to the population growth in the Denver/Boulder area are two seemingly unrelated trends: (1) an increase in empty retail space as an increasing proportion of consumer good are purchased online, and (2) the expansion of the nascent cannabis production market in the state. As one industry shrinks (retail stores) and another industry grows (cannabis production), it seems natural for this retail space to be converted to growth facilities. This may create opportunities for the product moving forward.
- **The growing popularity of variable refrigerant flow (VRF) systems.** Although VRF systems still represent a small fraction of installed commercial HVAC systems in the US, this technology has been popular in other parts of the world for over thirty years, and continues to experience double-digit growth in this country.[13] VRF systems are currently incentivized by at least one other midstream/upstream program in the US and, based on conversations with program staff at other utilities, is being considered for inclusion in more programs.

Trade partner interviewees also made mention of more specific observations in their work, though the evaluation team could not determine if these were indicative of broader trends or merely isolated changes in project work:

- One trade partner believed that more people are becoming interested in evaporative precooling.
- One trade partner reported that his customers were installing fewer VFDs than in the past, but was not sure why this was the case.

[13] ACHR News (2017). VRF Market Expected to Hit $24B by 2022. Available: https://www.achrnews.com/articles/134465-vrf-market-expected-to-hit-24b-by-2022

4. CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the evaluation team's key findings and associated recommendations regarding the Xcel Energy Cooling 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 program changes.

Overall, the evaluation team found that the Cooling Efficiency Product is operating effectively, with generally high levels of satisfaction among participating customers, trade partners, and distributors. There is evidence that both the midstream and downstream delivery channels have had a positive net impact on energy efficiency within the Xcel Energy Colorado service. However, as the midstream delivery channel matures in the next few years, it will be important to make sure that the product as a whole continues to adapt and stay ahead of the market. It is also important to clarify the intended relationship between these delivery channels. Specific findings and recommendations follow.

- **[All channels] Key Finding: There is evidence from this research that both the midstream and downstream delivery channels of the Cooling Efficiency Product are having a positive influence on customer decisions regarding high efficiency cooling equipment.** The recommended prospective NTGR for the midstream delivery channel is 0.89. The recommended prospective NTGR for the downstream delivery channel is slightly lower at 0.71, reflecting higher levels of reported free ridership amongst customers interviewed as part of this evaluation.
    - **Recommendation 1:** The recommended overall prospective midstream NTGR is 0.89 (subject to the midstream product offering keeping pace with the market). The recommended overall prospective downstream NTGR is 0.71. When weighted by 2016 kWh savings, this results in an overall product NTGR of 0.80. If the proportion of kWh savings from the midstream and downstream delivery channels were to change, this would impact the overall weighted product NTGR accordingly.
- **[Downstream] Key Finding**: **While customers appear generally satisfied with the downstream rebates, there were several indications that communication with these customers could be improved while improving evaluation data collection at the same time.** Additionally, the evaluation team noted great difficulties in reaching some of these customers due to out-of-date contact information. Establishing a more routine communications strategy would enable Xcel Energy to solicit feedback from these customers in a timely manner, and would facilitate future evaluation research.
    - **Recommendation 2:** Conduct periodic surveys with customers immediately after they receive their rebate check. These surveys would serve three purposes: (1) To collect immediate feedback related to net-to-gross estimation, (2) ensure that customers are aware of other related energy efficiency opportunities available through Xcel Energy, and (3) help keep customer contact information up to date.
- **[Midstream] Key Finding: The midstream delivery channel runs the risk of producing diminishing net impacts over time if it does not keep pace with changes in the market, including increasing efficiency levels.** In its first two years of operation,

the midstream product has achieved impressive savings claims and a correspondingly low value for estimated free ridership among participating distributors. However, as the product offering matures, it is important to keep the efficiency requirements dynamic. If the product does not keep up with increasing codes and with increasing market saturation of program-qualified equipment, the product is likely to suffer increasing free ridership and become less effective in terms of dollars spent per kWh or kW saved. Communication with market actors about these tier changes is also important, as distributors, engineers, and trade partners need sufficient forewarning to adjust their business practices.

  - **Recommendation 3:** Efficiency tiers for the midstream delivery channel should continue to be periodically increased, with the minimum qualifying tier becoming ineligible and the new, highest tier entering the product offering. While using this strategy does not imply an increase in the product's NTGR value, it does allow the product to maintain its current NTGR. Tracking the cost effectiveness of kWh for each product incented by the product is advisable. It is also critical to make sure that participating distributors have advance notice of any tier adjustments given that the lead times for commercial HVAC equipment may be six months or more, and these market actors will need time to adjust their business strategies.
  - **Recommendation 4:** Ensure trade partners (e.g., contractors) understand that the benefits of the midstream incentives do ultimately accrue to the end-use customer, though the path is not as direct as a traditional downstream rebate. Making this concept clear may help reduce potential trade partner resentment at "losing downstream rebates."

- **[Midstream] Key Finding**: **For smaller equipment, the midstream incentives are used in a variety of ways besides price reductions. For larger equipment, the midstream incentives are often being passed through as a price discount, and are thus acting like a rebate.** This evaluation research showed that midstream incentives are used in different ways for different types of equipment, with many distributors "passing through" the discount to their customers even though this is not required by the product. This is more typical for larger, more sophisticated equipment that is not locally stocked (and thus not commonly subject to availability limitations).
  - **Recommendation 5:** Consider the cost effectiveness ramifications of splitting the existing midstream incentive into two parts: (1) an incentive for small equipment, and (2) a point-of-sale (POS) rebate for large equipment. For larger equipment that is typically not stocked, treating the incentive as a POS rebate and requiring that it gets passed through to the customer may increase the cost-effectiveness of the delivery channel. This classification would not alter the product NTGR but could help with cost-effectiveness of the product. For small equipment that is typically stocked, the incentive may still be used as a stocking tool/incentive without a pass-through requirement.
- **[All Channels] Key Finding: There is currently limited evaluation-related documentation, particularly for the midstream delivery channel.** The evaluation team created a simplified logic model to illustrate the theory of change underlying the midstream delivery channel, but this logic model may not capture all the ways in which the midstream incentives are designed to impact the market. Furthermore, without tying this logic model more closely to the downstream logic model, there is a risk that the two delivery channels are not functioning at an optimal level *together*. A related need is to understand how the

performance of the midstream delivery channel will be assessed over time. Because this product offering is designed to transform the market, it is important to define and track key performance indicators that will make this transformation measurable.

- **Recommendation 6**: Create a more detailed logic model for both the midstream and downstream delivery channels. These logic models should be completed in parallel, so that the intended relationship between the two delivery channels is clear.
- **Recommendation 7**: Define and begin tracking a set of key performance indicators that can be used to measure market transformation of the Colorado HVAC market over time.

The evaluation team also makes the following recommendation regarding future research:

- **[Research] Key Finding: There is currently very limited information regarding the market penetration of HVAC equipment in Colorado, including what is currently installed (the installed base) and what is currently being sold (sales penetration).** Without knowing these values, it is difficult to know when efficiency tiers should be adjusted accordingly.
  - **Recommendation 8:** Perform a market baseline study to estimate the penetration of energy efficient measures (installed base and sales) in the Xcel Energy service territory in Colorado.

EMI CONSULTING

Xcel Energy
Colorado Cooling Efficiency

January 15, 2017

APPENDICES

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APPENDIX A: EVALUATION PLANNING DOCUMENTS

A.1 Evaluation Plan

To support the process and impact evaluation of the 2016 Xcel Energy efficiency programs, members of the EMI Consulting evaluation team are conducting a process and impact evaluation of the Xcel Energy Cooling Efficiency Product.

As described in more detail in this memo, after reviewing program data we recommend the following activities be included in the scope of work for the CO Cooling Efficiency evaluation:

- Conduct a total of 65 interviews, broken down as follows:
  - **Midstream**: Approximately 10 interviews with the largest participating distributors.
  - **Prescriptive**: 10 interviews with customers and 10 interviews with contractors.
- If data are available, conduct a sales data analysis for equipment categories included in the product.

In this memo we first summarize our review of program data. We then provide recommendations for the revised evaluation plan. Finally, we provide a comparison between these proposed revisions and the original scope.

Summary of Program Data Review

The evaluation team completed an initial review of program data to gain a better understanding of how the program operates, the types of measures that are most popular, and how levels of participation vary by distributor, contractor, and customer. Table 1 shows the number of unique premises by product and measure category, as well as the associated gross kWh savings (and percent gross kWh savings, relative to each product).

Table 1. CO Cooling Efficiency Summary of Premises and kWh Savings by Product/Measure[1]

Opportunity: Product	Measure Name	Unique Premise IDs	% Unique Premise IDs	Customer kWh	% Customer kWh
Midstream	Air-Cooled Chillers	27	7.5%	1,401,361	23.4%
	Water-source Heat Pumps	33	9.2%	1,088,999	18.2%
	DX Units > 63.3 Tons	12	3.3%	1,015,890	17.0%
	DX Units 20 - 63.3 Tons	32	8.9%	931,200	15.6%
	DX Units < 5.4 Tons	162	45.0%	458,386	7.7%
	DX Units 5.5 - 11.3 Tons	144	40.0%	390,303	6.5%
	DX Units 11.4 - 19.9 Tons	67	18.6%	356,506	6.0%
	PTAC	11	3.1%	340,559	5.7%
	Total	***360***	***100.0%***	***5,983,204***	***100.0%***
Prescriptive	Plate & Frame Heat Exchangers	2	7.4%	1,821,700	34.4%
	Centrifugal Chillers	9	33.3%	1,647,170	31.1%
	VFD Chiller Retrofit	2	7.4%	833,036	15.7%
	DEPACC	6	22.2%	617,549	11.7%
	Screw/Scroll Chillers	4	14.8%	209,789	4.0%
	EC Motors - Walk in Cooler	4	14.8%	162,728	3.1%
	Anti-Sweat Heater - Low Temp	1	3.7%	8,056	0.2%
	Adjustment Measure	2	7.4%	0	0.0%
	Total	***27***	***100.0%***	***5,300,028***	***100.0%***
Custom	Non-Calculated Measure	4	100.0%	1,741,583	100.0%
	Total	***4***	***100.0%***	***1,741,583***	***100.0%***
Grand Total	**Total**	**388**	**100.0%**	**13,024,815**	**100.0%**

From Table 1 we note the following:

- **Overall:** Savings are approximately equal between the midstream and prescriptive products (5,983,204 kWh vs. 5,300,028 kWh), while the custom product comprises slightly less savings (1,741,583 kWh).
- **Midstream**: Within the midstream product offering, nearly 60% of the savings are concentrated within just four measure categories: air-cooled chillers, water-source heat pumps, DX units > 63.3 tons and DX units > 20 tons.

[1] The numbers in this table include "closed – lost" opportunities in the Xcel tracking data and thus may not be representative of actual savings.

- **Prescriptive**: Within the prescriptive product offering, over 90% of total savings are concentrated within four measure categories: plate/frame heat exchangers, centrifugal chillers, VFD chiller retrofits, and direct evaporative pre-cooling technology for air-cooled condensers (DEPACC). Overall, there are only 27 unique premises within the prescriptive offering.
- **Custom**: There are only 4 unique premises within the custom product offering, but these 4 premises constitute a substantial amount of savings for the program.

For the midstream product offering, we also analyzed savings by distributor as shown in Table 2.

Table 2. Midstream Product Distribution of Units and Savings by Distributor

Payee Name[a]	# Of Units	kWh Savings	% kWh Savings	Cumulative % kWh Savings
Distributor A	1,962	4,092,111	42.5%	42.5%
Distributor B	1,245	1,311,771	13.6%	56.2%
Distributor C	152	1,175,256	12.2%	68.4%
Distributor D	1,509	610,178	6.3%	74.7%
Distributor E	561	566,774	5.9%	80.6%
Distributor F	927	550,862	5.7%	86.4%
Distributor G	746	430,580	4.5%	90.8%
Distributor H	27	362,746	3.8%	94.6%
Distributor I	27	287,986	3.0%	97.6%
Distributor J	2	159,523	1.7%	99.3%
Distributor K	104	58,873	0.6%	99.9%
Distributor L	16	12,640	0.1%	100.0%
Distributor M	1	725	0.0%	100.0%

[a] These distributor names have been anonymized.

From Table 2 we see that a fairly small group of distributors is responsible for touching a large number of units incentivized through the program. Some of these distributors are more active than others, though without additional information we cannot say if that is because certain distributors do not sell as much high efficiency equipment or because some distributors simply don't specialize in the types of measures incentivized through the program.

Proposed Revisions to Evaluation Scope

The analysis presented above leads us to make the following recommendations regarding the evaluation approach:

- **Midstream**: We recommend conducting interviews with the 10 largest distributors (in terms of KWH) involved with the midstream product, and 10 interviews with contractors who install units incented through this channel.
  - If we are able to speak to the top 10 distributors by KWH, we should be able to account for more than 99% of the savings being claimed through this product/channel, and thereby eliminate any sampling error.[2]
- **Prescriptive**: While we initially recommended conducting interviews with all 27 customers in the prescriptive product, we now understand that not all of these customers actually completed projects.
  - We advise interviewing the greatest number of customers possible.
  - Because contractors also play an important role in this product offering, we recommend interviewing a number of contractors (e.g., 5-10) linked to these customers.
- **Sales Data Analysis:** The evaluation team is exploring the feasibility of obtaining appropriate sales data for the State of Colorado. If such data are available and can be obtained, we recommend conducting a sales data analysis to understand the how program trends may relate to broader market trends.

These recommended modifications to the data collection tasks as shown in Table 3.

Table 3. CO Cooling Efficiency Summary of Proposed Research Task Revisions

Product/Channel	Distributors		Contractors		Customers	
	# interviews	coverage	# interviews	coverage	# interviews	coverage
Midstream	8-10	99% of kWh[a]	-	[b]	-	-
Prescriptive	-	-	5-10	partial	5-10	100%
TOTAL	8-10 interviews		5-10 interviews		5-10 interviews	

[a] Speaking with the top 10 distributors (by kWh) will be essentially a census attempt, as program data show that these distributors account for more than 99% of the KWH through the midstream product.
[b] The evaluation team did not include contractors participating in the midstream delivery channel at the request of Xcel Energy.

There are several advantages to this proposed research approach:

- If we are able to achieve a census of customers in the custom and prescriptive channels, *we eliminate any possible sampling error associated with these two channels*. This also means that we restrict any sampling error in the overall product to the midstream channel.
- This structure will allow us to produce NTG estimates separately for each of the three channels. The final, overall program NTG estimate will then be computed by simply summing net savings across all three channels and dividing by gross savings across all three channels without a substantial amount of additional computation.

[2] This 99% value is based on EMI Consulting's analysis of program data provided by Energy Solutions via Xcel Energy. The actual value may change if data are updated.

Comparison of Original and Revised Scope

Table 4 below summarizes what was initially proposed in the evaluation workplan, the reason why the initially-proposed task may be deficient, and what the evaluation team believes is most appropriate given their review of program data.

Table 4. CO Cooling Efficiency Comparison of Original and Proposed Research Activities

Research Task	Objectives	Original Scope	Proposed Scope
Trade Partner Research	Assess the impact of midstream incentives on trade partner/contractor selling practices and distributor/retailer stocking practices. Collect data for NTG ratio.	10 interviews with participating trade partners, 10 interviews with participating distributors. PROBLEM: Insufficient coverage of program/measure categories.	Conduct **10-20** interviews, including 5-10 interviews with contractors (downstream only) and 10 interviews with participating distributors (midstream only).
Participant Surveys	Assess awareness, motivations, and influence of downstream incentives on customer decisions. Collect data for NTG ratio.	70 telephone surveys with downstream participants. PROBLEM: Insufficient number of participants to conduct surveys.	Conduct **5-10** interviews, including as many downstream participants as possible.
Non-participant Surveys	Assess awareness, motivations, and influence of downstream incentives on customer decisions.	70 non-participant surveys. PROBLEM: Of limited use for a program that has a large midstream component (of which customers are likely unaware).	Do not conduct non-participant surveys.
Sales Data Analysis	Support findings from interviews; provide broader view on market trends	Not originally scoped.	If feasible, conduct sales analysis for equipment categories for which sales data is available and provides reasonable coverage.[3]

[3] Sales data analysis will be dependent on the availability and granularity of sales data for Colorado.

A.2 Sampling Plan

To support the process and impact evaluation of the 2016 Xcel Energy energy efficiency programs, the EMI Consulting evaluation team will be conducting a process and impact evaluation of the CO Cooling Efficiency product. The evaluation objectives are to:

- Assess key indicators of product performance, such as customer satisfaction, product awareness, and motivations for participating.
- Assess product free-ridership and spillover.
- Assess awareness of the product and barriers to participation among general non-residential customers and explore possible opportunities to increase participation (e.g. rebate amounts, financing, etc.).
- Gain insight into trade partners' satisfaction with the product and perceived barriers to participation, the impact of the product on their sales and business practices, and perceptions surrounding ways the product could better assist them in selling high efficiency HVAC equipment.
- Assess how the financial and technical assistance given to customers has influenced the HVAC marketplace.

Summary

To conduct the evaluation, the evaluation team will be surveying participating customers and interviewing trade partners (including both distributors and contractors). This memorandum presents our sampling approach to conducting the data collection, including the participating customer sampling plan and the trade partner sampling plan.

As described in more detail in this memo, after reviewing program data we recommend the following sampling approach for the CO Cooling Efficiency evaluation:

- Conduct a total of roughly 55 interviews, broken down as follows:
  - **Midstream**: 10 interviews with the largest participating distributors.
  - **Prescriptive**: 5-10 interviews with customers and 5-10 interviews with contractors.

In this memo we first summarize our review of program data. We then provide a table summarizing the sample targets for each type of program actor (participating customers and trade partners) by product offering (midstream, downstream, and custom).

Program Data Review

The evaluation team completed an initial review of program data to gain a better understanding of how the program operates, the types of measures that are most popular, and how levels of participation vary by distributor, contractor, and customer. Table 1 shows the number of unique premises by product and measure category, as well as the associated gross kWh savings (and percent gross kWh savings, relative to each product).

Table 5. CO Cooling Efficiency Summary of Premises and kWh Savings by Product/Measure

Opportunity: Product	Measure Name	Unique Premise IDs	% Unique Premise IDs	Customer kWh	% Customer kWh
Midstream	Air-Cooled Chillers	27	7.5%	1,401,361	23.4%
	Water-source Heat Pumps	33	9.2%	1,088,999	18.2%
	DX Units > 63.3 Tons	12	3.3%	1,015,890	17.0%
	DX Units 20 - 63.3 Tons	32	8.9%	931,200	15.6%
	DX Units < 5.4 Tons	162	45.0%	458,386	7.7%
	DX Units 5.5 - 11.3 Tons	144	40.0%	390,303	6.5%
	DX Units 11.4 - 19.9 Tons	67	18.6%	356,506	6.0%
	PTAC	11	3.1%	340,559	5.7%
	Total	***360***	***100.0%***	***5,983,204***	***100.0%***
Prescriptive	Plate & Frame Heat Exchangers	2	7.4%	1,821,700	34.4%
	Centrifugal Chillers	9	33.3%	1,647,170	31.1%
	VFD Chiller Retrofit	2	7.4%	833,036	15.7%
	DEPACC	6	22.2%	617,549	11.7%
	Screw/Scroll Chillers	4	14.8%	209,789	4.0%
	EC Motors - Walk in Cooler	4	14.8%	162,728	3.1%
	Anti-Sweat Heater - Low Temp	1	3.7%	8,056	0.2%
	Adjustment Measure	2	7.4%	0	0.0%
	Total	***27***	***100.0%***	***5,300,028***	***100.0%***
Custom	Non-Calculated Measure	3	100.0%	1,741,583	100.0%
	Total	***3***	***100.0%***	***1,741,583***	***100.0%***
Grand Total	**Total**	**387**	**100.0%**	**13,024,815**	**100.0%**

From Table 1 we note the following:

- **Overall:** Savings are approximately equal between the midstream and prescriptive products (5,983,204 kWh vs. 5,300,028 kWh), while the custom product comprises slightly less savings (1,741,583 kWh).
- **Midstream**: Within the midstream product offering, nearly 60% of the savings are concentrated within just four measure categories: air-cooled chillers, water-source heat pumps, DX units > 63.3 tons and DX units > 20 tons.
- **Prescriptive**: Within the prescriptive product offering, over 90% of total savings are concentrated within four measure categories: plate/frame heat exchangers, centrifugal chillers, VFD chiller retrofits, and direct evaporative pre-cooling technology for air-cooled condensers (DEPACC). Overall, there are only 27 unique premises within the prescriptive offering.

- **Custom**: There are only 3 unique premises within the custom product offering, but these 3 premises constitute a substantial amount of savings for the program.

For the midstream product offering, we also analyzed savings by distributor as shown in Table 2.

Table 6. Midstream Product Distribution of Units and Savings by Distributor

Payee Name	# Of Units	kWh Savings	% kWh Savings	Cumulative % kWh Savings
Distributor A	1,962	4,092,111	42.5%	42.5%
Distributor B	1,245	1,311,771	13.6%	56.2%
Distributor C	152	1,175,256	12.2%	68.4%
Distributor D	1,509	610,178	6.3%	74.7%
Distributor E	561	566,774	5.9%	80.6%
Distributor F	927	550,862	5.7%	86.4%
Distributor G	746	430,580	4.5%	90.8%
Distributor H	27	362,746	3.8%	94.6%
Distributor I	27	287,986	3.0%	97.6%
Distributor J	2	159,523	1.7%	99.3%
Distributor K	104	58,873	0.6%	99.9%
Distributor L	16	12,640	0.1%	100.0%
Distributor M	1	725	0.0%	100.0%

From Table 2 we see that a fairly small group of distributors is responsible for touching a large number of units incentivized through the program. Some of these distributors are more active than others, though without additional information we cannot say if that is because certain distributors do not sell as much high efficiency equipment or because some distributors simply don't specialize in the types of measures incentivized through the program.

Overall Sampling Approach

The analysis presented above leads us to make the following recommendations regarding the sampling approach:

- **Midstream**: We recommend conducting interviews with the 10 largest distributors (in terms of KWH) involved with the midstream product.
    - If we are able to speak to the top 10 distributors by KWH, we should be able to account for more than 99% of the savings being claimed through this product/channel, and thereby eliminate any sampling error.[4] To interview the bottom three distributors who account for less than 1% of the claimed savings would not be cost-effective.

[4] This 99% value is based on EMI Consulting's analysis of program data provided by Energy Solutions via Xcel Energy. The actual value may change if data are updated.

    - While we initially had proposed speaking with contractors regarding their experiences with the midstream product offering, through conversations with the Xcel Energy product team and implementer, it was decided that this would not be advisable since such discussions may jeopardize the product's relationship with trade partners. Instead, the evaluation team will attempt to better understand the contractor perspective on the effect of the midstream product offering by asking *downstream* participating contractors general questions about market trends related to equipment types receiving midstream incentives.
- **Prescriptive**: We recommend attempting as many customers in the prescriptive product as possible, or at least 5-10, and additionally talking to 5-10 contractors involved with those projects.
    - The small number of unique customers in the prescriptive channel account for nearly half of the entire Cooling Efficiency product's overall claimed savings, making each of these customers important.
    - Because contractors also play an important role in this product offering, we recommend interviewing a number of contractors linked to these customers.
    - The determination of whether or not to interview a contractor for a given project will be based on availability/response and on the customer's assessment of the degree to which that contractor had an influence on their equipment purchasing decisions.
- **Custom**: We recommend attempting to conduct interviews with all 3 customers and their associated contractors.
    - By conducting a census on this population, we eliminate any sampling error.

This sampling approach is summarized in Table 3.

Table 7. CO Cooling Efficiency Summary of Proposed Sample Targets

Product/Channel	Distributors		Contractors		Customers	
	# interviews	*coverage*	*# interviews*	*coverage*	*# interviews*	*coverage*
Midstream	8-10	99% of kWh[a]	(b)	-	-	-
Prescriptive	-	-	5-10	partial	5-10	100%
TOTAL	**10 interviews**		**~5-10 interviews**		**5-10 interviews**	

[a] Speaking with the top 10 distributors (by kWh) will be essentially a census attempt, as program data show that these distributors account for more than 99% of the KWH through the midstream product.

[b] The evaluation team does not currently have sample or contact information for contractors selling units incented by the midstream program. As discussed above, supporting information from contractors related to the midstream product offering will be collected by talking with contractors participating in the downstream product offering.

There are several advantages to this sampling approach:

- If we are able to achieve a census of customers in the custom and prescriptive channels, *we eliminate any possible sampling error associated with these two channels*. For the distributors, we will interview those top 10 that account for 99% of the savings[5]. Excluding the bottom three distributors because they are so small will have virtually no effect on the estimated NTGR.

[5] To interview the bottom 3 distributors who account for less than 1% of the claimed savings would not be cost-effective.

This structure will allow us to produce NTG estimates separately for each of the three channels. The final, overall program NTG estimate will then be computed by simply summing net savings across all three channels and dividing by gross savings across all three channels without a substantial amount of additional computation.

Risks to Sample Plan

With any purposeful sample, interview results are subject to biases, some of which may be proactively addressed. For those that cannot be addressed, EMI Consulting will exercise caution in correctly interpreting the results with these potential sources of bias in mind.

