EMI CONSULTING

Xcel Energy
MN Motor and Drive Efficiency Product 2018 Evaluation

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FINAL REPORT

Presented To:

Nicholas Minderman
DSM Policy & Strategy Consultant
Xcel Energy
414 Nicollet Mall
Minneapolis, MN 55401

Presented By:

Jeremy Kraft
Project Director
EMI Consulting
83 Columbia St. Suite 400
Seattle, WA 98104

PARTNERS

This report was produced by the evaluation team lead by EMI Consulting. The evaluation team includes the following partners:

Evergreen Economics

RIDGE & ASSOCIATES

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Introduction

The Xcel Energy Motor and Drive Efficiency Product in Minnesota offers prescriptive and custom rebates to Xcel Energy commercial and industrial (C&I) customers who install qualifying motor and drive equipment in existing or new buildings. Rebates are offered to encourage C&I customers to purchase energy-efficient motors and drives by lowering the upfront premium costs associated with this equipment. The Xcel Energy 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, equipment and product awareness, barriers to participation, product influence on customer decisions and on the motor and drive market, similarity to peer programs, and opportunities for improving the product. The evaluation also examined the potential for adding a midstream or upstream offering to the product, and looked to peer utilities for lessons learned and keys to success with these delivery mechanisms. This summary includes the key findings and recommendations from this evaluation.

Methods

Participant telephone survey (n=71)

Trade partner interviews (n=20)

Peer program interviews (n=5)

Staff interviews (n=5)

Portfolio influence data analysis

Fielding: July 2018 – September 2018

Key Findings

Product processes appear to work well for participating customers. Customers reported processes were easy to complete and were very satisfied with the product. Customers' favorite aspect of the product was that it was easy to participate in, and 99% of customers said they were somewhat or very satisfied with their experience with the product overall.

Participants in the product also have extremely high satisfaction with Xcel Energy. Almost all (94%) were somewhat or very satisfied with Xcel Energy. As such, it is likely that the positive experiences customers are having through the product are also having a positive impact on customers' perceptions of Xcel Energy as a whole.

Xcel Energy staff play a key outreach and education role. Customers often heard about the product and the technology through Xcel Energy staff, and reported that the staff were very influential in their decision to install the equipment. Trade partners also liked the education that Xcel Energy was providing for customers.

Some customers find it difficult to assess what equipment is eligible. When asked for suggestions for improving the product, customers most commonly cited a desire for more clarity on eligibility. Additionally, identifying eligible equipment received the lowest score related to ease of participation.

For midstream or upstream offerings, it is important to have a simple, well-defined calculation for energy savings. Benchmarked utilities noted that midstream and upstream programs work best when the savings are simple to calculate (i.e., measures that have fewer parameters that could affect the savings calculations).

For midstream or upstream offerings, it is important to understand the supply channel prior to launching the offering. One benchmarked utility noted that knowledge of the supply chain is key to midstream and upstream products. This utility specifically mentioned challenges they had experienced due to an inadequate understanding of the VFD market, and highly recommended spending time formally mapping that market prior to launching offerings targeted at it.

Executive Summary

2018 Motor and Drive Efficiency Product (Minnesota)

Impact Results

Both Motors and Drives	Drives only	Motors only
0.86 Recommended NTGR for motor & drive downstream rebates	**0.86** Recommended NTGR for drives-specific midstream offerings	**0.78** Recommended NTGR for motors-specific downstream offerings

Key Drivers of Influence:

Xcel Energy staff: Drive education and awareness of technology and rebates

Seen as a trusted resource for unbiased information, including on key financial decision-making factors

Timing: Xcel Energy is helping customers complete projects soon than they would have without the product

Important to continue to encourage customers to replace equipment early

Project size: Larger projects (which are weighted more heavily) had lower free-ridership

Important to continue to engage large projects to maintain this influence

Impact Conclusions & Recommendations

The product shows strong influence in the market, with retrospective NTGRs at 0.86 for both kWh and kW.

Recommendation 1a: If the product design remains the same (downstream rebates for both motor and drive equipment, the evaluation team recommends using the retrospective NTGR of 0.86 for both kWh and kW. The evaluation team recommends this NTGR for any year in which the product is offering a similar mix of both motor and drive downstream rebates.

Recommendation 1b: If the product begins to offer midstream of upstream rebates for drives, the evaluation team recommends using a preliminary NTGR of 0.86 for the midstream or upstream drives only. This NTGR represents the weighted average for the 55 customers who installed drives equipment. While it is the most representative NTGR available, it is based on a downstream delivery mechanism, which is a very different product design. Thus, this ratio should be treated as a preliminary number, and Xcel Energy staff should re-evaluate the product approximately two years after the product launches to account for the change in delivery mechanism.

Recommendation 1c: If the product begins to offer downstream rebates for motors only (and not drives), the evaluation team recommends using a preliminary NTGR of 0.78. This NTGR is based on the unweighted average for the 15 customers who installed motor equipment. The evaluation team had a low sample for motors only, which was not sufficient for 90% confidence +/- 10% precision at the strata-level (as the survey was designed for precision at the product-level). Thus, this ratio should be treated as a preliminary number, and Xcel Energy staff should re-evaluate the product after the first year of implementation, should this product design occur. The unweighted average is recommended for the motor-only score to eliminate the potential for a single outlier to skew the small sample dramatically, as this stratum had only 15 participants.

Executive Summary

2018 Motor and Drive Efficiency Product (Minnesota)

Process Results

Awareness of Technology and Rebates

Customers are typically **aware of the technology prior to participating** in their most recent project.

However, nearly a quarter of customers (23%) said they **first learned about the technology through Xcel Energy staff**, and an additional 11% said they learned about it through previous participation.

Xcel Energy staff play a critical role in increasing awareness of the product; 28% of customers heard of the rebates through their account manager and another 8% heard through other Xcel Energy staff.

Motivators and Barriers to Decision-Making

Customers were **most influenced by financial decision-making factors**, as well as previous experience with and the age of the equipment.

Trade partners perceive the **rebates and energy savings are motivational for customers**, and typically bring up conversations about rebates in their first conversation with the customers.

Trade partners cited needing **more information on the application and rebate status** and the **amount of effort needed to participate** as the top barriers to participation in the product.

Additional Measures and Delivery