Respondents that choose to participate in the interviews or surveys may be systematically different than those that do not participate, leading to non-response bias. We will investigate any firmographic/demographic differences between the respondents and nonrespondents to assess the potential for any bias. If there is a high response rate, the likelihood of non-response bias is smaller. To mitigate non-response bias, the evaluation team will provide $25 incentives to participant and trade partner respondents.

Finally, while the evaluation team will attempt to conduct the number of interviews shown in Table 3, the population of actors (distributors, contractors, and customers) involved in this product is relatively small. Thus the ability to achieve these targets is limited by the response rate of these actors, as well as by the quality of contact information.

A.3 Benchmark Scope and Peer Utility List

To support the process and impact evaluation of the 2016 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 peer utility programs. 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. The intent of this memo is to identify the primary benchmarking data points and the list of recommended peer utilities that the evaluation team will contact for the CO Cooling Efficiency program.

Benchmarking Data

To understand how Xcel Energy compares with its peers, the evaluation team will collect data on the following key indicators of program performance and supporting context that program staff can use to better understand key indicators results.

- **Key Indicators**
  - **Relative magnitude of program energy savings goals –** The evaluation team will determine peer program energy savings goals (e.g. MWh and Mcf) and the program's savings as a percentage of the total energy efficiency portfolio goal. These data can inform the size of the program and its relative importance to the peer utilities' portfolio.
  - **Net-to-gross ratios (NTGRs)** – The evaluation team will ask about NTG values and determine if they are estimated at the program level, the measure level, or both.

  - **Program budget cost of acquisition –** This metric will include the program budget divided by the total gross energy savings for each peer program (e.g. $/MWh, $/Mcf). Cost of acquisition is a common industry metric that provides insight into the cost effectiveness of efforts implemented by peers.
  - **Total resource cost test (TRC) values –** If available, the evaluation team will compare such values with Xcel Energy product values.

- **Supporting Context**
  - **Program description –** The benchmarking results will include a description of the overall program objectives, implementation strategies, and customer types targeted for participation. For midstream programs, this will include a description of how the midstream incentives are distributed and processed. This section may also include information on program staffing, the length of time of program operation, any recent changes that have been made to the program, and future outlook.
  - **Program market coverage –** If such information is available, the evaluation team will seek to estimate the size of the market covered by midstream program channels.
  - **Customer engagement practices –** A summary of methods the program implements to engage customers will be included in the benchmarking results.
  - **Trade partner engagement practices –** The evaluation team will include a brief summary of methods the program implements to engage trade partners, including contractors and distributors.
  - **Measure types and incentives –** Included in the benchmarking results will be a list of measures and their efficiency levels offered through the various programs, their incentive levels, and (if available) incremental costs. To the extent possible, the evaluation team will seek to compare incentive levels and energy savings values across utility programs.

To conduct this research, the evaluation team will initiate the research by performing a review of publically available documents on utility websites, regulatory filings, and data available from the U.S. Energy Information Administration (EIA). The evaluation team will then conduct 30-60 minute telephone interviews with program managers from specified peer utilities to collect any missing information and contextual data to support the analysis. We will rely on Xcel Energy staff as well as industry networking channels to identify program manager contact information for each peer program.

Recommended Peer Utilities

The evaluation team, working with Xcel Energy product staff and leveraging internal resources, identified the following peer programs to include in the benchmarking research. These utilities were included primarily because they offer a commercial HVAC midstream program.

[REDACTED]

A.4 Net-to-Gross Approach

To support the process and impact evaluations of the 2016 Xcel Energy energy efficiency programs, the EMI Consulting evaluation team will be calculating a net-to-gross ratio (NTGR) for the Colorado Cooling Efficiency product. The objective for calculating a NTGR is to document the product's influence on the customer's decision to purchase energy efficiency equipment. Additionally, the results of the NTGR can inform improvements to the product design.

To estimate the NTGR[6] for the Colorado Cooling Efficiency product, the evaluation team will use a hybrid approach comprising two components:

1. A standard self-report approach (SRA) based on interview results with participating customers for the downstream offerings (both prescriptive and custom), and
2. A modified self-report approach aimed at understanding how distributors are influenced by the midstream offering.

In the following sections, we first present a short description of the program to help frame the context of the NTGR discussion. We next provide an overview of the SRA for the downstream offerings, an overview of the SRA for the midstream offering, and finally a discussion of the overall NTGR method for the Colorado Cooling Efficiency product.

Program Description

The Cooling Efficiency Product in Colorado provides commercial customers with downstream financial incentives to encourage the purchase of high efficiency cooling equipment such as chillers, direct evaporative pre-coolers, EC motors, heat exchangers, and VSDs (both on failure and as early replacement). This offering also includes a custom project option. In addition, the product provides midstream incentives to participating distributors to upsell high efficiency equipment that is not part of the downstream product. The midstream channel was launched in 2015 and includes packaged and split AC units, water source heat pumps, air cooled chillers, and PTAC/PTHP units. The major barrier to customers selecting energy efficient cooling equipment is the incremental first cost. This increased cost impacts not only a customer's decision but also the availability of the equipment, further limiting product participation and contractor engagement.

Self-Report Approach (SRA)

To develop the SRA for estimating the NTGR for the Colorado Cooling Efficiency product, the evaluation team began with the 2016 Illinois Statewide Technical Reference Manual for Energy Efficiency Version 6.0: Volume 4: Cross-Cutting Measures and Attachments: Attachment A. Attachment A contains the Illinois Statewide Net-to-Gross Methods (the Illinois-NTG) developed by experienced evaluators working in Illinois, in collaboration with the Illinois Stakeholder Advisory Group. These methods focus on the estimation of the NTGR for a wide variety of programs using the SRA. The SRA involves contacting one or more key participant decision-makers and asking them a series of closed- and open-ended questions about their motivations for installing the efficiency equipment, about whether they would have installed the same energy efficient equipment in the absence of the program, and questions that attempt to rule out rival explanations for the installation (Weiss 1998; Scriven 1976; Shadish 1991; Wholey et al. 1994; Yin 1994; Mohr 1995; Rogers et al. 2000; Donaldson, Christie, & Mark 2008).

The SRA is based primarily on quantitative data, while in more complex cases in the nonresidential programs, the SRA is strengthened by the inclusion of additional quantitative and qualitative data which can include, among other methods, in-depth, open-ended interviews, direct observation, and review of customer and

[6] The NTGR is a factor representing the portion of gross savings that are attributable to the program. The product of the gross savings and the NTGR equal the net savings of the program. The NTGR may be composed of a variety of factors that create differences between gross and net savings, commonly including free riders, participant spillover and nonparticipant spillover (NTGR = (1-Free Ridership) + Participant Spillover + Nonparticipant Spillover)). The factor can be estimated and applied separately to either gross energy or demand savings.

program records.[7] Many evaluators believe that additional qualitative data regarding the economics of the customer's decision and the decision process itself can be very useful in supporting or modifying quantitatively-based results (Britan, 1978; Weiss and Rein, 1972; Patton, 1987; Tashakkori and Teddlie, 1998). The output of the SRA is an index (the NTGR), which is a single number representing program influence (i.e., that portion of the gross savings that are attributable to the program).

The evaluation team chose the Illinois NTG protocols to base its SRA because it was informed by a number of best practices guidelines including Ridge et al. (2007), Winch et al. (2008), and Ridge et al. (2013). These best practice documents contain recommendations for enhancing the validity and reliability of the SRA. Included are such topics as:

- Timing of the Interview
- Identifying the Correct Respondent
- Use of Multiple Questions
- Consistency Checks
- Making the Questions Measure-Specific
- Scoring Algorithms
- Weighting the NTGR
- Ruling Out Rival Hypotheses
- Precision of the Estimated NTGR
- Pre-Testing the Questionnaire

Selected Net-to-Gross Ratio Method: Downstream and Custom Offerings

The evaluation team reviewed the various Illinois nonresidential programs and identified the program that best matched the Xcel Energy Colorado Cooling Efficiency product with respect to its design and delivery. For the Colorado Cooling Efficiency product, we identified the Core Nonresidential Protocol as the one that was most similar in terms of its design and delivery. To recognize the unique characteristics of the Xcel Energy Colorado Cooling Efficiency product, the evaluation team then customized the questions and the algorithms used to convert participant responses into the NTGR. The selected method is summarized below.

Net-to-Gross Ratio: Prescriptive and Custom Offerings

The evaluation team will calculate a net-to-gross ratio for both the prescriptive offering and the custom offering separately using the following formula:

$$NTGR = (1 - (Free\text{-}ridership\ Ratio)) + (Participant\ Spillover\ Ratio)$$

The term, ((1-Free-Ridership Ratio)) is referred to as the Core NTGR.

[7] Of course, even in the simplest cases, an evaluator is free to supplement the analysis with additional quantitative and qualitative data such as interviews with architects and engineers involved in residential new construction or HVAC installers and a review of available market share data.

Free-Ridership

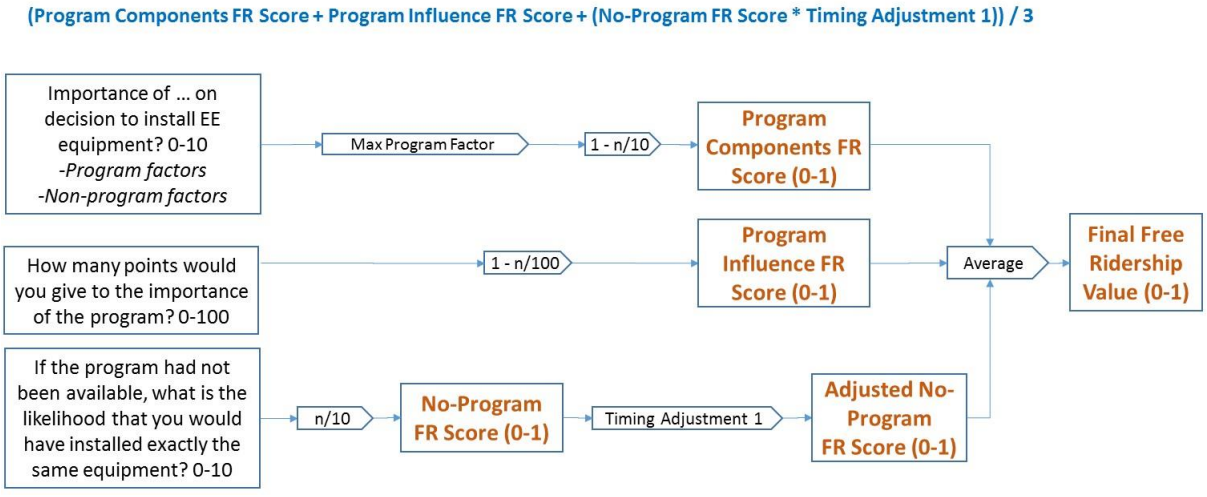
Free-ridership is a measure of the amount of a program's claimed savings that would have occurred in the absence of the program. Free-ridership is assessed on a scale from 0 to 1, where 1 indicates that the program had 100% free-ridership and all program savings would have occurred without any of the program's rebates or assistance.

To determine free-ridership, the EMI evaluation team started with the Core Nonresidential Protocol from the Illinois TRM, and wrote specific questions to assess each free-ridership component. The free ridership assessment battery is brief to avoid applying an undue survey burden, yet it seeks to reduce self-report biases by including four main free ridership components:

- A Program Components score, based on the participant's perception of the importance of various program components in their decision to carry out the energy-efficient project;
- A Program Influence score, based on the participant's perception of the program's influence on the decision to carry out the energy-efficient project versus non-program factors;
- A No-Program score, based on the participant's intention to carry out the energy-efficient project without program 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 program.

When scored, the first three components assess the likelihood of free ridership on a scale of 0 to 10, with the three scores averaged and the timing adjustment applied to create a final free-ridership score. As different and opposing biases potentially affect the main components, the No-Program score typically indicates higher free ridership than the Program Influence score and the Program Components score. Therefore, combining these decreases these biases. Figure 1 illustrates the scoring algorithm.

Figure 1: Core Nonresidential Protocol, Illinois TRM



Finally, we will also conduct sensitivity analyses (e.g., changing weights, omitting questions used in estimating the NTGR, etc.) to assess the stability and possible bias of the estimated NTGR.

Colorado Cooling Efficiency Free-ridership Calculations

To provide additional detail on how each program component will be assessed, the EMI evaluation team developed flow charts that show how each survey question will feed into the free-ridership scores. Each figure shows the net-to-gross component, the questions used to determine the component (including survey question numbering in parentheses), how those questions are scored, and how the overall component is calculated.

Figure 2 shows the flow chart for the Program Components Score. As previously stated, the Program Components Score is a measure of the participant's perception of the importance of various program components in their decision to carry out the energy-efficient project. For this component, customers are asked to rate the importance of various program and non-program factors in their decision to install energy efficient equipment. For the purposes of the Program Components Score, the evaluation team assigns program influence using the program factor with the highest score. The Program Components Score is then calculated by dividing the program's influence by 10 and then subtracting it from 1; thus, if a program factor is rated a 10 (the highest available rating), the Program Components Score will be 0, indicating no free-ridership from this component.

Figure 2: Program Components Score Flow Chart

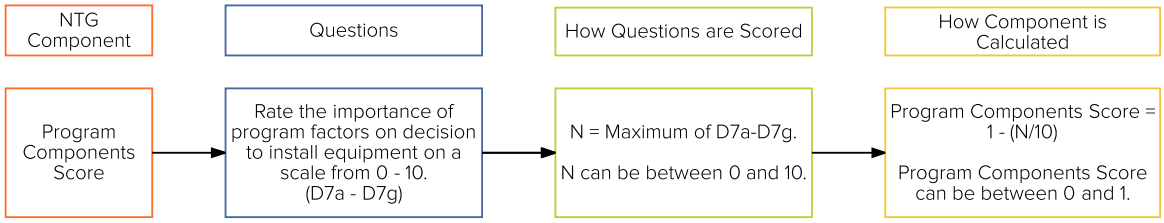


Figure 3 shows the flow chart for the Program Influence Score. As previously stated, the Program Influence Score is a measure of the participant's perception of the program's influence on the decision to carry out the energy-efficient project versus non-program factors. For this component, customers are asked to allocate 10 points between the influence of the program and the influence of non-program factors. Then, the customers are asked whether they learned about the program before or after they decided to install the equipment. However, iIf a customer learned about the program before they decided to install the equipment, the Program Influence Score is equal to dividing the total points assigned to the program by 10 and subtracting that from 1. If a customer learned about the program after they decided to install the equipment, the number of points they assigned to the program is divided in half. Thus, if the customer assigned the program all 10 points (the highest available rating) and they learned about the program before installing equipment, the Program Influence Score will be 0, indicating no free-ridership from this component.

Figure 3: Program Influence Score Flow Chart

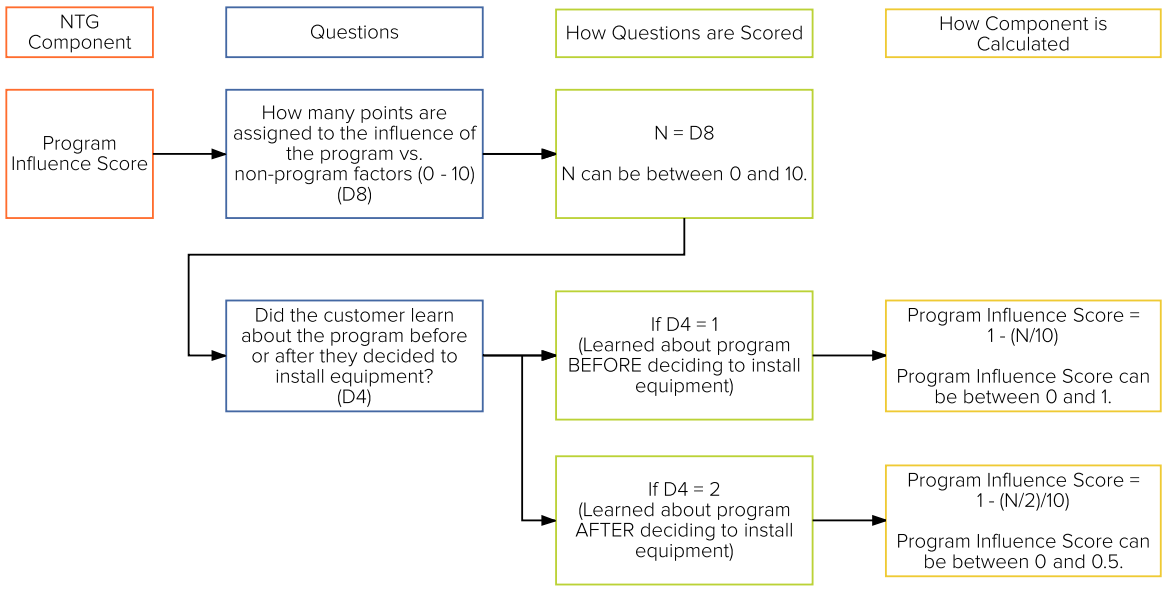


Figure 4 shows the flow chart for the No Program Score. As previously stated, the Program Influence Score is a measure of the participant's intention to carry out the energy-efficient project without program funds. For this component, customers are asked to rate their likelihood of installing the exact same equipment in the absence of the program. The No Program Score is equal to dividing this rating by 10.

Figure 4: No Program Score Flow Chart

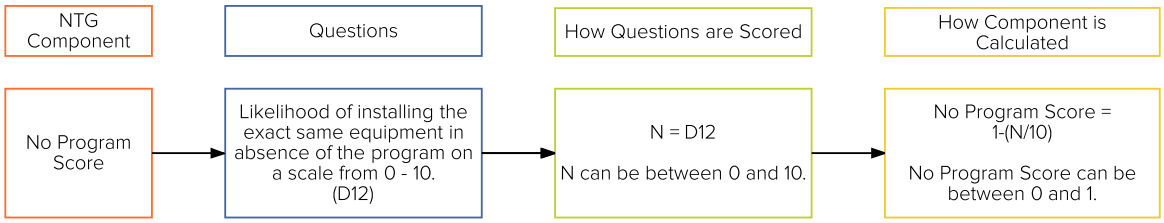


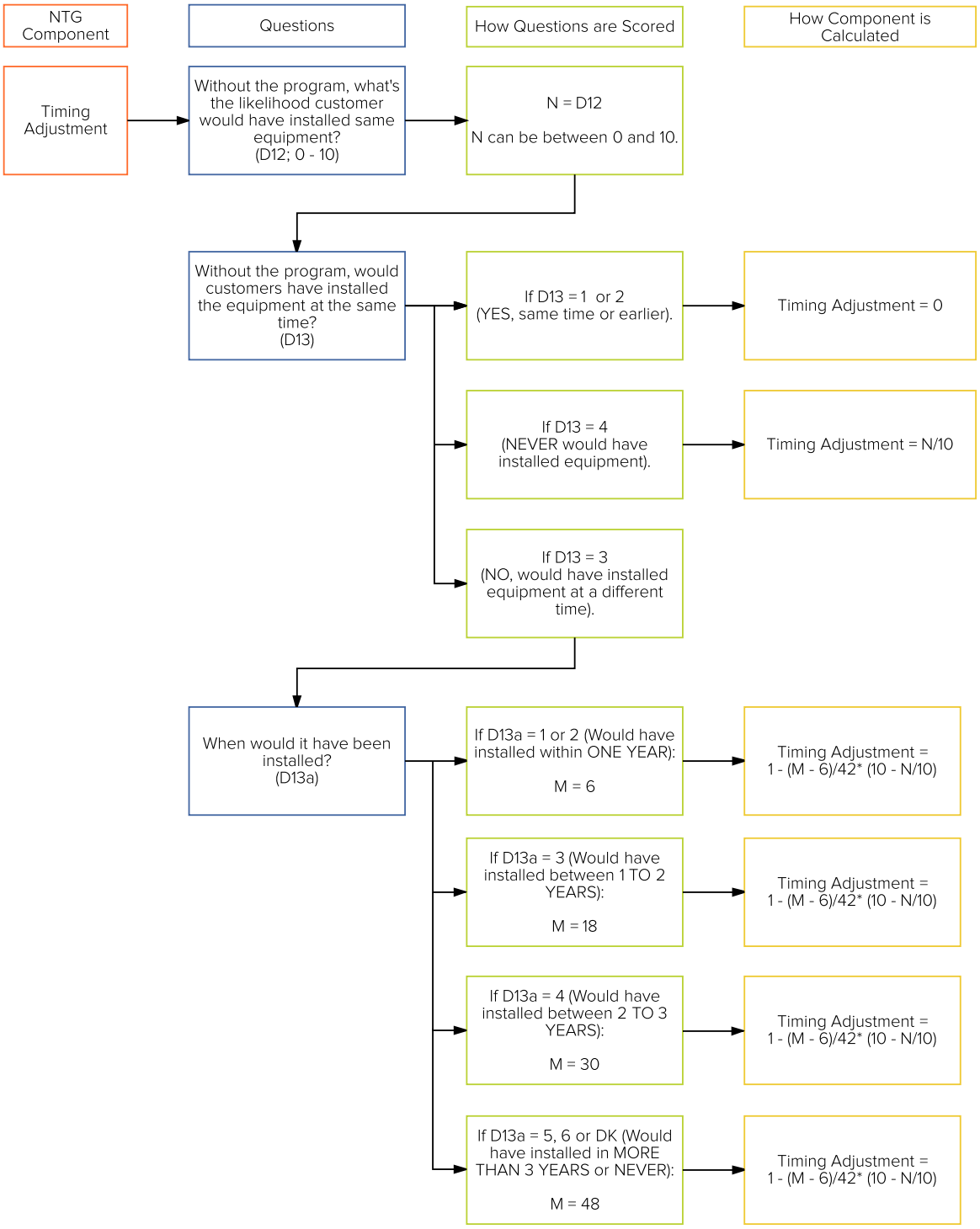
Figure 5 shows the flow chart for the Timing Adjustment. As previously stated, the Timing Adjustment is a measure of the participant's perception of when they would have carried out the project in the absence of the program. To ensure the answers to this question are accurate, the evaluation team asks about the timing adjustment in two ways. First, the evaluation team asks about the likelihood that customers would have installed the exact same equipment within one year of when they installed the equipment, had the program not been available. This answer is scaled from 0 to 10, where 10 indicates that the customer would have installed the exact same equipment within one year even if the program were not available.

Next, the evaluation team asks customers when they would have installed the equipment if the program were not available, to understand how much the program accelerated the installation of the energy efficient equipment. In answer this question, customers are given ranges, including within 1 year, 1 to 2 years, 2 to 3 years, and more than 3 years. The evaluation team then calculates a measure (*M*) for the number of months the equipment's installation was expedited because of the program. This score is calculated as the midpoint of

the time range selected by the participant. For example, if a participant said that without the program, they would have installed the equipment 1 to 2 years later than they did, *M* is equal to 18 months (the midpoint of 12 months and 24 months). For participants that say the equipment would have never been installed, or would have been installed more than 3 years later, *M* is assigned the maximum value of 48. The evaluation team then subtracts 6 months (i.e., the minimum answer) from *M*, and divides that value by 42, to get a range between 0 and 1.

Finally, the evaluation team combines these two metrics to create the participant's Timing Adjustment. The Timing Adjustment is created by multiplying the ratio of the number of months expedited (*M* – 6 / 42) by the ratio of the likelihood that they would have installed the equipment within one year ((10 – *N*) / 10), and then subtracting that value from 1. For example, if a participant rated their likelihood to install the equipment within one year as an "8", and said they would have installed the equipment within 1 – 2 years in the absence of the program, the timing adjustment would be equal to: 1 – (12/42) * (2/10) = 0.9429.

Figure 5: Timing Adjustment Score Flow Chart



The Timing Adjustment is multiplied by the No Program Score, and the result is referred to as the Adjusted No-Program Score. Finally, free ridership for a measure is calculated by averaging the Program Components Score, Program Influence Score, and Adjusted No-Program Score (see Figure 1). The evaluation team will ask

the battery of questions for up to two different types of equipment, as the decision-making process may vary for each equipment type. Then, the evaluation team will create a program-level free-ridership score by weighting the equipment-level free-ridership results by the proportion of the program's energy savings that are attributed to that equipment type.[8] The free-ridership score can range from 0 (no free-ridership) to 1 (full free-ridership).

Spillover

The evaluation team will also ask participants a series of questions to assess participant spillover. Spillover is a measure of the amount of energy savings that occur due to the program that are *not* captured in the program's claimed energy savings. For the purposes of this evaluation, the EMI evaluation team is only measuring participant spillover; we will not be measuring non-participant spillover. The evaluation team chose not to measure non-participant spillover for this product, as doing so would require the ability to identify non-participating customers who had installed qualifying Cooling equipment but had not done so through the program. The evaluation team would not be able to easily identify these customers with the general non-participant data provided by Xcel Energy. To capture participant spillover, the evaluation team will ask participants whether they installed any additional energy efficient equipment outside of the program (for which they did not receive a rebate), and to provide as much detail as they can on what they installed. The evaluation team then asks the following questions:

1. How important was your experience in the Cooling Efficiency program in your decision to install this equipment, using a scale from 0 to 10, where 0 is "not at all important" and 10 is "extremely important"?
2. If you had not participated in the Cooling Efficiency program, how likely is it that your organization would still have implemented this measure, 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?

The additional equipment is considered spillover equipment if the average of question 1 and (10 – question 2) is greater than 5. If the measure is identified as a spillover measure, the evaluation team will then use the information provided about the type of equipment installed to determine the savings associated with the measure. The product's spillover ratio is calculated by dividing the total spillover savings by the product's total gross energy savings.

Within each of the two downstream offerings (prescriptive and custom), the gross-savings-weighted Core NTGR will be calculated and adjusted upwards for any participant spillover and then applied to the gross savings for all respondents to yield net savings. This NTGR will then be applied to the gross savings for any non-respondents.

Selected Net-to-Gross Ratio Method: Midstream Offerings

There was limited information in the Illinois TRM related to midstream commercial HVAC programs. Instead, the evaluation team relied on approaches used to measure NTGRs for midstream programs in other

[8] This level of detail may not be achievable for the custom delivery channel since there are so few projects that were completed in 2015/2016.

states,[9] customizing the questions and the algorithms as needed for the CO Cooling Efficiency midstream product offering. In this section, we first provide a brief overview of midstream product logic, as illustrated by a simplified logic model. We then discuss our approach to determining the NTGR for the midstream offering.

Midstream Product Logic

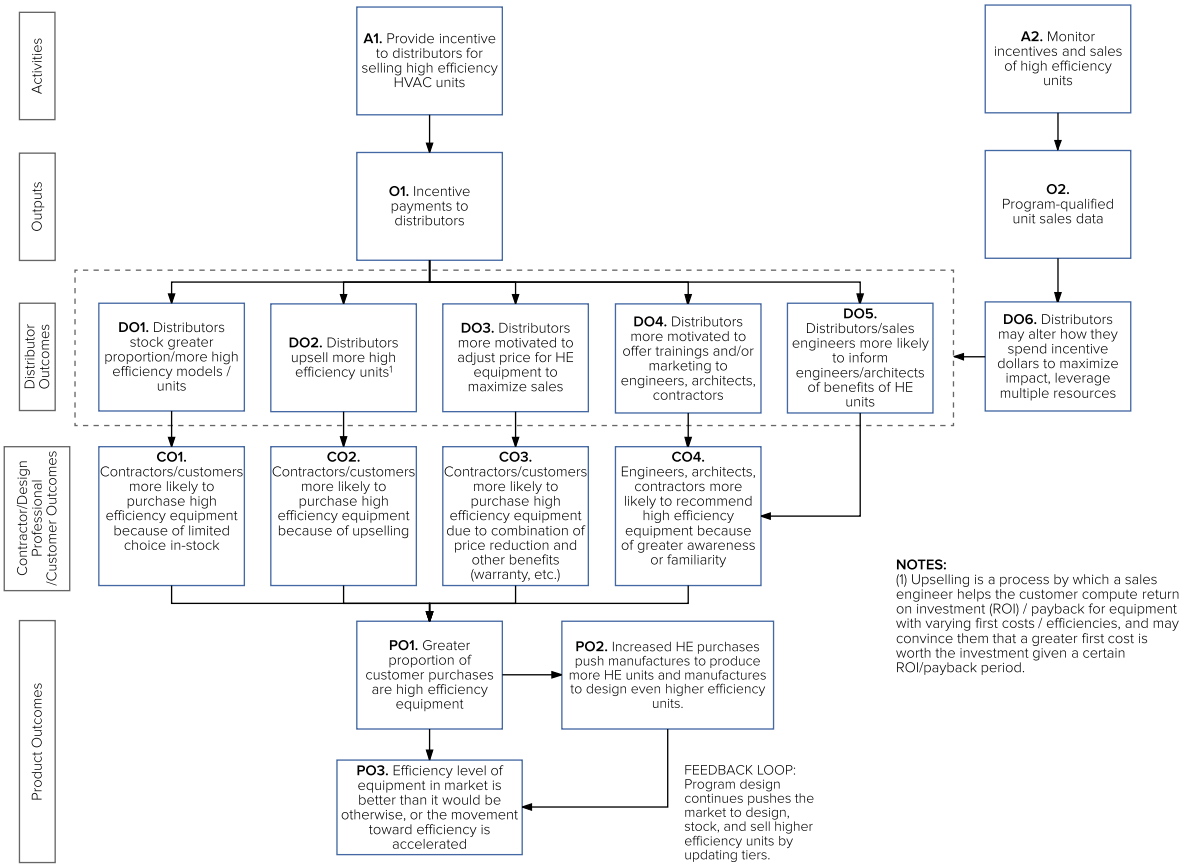
Because a logic model was not available for the CO Cooling Efficiency midstream product offering, the evaluation team created a simplified model to show the pathways by which the midstream offering is designed to have influence. As shown in Figure 6, the simplified logic can be summarized by the following description:

- Incentives are paid directly to distributors for the sale of high efficiency units (A1).
- Distributors receive these payments and can choose to spend them in one of many ways (O1).
- Knowing that they will receive an incentive for selling high efficiency units, distributors may choose to increase their stocking (DO1) of high efficiency units or upselling high efficiency units (DO2) to contractors. Distributors are better able to maximize sales of high efficiency units by adjusting pricing (DO3), and may also choose to start offering training sessions or marketing campaigns aimed at engineers, architects, and contractors (DO4) or reaching out to design professionals to make them more aware of these high efficiency units (DO5).
- Because of these decisions made by distributors, there are several potential outcomes associated with contractors and customers:
    - Contractors/customers may be more likely to purchase high efficiency units because they are in stock (CO1).
    - Contractors may be more likely to purchase high efficiency equipment because the distributor upsold these units (CO2).
    - Contractors/customers may be more likely to purchase high efficiency units because the incremental cost is lower than it would have been without the incentive (CO3).
    - Design professionals and contractors may be more likely to specify or recommend high efficiency units because they are more aware or more familiar with these options (CO4).
- The expected overall outcome is that a greater proportion of customer purchases will be high efficiency units (PO1).
- As distributors sell more high efficiency units, manufacturers will respond to this signal by producing more high efficiency equipment (PO2).
- Ultimately, this will cause the HVAC market in Xcel's territory in CO to become more efficient than it otherwise would have been, or to help achieve this efficiency faster than if no intervention had been applied (PO3).

As a secondary pathway, sales of product-eligible units are tracked and this data is provided to participating distributors as a feedback mechanism (A2 → O2 → DO6). This allows distributors to refine their incentive spend strategy to maximize impact, but does not feed directly into increased sales of high efficiency units.

[9] There are limited examples of midstream HVAC programs currently in existence. The evaluation team relied as much as possible on evaluations of midstream HVAC programs in California and Connecticut, though neither of these programs were identical in to the Xcel midstream product in all aspects.

Figure 6. Simplified Logic Model for Midstream Offering



In order for the midstream offering to achieve its ultimate goal of increasing the efficiency level in the market, we must verify that the activities (providing incentives to distributors for the sale of high efficiency units) leads to the set of outcomes shown in the logic model above.

Capturing Market Effects

It is important to note that a design like the midstream Cooling Efficiency product may have longer-term impacts that may not be immediately measurable in the short-term. Such longer-term impacts manifest as "market effects," which signify a transformation in the underlying structure and functioning of the market . To the extent possible, the evaluation team will collect information that may be helpful in understanding these longer-term impacts resulting from the product offering.

In the next section we discuss how information obtained from speaking with distributors will allow us to calculate a NTG score for the midstream offering.

Assessing NTG: Distributors

To assess the degree to which distributors may be altering their stocking practices as a result of the midstream offering, we will ask distributors questions regarding the percentage of units they stock that are currently

program-eligible, and what they would have stocked if the program had not existed. The difference between these two values will provide a measure of program influence. We will also ask distributors to gauge the extent to which the program has affected their stocking decisions. Finally, to assess spillover, we will ask distributors about units they sell in CO that do not receive the midstream incentive.

Free-ridership Questions

D1. Generally speaking, can you describe how the program has changed the way you do business in the Xcel Energy service territory in CO?

[RECORD OPEN-END RESPONSE]

Now I have some questions about efficiency levels. When I say "program qualified," I mean that the unit must qualify for a midstream incentive from the program. [REFERENCE EFFICIENCY REQUIREMENTS AS NEEDED]

D2a. Prior to the program, did you have any specific plans to promote program-qualified units?

__Yes
__No
__DK

D2b. [IF YES, ASK] Can you briefly describe these plans?

D3. Currently, which of the following strategies do you use to sell more program-qualified units?

A.	Upsell contractors to purchase program-qualified units	__Yes
B.	Conduct training workshops for contractors	__Yes
C.	Increase marketing of program-qualified units	__Yes
D.	Reduce the prices of program-qualified units	__Yes
E.	Increase the stocking or assortment of program-qualified units	__Yes
F.	Discuss the benefits of program-qualified units with design professionals (e.g., engineers or architects)	__Yes

What other strategies have you used to sell more program-qualified units? [INDICATE "NONE" OR SPECIFY BELOW]

G. First Mention:
H. Second Mention:
I. Third Mention:

D4. [FOR EACH STRATEGY MENTIONED IN D3, ASK]

D4a. [IF D3A=YES, ASK] How often do you upsell contractors to purchase program-qualified units?

__ Rarely
__ Occasionally

__ Often
__ Always

D4b. [IF D3B=YES, ASK] Since September 2015, how often do you conduct contractor training workshops?

__ Never
__ Rarely [Approximately, how many have you conducted? _____]
__ Occasionally [Approximately, how many have you conducted? _____]
__ Often [Approximately, how many have you conducted? _____]
__ Always [Approximately, how many have you conducted? _____]

D4c. IF D3C=YES, ASK] Since September 2015, by how much on average have you increased your marketing of program-qualified units?

__ No Increase
__ Small Increase
__ Moderate Increase
__ Large Increase

D4d. [IF D3D=YES, ASK] How often do you reduce the price of program-qualified units?

__ Never
__ Rarely [Approximately, by what % have you reduced the price? __]
__ Occasionally [Approximately, by what % have you reduced the price? __]
__ Often [Approximately, by what % have you reduced the price? __]
__ Always [Approximately, by what % have you reduced the price? __]

D4e. [IF D3D=YES, ASK] Approximately, for what percentage of the program-qualified models do you offer price discounts?

[RECORD NUMERIC VALUE %]
DK

D4f. [IF D3E=YES, ASK] Approximately, since the time you joined the program by how much have you increased your stocking of program-qualified units? [READ]

[IF HESITANT, SAY: If you prefer, just give me a range.]

__ No Increase
__ Small Increase [By approximately how much? ___]
__ Moderate Increase [By approximately how much? ___]
__ Large Increase [By approximately how much? ___]

D4g. [IF D4f=NO INCREASE, ASK] Approximately, what percent increase are you planning to make over the next 2-3 years? [READ]

[IF HESITANT, SAY: If you prefer, just give me a range.]

__ No Increase
__ Small Increase [By approximately how much? ___]
__ Moderate Increase [By approximately how much? ___]
__ Large Increase [By approximately how much? ___]

D5a. [IF D3G, H, and I ARE NOT BLANK, ASK] Approximately, how often have you used [INSERT FIRST STRATEGY MENTIONED]?

__ Rarely
__ Occasionally
__ Often
__ Always

D5b. Approximately, how often have you used [INSERT SECOND STRATEGY MENTIONED]?

__ Rarely
__ Occasionally
__ Often
__ Always

D5c. Approximately, how often have you used [INSERT THIRD STRATEGY MENTIONED]?

__ Rarely
__ Occasionally
__ Often
__ Always

D6.* So, you've mentioned the following strategies [LIST ALL STRATEGIES MENTIONED IN BOTH D3] [FOR EACH STRATEGY MENTION, SAY] Now, I'm going to ask you about the *extent to which the program incentives influenced your decision to use each strategy*. For each, please give an answer on a scale from 0 to 10 where 0 means "no influence" and 10 means "a great deal of influence."

A. Upsell contractors to purchase program-qualified units
B. Conduct training workshops for contractors
C. Increase marketing of program-qualified units
D. Reduce the prices of program-qualified units
E. Increase the stocking or assortment of program-qualified units
F. Discuss the benefits of program-qualified units with design professionals
G. Additional mention #1
H. Additional mention #2
I. Additional mention #3

D7. You mentioned a number of strategies that you use to sell program-qualified units. Generally, do you use the same strategies across all equipment categories incented by the midstream program?

__Yes
__No
__DK

D8. [IF D7=NO, ASK] For which specific types of program-qualified equipment categories do you use different strategies? [LIST MEASURE TYPES]

First Measure Type: _____
Second Measure Type: _____
Third Measure Type: _____
Fourth Measure Type: _____

[IF D7=NO, CAN LOOP THROUGH THESE QUESTIONS FOR DIFFERENT EQUIPMENT CATEGORIES IN QUESTION D8; OTHERWISE ASK GENERALLY ABOUT ALL CATEGORIES]

[IF D7=NO, READ] For the following questions, I would like you to think about the <MEASURETYPE>s you stock at locations in Xcel Energy's service territory in Colorado.

D9a.* On a scale from 0-10 where 0 means "no change" and 10 means "a substantial change," how much has your stock of *program-qualified* <MEASURETPE>s changed since early 2015?

[RECORD NUMERIC VALUE 0-10; CONFIRM WHETHER INCREASE OR DECREASE]

D9b.* [IF D9a ≠ 0] In early 2015, approximately what percentage of all [OPTIONAL: <MEASURETYPE>] units you stocked in the Xcel Energy service territory in CO would have been considered program-qualified?

[RECORD NUMERIC VALUE 0%-100%]

D9c.* [IF D9a ≠ 0] Currently, approximately what percentage of all [OPTIONAL: <MEASURETYPE>] units you stock in the Xcel Energy service territory in CO are program-qualified?

[RECORD NUMERIC VALUE 0%-100%]

D9d.* [IF INCREASE BETWEEN D9b and D9c] To what extent have the program incentives influenced these increases in stock of <MEASURE TYPE>] units? Please give an answer on a scale from 0 to 10 where 0 means "no influence" and 10 means "a great deal of influence."

[RECORD NUMERIC VALUE 0-10]

D9e.* [IF D9a = 0] Currently, *if the midstream rebates had never been available*, approximately what percentage of all [OPTIONAL: <MEASURETYPE>] units you stock in the Xcel Energy service territory in CO would be considered program-qualified?

[RECORD NUMERIC VALUE 0%-100%]

D10a.* [READ: "The following questions are about sales."]

On a scale from 0-10 where 0 means "no change" and 10 means "a substantial change," how much have sales of *program-qualified* <MEASURETPE>s changed since early 2015?

[RECORD NUMERIC VALUE 0-10; CONFIRM WHETHER INCREASE OR DECREASE]

D10b.* [IF D10a ≠ 0] In early 2015, approximately what percentage of all [OPTIONAL: <MEASURETYPE>] units you sold in the Xcel Energy service territory in CO would have been considered program-qualified?

D10c.* [IF D10a ≠ 0] Currently, approximately what percentage of all [OPTIONAL: <MEASURETYPE>] units you sell in the Xcel Energy service territory in CO are program-qualified?

D10d.* [IF INCREASE BETWEEN D10b and D10c] To what extent have the program incentives influenced these increases in the percentage of program-qualified [OPTIONAL: <MEASURE TYPE>] units sold? Please give an answer on a scale from 0 to 10 where 0 means "no influence" and 10 means "a great deal of influence."

D10e.* [IF D10a = 0] Now imagine that the *midstream rebates were not available.* Approximately what percent of all [OPTIONAL: <MEASURETYPE>] units you sell in the Xcel Energy service territory in CO would be considered program-qualified?

[RECORD NUMERIC VALUE 0%-100%]

Consistency Check

IF [MAX OF D9A AND D10A IS < 4 AND MAX OF ALL D6 RESPONSES IS > 7] OR IF [MAX OF D9A AND D10A IS > 7 AND MAX OF ALL D6 RESPONSES IS < 4] ASK: Earlier, you assigned a value of [INSERT MAX OF D6] to the question about the influence of the program on your strategies to sell more program-qualified units but assigned a value of [INSERT MAX OF D9A AND D10A] to the question about the influence of the program on your (increased sales or increased of stocking of program-qualified units). The first suggests (HIGH OR LOW PROGRAM INFLUENCE) while the other suggests (HIGH OR LOW) program influence). These answers seem inconsistent. Just to make sure I understand, would you explain why the program was very important in your decision to install this equipment? It's OK if you want to change one of your answers.

[NOTE TO INTERVIEWER: THE FOLLOWING QUESTIONS MEASURE SPILLOVER]

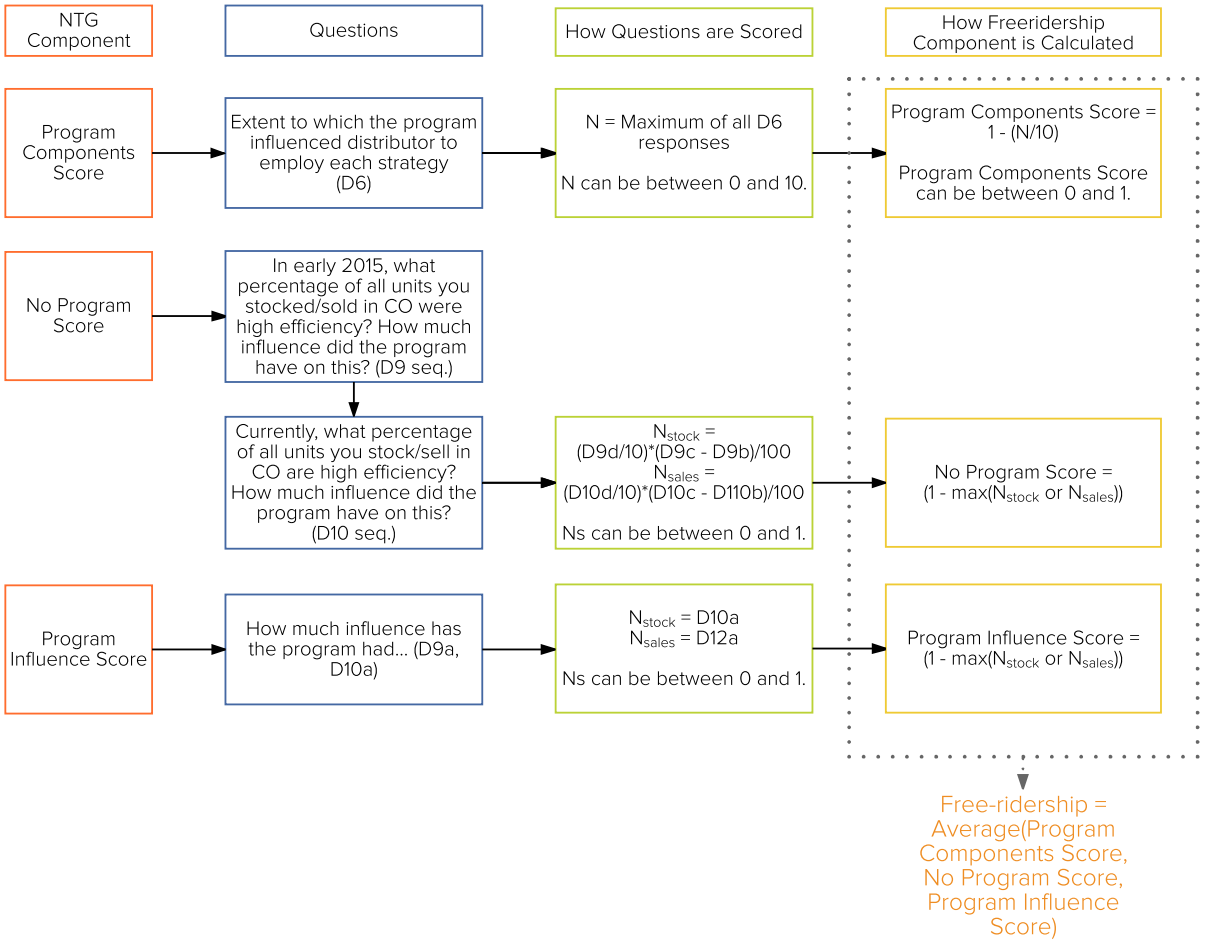
D11. In 2016, approximately what percentage of all program-qualified units you sold in Colorado went to customers *outside* Xcel Energy's service territory? As a reference point, Xcel Energy comprises about 60% of all commercial customers in CO.

D12. To what extent do you use the same strategies for selling program-qualified units that you mention earlier to selling program-qualified units in the non-Xcel regions of Colorado? Please give an answer on a scale from 0 to 10 where 0 means "not at all similar" and 10 means "completely the same."

Distributor Free-ridership

The distributor free ridership score will be calculated as shown in Figure 7. Once the No Program Score, the Program Influence Score, and Spillover are calculated for each distributor, we will compute an overall by averaging the No Program score and Program Influence score, subtracting this value from 1, as described earlier. The gross-savings-weighted Core NTGR will then be calculated and applied to the gross savings for all respondents to yield net savings. This NTGR will then be applied to the gross savings for any non-respondents.

Figure 7. Midstream Free-ridership: Distributors



Distributor Spillover

The evaluation team will ask distributors a series of questions to assess spillover from the midstream offering. Spillover is a measure of the amount of energy savings that occur due to the program that are *not* captured in the program's claimed energy savings. In the context of a midstream incentive, spillover manifests as an increase in the sales of energy efficient units to customers outside of Xcel's service territory in Colorado. This is most likely to occur because distributors *within* Xcel's service territory change their stocking practices to

include more energy efficient units or models, and then sell these units to customers *outside* of Xcel's service territory. **However, spillover will not be factored into the NTG ratio for the midstream product offering since the benefits of spillover from this program do not accrue to Xcel Energy ratepayers. It is only estimated to show that the benefits of Xcel's Cooling Product go beyond its service territory.**

Supporting NTG Information: Contractors

Although we anticipate using only information from distributors to calculate the NTG ratio for the midstream offering, we will collect additional information from contractors to form a more complete understanding of the product's impact. Specifically, we will assess the degree to which contractors are more likely to recommend or sell energy efficient equipment to their customers as a result of the midstream offering, either because of greater availability of high efficiency units, greater familiarity with these units through any distributor training, or reduced incremental cost. We are limited in our ability to collect this information as the intention is to not make these contractors aware of the midstream product offering. Thus any information we collect from contractors will likely be quite limited.

Computing the Overall Cooling Efficiency Product NTGR

The overall CO Cooling Efficiency product NTGR will be calculated by summing net savings across the three product offerings (midstream, prescriptive, and custom), and dividing by the product's total gross savings, as shown below:

$$Product\ NTGR = \Sigma\ Net\ savings\ /\ \Sigma\ Gross\ savings$$

Final Data Integration and Possible Need for Adjustment

It is impossible to anticipate all permutations of the data and results that may be encountered during the analysis. As a result, it may be necessary to refine existing rules or even develop new ones in the initial phases of the analysis. It must also be recognized that deterministic scoring algorithms may in some cases fail to adequately integrate the quantitative and qualitative data presented. It is therefore necessary to use judgment in deciding how much weight to give to the quantitative versus qualitative data and how best to integrate them (Ridge et al, 2007).

To the extent possible, the evaluation team will rely on the scoring algorithms to produce robust estimates of the NTGRs. However, occasionally it may be necessary to adjust or modify one or more of the individual components that feed into the final NTGR. The evaluation team's approach in these instances will be to have two experienced researchers review the data and independently produce a rationale justifying any recommended changes to the existing data. Such rationales will necessarily reference specific data and clearly explain why any deviations from the scoring algorithm are appropriate. Each rationale will include a specific description of the argument for any adjustments, along with the resulting change in the final NTGR (for instance, one researcher may decide that a No Program score should be adjusted for a specific reason – in this case the rationale will include a statement indicating the justification for such a change and the corresponding numerical difference in the final NTGR).

Once each researcher has produced an independent rationale for adjusting the NTGR components, the two researchers will share their results and decide on the most appropriate path forward. The final NTGR will come from the convergence of the two reviews. The line of reasoning from both researchers, including where they agreed, where they disagreed, and the final negotiated value, will be clearly documented.

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APPENDIX B: DATA COLLECTION DOCUMENTS

B.1 Product Staff Interview Guide

Introduction

This guide is to be used to interview staff associated with Xcel Energy's DSM products as part of the EMI Consulting 2017 evaluation of the Xcel Energy DSM products. 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.[10] 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 product resources are sufficient to conduct product activities with fidelity to the implementation plan
- Collect staff feedback on implementation successes and challenges
- Identify themes and issues for possible revisions to the evaluation plan

Interview

Section A: Introduction

[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 product, what Xcel hopes to achieve through implementing this product how it operates, and a bit about your experiences with the <PROGRAM NAME>. We are interested in asking you some questions about <PROGRAM NAME> so we can benefit from your knowledge and experience to improve our understanding of the product. I have a set of questions that should take approximately 45 - 60 minutes, depending upon your experiences and involvement with the product. 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. First, will you please take a moment and explain your overall role and scope of responsibilities with respect to the Cooling Efficiency product?

Probes:

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

- 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 does Energy Solutions play in product implementation?

Section B: Product Goals

I'd like to be sure I understand the goals of this product, both overall and specific. My understanding is that, with the midstream component, there are likely some longer-term market transformation goals in addition to the more immediate savings goals.

B1. Let's start big picture -- what are the overall goals for this product, and over what time horizon?

B1a. What specific energy and/or demand savings goals are associated with this product? Do you have specific goals for individual components of the product (e.g., upstream vs. downstream, by measure type)?

B1b. What specific market transformation goals, if any, are associated with this product?

B1c. Are there any other, non-energy goals?

Probes:

- Participation goals?
- Customer engagement goals?
- Improving customer satisfaction?
- Changing customer awareness of or attitudes about energy efficiency measures?
- Altering the market?
- GHG emissions?

B2. What are "indicators of success"?

B2a. What are interim indicators that the product 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 operation or outcomes of the product?

B4. How, if at all, has this product influenced the market?

Section C: Product Activities

I would like to make sure I have a solid understanding of how this product serves customers directly and how the processes that aren't visible to customers work. If there is any formal documentation that you can refer me to as we walk through these next questions, I'd appreciate getting copies.

C1. Let's start with the downstream component of the product. Will you please walk through how this part of the product operates?

Probes:

- How is the product marketed to customers?
- What equipment is eligible for rebates?
- How are incentive levels calculated?
- Is any sort of pre-approval required?
- Is any sort of post-installation inspection required?
- What aspects of the product, if any, have changed in recent years? What have been the effects of these changes?

C2. Continuing with the midstream component of the product, will you please walk me through how this part of the product operates?

Probes:

- How many distributors do you currently have participating?
  - How are distributors recruited? (i.e., marketing/outreach?)
  - What does the enrollment process look like for them?
  - Is there ongoing communication with participating distributors?
  - Is there verification of stocking and/or sales?
- How do contractors interact with the product?
  - Are there any requirements regarding how the incentive money is used by distributors?

Section D: Product Achievements

Now I have some questions about rebate numbers for both the downstream and midstream product components.

D1. Approximately how many downstream rebates were issued last year? Upstream rebates?

D2. How many downstream rebates do you expect to issue this product year? Upstream rebates?

Section E: Product Tracking and Reporting

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

E1. What kind of documentation is available for the product? Implementation plans? Product manuals? Process maps?

E2. What kinds of customer-specific data are collected for the Cooling Efficiency Product? What kinds of aggregated data are collected?

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

E4. Besides the upstream sales data, are there any data 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 product is running.

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

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

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

F3. Do you have sufficient resources to implement the product as designed?

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

F4. What feedback, if any, do you receive from customers and/or market partners on the product? (PROBE FOR CUSTOMER ENGAGEMENT/ CUSTOMER SATISFACTION)

F5. What do you believe are the biggest barriers to getting customers and/or market partners to participate in this product?

F6. Are there any specific opportunities for improvement in the design or implementation of the product? Please describe.

F7. What would you like to see changed in how the product is designed or run, if anything?

F7a. Do you think there are any roadblocks preventing these changes from happening?

Section G: Closing

G1. Based on the kickoff meeting, we are planning to prioritize <RESEARCH PRIORITIES>, does this align with your understanding? Do you have anything you would like to add to these priorities, remove from this set of priorities, or change about these priorities?

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 product 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.1 Participant 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 participating customers. This guide presents the questions to be covered in the in-depth interviews for the Xcel Energy Colorado Cooling Efficiency prescriptive and custom offerings. We will attempt a census of all customers who participated in either the prescriptive or custom offerings in 2016 (comprising approximately 27 prescriptive customers and 3 custom customers).
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 Cooling Efficiency product **process evaluation** are to:

- Explore trade partners' and customers' experience with the product.
- Explore the effects of downstream financial incentives.
- Assess the effects of the product on the overall availability of and interest in high efficiency cooling equipment.
- Understand motivation for product participation.
- Understand how the product may influence customer engagement and satisfaction with Xcel Energy.
- Identify opportunities for improving delivery of both product tracks.
- Understand product delivery and clearly document desired outcomes of each intervention and what data the product is tracking to inform continuous improvement.

The objectives of the **impact evaluation** are to:

- Develop a net-to-gross ratio documenting the product's influence on customer's decisions.
- Use benchmarking results to calibrate research focusing on "like" delivery methods.

The participating customer interviews do not address every evaluation objective. For reference, the following table provides the evaluation efforts used for each objective.

Evaluation Objectives	Research Activity
Process Evaluation	
Explore customers' experience with the product.	Distributor/contractor/customer interviews
Explore the effects of downstream/midstream financial incentives.	Distributor/contractor/customer interviews
Assess the effects of the product on the overall availability of and interest in high efficiency cooling equipment.	Distributor/contractor/customer interviews
Understand motivation for product participation.	Distributor/contractor/customer interviews
Understand how the product may influence trade partner/customer engagement and satisfaction with Xcel Energy.	Distributor/contractor/customer interviews
Identify opportunities to improve the delivery of downstream and midstream product tracks.	Staff interviews Distributor/contractor/customer interviews
Understand product delivery and clearly document desired outcomes of each intervention and what data the product is tracking to inform continuous improvement.	Program staff interviews/program data analysis
Identify market trends that may impact the Cooling Efficiency product in the future	Distributor/contractor interviews
Impact Evaluation	
Develop a net-to-gross ratio documenting the product's influence on customer's decisions.	Distributor/customer interviews
Use benchmarking results to calibrate research focusing on "like" delivery methods.	Program benchmarking

Specific research questions which this participating customer interview guide is designed to address are the following:

- What types of customers participate in the program? How many have participated in other energy efficiency programs?
- How do customers hear about the program? What contact do they have with Xcel Energy, and how would they like to be contacted?
- How well are the program's processes working for customers? What aspects of the program are easy for customers, and what is challenging?
- 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)?
- What are customers' primary motivations for participating in the program?
- What barriers do they face in pursuing additional projects?
- Are customers satisfied with their experience with the program, including all elements of program design? If not, why were they dissatisfied?
- Are customers satisfied with their experience with Xcel Energy as a utility? Does the program have any effect on this satisfaction?

The following table presents the link between each evaluation objective, research question, and interview question(s).

Research Objective	Research Question(s)	Interview Question Number(s)
Understand motivation for product participation.	What are customers' primary motivations for participating in the program?	B2
Explore trade partners' and customers' experience with the product.	How do customers hear about the program? What contact do they have with Xcel Energy, and how would they like to be contacted? How well are the program's processes working for customers? What aspects of the program are easy for customers, and what is challenging?	B1, C1 Section F
Explore the effects of downstream/midstream financial incentives.	How do customers perceive the downstream incentive levels?	F4
Assess the effects of the product on the overall availability of and interest in high efficiency cooling equipment.	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)?	Section D
Understand how the product may influence trade partner/customer engagement and satisfaction with Xcel Energy.	Are customers satisfied with their experience with Xcel Energy as a utility? Does the program have any effect on this satisfaction?	G1, G2
Identify opportunities to improve the delivery of downstream and midstream product tracks.	Are customers satisfied with their experience with the program, including all elements of program design? If not, why were they dissatisfied?	Section F, H1
Develop a net-to-gross ratio documenting the product's influence on customer's decisions.	n/a	Section D

Note that questions that feed directly into the net-to-gross calculation are marked by an asterisk (*).

Fielding Instructions

The following fielding guidelines should be used for participant recruiting and interviews:

- Attempt to reach each participant 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.
- Commercial customer calling hours are 9 AM to 5 PM UTC.
- Record interviews

Recruiting Dialog/Message Script

WHEN LEAVING A VOICE MESSAGE: Hi, this is **NAME** from EMI Consulting, calling on behalf of Xcel Energy. We're contacting customers who participated in the Xcel Energy Cooling Efficiency Program to better understand how Xcel Energy can improve this offering. I'd appreciate the opportunity to schedule a quick half-hour interview with you to discuss your experience. Additionally, we are offering a $25 gift card as a thank you. 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.

Interview Guide

Section A: Screener/Background Information

Thank you for agreeing to talk with me today. EMI Consulting is an independent third-party contractor hired by Xcel Energy to evaluate their Cooling Efficiency Program. 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.

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. I see COMPANY NAME participated in the Xcel Energy Cooling Efficiency Program, is this correct?

IF YES:

A1a. Are you the person at your firm who is most familiar with the Xcel Energy Cooling Efficiency Program?

IF NO: ASK TO SPEAK TO PERSON MOST FAMILIAR]
IF YES: CONTINUE

A2. Can you briefly describe your company's work?

PROBE FOR NAICS CATEGORIES

	Sector 11: Agriculture, Forestry, Fishing and Hunting
	Sector 21: Mining, Quarrying, and Oil and Gas Extraction
	Sector 22: Utilities
	Sector 23: Construction
	Sector 31-33: Manufacturing
	Sector 42: Wholesale Trade
	Sector 44-45: Retail Trade
	Sector 48-49: Transportation and Warehousing
	Sector 51: Information
	Sector 52: Finance and Insurance
	Sector 53: Real Estate and Rental and Leasing
	Sector 54: Professional, Scientific, and Technical Services
	Sector 55: Management of Companies and Enterprises
	Sector 56: Administrative and Support and Waste Management and Remediation Services
	Sector 61: Educational Services
	Sector 62: Health Care and Social Assistance
	Sector 71: Arts, Entertainment, and Recreation
	Sector 72: Accommodation and Food Services
	Sector 81: Other Services (except Public Administration)
	Sector 92: Public Administration

A3. What is your title or role at your company?

A4. Does your organization have multiple locations in CO?

A4a. **IF YES:** How many?

A4b. **IF YES:** How many of these locations have participated in an Xcel Energy efficiency program?

Section B: Awareness

B1. How did you first hear about the Xcel Energy Cooling Efficiency program?

B1a. Is this your preferred method for hearing about opportunities?

B1b. What are other ways that you would like to hear about Xcel Energy efficiency program opportunities?

B2. What was your primary motivation for participating in the Cooling Efficiency program?

B3. When you first heard about Xcel Energy's Cooling Efficiency program, was there any information that was particularly useful to you?

PROBE: incentive levels, materials, application process

B3a. What additional information about the program would have been useful to help you determine whether to participate in the Cooling Efficiency program?

Section C: Application and Program Implementation

C1. Were you the primary contact between your facility and the Xcel Energy program staff, or between your facility and your Xcel Energy Account Manager?

PROBE if needed: do you have an account manager?

C1a. **[If C1=Yes]** How did you communicate with the Xcel Energy representative and/or your account manager?

Probe: email, phone, in-person, mail, web chat

C1b. [IF more than 1 method mentioned in C1a] Which of these methods was most effective for communicating with program staff and/or account manager?

C1c. What is your preferred method for reaching Xcel Energy staff and/or your account manager?

C1d. [**IF C1=NO]** Who was the primary contact for the program staff or your account manager?

PROBE: Trade Partner/Contractor, someone else at their firm

C2. Did you work with a firm/contractor to conduct a study for your Cooling project? To implement/install the measures for your project?

C3. How did you decide to work with FIRM/CONTRACTOR?

PROBE: Who contacted who? Were you referred to FIRM/CONTRACTOR by anyone?

C4. How difficult or easy would you say it was to complete the following tasks associated with the Xcel Energy Cooling Efficiency Program on a scale from 1 to 5 where 1 is extremely difficult and 5 is extremely easy.

1. Complete program applications

2. Submit program applications
3. Complete rebate forms
4. Submit rebate forms
5. Determine your organization's program eligibility
6. Implement recommendations
7. Meet program deadlines
8. Get in touch with an Xcel Energy representative
9. Determine equipment / models that are eligible
10. Find a contractor to (*install measures*) (*conduct studies)*

C4a. Ask for any C4 responses LESS THAN 4: Please provide a sentence or two describing why it was not easy.

C5. About how long did it take to receive your rebate after completing and submitting the necessary paperwork?

C6. From the time work started to project completion, did the project take less or more time to complete than you expected?

Section D: Free-ridership and spillover

The purpose of this section is to learn the role of the program in your company's decision to install energy efficient equipment.

D1. In your own words, can you tell me why you decided to implement the project?

D1a. Did the project *have to be implemented at the time it was*? (i.e., because existing equipment had failed or some other logistical reason)
D1b. Did you participate in an energy assessment through Xcel Energy?
D1c. Did you participate in an Energy Analysis offered through Xcel Energy?

[LOOP D2 THROUGH D24 UP TO 3 TIMES, ONCE FOR EACH MEASURE]

MEASURE = Insert measure #1, measure #2, measure #3 each loop through:

D2. When did you first learn about the Cooling Efficiency program? Was it *before* or *after* you first began to *think* about implementing the MEASURE?

1 before
2 after
3 other – **Answer:**

D3. Where did the idea for the project come from? [IF NEEDED: Did your company develop the idea, was it suggested by a vendor or consultant or your key account manager, was it the result of a study, was it part of a larger expansion or remodeling effort?]

PROBES:

a. Energy Analysis through Xcel Energy

D4.* Did you learn about the availability of incentives through the Cooling Efficiency program *before* or *after* you *decided* to implement the project?

1 before
2 after
3 other – **Answer:**

D5. [IF COMPLETED AN ENERGY ANALYSIS THROUGH XCEL, D1c = YES]

D5a. What role did the firm that conducted the study play in the decision to implement the MEASURE?

D5b. Did the Xcel Energy sponsored study influence the energy efficiency level of the MEASURE you ultimately selected?

1 yes
2 no

[If yes] how?

D5c. If the Xcel Energy Cooling Efficiency program hadn't been available, what is the likelihood that you would have performed the study on your own, using a 0-to-10 scale where 0 is "not at all likely" and 10 is "extremely likely"?

D6. Were there any other firms or individuals involved in the decision to implement the MEASURE? If so, who were they?

D7.* Next, I'm going to ask you to rate the importance of the Cooling Efficiency program as well as other factors that might have influenced your decision to implement the MEASURE. Think of the degree of importance as being shown on a scale with equally spaced units from 0 to 10, where 0 means "not at all important" and 10 means "extremely important". Now using this scale please rate the importance of each of the following factors in your decision to implement the measure at the time that you did. (If needed: How important in your DECISION to implement the MEASURE was the…)

[RECORD 0-10 RATING FOR EACH]

Program Factors
D7a. The availability of the incentive offered by Xcel Energy
D7b. The technical assistance offered by Xcel Energy staff
D7c. [If received a study] Technical assistance from the firm that conducted the Xcel Energy sponsored study
D7d. Endorsement or recommendation by your Xcel Energy account manager
D7e. Recommendation from an equipment vendor or contractor affiliated with Xcel Energy that helped you with the choice of the equipment
D7f. Information from Xcel Energy marketing or informational materials
D7g. Past experience with the program (or a similar program)

Non-program factors

D7h. Previous experience with this type of equipment
D7i. Standard practice in your business/industry
D7j. Corporate policy or guidelines
D7k. Payback on the investment
D7l. Minimizing operating cost
D7m. Maximizing facility reliability
D7n. Positive marketing or public relations for your company
D7o. Recommendation from a design or consulting engineer or vendor not affiliated with Xcel Energy
D7p. Were there any other factors we haven't discussed that were influential in your decision to implement the MEASURE?

Thinking about this differently, I would like you to compare the importance of Xcel's Cooling Program with the importance of other factors in implementing the MEASURE.
You just told me that the following factors were important:

[Read only the items that they gave a rating of 8 or higher in D7a-D7p]

D8.* If you were given a TOTAL of 10 points to divide between the importance of the program and the importance of non-program factors, in your decision to implement the Cooling MEASURE how many points would you give to the importance of the Xcel Cooling Efficiency program?

Answer:

D9. And how many points would you give to other non-program factors? [NOTE: the total of D8 and D9 should total 10 points.]

Answer:

****

Consistency check on program importance score
[Ask If (D8> 7 AND no program factors in D7a-D7g >3) else skip to D12]

D10. You just gave <D8 RESPONSE> points to the importance of the program, I would interpret that to mean that the program was quite important to your decision to install this equipment. Earlier, when I asked about the importance of individual elements of the program I recorded some answers that would imply that they were not that important to you. Just to make sure I understand, would you explain why the program was very important in your decision to install the MEASURE? [IF NEEDED, ask about specific program elements rated highly in D7]

[Ask If (D8<3 AND any program factors in D7a-D7g >7) else skip to D12]

D11. You just gave <D8 RESPONSE> points to the importance of the program. I would interpret that to mean that the program was not very important to your decision to install this equipment. Earlier, when I asked about the importance of individual elements of the program I recorded some answers

that would imply that they were very important to you. Just to make sure I understand, would you explain why the program was not very important in your decision to install this equipment?

Now I would like you to think about the action you would have taken with regard to installing this measure if the Xcel Energy Cooling Efficiency program had not been available.

D12.* 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 exactly the same MEASURE if the Xcel Energy Cooling Efficiency program had not been available. When I say "exactly the same," I mean the same type of equipment *and* the same efficiency level.

[ASK IF PROJECT WAS NOT REPLACE-ON-BURNOUT (D1b) AND D12>0, ELSE SKIP TO D14]

D13.* Without the program, when do you think you would have installed this equipment? [READ LIST]

1 At the same time
2 Earlier
3 Later
4 (Never)

[ASK IF D13=3 (later)]

D13a. How much later would you have implemented the Cooling MEASURE? Would you say…

1 Within 6 months
2 more than 6 months and up to 1 year later
3 more than 1 year and up to 2 years later
4 more than 2 years and up to 3 years later
5 more than 3 years and up to 4 years later
6 more than 4 or more years later
7 DK

****

CONSISTENCY CHECKS
[ASK D14a-c IF D7a > 7 AND D12 > 3]

D14. When you answered ...<D7a RESPONSE> ... for the question about the influence of the incentive, I would interpret that to mean that the incentive was quite important to your decision to implement the Cooling MEASURE. Then, when you answered <D12 RESPONSE> for how likely you would be to install the same equipment without the incentive, it sounds like the incentive was not very important in your installation decision.

I want to check to see if I am misunderstanding your answers or if the questions may have been unclear. Will you explain the role the incentive played in your decision to install this efficient equipment?

Answer:

D14a. Would you like for me to change your score on the importance of the incentive that you gave a rating of <D7a RESPONSE> or change your rating on the likelihood you would implement the Cooling MEASURE without the incentive which you gave a rating of <D12 RESPONSE> and/or we can change both if you wish?

1 (Change importance of incentive rating)
2 (Change likelihood to install the same equipment rating)
3 (Change both)
4 (No, don't change)

[ASK IF D14a=1,3]

D14b. How important was… availability of the PROGRAM incentive? (IF NEEDED: in your DECISION to implement the Cooling MEASURE)

0 to 10 rating:

[ASK IF D14a=2,3]

D14c. If the utility program had not been available, what is the likelihood that you would have implemented the Cooling MEASURE?

0 to 10 rating:

****

Corporate Policy Questions
[ASK IF D7j > 6 ELSE D20]

D15. Does your organization have a corporate environmental policy to reduce environmental emissions or energy use? Some examples would be to "buy green" or use sustainable approaches to business investments.

[ASK D16-D18 IF D15=YES ELSE D20]

D16. What specific corporate policy, if any, influenced your decision to implement the Cooling MEASURE through Xcel Energy's Cooling Efficiency program?

D17. Did that policy cause you to adopt energy efficient measures at this facility before participating in Xcel Energy's Cooling Efficiency program?

D17a. Did you receive an incentive for installing that previous measure?

D18. Does <COMPANY> ever deviate from the corporate policy when installing cooling equipment?

[ASK IF D17=YES ELSE D23]

D19. If I understand you correctly, you said that <COMPANY>'s corporate policy has caused you to install energy efficient measures previously at this facility. I want to make sure I fully understand how this corporate policy influenced your decision versus the Xcel Energy Cooling Efficiency program. Can you please clarify that?

Standard Practice Questions

[ASK IF D7i >7 ELSE D25]

D20. In an earlier question, you rated the importance of STANDARD PRACTICE in your industry very highly in your decision making. Could you please rate the importance of the PROGRAM, relative to this standard industry practice, in influencing your decision to implement the Cooling MEASURE. Would you say the program was much more important, somewhat more important, equally important, somewhat less important, or much less important than the standard practice or policy?

1 (Much more important)
2 (Somewhat more important)
3 (Equally important)
4 (Somewhat less important)
5 (Much less important)

D21. Approximately, how long has use of MEASURE been standard practice in your industry?

D22. Does <COMPANY> ever deviate from the standard practice for energy efficient measures?

D23. How did this standard practice influence your decision to implement the Cooling MEASURE through Xcel Energy's Cooling Efficiency program?

D24. Could you please rate the importance of Xcel Energy's Cooling Efficiency Program, versus this standard industry practice in influencing your decision to implement the Cooling MEASURE? Would you say Xcel Energy's Cooling Efficiency Program was…

1 Much more important
2 Somewhat more important
3 Equally important
4 Somewhat less important

5 Much less important

END FREERIDERSHIP MEASURE LOOP. GO BACK to D2 if needed.

SPILLOVER QUESTIONS

Thank you for discussing the new Cooling measures that you installed through the Cooling Efficiency Program. Next, I would like to discuss any energy efficient equipment you might have installed OUTSIDE of the program.

D25.* Since receiving a rebate for the project(s) we just discussed, did you implement any ADDITIONAL energy efficiency improvements at this facility or at your other facilities within Xcel Energy's service territory that you did NOT receive incentives for?

1 Yes
2 No

[ASK IF D25. = Yes ELSE E1]

D25a. Do you plan to apply for incentives for these energy efficiency measure(s) through a utility program in the future?

1 Yes
2 No

D25b. Which program do you plan to apply to for incentives for these measures?

D25c. Approximately when do you plan to apply for incentives through these programs?

[ASK IF D25 = YES, ELSE E1]

D26.* What measures did you implement without an incentive?

[Repeat D27-D30 for each end use]

D27. I have a few questions about the [first, second, third] measure that you installed. (If needed, read back measure.]

a. Can you briefly explain why you decided to install this energy efficiency measure(s) on your own, rather than going through a utility or government incentive program?
b. Why did you not install this measure through the Xcel Energy Program?
c. How many of this measure did you install?
d. Please describe the SIZE, TYPE, and OTHER ATTRIBUTES of this measure.
e. Please describe the EFFICIENCY of this measure.
f. When did you install this measure?

D28. Was this measure recommended by a program related study, report, trade partner or your key account manager?

D29. How important was your experience in Xcel Energy's Cooling Efficiency Program in your decision to implement this <MEASUREX>? Please use a scale of 0 to 10, where 0 is not at all important and 10 is extremely important.

D29a. Can you explain how your experience with the Xcel Energy's Cooling Efficiency program influenced your decision to install this additional high-efficiency measure?

D30. If you had not participated in the Xcel Energy's Cooling Efficiency program, how likely is it that your organization would still have implemented <MEASURE>? Please use 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.

[END LOOP FOR EACH MEASURE]

[If D25=Yes] Thank you for sharing this information. As we assess the information we've collected from these surveys we may want to contact you further to learn more about these measures you've installed at your facility.

Section E: Barriers to Participation

E1. To what extent did you consider having additional upgrades beyond the installed measures through the Xcel Cooling Efficiency program?

E1a. **IF SOMEWHAT OR MORE:** What else did you consider having done?

E1b. Which of the following best describes your reason for not pursuing these additional upgrades / services?

PROBE:

1. Lack of knowledge about Xcel Energy energy efficiency programs
2. Lack of knowledge regarding equipment cost
3. Lack of knowledge regarding eligibility for Xcel Energy energy efficiency programs
4. Lack of knowledge regarding rebate amounts
5. Amount of time it takes to install equipment
6. Amount of time it takes to get audit
7. Upgrades are not relevant to my facility
8. Getting upgrades approved
9. Finding a trustworthy contractor/trade partner to perform the measure installation or engineering study
10. Amount of paperwork
11. Program requirements
12. Other ____

Section F: Satisfaction (Programs and Components)

Using a scale from 1 to 5, where 1 is extremely dissatisfied and 5 is extremely satisfied, please rate your satisfaction with the following items:

F1. Your **overall satisfaction** with the Cooling Efficiency Program?

F1a. IF F1<5: What could Xcel Energy do to increase your satisfaction with the Cooling Efficiency Program?

F2. The **Xcel Energy Cooling Efficiency Program staff**?

F3. The **equipment you received a rebate for as part of the** Cooling Efficiency Program?

F4. The size of the Cooling Efficiency Program **rebate**?

F5. **The amount of time it took to receive your rebate**?

F6. The amount of time it took to go through the whole process?

F7. Is there anything the Xcel Cooling Efficiency program is doing especially well and should keep doing?

G: Net Promoter

G1. How likely is it that you would recommend the Cooling Efficiency program to a colleague or professional contact?

(0) Not at all likely - - - - - - - - - (10) Very likely

[If G1 < 9, ASK FOR BRIEF EXPLANATION]

G2. How likely is it that you would recommend Xcel Energy to a colleague or professional contact?

(0) Not at all likely - - - - - - - - - (10) Very likely

[IF G2 < 9, ASK FOR BRIEF EXPLANATION]

PROBE: Did your experience with the Cooling Efficiency program impact your view of Xcel Energy?

Section H: Closing

H1. Do you have any recommendations for improving the Cooling Efficiency program?

H2. We're also interested in keeping up with any trends or emerging market factors relevant to the commercial cooling market. Do you see any big developments happening now or on the horizon?

H3. Is there anything we didn't cover that you'd like to mention or discuss about your experiences as a participant in the Xcel Energy Cooling Efficiency Program?

H4. Thank you. Those are all the questions I have today.

THANK AND TERMINATE

B.2 Contractor Interview Guide

Introduction

To support the process and impact evaluation of the 2016 Xcel Energy efficiency products, members of the EMI Consulting evaluation team are conducting in-depth telephone interviews with contractors. This guide presents the questions to be covered in the in-depth interviews for the Xcel Energy CO Cooling Efficiency product. We will interview two types of contractors only: (1) contractors who have recently participated in either the prescriptive (downstream) or custom product offerings, and (2) contractors who purchase large quantities of measures incented through the midstream program. The sample for these interviews will come from program data for the prescriptive/custom offerings, and from distributor referrals for the midstream offering.

The remainder of the introduction provides the research questions that this guide is designed to address and fielding instructions for the interviewees.

Evaluation Objectives

The objectives for the CO Cooling Efficiency product process evaluation are to:

- Explore trade partners' and customers' experience with the product.
- Explore the effects of midstream financial incentives.
- Assess the effects of the product on the overall availability of and interest in high efficiency cooling equipment.
- Understand motivation for product participation.
- Understand how the product may influence customer engagement and satisfaction with Xcel Energy.
- Identify opportunities for improving delivery of both product tracks.
- Understand product delivery and clearly document desired outcomes of each intervention and what data the product is tracking to inform continuous improvement.
- Identify market trends that may impact the Cooling Efficiency product in the future.

The objectives of the impact evaluation are to:

- Develop a net-to-gross ratio documenting the product's influence on customer's decisions.
- Use benchmarking results to calibrate research focusing on "like" delivery methods.

The contractor interviews do not address every evaluation objective. The following table provides the evaluation efforts used for each objective.

Evaluation Objectives	Research Activity
Process Evaluation	
Understand motivation for [downstream] product participation.	Distributor/contractor/customer interviews
Explore trade partners' and customers' experience with the [downstream] product.	Distributor/contractor/customer interviews
Explore the effects of midstream financial incentives.	Distributor/contractor/customer interviews
Assess the effects of the product on the overall availability of and interest in high efficiency cooling equipment.	Distributor/contractor/customer interviews
Understand how the product may influence trade partner/customer engagement and satisfaction with Xcel Energy.	Distributor/contractor/customer interviews
Identify opportunities to improve the delivery of downstream and midstream product tracks.	Staff interviews Distributor/contractor/customer interviews
Understand product delivery and clearly document desired outcomes of each intervention and what data the product is tracking to inform continuous improvement.	Program staff interviews/program data analysis
Identify market trends that may impact the Cooling Efficiency product in the future.	Distributor/contractor interviews
Impact Evaluation	
Develop a net-to-gross ratio documenting the product's influence on customer's decisions.	Distributor/customer interviews
Use benchmarking results to calibrate research focusing on "like" delivery methods.	Program benchmarking

Specific research questions that this contractor interview guide is designed to address are the following:

- [PRESCRIPTIVE AND CUSTOM] Why did they decide to be a registered contractor? What motivated their decision to participate in the product?
- [PRESCRIPTIVE AND CUSTOM] What is the contractors' experience with the product and with other Xcel Energy energy efficiency products?
- [MIDSTREAM] What are contractors' perceptions of trends in high efficiency cooling equipment since 2015? Have contractors seen evidence of distributor activities related to midstream incentives?

- [PRESCRIPTIVE AND CUSTOM] How do contractors sell projects? What is the role of the product in helping them sell projects, and what motivates their customers to participate?
- What do contractors see as the direction of the cooling market? Are there emerging technologies that the product should consider?
- [PRESCRIPTIVE AND CUSTOM] What barriers do contractors face in participating in the product? Are there actions Xcel Energy can take to increase participation? Are there actions Xcel Energy can take to improve the product?
- [PRESCRIPTIVE AND CUSTOM] How satisfied are contractors with their experience with the product? What do contractors like about the product, and what do they think could be improved?
- [PRESCRIPTIVE AND CUSTOM] What would contractors' business be like in absence of the product? How would the percentage of EE equipment that they sell change if the product were not available?

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

Research Objective	Research Question(s)	Interview Question Number(s)
Understand motivation for product participation.	[PRESCRIPTIVE AND CUSTOM] Why did they decide to be a registered contractor? What motivated their decision to participate in the product?	Section B
Explore trade partners' and customers' experience with the product.	[PRESCRIPTIVE AND CUSTOM] What is the contractors' experience with the product and with other utility energy efficiency products? [PRESCRIPTIVE AND CUSTOM] How do contractors sell projects? What is the role of the product in helping them sell projects, and what motivates their customers to participate?	Section C Section D
Explore the effects of midstream incentives.	[MIDSTREAM] What are contractors' perceptions of trends in high efficiency cooling equipment since 2015? Have contractors seen evidence of distributor activities related to midstream incentives?	F1, F6, F7
Assess the effects of the product on the overall availability of and interest in high efficiency cooling equipment.	[PRESCRIPTIVE AND CUSTOM] What would contractors' business be like in absence of the product? How would the percentage of EE equipment that they sell change if the product were not available?	Section F

Research Objective	Research Question(s)	Interview Question Number(s)
Understand how the product may influence trade partner/customer engagement and satisfaction with Xcel Energy.	[PRESCRIPTIVE AND CUSTOM] How satisfied are contractors with their experience with the product? What do contractors like about the product, and what do they think could be improved?	Section G
Identify opportunities to improve the delivery of downstream and midstream product tracks.	[PRESCRIPTIVE AND CUSTOM] What barriers do contractors face in participating in the product? Are there actions Xcel Energy can take to increase participation? Are there actions Xcel Energy can take to improve the product?	Section E
Identify market trends that may impact product in the future	What are trends in efficiency levels over time? What do contractors see as the direction of the cooling market? Are there emerging technologies that the product should consider?	Section F

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 contractor recruiting and interviews:

- Attempt to reach each 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 CST.
- Record interviews
- Definitions:

  COMPANY NAME = Update COMPANY NAME with Contractor's company name

Telephone Recruiting Dialog/Message Script (Prescriptive/Custom)

[INTRO:] Hi, this is NAME from EMI Consulting, calling on behalf of Xcel Energy. We're contacting professionals that have worked on projects in the Xcel Energy Cooling 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 Cooling Efficiency Program?

[ONCE CONTACT IS ON THE PHONE, REPEAT INTRO AS NEEDED:] EMI Consulting is an independent third-party contractor hired by Xcel Energy to evaluate their Cooling 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 (Prescriptive/Custom)

Hello _____,
I work for EMI Consulting, an independent third-party contractor hired by Xcel Energy to evaluate their Cooling Efficiency Program. I am contacting professionals that have worked on projects in the Xcel Energy Cooling Efficiency Program to learn how Xcel Energy can improve their program. Regardless of whether you've completed many Cooling 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 $50 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.

Survey/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?

A4. What types of customers does COMPANY NAME typically serve? [**PROBE:** In general, do you serve commercial, residential, multifamily?]

(POTENTIAL FOLLOW-UP QUESTIONS:)

1. Has this changed over time?
2. Approximately what percentage of your sales are to residential vs. commercial customers?

3. Overall, approximately what percentage of the units you sell to commercial customers are code-minimum?

A5. Which of the following equipment types does COMPANY NAME sell to commercial customers in Colorado?

[NOTE: MIDSTREAM AND DOWNSTREAM DESIGNATION ARE FOR INTERNAL USE ONLY]

Measure Type	Downstream	Sells?
Air-Cooled Chillers	x	
Screw/Scroll Chillers	x	
Centrifugal Chillers	x	
DX Units < 5.4 Tons	x	
DX Units >= 5.4 tons	x	
Mini-Split AC	x	
Mini-Split Heat Pump	x	
Anti-Sweat Heater - Low Temp	x	
DEPACC (direct evaporative pre-cooling for air-cooled condensers for either RTUs or air-cooled chillers)	x	
EC Motors	x	
Plate & Frame Heat Exchangers	x	
VFD Chiller Retrofit	x	
Water-source Heat Pumps	(2015)	

A6. To your knowledge, how long has COMPANY NAME been a registered Trade Partner for the Cooling Efficiency program?

Section B: Awareness

B1. How did you initially learn about becoming a Trade Partner for the Cooling Efficiency program?

(POTENTIAL FOLLOW-UP QUESTIONS:)

1. Is this your preferred method for hearing about opportunities?

2. What are other ways that you like to hear about Xcel Energy Trade Partner opportunities?

3. What program information was most useful for you when deciding to participate in the Cooling Efficiency program? [**PROBE:** incentive levels, materials, application process]

B2. What are the reasons why your firm decided to register as a Trade Partner?

Section C: Motivations/Barriers to be a Registered Trade Partner

C1. Over the years, what have been your primary motivations/reasons for staying a registered Trade Partner?

1. Have your motivations/reasons changed over the years?

2. If yes, how so?

C2. Our records indicate that your firm has participated in [INSERT VALUE FROM PROGRAM DATA] projects through the Xcel Energy Cooling Efficiency program since 2015.

1. What have been the biggest challenges that have prevented your organization from completing additional Cooling Efficiency projects?

2. What would motivate you to complete more projects through the program? (PROBE: additional resources, higher rebates, more program support, shorter applications, more eligible equipment).

Section D: Trade Partner Marketing

D1. What sales techniques do you use to attract customers into the Xcel Cooling Efficiency product?? [**PROBE**: brochures, cold calls, ads, door to door]

D2. At what point in the project do you talk to your customers about the Cooling Efficiency program?

D3. What aspects of the Cooling Efficiency program do you discuss with customers?

1. What do you think motivates customers to participate?

D4. 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. Can you provide an example of how you typically approach rebates/incentives discussions for the Cooling Efficiency program?

    a. What questions or concerns do customers have during initial discussions about rebates/incentives, if any?

3. How big of a factor are the Cooling Efficiency program rebates/incentives when customers are deciding to fund a project?

a. To what extent does discussing rebates/incentives help or hurt the sale?

4. Are there ever instances when you don't mention rebates/incentives during sales discussions with customers?

a. When?

b. What are the reasons why?

D5. Do you sell any eligible projects without applying for incentives/rebates?

a. What are the reasons why?

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 have you submitted per year, on average?

1. Thinking back to 2016, would you say your involvement increased, decreased, or stayed the same compared with previous years?

a. [**PROBE:** Would you say the number of projects you have completed through the program increased, decreased or stayed the same?]

b. [**PROBE:** Would you say the size/scope of projects you have completed through the program increased, decreased or stayed the same?]

2. [**IF INCREASE/ DECREASE**:] What are the reasons why your involvement has increased/decreased?

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

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

E3. Are there (other) challenges related to selling this EQUIPMENT?

1. Is there anything Xcel can do to help resolve these challenges?

Section F: Evolving Market Place

F1. [REFER TO SECTION A, SELECT UP TO THREE TYPES OF EQUIPMENT BASED ON SAMPLE DESIGN OR MENTIONED IN A5, ASSIGN TO <MEASURETYPE> AND LOOP THROUGH F1 FOR EACH TYPE]

Currently, about what percent of the <MEASURETYPE> units you sell to customers in Xcel Energy's service territory are considered high efficiency?

(NOTE: EACH CONTRACTOR SHOULD HAVE A CUTSHEET WITH THE EFFICIENCY REQUIREMENTS FOR EACH TECHNOLOGY TYPE. INTERVIEW MAY ASK CONTRACTOR TO REFER TO THESE REQUIREMENTS)

1. Thinking back to 2015, about what percent of <MEASURETYPE>s you sold to customers in Xcel Energy's service territory then were considered high efficiency?

2. [IF DIFFERENCE BETWEEN CURRENT AND 2015] Why do you think the percentage of high efficiency sales today is different than in 2015?

3. Now imagine that the Xcel Energy program were not available, and you were not able to offer rebates for equipment or have any program support. About what percent of the equipment you sell to customers in Xcel Energy's service territory do you think would be high efficiency?

F2. More broadly, how would your business be affected if Xcel Energy Cooling Efficiency rebates were not available? **(PROBE:** employees, sales techniques, number of clients, time it takes to sell projects)

F3. Do you do any work outside of Xcel Energy's service territory? About what percent of the equipment you sell outside of Xcel Energy's service territory is considered high efficiency? (PROBE ON SAME MEASURES DISCUSSED IN F1)

F4. [GENERAL] Now I have a few more general questions.

What do you see as new/emerging energy efficiency opportunities in the HVAC cooling market?

F5. [GENERAL] What energy codes or regulatory changes do you see coming into the future that may affect code baselines?

F6. [GENERAL] Have you participated in any workshops, seminars, or classes since 2015 related to specific types of cooling equipment?

1. [IF YES] What types of equipment were these trainings for?

2. [IF YES] Who offered these trainings?

F7. [GENERAL] Have you noticed any sales trends related to a type of cooling equipment ***not*** covered by the Cooling Efficiency rebate in the past few years?

1. [IF YES] What types of equipment?

2. What type of trend?

F8. [GENERAL] What types of equipment would benefit most from being included in the Cooling Efficiency rebate program?

Section G: Satisfaction

G1. What is the Cooling 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 Cooling Efficiency program that you think Xcel Energy should know?

Section I: Closing

I1. Is there anything we didn't cover that you'd like to mention or discuss about your experiences as a registered Trade Partner for Cooling Efficiency program?

I2. Thank you. Those are all the questions I have today.

[THANK AND TERMINATE]

B.3 Distributor 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 Distributors. This guide presents the questions to be covered in the in-depth interviews for the Xcel Energy Colorado Cooling Efficiency program. We will interview participating distributors. The sample for these interviews will include the top ten highest-grossing distributors (by kWh) in the midstream product offering. If we are unable to speak with all ten of these distributors, we may attempt to speak with distributors outside the top ten. Where appropriate, the relative size of each distributor's sales will be incorporated into the final results.
The remainder of the introduction provides the research questions that this guide is designed to address and fielding instructions for the interviewees.

Evaluation Objectives

The objectives for the CO Cooling Efficiency product process evaluation are to:

- Explore trade partners' and customers' experience with the product.
- Explore the effects of midstream financial incentives.
- Assess the effects of the product on the overall availability of and interest in high efficiency cooling equipment.
- Understand motivation for product participation.
- Understand how the product may influence customer engagement and satisfaction with Xcel Energy.
- Identify opportunities for improving delivery of both product delivery channels.
- Understand product delivery and clearly document desired outcomes of each intervention and what data the product is tracking to inform continuous improvement.
- Identify market trends that may impact the Cooling Efficiency product in the future

The objectives of the impact evaluation are to:

- Develop a net-to-gross ratio documenting the product's influence on customer's decisions.
- Use benchmarking results to calibrate research focusing on "like" delivery methods.

The distributor interviews do not address every evaluation objective. For reference, the following table provides the evaluation efforts used for each objective.

Evaluation Objectives	Research Activity
Process Evaluation	
Explore trade partners' and customers' experience with the product.	Distributor/contractor/customer interviews
Explore the effects of midstream financial incentives.	Distributor/contractor/customer interviews
Assess the effects of the product on the overall availability of and interest in high efficiency cooling equipment.	Distributor/contractor/customer interviews
Understand motivation for product participation.	Distributor/contractor/customer interviews
Understand how the product may influence trade partner/customer engagement and satisfaction with Xcel Energy.	Distributor/contractor/customer interviews
Identify opportunities to improve the delivery of downstream and midstream product tracks.	Staff interviews Distributor/contractor/customer interviews
Understand product delivery and clearly document desired outcomes of each intervention and what data the product is tracking to inform continuous improvement.	Program staff interviews/program data analysis
Identify market trends that may impact the Cooling Efficiency product in the future	Distributor/contractor interviews
Impact Evaluation	
Develop a net-to-gross ratio documenting the product's influence on customer's decisions.	Distributor/customer interviews
Use benchmarking results to calibrate research focusing on "like" delivery methods.	Program benchmarking

Specific research questions that this distributor interview guide is designed to address are the following:

- What is the distributors' experience with the product and with other utility energy efficiency programs?
- What motivated their decision to participate in the program?
- What is the role of the product in helping them sell EE units, and what motivates their customers to buy them?
- How do distributors perceive the midstream incentives? How do they use these funds? What is the perceived impact on their business practices?
- What do distributors see as the direction of the cooling market?
- What barriers do distributors face in participating in the program? Are there actions Xcel Energy can take to increase participation?
- How satisfied are distributors with their experience with the program? What do distributors like about the product, and what do they think could be improved?

- What would distributors' business be like in absence of the product? How would the percentage of EE equipment that they sell change if the product were not available?

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

Research Objective	Research Question(s)	Interview Question Number(s)
Understand motivation for product participation.	What motivated their decision to participate in the program?	B1-B2
Explore trade partners' and customers' experience with the product.	What is the distributors' experience with the product and with other utility energy efficiency programs?	C1-C2, A8
	What is the role of the product in helping them sell EE units, and what motivates their customers to buy them?	C3
Explore the effects of midstream financial incentives.	How do distributors perceive the midstream incentives? How do they use these funds? What is the perceived impact on their business practices?	D1-D8
Assess the effects of the product on the overall availability of and interest in high efficiency cooling equipment.	What would distributors' business be like in absence of the product? How would the percentage of EE equipment that they sell change if the product were not available?	D9-D10 sequence
Understand how the product may influence trade partner/customer engagement and satisfaction with Xcel Energy.	How satisfied are distributors with their experience with the program? What do distributors like about the product?	E1-E2
Identify opportunities to improve the delivery of downstream and midstream product tracks.	What do distributors like about the product, and what do they think could be improved?	E3-E4
Identify market trends that may impact the product in the future.	What do distributors see as the direction of the cooling market?	F1-F3
Develop a net-to-gross ratio documenting the product's influence on customer's decisions.	n/a	Section D

Note that questions marked with an asterisk (*) will feed directly into the net-to-gross calculations during analysis.

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 distributor/contractor recruiting and interviews:

- Attempt to reach each distributor/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 CST.
- Record interviews
- Definitions:

  COMPANY NAME = Update COMPANY NAME with Distributor's/Contractor's company name

Telephone Recruiting Dialog/Message Script

[INTRO:] Hi, this is **NAME** from EMI Consulting, calling on behalf of Xcel Energy. We're contacting distributors involved with the midstream component of Xcel Energy's Cooling Efficiency program to learn how Xcel Energy can improve this offering. May I please speak with <CONTACT> or the person most familiar with your company's participation in Xcel's midstream Cooling Efficiency Program?

[ONCE CONTACT IS ON THE PHONE, REPEAT INTRO AS NEEDED:] EMI Consulting is an independent third-party contractor hired by Xcel Energy to evaluate the midstream component of their Cooling Efficiency Program. 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.

[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 EMI Consulting, an independent third-party contractor hired by Xcel Energy to evaluate the midstream component of their Cooling Efficiency Program. I am contacting distributors involved with the Xcel Cooling Efficiency program to learn how Xcel Energy can improve this offering. 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.

Email Confirmation Text with Program Equipment Efficiency Information

[NOTE: This email should be sent out the day before the scheduled interview and will include a cut sheet of program equipment categories and efficiency tiers.]

Hello _____,

I am looking forward to speaking with you tomorrow regarding your experiences with the Xcel Energy Cooling Efficiency program. I am attaching some program information that I would like you to reference during the call.

Survey/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 ask you a few questions about your role:

A1. What is your title or role at COMPANY NAME [**PROBE:** Owner, Manager, Engineer, Contractor, Field Technician, Project Manager, etc.]

A2. What are your primary responsibilities at COMPANY NAME?

A3. How many locations does your company operate within Xcel's service territory in Colorado?

4. [IF MORE THAN ONE LOCATION] For how many of these locations do you have job responsibilities?

A4. Can you briefly describe your company's largest target markets? **[PROBE FOR TECHNOLOGIES]**

A5. What types of customers does COMPANY NAME typically serve? [**PROBE:** In general, do you serve commercial, industrial, residential?]

(POTENTIAL FOLLOW-UP QUESTIONS:)

1. Has this changed over time?

2. [**IF YES:**] Did the Cooling Efficiency program have anything to do with this change?

A6. Which of the following equipment types does COMPANY NAME sell through the midstream Cooling Efficiency program?

1. Air-cooled chillers
2. Direct expansions (DX) units < 5.4 tons (typically these are rooftop units, or RTUs)
3. Direct expansions (DX) units >= 5.4 tons (typically these are rooftop units, or RTUs)
4. Packaged-terminal AC (PTAC) units
5. Water-source heat pumps

A7. To your knowledge, how long has COMPANY NAME been participating in the CO midstream Cooling Efficiency program?

A8. To your knowledge, has COMPANY NAME participated in any other programs offered by Xcel Energy in Colorado?

Section B: Awareness

B1. How did you initially learn about becoming involved with the midstream Cooling Efficiency program?

(POTENTIAL FOLLOW-UP QUESTIONS:)

4. Is this your preferred method for hearing about opportunities?

5. What are other ways that you like to hear about Xcel Energy program opportunities?

6. What were the key considerations when deciding to participate in the Cooling Efficiency midstream program? [**PROBE:** incentive levels, incentive processing]

B2. What are the reasons why your firm decided to register for the program?

B3a. Do you receive periodic information on sales ranking from Xcel Energy?

B3b. [IF B3a = YES] How much influence does this information have on the choice of strategies you spend the incentive dollars on?

__ No influence
__ Some influence
__ Significant influence

Section C: Experiences in the Program

C1. Can you briefly describe your experience with the midstream Cooling Efficiency program since you began?

C2. What have been your primary motivations/reasons for staying involved in the midstream program?

1. Have your motivations/reasons changed over the years?

2. If yes, how so?

C3. What is it about the midstream Cooling Efficiency program that helps you sell energy efficient equipment to your customers?

C4. Is the Cooling Efficiency program more helpful for certain types of sales transactions? If so, which ones?

[PROBE FOR THE FOLLOW TRANSACTION TYPES]

1. Design Build (generally without competitive bidding)
2. Design Specification (competitive bidding)
3. Direct Sales (one-on-one sales transaction between two market actors, e.g., distributor and contractor or distributor and large customer)
4. Indirect Sales (sales between more than two market actors, e.g., mechanical engineer, distributor, contractor)
5. Counter Sales (where contractor comes to distributors and purchases unit)

Section D: Program Impacts

D1. Generally speaking, can you describe how the program has changed the way you do business in the Xcel Energy service territory in CO?

[RECORD OPEN-END RESPONSE]

Now I have some questions about efficiency levels. When I say "program qualified," I mean that the unit must qualify for a midstream incentive from the program. [REFERENCE EFFICIENCY REQUIREMENTS AS NEEDED]

D2a. Prior to the program, did you have any specific plans to promote program-qualified units?

__Yes
__No
__DK

D2b. [IF YES, ASK] Can you briefly describe these plans?

D3. Currently, which of the following strategies do you use to sell more program-qualified units?

J.	Upsell contractors to purchase program-qualified units	__Yes
K.	Conduct training workshops for contractors	__Yes
L.	Increase marketing of program-qualified units	__Yes
M.	Reduce the prices of program-qualified units	__Yes
N.	Increase the stocking or assortment of program-qualified units	__Yes
O.	Discuss the benefits of program-qualified units with design professionals (e.g., engineers or architects)	__Yes

What other strategies have you used to sell more program-qualified units? [INDICATE "NONE" OR SPECIFY BELOW]

P. First Mention:
Q. Second Mention:
R. Third Mention:

D4. [FOR EACH STRATEGY MENTIONED IN D3, ASK]

D4a. [IF D3A=YES, ASK] How often do you upsell contractors to purchase program-qualified units?

__ Rarely
__ Occasionally
__ Often
__ Always

D4b. [IF D3B=YES, ASK] Since September 2015, how often do you conduct contractor training workshops?

__ Never
__ Rarely [Approximately, how many have you conducted? _____]
__ Occasionally [Approximately, how many have you conducted? _____]
__ Often [Approximately, how many have you conducted? _____]
__ Always [Approximately, how many have you conducted? _____]

D4c. IF D3C=YES, ASK] Since September 2015, by how much on average have you increased your marketing of program-qualified units?

__ No Increase
__ Small Increase
__ Moderate Increase
__ Large Increase

D4d. [IF D3D=YES, ASK] How often do you reduce the price of program-qualified units?

__ Never
__ Rarely [Approximately, by what % have you reduced the price? __]
__ Occasionally [Approximately, by what % have you reduced the price? __]
__ Often [Approximately, by what % have you reduced the price? __]
__ Always [Approximately, by what % have you reduced the price? __]

D4e. [IF D3D=YES, ASK] Approximately, for what percentage of the program-qualified models do you offer price discounts?

[RECORD NUMERIC VALUE %]
DK

D4f. [IF D3E=YES, ASK] Approximately, since the time you joined the program by how much have you increased your stocking of program-qualified units? [READ]

[IF HESITANT, SAY: If you prefer, just give me a range.]

__ No Increase
__ Small Increase [By approximately how much? ___]
__ Moderate Increase [By approximately how much? ___]
__ Large Increase [By approximately how much? ___]

D4g. [IF D4f=NO INCREASE, ASK] Approximately, what percent increase are you planning to make over the next 2-3 years? [READ]

[IF HESITANT, SAY: If you prefer, just give me a range.]

__ No Increase
__ Small Increase [By approximately how much? ___]
__ Moderate Increase [By approximately how much? ___]
__ Large Increase [By approximately how much? ___]

D5a. [IF D3G, H, and I ARE NOT BLANK, ASK] Approximately, how often have you used [INSERT FIRST STRATEGY MENTIONED]?

__ Rarely
__ Occasionally
__ Often
__ Always

D5b. Approximately, how often have you used [INSERT SECOND STRATEGY MENTIONED]?

__ Rarely
__ Occasionally
__ Often
__ Always

D5c. Approximately, how often have you used [INSERT THIRD STRATEGY MENTIONED]?

__ Rarely
__ Occasionally
__ Often
__ Always

D6.* So, you've mentioned the following strategies [LIST ALL STRATEGIES MENTIONED IN BOTH D3] [FOR EACH STRATEGY MENTION, SAY] Now, I'm going to ask you about the *extent to which the program incentives influenced your decision to use each strategy*. For each, please give an answer on a scale from 0 to 10 where 0 means "no influence" and 10 means "a great deal of influence."

J. Upsell contractors to purchase program-qualified units
K. Conduct training workshops for contractors
L. Increase marketing of program-qualified units
M. Reduce the prices of program-qualified units
N. Increase the stocking or assortment of program-qualified units
O. Discuss the benefits of program-qualified units with design professionals
P. Additional mention #1
Q. Additional mention #2
R. Additional mention #3

D7. You mentioned a number of strategies that you use to sell program-qualified units. Generally, do you use the same strategies across all equipment categories incented by the midstream program?

__Yes
__No
__DK

D8. [IF D7=NO, ASK] For which specific types of program-qualified equipment categories do you use different strategies? [LIST MEASURE TYPES]

First Measure Type: _____
Second Measure Type: _____
Third Measure Type: _____
Fourth Measure Type: _____

[IF D7=NO, CAN LOOP THROUGH THESE QUESTIONS FOR DIFFERENT EQUIPMENT CATEGORIES IN QUESTION D8; OTHERWISE ASK GENERALLY ABOUT ALL CATEGORIES]

[IF D7=NO, READ] For the following questions, I would like you to think about the <MEASURETYPE>s you stock at locations in Xcel Energy's service territory in Colorado.

D9a.* On a scale from 0-10 where 0 means "no change" and 10 means "a substantial change," how much has your stock of *program-qualified* <MEASURETPE>s changed since early 2015?

[RECORD NUMERIC VALUE 0-10; CONFIRM WHETHER INCREASE OR DECREASE]

D9b.* [IF D9a ≠ 0] In early 2015, approximately what percentage of all [OPTIONAL: <MEASURETYPE>] units you stocked in the Xcel Energy service territory in CO would have been considered program-qualified?

[RECORD NUMERIC VALUE 0%-100%]

D9c.* [IF D9a ≠ 0] Currently, approximately what percentage of all [OPTIONAL: <MEASURETYPE>] units you stock in the Xcel Energy service territory in CO are program-qualified?

[RECORD NUMERIC VALUE 0%-100%]

D9d.* [IF INCREASE BETWEEN D9b and D9c] To what extent have the program incentives influenced these increases in stock of <MEASURE TYPE>] units? Please give an answer on a scale from 0 to 10 where 0 means "no influence" and 10 means "a great deal of influence."

[RECORD NUMERIC VALUE 0-10]

D9e.* [IF D9a = 0] Currently, *if the midstream rebates had never been available*, approximately what percentage of all [OPTIONAL: <MEASURETYPE>] units you stock in the Xcel Energy service territory in CO would be considered program-qualified?

[RECORD NUMERIC VALUE 0%-100%]

D10a.* [READ: "The following questions are about sales."]

On a scale from 0-10 where 0 means "no change" and 10 means "a substantial change," how much have sales of *program-qualified* <MEASURETPE>s changed since early 2015?

[RECORD NUMERIC VALUE 0-10; CONFIRM WHETHER INCREASE OR DECREASE]

D10b.* [IF D10a ≠ 0] In early 2015, approximately what percentage of all [OPTIONAL: <MEASURETYPE>] units you sold in the Xcel Energy service territory in CO would have been considered program-qualified?

D10c.* [IF D10a ≠ 0] Currently, approximately what percentage of all [OPTIONAL: <MEASURETYPE>] units you sell in the Xcel Energy service territory in CO are program-qualified?

D10d.* [IF INCREASE BETWEEN D10b and D10c] To what extent have the program incentives influenced these increases in the percentage of program-qualified [OPTIONAL: <MEASURE TYPE>] units sold? Please give an answer on a scale from 0 to 10 where 0 means "no influence" and 10 means "a great deal of influence."

D10e.* [IF D10a = 0] Now imagine that the *midstream rebates were not available.* Approximately what percent of all [OPTIONAL: <MEASURETYPE>] units you sell in the Xcel Energy service territory in CO would be considered program-qualified?

[RECORD NUMERIC VALUE 0%-100%]

Consistency Check

IF [MAX OF D9A AND D10A IS < 4 AND MAX OF ALL D6 RESPONSES IS > 7] OR IF [MAX OF D9A AND D10A IS > 7 AND MAX OF ALL D6 RESPONSES IS < 4] ASK: Earlier, you assigned a value of [INSERT MAX OF D6] to the question about the influence of the program on your strategies to sell more program-qualified units but assigned a value of [INSERT MAX OF D9A AND D10A] to the question about the influence of the program on your (increased sales or increased of stocking of program-qualified units). The first suggests (HIGH OR LOW PROGRAM INFLUENCE) while the other suggests (HIGH OR LOW) program influence). These answers seem inconsistent. Just to make sure I understand, would you explain why the program was very important in your decision to install this equipment? It's OK if you want to change one of your answers.

[NOTE TO INTERVIEWER: THE FOLLOWING QUESTIONS MEASURE SPILLOVER]

D11. In 2016, approximately what percentage of all program-qualified units you sold in Colorado went to customers *outside* Xcel Energy's service territory? As a reference point, Xcel Energy comprises about 60% of all commercial customers in CO.

D12. To what extent do you use the same strategies for selling program-qualified units that you mention earlier to selling program-qualified units in the non-Xcel regions of Colorado? Please give an answer on a scale from 0 to 10 where 0 means "not at all similar" and 10 means "completely the same."

Section E: Satisfaction

E1. Overall, how satisfied are you with the midstream Cooling Efficiency program?

E2. What is the midstream Cooling Efficiency program doing well that they should keep doing?

E3. What recommendations do you have for improving the program?

E4. Have you had any feedback from your customers about their experiences with the midstream Cooling Efficiency program that you think Xcel Energy should know?

Section F: Evolving Market Place

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

[PROBES]
Which energy-saving technologies would you like Xcel to consider incenting?
How many units/tons of this technology do you sell annually?

F2. What do you see as trends in the market place for midstream Cooling Efficiency program?

[**PROBE:** trends for specific measures]

F3. What energy codes or regulatory changes do you see coming into the future that may affect baselines?

Section G: Closing

G1. Is there anything we didn't cover that you'd like to mention or discuss about your experiences as a distributor in the midstream Cooling Efficiency program?

G2. Thank you. Those are all the questions I have today.

[THANK AND TERMINATE]

B.4 Peer Program Benchmarking Guide

Introduction

To support the process and impact evaluation of the 2016 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. We will target the utilities/programs shown below in Table 8.

Table 8: Target Peer Utilities/Programs

Utility	Program Name	Reason for Inclusion
Pacific Gas & Electric (PG&E)	CA Statewide Upstream HVAC Program	Similar delivery mechanism; program has been operating for several years
Southern California Edison (SCE)	CA Statewide Upstream HVAC Program	Similar delivery mechanism; program has been operating for several years
MASS Save Utilities	Commercial Upstream HVAC/HP Initiative	Similar measures covered; program is of similar size to Xcel CO Cooling product
Centerpoint Energy (TX)	Small Business Program	Midstream HVAC program
Rocky Mountain Power (UT)	HVAC Instant Incentives	Midstream HVAC program
Public Service Company of New Mexico	Midstream Commercial HVAC Program	Recommended by Energy Solutions

This document presents the in-depth interview guide for peer utilities for the CO Cooling Efficiency product. Table 9 identifies the interview questions related to each key performance indicator. Table 10 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 HVAC energy efficiency programs.

Table 9: Mapping of interview questions to indicators

Key Performance Indicator	Data Needed	Interview Question
Program energy savings goals	• 2016 program energy savings goals (MWh and Mcf) • 2016 program's savings (MWh and Mcf) • 2016 total energy efficiency portfolio goal (MWh and Mcf)	B2, B4, B5
Program budget cost of acquisition (e.g. $/MWh, $/Mcf)	• 2016 program budget • 2016 total gross energy savings for each peer program	B4, B6
Net-to-gross ratios (NTGRs)	• NTG values estimated at program level, measure level, or both.	B3
Total resource cost test (TRC) values	• TRC values	B7

Table 10: Mapping of interview questions to contextual themes

Contextual themes	Data Needed	Interview Question
Net-to-gross (NTG) savings approach	• NTG approach, ratio applied, and calculation details.	B3
Program description	• Overall program objectives, implementation strategies, customer types targeted for participation • For midstream programs, midstream incentive process overview • Program staffing, the length of time of program operation, any recent changes that have been made to the program, and future outlook.	A1, A2
Customer engagement practices	• Methods used to engage customers	C1
Trade partner engagement practices	• Methods to engage trade partners, including contractors and distributors	C2
Measure types and incentives	• List of measures and their efficiency levels, incentive levels, and (if available) incremental costs	A3
Program market coverage	• Size of the market covered by midstream program channels	B1

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 Cooling 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 EMI Consulting 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 HVAC energy efficiency programs [IF APPLICABLE: "with a particular focus on upstream and midstream program"]. As part of this study, we are reaching out to leaders of these programs to learn about innovative designs and best practices in the field.

We would like to include UTILITY in this study, as your PROGRAM has been identified as an [innovative/peer] program. We would like to spend some time [add estimated time once final/tested] talking with you about your PROGRAM's design and implementation, as well as your successes and challenges with the PROGRAM.

[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 program. **[ASK/CONFIRM BASED ON HOLES IN BACKGROUND RESEARCH ON PROGRAM]**

Can you describe your program at a high level?

a. What are the program's overall objectives?

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

c. How many PROGRAM STAFF OR IMPLEMENTER STAFF members support the program?

d. How long has the program been in existence? Has it undergone any major changes during this time?

A2. Can you describe the implementation strategies used by STAFF OR IMPLEMENTER?

a. What is the typical length of a project?

A3. Next, I'd like to talk about your program's efficiency incentives. **[ASK/CONFIRM BASED ON HOLES IN BACKGROUND RESEARCH ON PROGRAM]**

a. What types of measures do you offer? [**PROBE:** Prescriptive, Custom, Design]

b. What specific measures are included in the program?

c. Are the measure savings estimated, deemed or some combination?

a. What measures have deemed vs. calculated savings?

d. How are specific measures selected and/or vetted for inclusion in the program?

1. What are the incentive levels for each measure?

2. What are the incremental costs for each measure?

Section B: Savings goals/cost

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. How many units (or KWH or tons) were incentivized via upstream/midstream channels in 2016?

a. About what size of the market is covered by midstream program channels?

B2. What were the program's energy savings goals in 2016? (MWh and Mcf)?

B3. Are these goals based on gross or net savings?

a. Did/will you apply a NTG ratio to these savings?

b. What NTG ratio do you use?

c. What methods are used to calculate NTG ratio?

d. Are NTG ratios estimated at the program level, measure level, or both?

B4. How much net/gross energy savings did the program report in 2016?

B5. What was the total energy efficiency portfolio goal in 2016?

B6. 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, and other overhead.

a. What is the program's total operating budget?

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

B7. What type of cost effectiveness test is applied to the program?

a. If TRC, what was the TRC in 2016?

Section C: Program Participation

Next, I'd like to talk about program outreach and marketing. **[ASK/CONFIRM BASED ON HOLES IN BACKGROUND RESEARCH ON PROGRAM]**

C1. What steps does the utility take to engage potentional program participants?

a. What has been the most effective?

b. Do you target certain customer types?

C2. Next, I'd like to talk about the program's trade allies.

a. What activities do program staff conduct to engage trade allies? Approximately how many trade allies are active in the program?

b. What types of companies typically serve as the primary trade ally contact? (Contractors, distributors)

c. What roles do trade allies play in driving participation in the program?

d. What have you found to be the most effective ways of engaging trade allies to drive participation in the program?

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 FINDINGS

To support the process and impact evaluation of the 2016 Xcel Energy efficiency programs, the EMI Consulting evaluation team conducted telephone interviews with key staff managing and implementing the Colorado Cooling Efficiency product. The interview objectives were to collect staff feedback on product experiences and evaluation priorities. Members of the EMI Consulting evaluation team interviewed the following key staff managing and implementing the Colorado Cooling Efficiency product:

- Product Manager
- Trade Relations Manager
- Engineer
- Cost Analyst
- Energy Solutions (Implementation Contractor) Manager for Midstream Product
- Energy Solutions Engineer for Midstream Product

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.

1.1 Key Takeaways

Below are key takeaways from staff experiences with the CO Cooling Efficiency program. 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 product consists of two main offerings: (1) a traditional downstream rebate offering, including both prescriptive and custom rebates paid to participating customers, and (2) a newer midstream offering where incentives are paid directly to participating distributors. The downstream offering has been in operation since 2008, while the midstream offering was launched in Q4 2015.
- The two offerings (midstream and downstream) are designed to impact the market in different ways. The downstream rebate offering is primarily targets first cost barriers associated with the purchase of high efficiency equipment by end users. In contrast, the midstream offering is primarily targeted at changing stocking and upselling practices by distributors and contractors in the middle of the supply chain.
- The midstream offering has exhibited substantial growth since its inception in Q4 2015. The offering achieved its stated goal for 2016 (the first full year of operation) of 20,000 tons of various types of cooling equipment. The offering was so successful that this goal was increased for 2017 to 25,000 tons. Additionally, program staff reported that a majority of distributors in Xcel Energy's service territory are participating in the midstream cooling offering – approximately 18 or 19 out of a total of 24 distributors – and that this participation level means most of the market is likely covered by the product.
- It is the opinion of staff members that the midstream offering in particular is well positioned to address market barriers associated with HVAC equipment market – namely, it encourages distributors to stock more high-efficient units and encourages contractors to recommend that equipment to their customers.

- As more stringent codes and standards continue to be adopted, it becomes increasingly difficult for the Cooling Efficiency product to offer cost-effective measures. Additional information on what type of equipment currently exists in the market (i.e., the installed base) would be helpful for program staff to understand the types of equipment being replaced, and may help them calculate baselines.

1.2 Product Description

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

- The Cooling Efficiency product includes downstream prescriptive rebates, downstream custom rebates, and midstream incentives paid directly to participating distributors. No pre-approval is required on normal downstream projects, but is required for custom projects.
- The downstream offering functions like most other traditional rebate channels, where trade allies will assist the end-use commercial customer with filling out the paperwork for prescriptive measures. Custom measures take some additional paperwork and potentially other engineering support, the degree to which depends on the magnitude of the project.
- The midstream offering is based on a completely different model, and is designed to help distributors sell more high-efficient units with the aim of altering stocking practices in the long-term. The midstream model is administered in conjunction with the Implementation Contractor, which is involved with recruiting and retaining distributors, processing incentive payments, and paying the distributors.
- The overall product's primary goal is based on energy savings, tracked using HVAC tonnage, and covers both the downstream and midstream offerings. Because of the success of the midstream offering in its first year, more aggressive goals have been set for 2017. There are not numeric goals related to program participation (either by distributors or customers) or trade ally engagement; however, staff members indicated that these types of goals are inherent in the product design (at least for the midstream offering), because the energy savings goals are dependent on participation from these actors. Implementation Contractor staff members also indicated that they set rough goals for distributors to increase their stocking of high efficient equipment.
- Individual measures are initially screened for possible inclusion in the product using cost effectiveness tests. However, overall cost effectiveness is only required at the product level. This means that some individual measures may be less cost effective than others, as long as the product as a whole is cost effective.
- Xcel Energy processes downstream rebates internally, while the midstream incentive payment processing is entirely web-based and is handled by the Implementation Contractor. Xcel Energy simply reimburses the Implementation Contractor for the distributor incentives paid out.
- Custom downstream rebates are meant to cover technologies that are not captured by other prescriptive rebates, including less common measures like certain types of chillers.

1.3 Product Strengths and Barriers

During interviews, staff identified the following strengths and barriers to implementing this product in 2016 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

- Staff involved with the administration of the midstream offering explained that this channel has a number of strengths: (1) it is easy for distributors to participate, as the amount of additional administrative work is minimal, (2) it is easy for contractors to participate, as they do not have to fill out additional paperwork that might be required for a downstream rebate, and (3) it is easy for Xcel Energy to administer, as the processing of incentive applications and savings reporting are largely automated.
- The midstream offering is aimed at addressing two key barriers to market transformation — limited stocking of high efficient equipment and the unwillingness of contractors to upsell high efficient equipment — barriers that a downstream program may not be able to address. The midstream model should lead to increased stocking of high efficient equipment via greater demand from customers and contractors; subsequently, contractors are more likely to recommend this high efficient equipment, as it is readily available.
- Although the midstream offering has only been running for less than two years, staff indicate that distributor participation is very high and they expect this means they have reached a substantial portion of the market.

Barriers

- The adoption of more stringent codes and standards has made it more difficult for the Cooling Efficiency product measures to remain cost effective. As the code-minimum efficiency level continues to rise, the product must continue to find more efficient measures to offer.
- Because the midstream incentive cannot be considered a rebate, it must be classified as an administrative cost in cost-benefit tests. The overall cost-benefit metrics associated with midstream incentives reflect this classification.
- Program staff mentioned that it sometimes necessary to prevent participating distributors from becoming complacent in pushing sales of high efficiency equipment. Additionally, it is difficult to keep distributors engaged without a relationship to an upper-level manager at the distributor organization.

1.4 Feedback on Evaluation Priorities

During interviews, staff identified research topics they would like the evaluation to address. The following bullets compile these topics along with additional topics that the evaluation team identified based on staff interview findings. The evaluation team will consider these research topics when prioritizing portfolio-wide evaluation needs and as able, incorporate them into the final evaluation plan for the 2016 CO Cooling Efficiency program. The EMI Consulting team will deliver this plan at the end of May.

- Understanding why more customers are not applying for custom rebates.
- Assessing the types of equipment that currently exist in the market (i.e., the installed base) that are being replaced by the newer equipment purchased through the program. In particular, it is very difficult to get information on existing equipment in leased spaces. This is also important because it may help inform how baselines are calculated.

- Understanding how much "double counting" of rebates is occurring (i.e., when a customer receives both a midstream rebate and a downstream rebate).

In addition to evaluation priorities mentioned by staff interviewees, EMI Consulting has developed the following additional evaluation considerations that will be incorporated into the evaluation plan.

- Because the downstream offering and midstream offering operate differently, it may be useful to construct a logic model showing what types of impacts may be expected from each channel. A logic model would be helpful in connecting program actions to outcomes, and making sure that the products can claim credit for market transformation effects over the longer term.
- There is also a need to understand when measures that have been included in either the midstream or downstream offering should be removed from the qualified products list in order to allow newer measures to enter the program.
- A market flow diagram, which shows the flow of equipment along the supply chain and through the different products, may also be helpful in understanding potential interactions between the product offerings and how they complement (or do not complement) each other.
- It may be important to consider how spillover from the midstream offering maybe impacting the market in other geographic areas outside the product's targeted area.

APPENDIX D: PARTICIPATING CUSTOMER INTERVIEW RESULTS

Section A: Screener/Background Information

Summary: Customers interviewed include three property managers, one county government and a manufacturer. All respondents were in management roles. Three of five respondents indicated they had multiple properties in which other facilities also participated in Xcel Energy programs.

Section B: Awareness

B1. How did you first hear about the Xcel Energy Cooling Efficiency program?

Category	#	%
Email	0	0.0%
Regular Mail	0	0.0%
Seminar	0	0.0%
Xcel Representative	3	37.5%
Contractor	3	37.5%
Other	2	25.0%
Total	8	100.0%

B1a. Is this your preferred method for hearing about opportunities?

Category	#	%
Email	2	28.6%
Regular Mail	0	0.0%
Seminar	0	0.0%
Xcel Representative	3	42.9%
Contractor	2	28.6%
Other	0	0.0%
Total	7	100.0%

NOTE: Multiple responses possible.

B1b. What are other ways that you would like to hear about Xcel Energy efficiency program opportunities?

Category	#	%
Email	1	25.0%
Regular Mail		0.0%
Seminar		0.0%
Xcel Representative		0.0%
Contractor	1	25.0%
Other	2	50.0%
Total	4	100.0%

NOTE: Multiple responses possible.

B2. What was your primary motivation for participating in the Cooling Efficiency program?

Summary: Two participants mentioned the rebate as their primary motivation while one other mentioned equipment was at end of life. The other two responses were energy efficiency gains and employing best practices at facilities

B3. When you first heard about Xcel Energy's Cooling Efficiency program, was there any information that was particularly useful to you?

Summary: Only two respondents indicated useful information and this included the brochure showing payback and the general program information was useful.

B3a. What additional information about the program would have been useful to help you determine whether to participate in the Cooling Efficiency program?

Summary: One respondent indicated that they wish an Xcel Energy Rep could have come and talked to them as they trust them as a neutral source of energy efficiency information.

Section C: Application and Program Implementation

C1. Were you the primary contact between your facility and the Xcel Energy program staff, or between your facility and your Xcel Energy Account Manager?

Summary: Three respondents indicated they are the primary contact while two said no.

C1a. [If C1=Yes] How did you communicate with the Xcel Energy representative and/or your account manager?

Summary: "Most the time it is an email or if a phone call I am reaching out to him." Note: only asked of one customer due to time constraints

C1b. [IF more than 1 method mentioned in C1a] Which of these methods was most effective for communicating with program staff and/or account manager?

Summary: Phone. Note: only asked of one customer due to time constraints

C1c. What is your preferred method for reaching Xcel Energy staff and/or your account manager?

Summary: Phone. Note: only asked of one customer due to time constraints

C2. Did you work with a firm/contractor to conduct a study for your Cooling project? To implement/install the measures for your project?

Summary: One respondent said "yes." One respondent said "no," while one respondent wasn't sure. Note: only asked of 3 customers due to time constraints

C3. How did you decide to work with FIRM/CONTRACTOR?

Summary: One respondent indicated they have an ongoing relationship with their maintenance contractor. Another respondent (a property manager) said they simply worked with the building owner's contractor. This question was not applicable for the third respondent. Note: only asked of 3 customers due to time constraints .

C4. How difficult or easy would you say it was to complete the following tasks associated with the Xcel Energy Cooling Efficiency Program on a scale from 1 to 5 where 1 is extremely difficult and 5 is extremely easy.
1 Complete program applications
2 Submit program applications
3 Complete rebate forms
4 Submit rebate forms
5 Determine your organization's program eligibility
6 Implement recommendations
7 Meet program deadlines
8 Get in touch with an Xcel Energy representative
9 Determine equipment / models that are eligible
10 Find a contractor to (install measures) (conduct studies)

Summary of Ease/Difficulty of Product Tasks

	Distribution						Statistics		
Category	**1**	**2**	**3**	**4**	**5**	**Total**	Mean	Median	Mode
Complete App	0	0	1	3	1	5	4	4	4
Submit App	0	0	1	1	3	5	4.4	5	5
Complete Rebate Form	0	0	1	2	2	5	4.2	4	4
Submit Rebate Form	0	0	1	1	3	5	4.4	5	5
Program Eligibility	0	0	1	0	3	4	4.5	5	5
Implement Recommendations	0	0	0	2	1	3	4.3	4	4
Meet Deadlines	0	0	0	1	3	4	4.8	5	5
Get in Touch with Xcel Energy Rep	0	0	1	1	2	4	4.3	4.5	5
Determine Equipment Eligibility	0	0	0	2	2	4	4.5	4.5	4
Find a Contractor	0	0	0	2	3	5	4.6	5	5

Section D: Free-ridership and spillover

D1. In your own words, can you tell me why you decided to implement the project?

Summary: Three respondents indicated equipment was at end of useful life, although two also gave responses building on this as to why they did high efficiency. One respondent said: "…the whole process and how to make it happen was in the spirit of sustainability that we want to follow." One respondent mentioned the rebate to offset the cost of high efficiency and the other said to save energy costs.

D1a. Did the project have to be implemented at the time it was? (i.e., because existing equipment had failed or some other logistical reason)

Summary: Two people indicated equipment had to replaced while three others gave responses that indicated it didn't have to happen at that particular time.

D1b. Did you participate in an energy assessment through Xcel Energy?

Summary: One person indicated that they had a study completed prior to installing the equipment. The other four participants indicated no or not sure regarding an energy assessment or analysis.

D7. Next, I'm going to ask you to rate the importance of the Cooling Efficiency program as well as other factors that might have influenced your decision to implement the MEASURE. Think of the degree of importance as being shown on a scale with equally spaced units from 0 to 10, where 0 means "not at all important" and 10 means "extremely important". Now using this scale please rate the importance of each of the following factors in your decision to implement the measure at the time

that you did. (If needed: How important in your DECISION to implement the MEASURE was the…)

Summary of Product and Non-Product Factor Responses

Product Factors	Mean	Median	Mode
The availability of the incentive offered by Xcel Energy	7.6	8.0	8.0
The technical assistance offered by Xcel Energy staff	8.3	8.0	-
[If received a study] Technical assistance from the firm that conducted the Xcel Energy sponsored study	8.0	8.0	-
Endorsement or recommendation by your Xcel Energy account manager	7.5	7.5	-
Recommendation from an equipment vendor or contractor affiliated with Xcel Energy that helped you with the choice of the equipment	8.4	9.0	7.0
Information from Xcel Energy marketing or informational materials	5.8	5.0	-
Past experience with the program (or a similar program)	8.0	8.0	8.0
Non-product factors	**Mean**	**Median**	**Mode**
Previous experience with this type of equipment	8.2	8.0	7.0
Standard practice in your business/industry	7.8	8.0	-
Corporate policy or guidelines	7.5	7.0	7.0
Payback on the investment	8.2	9.0	9.0
Minimizing operating cost	8.6	9.0	9.0
Maximizing facility reliability	9.2	9.0	9.0
Positive marketing or public relations for your company	7.2	8.0	8.0
Recommendation from a design or consulting engineer or vendor not affiliated with Xcel Energy	7.0	8.0	8.0

Individual Product and Non-Product Factor Responses

	Question	A	B	C	D	E
PRODUCT FACTORS	The availability of the incentive offered by Xcel Energy	8	2	8	10	10
	The technical assistance offered by Xcel Energy staff	8	0	0	7	10
	[If received a study] Technical assistance from the firm that conducted the Xcel Energy sponsored study	8	0	0	N/A	N/A
	Endorsement or recommendation by your Xcel Energy account manager	9	0	0	6	N/A
	Recommendation from an equipment vendor or contractor affiliated with Xcel Energy that helped you with the choice of the equipment	7	9	9	7	10
	Information from Xcel Energy marketing or informational materials	7	3	4	5	10
	Past experience with the program (or a similar program)	8	0	6	8	10
NON-PRODUCT FACTORS	Previous experience with this type of equipment	9	7	8	7	10
	Standard practice in your business/industry	5	9	0	7	10
	Corporate policy or guidelines	6	7	0	7	10
	Payback on the investment	9	5	9	8	10
	Minimizing operating cost	9	8	9	7	10
	Maximizing facility reliability	9	9	10	8	10
	Positive marketing or public relations for your company	8	5	8	5	10
	Recommendation from a design or consulting engineer or vendor not affiliated with Xcel Energy	9	3	8	8	N/A

Individual Product and Non-Product Importance Responses

	Category	Mean	St Dev	A	B	C	D	E
PERCENT ATTRIBUTED TO	Product factors	45.0	29.2	40	20	40	30	95
	Non-product factors	55.0	29.2	60	80	60	70	5

Individual No Product Score Responses

	Question	Mean	St Dev	A	B	C	D	E
NO PROGRAM SCORE	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 exactly the same MEASURE if the Xcel Energy Cooling Efficiency program had not been available. When I say "exactly the same," I mean the same type of equipment and the same efficiency level.	3.4	4.7	0	9	8	0	0

SPILLOVER QUESTIONS

D25. Since receiving a rebate for the project(s) we just discussed, did you implement any ADDITIONAL energy efficiency improvements at this facility or at your other facilities within Xcel Energy's service territory that you did NOT receive incentives for? (yes/no)

Summary: One participant indicated that they could have installed LED lighting without a rebate and possibly VFDs. They also indicated that they are sure 80% of projects participate within an Xcel Energy Program.

NTGR Calculations

SUMMARY						
	Respondent:	A	B	C	D	E
Program Components Score	Max	9	9	9	10	10
	1-N/10	0.1	0.1	0.1	0	0
Program Influence Score	Value	40	20	40	30	95
	1-N/100	0.6	0.8	0.6	0.7	0.05
	After adjustment	0.6	0.8	0.6	0.7	0.05
No Program Score	Value	0	9	8	0	0
	N/10	0	0.9	0.8	0	0

NTGR Weighting and Final Score

Item	Value	A	B	C	D	E
FR	0.32	0.23	0.60	0.50	0.23	0.02
Unweighted NTGR	0.68	0.77	0.40	0.50	0.77	0.98
Weights (% kWh)	-	61%	4%	19%	12%	4%
Weighted NTGR	**0.71**					

Section E: Barriers to Participation

E1. To what extent did you consider having additional upgrades beyond the installed measures through the Xcel Cooling Efficiency program?

Summary: None of the participants considered upgrades that aren't receiving a rebate. One participant installed equipment that wasn't eligible and was disappointed there wasn't a rebate.

Section F: Satisfaction (Programs and Components)

Using a scale from 1 to 5, where 1 is extremely dissatisfied and 5 is extremely satisfied, please rate your satisfaction with the following items:

Program Satisfaction Summary

Category	Mean	Median	Mode
With the Cooling Efficiency Program?	4.6	5.0	5.0
The Xcel Energy Cooling Efficiency Program staff?	4.5	4.5	#N/A
The equipment you received a rebate for as part of the Cooling Efficiency Program?	4.4	5.0	5.0
The size of the Cooling Efficiency Program rebate?	4.3	4.5	5.0
The amount of time it took to receive your rebate?	4.8	5.0	5.0
The amount of time it took to go through the whole process?	4.0	4.0	4.0

Program Satisfaction Individual Responses

Category	Distribution					
	1	2	3	4	5	Total
With the Cooling Efficiency Program?	0	0	1	0	4	5
The Xcel Energy Cooling Efficiency Program staff?	0	0	0	1	1	2
The equipment you received a rebate for as part of the Cooling Efficiency Program?	0	0	1	1	3	5
The size of the Cooling Efficiency Program rebate?	0	0	1	1	2	4
The amount of time it took to receive your rebate?	0	0	0	1	3	4
The amount of time it took to go through the whole process?	0	0	1	2	1	4

G: Net Promoter

Net Promoter Response Summary

Category	Distribution										
	1	2	3	4	5	6	7	8	9	10	Total
Recommend Program	0	0	0	0	1	0	0	0	0	4	5
Recommend Xcel Energy	0	1	0	0	0	0	0	0	0	4	5

Section H: Closing

H1. Do you have any recommendations for improving the Cooling Efficiency program?

Summary: One respondent indicated it would be great if they could have a regular follow-up meeting with their account manager with regards to existing projects and additional services as this used to be a service provided by Xcel Energy.

H3. Is there anything we didn't cover that you'd like to mention or discuss about your experiences as a participant in the Xcel Energy Cooling Efficiency Program?

Summary: One respondent mentioned they would like to see Xcel Energy continue in the same direction with programs as they have for the past 5 to 7 years.

APPENDIX E: TRADE PARTNER (CONTRACTOR) INTERVIEW RESULTS

Section A: Screener/Background Information

A1. What is your title or role at COMPANY NAME [PROBE: Owner, Engineer, Contractor, Field Technician, Project Manager, etc.]

Summary: Mid-level positions except for the Efficiency Specialist and General Manager; we were able to get various perspectives given the different titles of the interviewees.

A2. What are your primary responsibilities at COMPANY NAME?

Summary: Responsibilities varied from installation to financial management giving us a breadth of participation experience from the interviewees.

A3. Can you briefly describe your company's work?

Summary: Primarily talked with contractors that install systems including design build. Two contractors were at companies that also were Manufacturer reps for relevant equipment.

A4. What types of customers does COMPANY NAME typically serve? [PROBE: In general, do you serve commercial, residential, multifamily?]

Summary: The full gamut of customers were covered by the contractors interviewed including large complexes and smaller commercial facilities.

A4.1 Has this changed over time?

Category	#	%
Yes	2	33.3%
No	4	66.7%
Total	6	100.0%

A4.2 Approximately what percentage of your sales are to residential vs. commercial customers?

Category	#	%
Mostly Residential	0	0.0%
Fairly Even Mix	1	16.7%
Mostly Commercial	5	83.3%
Total	6	100.0%

A4.3 Overall, approximately what percentage of the units you sell to commercial customers are code-minimum?

Summary: Responses varied with one contractor installing as much as 50% code minimum equipment and another installing all high efficiency. Only two contractors provided an actual percentage. Two quotes illustrative of the current status on code-minimum:

QUOTE: *"With upfront rebate given by Xcel…I only do high efficiency now; don't do any code-minimum given help by Xcel."*

QUOTE: *"Since Xcel changed program 1.5 to 2 years ago; put it on contractors/distributors to do the rebate paperwork; unless customer says they want high efficiency we don't push it any more...", we are not involved with paperwork on roof top units; some incentive to stock higher efficiency; more of a question with Trane, Carrier, mfg. that sell units...ask them how many our sold in each category…"*

A5. Which of the following equipment types does COMPANY NAME sell to commercial customers in Colorado? [SELECT TOP 2 or 3]

Measure Type	Respondent					
	A	B	C	D	E	F
Screw/Scroll Chillers	Yes	Yes	0	0	0	0
Centrifugal Chillers	Yes	0	0	0	0	Yes
DX Units < 5.4 Tons	Yes	Yes	0	0	Yes	0
DX Units >= 5.4 tons	Yes	Yes (more common)	0	Yes	0	Yes
Anti-Sweat Heater - Low Temp	Yes	0	0	0	0	0
DEPACC	Yes	0	Yes	0	0	0
EC Motors	Yes	0	0	0	Yes	0
VFD Chiller Retrofit	Yes	0	0	0	0	0

A6. To your knowledge, how long has COMPANY NAME been a registered Trade Partner for the Cooling Efficiency program?

Category	#	%
0 to 2 Years	0	0.0%
3 to 10 Years	3	50.0%
10+ Years	3	50.0%
Total	6	100.0%

Section B: Awareness

B1. How did you initially learn about becoming a Trade Partner for the Cooling Efficiency program?

Category	#	%
Email	0	0.0%
Regular Mail	0	0.0%
Seminar	0	0.0%
Xcel Representative	3	50.0%
Other	3	50.0%
Total	6	100.0%

B1.1 Is this your preferred method for hearing about opportunities? (Typically asked what is your preferred method)

Category	#	%
Email	5	83.3%
Regular Mail	0	0.0%
Seminar	0	0.0%
Xcel Representative	1	16.7%
Other	0	0.0%
Total	6	100.0%

B1.2 What are other ways that you like to hear about Xcel Energy Trade Partner opportunities?

Category	#	%
Email	1	16.7%
Regular Mail	0	0.0%
Seminar	0	0.0%
Xcel Representative	3	50.0%
Other	0	0.0%
No Other Method	2	33.3%
Total	6	100.0%

B1.3 What program information was most useful for you when deciding to participate in the Cooling Efficiency program? [PROBE: incentive levels, materials, application process]

Summary: Very positive feedback on program information being helpful including the application form. A quote that illustrates this is: "There are several key elements: flexibility of rebate is great…can assign rebates to different participants; can assign to us, customer or contractor; rebate application is simple…helps us with quotes…firm pricing and helps us present to customers; bonus rebates for distributors are great."

B2. What are the reasons why your firm decided to register as a Trade Partner?

Summary: Contractors expressed they want to take advantage of the rebates and services to benefit their customers. Two quotes illustrative of this are:

QUOTE*: "Mainly trying to work with Xcel Energy on custom rebates so it was nice when it became prescriptive…small company so this helped us work more directly with them…Xcel reached out to us and that was great for us…"*

QUOTE*: "Customers want rebates and we want to provide the service."*

Section C: Motivations/Barriers to Participation

C1. Over the years, what have been your primary motivations/reasons for staying a registered Trade Partner?

Summary: Responses to why contractors remain a trade partner are consistent with why they became partners in the first place. One contractor noted:

QUOTE: *"Rebates help make you more competitive. We need to stay involved as it is a big deal to end user."*

C1.1. Have your motivations/reasons changed over the years?

Category	#	%
Yes	2	33.3%
No	4	66.7%
Total	6	100.0%

C1.2 If yes, how so?

Summary: One contractor noted that they don't have to process rebates anymore for rooftop units as there is a program to support distributors. The other contractor decided to assign rebates more often to themselves to lower upfront cost to customer.

C2.1 What have been the biggest challenges that have prevented your organization from completing additional Cooling Efficiency projects?

Summary:
Contractors indicated various challenges in completing additional projects through the program including:

- Chiller that works for customer doesn't qualify due to part or full load efficiency
- Property management or customers renting space are more concerned about upfront costs then ROI
- Lack of manpower within the company to focus on qualifying projects
- Rebates that go directly to the distributor selling the equipment might not result in savings to the customer

C2.2 What would motivate you to complete more projects through the program? (PROBE: additional resources, higher rebates, more program support, shorter applications, more eligible equipment).

NOTE: this became one of our optional questions when the interview was taking more than 40 minutes.

Section D: Trade Partner Marketing

D1. What sales techniques do you use to attract customers into the Xcel Cooling Efficiency product?

Category	#	%
Brochures		0.0%
Cold Calls	1	7.7%
Ads	1	7.7%
Door to Door	1	7.7%
Word of Mouth	2	15.4%
Referrals	1	7.7%
Existing Relationships	3	23.1%
Internet/Email	2	15.4%
Other	2	15.4%
Total	13	100.0%

D2. At what point in the project do you talk to your customers about the Cooling Efficiency program?

Summary: All of the contractors mentioned that they talk about the program early in the sales process. Comments included:

QUOTE: *"Typically after we qualify the project financially; if the customer can do it, then talk about the program."*

QUOTE: *"The initial visit so we better understand what their priorities are."*

D3. What aspects of the Cooling Efficiency program do you discuss with customers?

Summary: Contractors mention the rebates as well as energy savings and lower bills. One contractor indicated that they also share information regarding other Xcel Energy programs. One contractor noted:

QUOTE: *"We give them two options, give customer an option for rebate and give another option that might not have rebate to see the payback comparisons between the two...this will show the benefits of lower bills, etc."*

D3.1 What do you think motivates customers to participate?

Summary: Lower upfront costs was the most common response on what motivates customers to participate.

D4. Do rebates/incentives ever come up in sales discussions with customers?

Category	#	%
Yes	6	100.0%
No	0	0.0%
Total	6	100.0%

D4.1 When in the conversation are rebates/incentives typically mentioned [PROBE: introduction, discussion of costs, etc.]?

Summary: All of the contractors indicated the rebate is discussed upfront early in the sales process.

D4.1a Who typically brings up rebates/incentives [PROBE: customer or contractor]?

Category	#	%
Contractor	6	100.0%
Customer	0	0.0%
Both equally	0	0.0%
Total	6	100.0%

D4.2 Can you provide an example of how you typically approach rebates/incentives discussions for the Cooling Efficiency program?

Response: Qualify financially and then bring it up as part of proposal/technical discussion. NOTE: only asked of one contractor due to interview taking over 40 minutes.

D4.2a What questions or concerns do customers have during initial discussions about rebates/incentives, if any?

Summary: Customers don't always have questions or concerns, but when they do it is typically when they will get the rebate, why does Xcel Energy offer rebates, or where can I get additional information about the programs.

D4.3 How big of a factor are the Cooling Efficiency program rebates/incentives when customers are deciding to fund a project?

Summary: Five of the six contractors indicated in their response that the rebate was influentual in the project moving forward. One contractor indicated it wasn't the primary motivator, but could sometimes push them to a higher efficiency unit.

QUOTE: *"Not the primary motivator as customers do it because something is wrong with the existing unit."*

QUOTE: *"The rebate is probably 65 to 70% of the decision to go with high efficiency."*

D4.3a To what extent does discussing rebates/incentives help or hurt the sale?

NOTE: Only asked of one contractor and he indicated it does not hurt the sale.

D4.4 Are there ever instances when you don't mention rebates/incentives during sales discussions with customers?

NOTE: Only asked this of one contractor due to time constraints.

Category	#	%
Yes	0	0.0%
No	1	100.0%
Total	1	100.0%

D5. Do you sell any eligible projects without applying for incentives/rebates?

Category	#	%
Yes	1	16.7%
No	5	83.3%
Total	6	100.0%

D5.1 What are the reasons why?

QUOTE: *"The roof top units are taken care of by distributor now."*

QUOTE: *"There were a couple of times where the customer needed it for capacity problems; not energy efficiency; so [we] went forward with it without rebate. This would have been a good time to assign rebate to ourselves... maybe 5% of the time this happens."*

Section E: Motivations/Barriers to Install Energy Efficient Equipment 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.

Summary: All of the contractors indicated involvement with customers, but typically limited interaction with Xcel Energy staff. One contractor also added a suggestion here that it would be great to have one place and one person in which to send all the rebate forms.

E1.1 How much do you do versus how much does the customer do?

Category	#	%
Contractor Does Paperwork	5	83.3%
Customer Does Paperwork	0	0.0%
Both Equally	1	16.7%
Total	6	100.0%

E1.2 Do the rebates go directly to customers or are they sent to you?

Category	#	%
Primarily Contractor	1	16.7%
Primarily Customer	3	50.0%
Both Equally	2	33.3%
Total	6	83.3%

E2. About how many projects have you submitted per year, on average?

Category	#	%
0 to 5 Projects	2	33.3%
6 to 10 Projects	1	16.7%
11-20 Projects	0	0.0%
More than 20 Projects	3	50.0%
Total	6	100.0%

E2.1 Thinking back to 2016, would you say your involvement increased, decreased, or stayed the same compared with previous years?

Category	#	%
Increased	1	16.7%
Stayed the Same	5	83.3%
Decreased	0	0.0%
Total	6	100.0%

E2.1a [PROBE: Would you say the number of projects you have completed through the program increased, decreased or stayed the same?]

Category	#	%
Increased	2	33.3%
Stayed the Same	2	33.3%
Decreased	2	33.3%
Total	6	100.0%

E2.1b [PROBE: Would you say the size/scope of projects you have completed through the program increased, decreased or stayed the same?]

Category	#	%
Increased	0	0.0%
Stayed the Same	6	100.0%
Decreased	0	0.0%
Total	6	100.0%

E2.2 [IF INCREASE/ DECREASE:] What are the reasons why your involvement has increased/decreased?

QUOTE: *"Varies year to year; hopefully trending up, but not sure."*
QUOTE: *"Sometimes just don't qualify; more service; don't bid on new construction or new units;* how many *chillers we install varies from year to year."*
QUOTE: *"More people are interested in evaporative precooling."*

E2.3 What, if anything, about the program keeps you from participating more?

Response: *"Nothing."* NOTE: only asked of one contractor due to time constraints.

E2.4 What can Xcel Energy do to increase your participation?

Response: *"They do well so nothing."* NOTE: only asked of one contractor due to time constraints.

E3. Are there (other) challenges related to selling this EQUIPMENT?

Summary: Challenges mentioned in selling this equipment include:
-Market program more aggressively so more customers know it is available
-Challenges are most physical in nature when involving retrofit as there are times you can only use certain equipment

E3.1 Is there anything Xcel can do to help resolve these challenges?

NOTE: not asked of contractors after first interview due to time constraints.

Section F: Evolving Marketplace

Summary of questions F1-F3:

- Current percentage HE sales varies by equipment type. One interviewee mentioned that 100% of DX units >=5.4 tons are HE, while another interviewee mentioned that 100% of water source heat pumps are HE.
- Three contractors mentioned that the percentage of sales of HE equipment was lower in 2015 than it is currently. Two of these contractors explicitly said that the rebates appear to be helping this.
- Overall the contractors agreed that sales of high efficiency units would be less if the program did not exist. One contractor noted: "Plan and spec without rebate will go with lowest cost option." Another mentioned: "Roof-tops would be much lower; this is a commodity equipment so low bid is typically taken." One contractor noted that for certain property owners it would be Ok either way on type of equipment they purchase as they only want the lowest cost option. Without the rebate, they would choose lower efficiency.
- Only a few of the contractors were able to provide a percentage estimate related to selling less high efficiency units and the numbers indicate anywhere from a 10% to as high as 75% depending on the type of equipment.

F2. More broadly, how would your business be affected if Xcel Energy Cooling Efficiency rebates were not available? (PROBE: employees, sales techniques, number of clients, time it takes to sell projects)

Summary: Overall, contractors indicated their businesses would still be able to thrive even if there was a negative impact of losing the program and rebates. They would adjust to not having the program and would most likely sell less high efficiency units.

F3. Do you do any work outside of Xcel Energy's service territory? About what percent of the equipment you sell outside of Xcel Energy's service territory is considered high efficiency? (PROBE ON SAME MEASURES DISCUSSED IN F1)

Summary: Overall, contractors indicated their businesses would still be able to thrive even if there was a negative impact of losing the program and rebates. They would adjust to not having the program and would most likely sell less high efficiency units.

F4. What do you see as new/emerging energy efficiency opportunities in the HVAC cooling market?

Response: "Something new always happening…not aware of anything that could be part of e program soon." NOTE: only asked of one contractor due to time constraints.

F5. [GENERAL] What energy codes or regulatory changes do you see coming into the future that may affect code baselines?

Response: Anything on outdoor air effects this; ventilation codes, but not sure when will change it again; more outdoor air can make it more challenging to achieve higher efficiency.

Response: ASHRAE is going to continue to set the standard and keep raising the bar.

NOTE: only asked of two contractors due to time constraints.

F6. [GENERAL] Have you participated in any workshops, seminars, or classes since 2015 related to specific types of cooling equipment?

Summary: 3/3 respondents were asked this question; all replied "yes."

F7. [GENERAL] Have you noticed any sales trends related to a type of cooling equipment not covered by the Cooling Efficiency rebate in the past few years?

Summary: 3/3 respondents were asked this question; all replied "no."

F8. [GENERAL] What types of equipment would benefit most from being included in the Cooling Efficiency rebate program?

Summary: Contractors gave a few ideas as to what else could be included in the prescriptive program:

- Economizer retrofits and controllers
- Low Load DX compressors
- Take a systems approach to cooling needs

Section G: Satisfaction

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

Summary: Generally, the comments regarding the program were very favorable. As far as what the program should continue to include, trade allies mentioned:

- The information provided, including a strong website, is useful and timely.
- Rebate turnaround time is very quick.
- The Expo is really good outreach and is helpful for trade allies to promote equipment.
- It is a good idea to move incentives to distributors so they will stock higher efficiency units.

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

Summary: Trade allies provided a few good suggestions for what they would like for improving the program:

- Matching invoicing requirements to what trade allies typically use for customers would make it easier to participate.
- Provide an official tool to calculate chiller savings as well as loggers for measuring chiller energy use would be helpful.
- Provide more in-depth easy to understand technical information to guide customer decision-making.
- Expand the range of eligible equipment to include a variety of potential savings to end-use customers.
- Take more of a systems approach as opposed to just a prescriptive rebate as equipment must operate properly or there aren't any savings.
- Providing one point of contact for contractors along with more automated forms that are easy to fill out.

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

Summary: There wasn't any specific feedback from customers other than they like receiving the rebate and they are generally satisfied with the program.

Section I: Closing

I1. Is there anything we didn't cover that you'd like to mention or discuss about your experiences as a registered Trade Partner for Cooling Efficiency program?

Summary: Three contractors responded "nothing." One respondent mentioned the importance of automation and controls:

QUOTE: "A customer can have a great efficient machine, but if not operating it properly no better than a standard machine…really need to look at building cooling design and how it operates…need good automation systems…automation is the key to energy efficiency."

APPENDIX F: DISTRIBUTOR INTERVIEW RESULTS

Section A: Introduction/Background Information

A1. What is your title or role at COMPANY NAME [**PROBE:** Owner, Manager, Engineer, Contractor, Field Technician, Project Manager, etc.]

Summary: Interviewees from smaller firms tended to be the owner or branch/operations manager. Interviewees from larger organizations were typically sales managers.

A2. What are your primary responsibilities at COMPANY NAME?

Summary: Responsibilities range from day-to-day operations to firm ownership and oversight of commercial sales.

A3. How many locations does your company operate within Xcel's service territory in Colorado?

Summary: Interviewees reported from 1 to 4 locations in Colorado. Some of these locations are actual warehouses that stock equipment, others are just offices.

A4. Can you briefly describe your company's largest target markets?

Summary: There was substantial diversity in the customer types targeted by each distributor, with most focused on the general commercial and institutional market. One interviewee indicated his firm focused mainly on multifamily. Another interviewee indicated his firm only did a small amount of commercial work, focusing instead on residential. There was some degree of specialization within the types of technologies that each firm focused on, but also quite a bit of overlap, with multiple interviewees indicating they focus on all types of unitary equpiment.

A5. What types of customers does COMPANY NAME typically serve? [**PROBE:** In general, do you serve commercial, industrial, residential?]

[see summary for A4]

A6. Which of the following equipment types does COMPANY NAME sell through the midstream Cooling Efficiency program?

	1. Air-cooled chillers	2. Direct expansions (DX) units < 5.4 tons (typically these are rooftop units, or RTUs)	3. Direct expansions (DX) units >= 5.4 tons (typically these are rooftop units, or RTUs)	4. Packaged-terminal AC (PTAC) units	5. Water-source heat pumps
DISTRIBUTOR A	sometimes	yes	yes	1	sometimes
DISTRIBUTOR C	no	yes	yes	no	no
DISTRIBUTOR D	yes	yes	yes	no	yes
DISTRIBUTOR E	yes	yes	yes	yes	yes
DISTRIBUTOR F	yes	yes	yes	no	yes
DISTRIBUTOR G	yes	yes	yes	yes	yes
DISTRIBUTOR H	no	no	no	yes	no
DISTRIBUTOR I	yes	no	no	yes	yes
DISTRIBUTOR J	yes	yes	yes	yes	yes

A7. To your knowledge, how long has COMPANY NAME been participating in the CO midstream Cooling Efficiency program?

Summary: All interviewees reported being involved with the program for at least two years.

A8. To your knowledge, has COMPANY NAME participated in any other programs offered by Xcel Energy in Colorado?

Summary: Four interviewees indicated they participate in at least one other Xcel Energy program, though they weren't very specific on which ones.

- Interviewees appreciate the face-to-face contact with either Energy Solutions or Xcel Energy. One interviewee indicated email is OK too. Three interviewees did not have an opinion.

- One interviewee indicated that in addition to face-to-face discussion, email is a good way to keep him up to date.

Section B: Awareness

B1. How did you initially learn about becoming involved with the midstream Cooling Efficiency program?

Summary: Most interviewees reported hearing about the program directly from Xcel Energy or from Energy Solutions.

B2. What are the reasons why your firm decided to register for the program?

Summary: Interviewees reported that the decision to join the midstream cooling product was a very easy one, as there was a clear benefit and did not require a large amount of effort or expense.

B3a. Do you receive periodic information on sales ranking from Xcel Energy?

Summary: Two interviewees representing smaller firms indicated they do not receive ranking information from Xcel Energy.

B3b. [IF B3a = YES] How much influence does this information have on the choice of strategies you spend the incentive dollars on?

Summary: Two interviewees noted that the midstream incentive aligned with their business focus on high efficiency equipment. Two interviewees indicated that although the ranking information is helpful, at the end of the day it does not have a huge influence on their sales strategies.

Section C: Experiences in the Program

C1. Can you briefly describe your experience with the midstream Cooling Efficiency program since you began?

Summary: None of the interviewees reported any negative experiences with the program. Several interviewees said they like the simplicity of the program design. One interviewee indicated it has had a substantial impact on how they go to market with their sales.

C2. What have been your primary motivations/reasons for staying involved in the midstream program?

Summary: Interviewees reported staying in the program because of the incentive dollars and because there was minimal effort required on their part. One interviewee noted that the program aligns well with how their business operates.

C3. What is it about the midstream Cooling Efficiency program that helps you sell energy efficient equipment to your customers?

Summary: Interviewees reported a variety of reasons why the midstream Cooling Efficiency product helps them sell efficient equipment. Generally these reasons revolved around the incentive allowing them to be more competitive in the market.

C4. Is the Cooling Efficiency program more helpful for certain types of sales transactions? If so, which ones?

Summary: There was no clear trend in whether the midstream product was more helpful for one type of transaction over another.

Section D: Program Impacts

D1. Generally speaking, can you describe how the program has changed the way you do business in the Xcel Energy service territory in CO?

Summary: Interviewees reported a variety of ways in which the midstream product offering has changed the way they do business in CO. Three interviewees mentioned that the

midstream incentives allow them to be more competitive in their bids, because they can build a price discount into their initial bid amount. One interviewee mentioned that his firm can sell more HE equipment because the incentives act as commission rewards to his sales staff. One interviewee mentioned the midstream product has allowed them to increase the assortment of HE models they offer.

Now I have some questions about efficiency levels. When I say "program qualified," I mean that the unit must qualify for a midstream incentive from the program. [REFERENCE EFFICIENCY REQUIREMENTS AS NEEDED]

D2a. Prior to the program, did you have any specific plans to promote program-qualified units?

Summary: Two interviewees reported they did not typically promote high efficiency equipment before the program. Seven interviewees reported they had always promoted high efficiency equipment, at least to a degree.

D3. Currently, which of the following strategies do you use to sell more program-qualified units?

A. Upsell contractors to purchase program-qualified units	Yes	Sometimes	No	Not applicable
B. Conduct training workshops for contractors	4	3	1	0
C. Increase marketing of program-qualified units	1	7	0	0
D. Reduce the prices of program-qualified units	7	1	0	0
E. Increase the stocking or assortment of program-qualified units	Stocking: 3 Assortment: 1	0	0	4
F. Discuss the benefits of program-qualified units with design professionals	7	0	1	0

Note: Questions D4-D5C were not asked of all respondents due to time constraints.

D6.* So, you've mentioned the following strategies [LIST ALL STRATEGIES MENTIONED IN BOTH D3] [FOR EACH STRATEGY MENTION, SAY] Now, I'm going to ask you about the *extent to which the program incentives influenced your decision to use each strategy*. For each, please give an answer on a scale from 0 to 10 where 0 means "no influence" and 10 means "a great deal of influence."

Strategy	1	2	3	4	5	6	7	8	9	10
A. Upsell contractors to purchase program-qualified units										3
B. Conduct training workshops for contractors										1
C. Increase marketing of program-qualified units								2		1
D. Reduce the prices of program-qualified units					1			2		4
E. Increase the stocking or assortment of program-qualified units									1	1
F. Discuss the benefits of program-qualified units with design professionals							1		1	2

D7. You mentioned a number of strategies that you use to sell program-qualified units. Generally, do you use the same strategies across all equipment categories incented by the midstream program?

Summary: Interviewees indicated that the choice of strategy depends on the type of equipment and customer.

NTGR Sequence: Responses

Battery		Question	Respondent						
			A	C	D	E	G	I	J
Program Components		D6 max	6	9	10	8	10	10	10
		FR Score	0.4	0.1	0	0.2	0	0	0
No Program Score	Stocking	D9b	15%-20%	DNS	n/a	n/a	n/a	n/a	0%
		D9c	15%-20%	DNS	n/a	n/a	n/a	n/a	100%
		D9e	15%-20%	DNS	n/a	n/a	n/a	n/a	0%
		Delta	0	DNS	n/a	n/a	n/a	n/a	1.00
	Sales	D10b	10%-15%	DNS	90%	10%	Only gave final value	35%	0%
		D10c	10%-15%	DNS	95%	70%	Only gave final value	70%	100%
		D10e	10%-15%	DNS	90%	15%	50%	35%	0%
		Delta	0	DNS	5%	55%	50%	35%	100%
	Overall	Score	1.00		0.95	0.45	0.50	0.65	0.00
Program Influence Score		D9d	-	-	-	-	-	-	10
		D10d	0	8	10	10	8	10	10
		FR Score	1	0.2	0	0	0.2	0	0

NTGR Sequence: Calculated Results

Respondent	Program Components Score	Program Influence Score	Adjusted No Program Score	Free-ridership (FR)	Unweighted NTGR	Weighted NTGR (kWh)	Weighted NTGR (kW)
	[A]	[B]	[C]	Avg[A,B,C]	1-FR	(based on % total kWH)	(bases on % total kW)
A	0.40	1.00	1.00	0.80	0.20	1%	1%
C	0.10	0.00	0.20	0.10	0.90	2%	2%
D	0.00	0.95	0.00	0.32	0.68	14%	20%
E	0.20	0.45	0.00	0.22	0.78	4%	3%
G	0.00	0.50	0.20	0.23	0.77	16%	21%
I	0.00	0.65	0.00	0.22	0.78	12%	7%
J	0.00	0.00	0.00	0.00	1.00	50%	46%
Overall	**0.10**	**0.51**	**0.20**	**0.27**	**0.73**	**0.89**	**0.86**

Section E: Satisfaction

E1. Overall, how satisfied are you with the midstream Cooling Efficiency program?

Summary: Interviewees reported high satisfaction levels with the program. One interviewee wished he could integrate the custom program into the existing midstream model.

E2. What is the midstream Cooling Efficiency program doing well that they should keep doing?

Summary: <not asked of all interviewees due to time limitations> One interview indicated he would like to see incentives offered for more equipment types, such as VRF.

E3. What recommendations do you have for improving the program?

Summary: Five interviewees indicated they would like to see additional products added to the midstream program.

E4. Have you had any feedback from your customers about their experiences with the midstream Cooling Efficiency program that you think Xcel Energy should know?

<not asked of all interviewees due to time limitations>

Section F: Evolving Market Place

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

<generally skipped because of time limitations>

F2. What do you see as trends in the market place for midstream Cooling Efficiency program?

Summary: Production line equipment for cannabis production; large tonnage water cooled chillers; occupancy sensors; VRF; integrated pipe systems; evaporative cooled condensers.

F3. What energy codes or regulatory changes do you see coming into the future that may affect baselines?

<generally skipped because of time limitations>

Section G: Closing

G1. Is there anything we didn't cover that you'd like to mention or discuss about your experiences as a distributor in the midstream Cooling Efficiency program?

Summary: One interviewee indicated he wished the midstream product was also available for residential equipment. Another interviewee indicated he thought the product could be improved by allowing him to do larger batch uploads of equipment information to the tracking system.

APPENDIX G: BENCHMARKING RESEARCH RESULTS

Approach

To support the process and impact evaluation of the 2016 Xcel Energy energy efficiency programs, the EMI Consulting evaluation team benchmarked the Xcel Energy programs against 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 understand the performance of the program in context with peer utility programs. To conduct the benchmarking, the evaluation team conducted secondary research on the peer utilities identified and performed in-depth interviews with program managers at the peer utilities.

In the following sections, we first provide an overview of the peer utility programs included in this research. We then compare these programs across several dimensions. We compare program design models, including measure types, rebate structure, rebate transparency, and program alignment with downstream models. Finally, we compare the program performance, using key indicators such as budget, energy savings, net-to-gross ratios, and Total Resource Cost values.

Peer Utility Programs

The evaluation team, working with Xcel Energy product staff and leveraging internal resources, identified six peer programs to include in the benchmarking research. These utilities were included primarily because they offer a commercial HVAC midstream program. In the follow section, we discuss each program in more detail, and compare programs in terms of program design.[11]

Comparison of Program Design Elements

In the sections below we present high-level descriptions of each program included in the benchmarking research.

Program Design Descriptions

Utility A

Utility A's midstream program offers incentives for AC units, variable refrigerant flow systems, water-cooled chillers, ductless mini-split systems, energy-efficient water heaters and food service equipment and has been operating for several years.

Utility B

In this program, incentives for high-level package units, chillers, and water chillers are paid directly to distributors. Utility B offers upstream only incentives for commercial HVAC. Downstream programs do not offer measures that overlap with the upstream.

[11] These utility names have been anonymized.

Utility C

Utility C runs midstream and upstream commercial HVAC programs, which send rebates to distributors and manufacturers of air-cooled packaged and split systems, water- or evaporative-cooled systems, PTAC/HP controllers (occupancy sensors/energy management systems and fan speed controllers), and VRF/VRV systems. Incentives are paid directly to the distributor or manufacturer, who then have the discretion to pass down as much money as they see fit to the contractor/customer. Utility C also has a downstream commercial HVAC rebate program.

Utility D

Utility D began running its commercial upstream program in 2013. In its first year, the upstream rebate garnered significantly more participation than the 2012 downstream HVAC program. The program offers air-cooled AC and heat pump systems, water-cooled air conditioning and heat pump systems, ductless mini and multi split systems, dual enthalpy economizer controls, electronically commutated motor (ECM) circulator pumps for hydronic heating or service hot water installations, and VRF systems. In 2013 (program's first year), Utility D paid out $400,000 in incentives for just over 1 million kWh of gross annual savings (40 cents per gross annual kWh). In total, the program incented approximately 960 units in 2013.

Utility E

Utility E includes a midstream rebate for installers and contractors of the installation of AC units and heat. Midstream rebate recipients do not have to pass along any direct incentives to customers; however, they are required by the program to inform customers that they are participating and receiving incentives. Rebate amounts are determined by cooling/heating capacity. The program is designed for small businesses, and thus has maximum demand capacities for facilities (100 kW) and aggregated facility projects (250 kW).

Utility F

Utility F's HVAC program began fairly recently, and for now includes only air-cooled roof-top units. Incentive amounts are determined by the equipment's cooling capacity and a two-tiered efficiency incentive structure. If the customers decide to go through one of 12 participating distributors for the midstream program, as opposed to downstream business efficiency program, Utility F gives the rebate money to distributors, who are required to pass down the rebate to customers. Participating distributors are required to submit a customer address on a private web portal that spits out a confirmation code. Non-participating distributors can also obtain rebates, but they must apply manually by calling Utility F, as opposed to using an electronic service.

Utility G

In 2015, Utility G began implementation of a midstream commercial HVAC program for Packaged Terminal AC (PTAC), Packaged Terminal Heat Pumps (PTHP), Unitary and Split AC, and Air Source Heat Pumps. The customer receives a rebate instantly at time of purchase. Currently there is no requirement for distributors to pass down incentive dollars; however, prior to 2017 it was required that 60% of the incentive dollars were passed through to the contractor/customer. Utility G also runs a downstream commercial HVAC program, which is designed to have nearly identical rebate amounts as the midstream program. The rebate amount is determined by heating/cooling capacity and a two-tiered efficiency rating. In 2015 (program's first year), Utility G paid $288,000 in incentives for 763,800 kWh of gross annual savings (about 38 cents per gross annual kWh), from about 600 units.

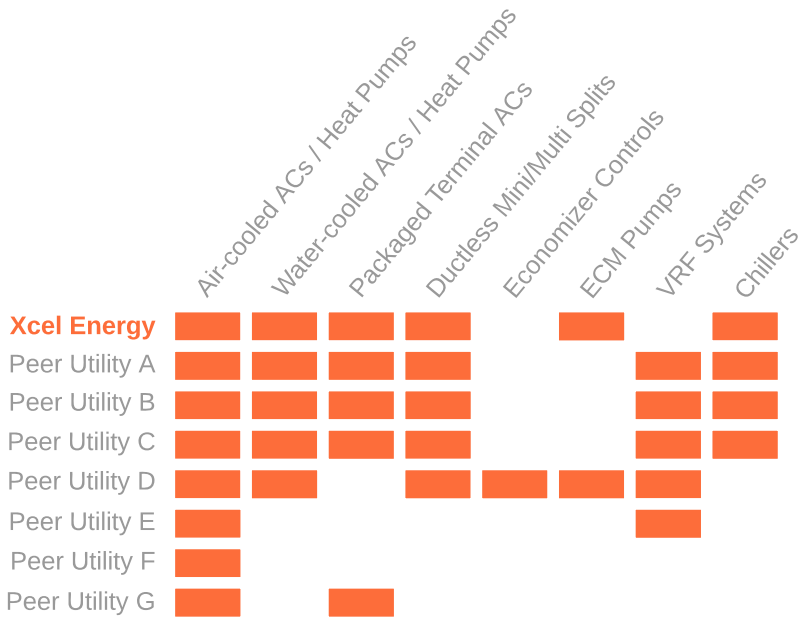
Program Design Elements

In this section we provide a brief discussion on the types of measures offered by each program, their incentive structures, the manner in which programs publicize the incentive amounts, their alignment with partner downstream programs, and budget information.

Measures Offered

As shown in Figure 1, benchmarked programs vary markedly in the variety of measures offered through their upstream/midstream programs. Xcel Energy is closely in line with many of these programs in terms of the types of measure offered, with the exception of variable refrigerant flow (VRF) systems. At the time this research was conducted, only one program was offering incentives for economizer controls (Utility D). Three programs (those run by Utilities E, F, and G) offered fewer types of measures, focusing instead on air-cooled ACs and heat pumps and/or packaged terminal AC units.

Figure 1: Measure Types Offered by Program



Rebate Structure

Of the seven utilities included in this benchmarking research (not including Xcel Energy), six of them allow participating distributors discretion in how much of the rebate to pass down to contractors and customers. Utility F, on the other hand, requires distributors to pass down the entire rebate amount. In general, interviews with program staff at these utilities reflected a desire to give distributors a choice in terms of how they spend the incentive money.

Despite the freedom provided, there is evidence that in some cases the distributors choose to pass down most or all of the incentive money to their customers. One program manager mentioned that he knows of distributors that pass down the entirety of the rebate. Separately, a program implementer indicated that his program's participating distributors requested to modify program rules so that they could pass down 100% of the incentive dollars.

Disclosure of Incentive Amount

Requiring distributors to be transparent with contractors and customers regarding the disclosure of rebate amounts marks a strategic divide in midstream program implementation. Three of the seven benchmarked utilities – Utility E, Utility F, and Utility G – publish the midstream incentive amounts online. The claim is that this strategy encourages distributors to pass down more of the money to contractors and customers. One utility (Utility E) even requires distributors to inform customers that the distributors are participating in a program and that they are receiving incentives for participating.

In contrast, four utilities (Utilities A, B, C, and D) do not publish their midstream incentive amounts online. Not requiring disclosure of incentive amounts allows distributors the freedom of spending the incentive money how they see fit (e.g., for inventory, training, etc.). Our interviews with program managers suggested that publishing these values may in some cases be detrimental, as it may put added pressure on distributors to pass through a greater proportion of the incentives (which may not be optimal in all cases).

Midstream-Downstream Program Alignment

Of the seven utilities with upstream/midstream programs included in this benchmarking research, six also had downstream commercial HVAC programs.

- Two utilities – Utility C and Utility D – will still process applications for downstream measures though they try to direct most new commercial HVAC projects to their upstream programs.
- Results from interviews with program managers reflected a concern that "double-counting" measures is a concern when both an upstream and downstream program exist in tandem. Similar to the approach taken by Xcel Energy, one program manager indicated that his program avoids the problem of double-counting by offering different measures in the upstream and downstream programs offered by his utility.
- Thee utilities (Utilities E, F, and G) offer nearly or completely identical measures in downstream and upstream for commercial HVAC.

Energy Savings and Market Transformation Goals

Utilities do not typically publish kWh savings goals specifically for their midstream HVAC programs. This may be due to utility commission regulations about data publishing, or by utilities not wanting to release inside data. However, it may also be because midstream incentive programs are measured less on energy savings than market transformation.

Market transformation goals are highly dependent on state-level regulatory environments, and thus tended to vary greatly across benchmarked utilities. However, from the interviews with program staff, it was clear that market transformation was an important consideration for upstream/midstream programs. One program manager mentioned in an interview that his midstream program initially set goals in terms of energy savings, but has since begun placing more emphasis on market transformation.

Administrative Considerations

One advantage of upstream/midstream programs, aside from the potential for increased energy savings, is simpler program administration which comes from involving fewer stakeholders. In multiple cases, program manager interviewees praised this approach because it allows for faster and more automated rebate processing. One program implementer explained in an interview that easier administration was a "key

attribute" of their midstream model. In several programs, the customers receive their part of the discount immediately – which is why utilities such as Utility F and Utility G advertise their programs as offering paperless "instant incentives" to the customer at the point of sale.

Budget Vignette

While most benchmarked programs were hesitant to provide detailed program budget data, we did find limited information on Utility G's program operation. To help understand how upstream/midstream programs may result in reduced administrative costs, we compared the budget for Utility G's midstream upstream program with other similar programs in its energy efficiency portfolio. Comparing the administrative cost as a percent of total program cost across the three programs, we see that the midstream program value is less than half of the corresponding values for the non-midstream programs (14% vs. 33% and 30%, respectively).

Table 2: Utility G Budget Breakdown

Program	Metric	2017	2018
Midstream	UCT	1.03	1.82
	Total cost	381,710	844,190
	Rebate cost	288,000	631,800
	3rd party administration cost	53,472	117,000
	Admin cost as percent of program total cost	14%	14%
	Admin cost as percent of rebate cost	19%	19%
Commercial New Construction / Retrofit	UCT	2.40	2.59
	Total cost	4,907,119	4,699,267
	Rebate cost	2,723,426	2,572,648
	3rd party administration cost	1,602,015	1,531,338
	Admin cost as percent of program total cost	33%	33%
	Admin cost as percent of rebate cost	59%	60%
Commercial Overall	UCT	1.95	2.12
	Total cost	9,185,576	8,660,343
	Rebate cost	5,436,507	5,019,865
	3rd party administration cost	2,710,503	2,562,668
	Admin cost as percent of program total cost	30%	30%
	Admin cost as percent of rebate cost	50%	51%

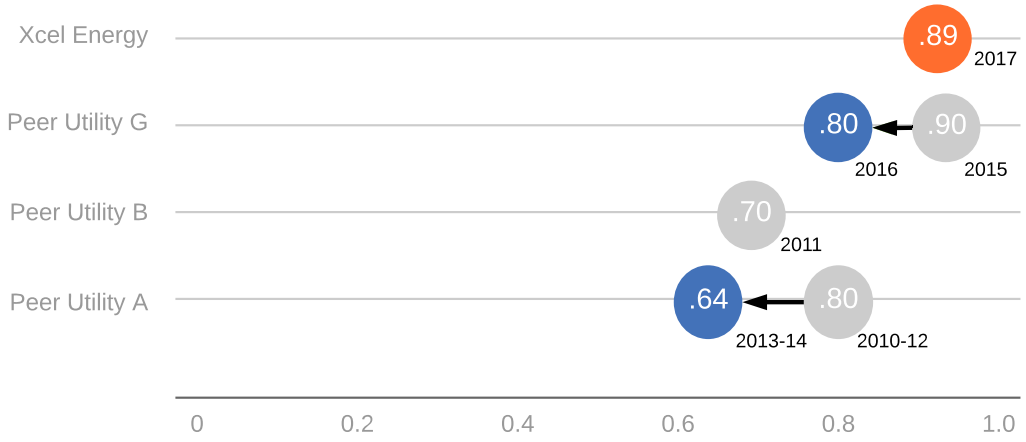
Comparison of Key Program Performance Indicators

In this section we provide a brief description of two types of program performance metrics: net-to-gross ratios (NTGRs) and savings claims.

Net-to-gross ratios

Although NTGR values were not available for all benchmarked programs, the data that was available indicated that NTGRs for midstream programs are generally high (0.8-0.9) but tend to decline over time. This is depicted graphically in Figure 4 below. It is important to note that the reasons for this declining trend are unclear, but likely incorporate (at least to some degree) the changing regulatory priorities in each program's respective jurisdiction.

Figure 2: Net-to-Gross Ratios for Select Peer Utility Programs



Program Savings Relative to Program Budget

While budget reporting is inconsistent across programs and utilities, it is possible to look at a normalized estimate of savings (represented as annual kWh savings) achieved per dollar of program budget. This data is shown in Table 3. Xcel Energy's Cooling Efficiency product is in line with other programs, exhibiting an estimated annual kWh savings of 2.31 kWh/dollar spent.

Table 3: Budget vs. Savings

Utility	Year(s)	Annual Program Budget	Annual Savings in kWh	Annual kWh Reduced per $1 of Budget
Utility B	2010-2012	$8,480,099[a]	38,637,911	4.56
Utility A	2010-2012	$5,157,841[a]	15,427,726	2.99
Xcel Energy [b]	2017	$4,312,694	9,950,311	2.31
Utility G [c]	2018	$844,190	1,872,000	2.22
Utility G	2017	$381,710	687,491	1.80

[a] Values reflect "revised" budget data.
[b] Incorporates both downstream and midstream channels.
[c] Reflects target values.

It is also possible to look at first-year program performance for midstream programs. The comparison in Table 4 shows that Xcel Energy's first year performance resulted in lower cost per annual kWh savings when compared to peer programs run by Utility G and Utility D.

Table 4: Midstream Program Performance in First Year of Implementation

Program	Incentives	Savings (kWh)	$ per gross annual kWh saved
Xcel Energy	$1,523,336	~5,000,000	0.30
Utility G	$288,000	763,800	0.38
Utility D [a]	$400,000	1,000,000	0.40

[a] Reflects target/estimated values.

CO Cooling Efficiency

2017 Program Evaluation: Recommendations and Responses

8/20/2018

Xcel Energy (The Company) engaged a team of researchers led by EMI Consulting to conduct a process and impact evaluation of the Cooling Efficiency product. The evaluation team was asked to assess the following:

- Customer satisfaction with the product
- Xcel Energy's influence on customers' decisions install efficient equipment and the customer journey paths that lead to such upgrades
- The roles, successes, and challenges faced by participating trade partners
- The impact of customer free ridership on product savings

Based on the results of this research, the evaluation team developed key findings and recommendations for Xcel Energy.

Recommendation	Response	Initials
1) The recommended overall prospective midstream NTGR is 0.89. The recommended overall prospective downstream NTGR is 0.71	The Company will revise the NTG for the product, retroactive to 1/1/2018. This NTG may not be applicable to measures that have been updated with technical assumptions that exclude free-ridership (e.g. higher baseline). This will be assessed on a case-by-case basis in future plan filings or modifications.	
2) Conduct periodic surveys with customers immediately after they receive their rebate check. These surveys would serve three purposes: (1) To collect immediate feedback related to net-to-gross estimation, (2) ensure that customers are aware of other related energy efficiency opportunities available through Xcel Energy, and (3) help keep customer contact information up to date	In the past, the Company conducted follow-up surveys with business customers as part of the M&V process. However, low responses rates that led to statistically invalid results caused the Company to discontinue this practice. The Company will investigate the feasibility of randomly selecting downstream opportunities and survey customers within 30 days of rebate. Survey questions will be similar in nature to the program evaluation questions. If found to be cost-effective, the Company will propose this practice in the 2021-2022 Biennial plan.	
3) Efficiency tiers for the midstream delivery channel should continue to be periodically increased, with plenty of forewarning for distributors.	The Company will evaluate efficiency tiers annually to ensure the program is encouraging distributors to upsell and stock efficiencies in the higher tiers.	
4) To counter possible contractor concerns that midstream benefits do not accrue to the end-use customer, make sure that contractors understand the rationale behind offering this type of product.	The Company will continue to provide contractor education as to the benefits of the midstream program and encourage them to shop multiple distributors to get the best price.	
5) Consider the cost effectiveness ramifications of splitting the	The Company evaluates cost effectiveness of each measure annually. Point of sale "rebates" for large	

	existing midstream incentive into: (1) an incentive for small equipment, and (2) a point-of-sale rebate for large equipment.	equipment will be considered in future filings.	
6)	Develop and document a more detailed strategy for how the midstream and downstream delivery channels should function.	The Company will evaluate in more detail the current strategy and enhance the strategy as the program begins to mature.	
7)	Define and begin tracking a set of key performance indicators that can be used to measure market transformation of the Colorado HVAC market over time.	The Company recognizes the midstream program is evolving and that an effective program will naturally phase out incentives for lower tiers as they are widely adopted. Identifying the KPIs that will guide that phase-out process is critical, but managing the KPIs can be overly burdensome if each up- or mid-stream program has un-coordinated metrics. The Company will leverage future evaluations, especially evaluations of up- and mid-stream programs, to identify consistent indicators that can be applicable across multiple programs including Cooling Effciency.	
8)	Perform a market baseline study to estimate the penetration of energy efficient measures (installed base and sales) in Xcel Energy's service territory in Colorado.	Stand-alone market baseline studies are typically cost-prohibitive. The Company will consider market baseline research for cooling equipment as an added task for its next DSM potential study to leverage a more cost-effective approach.	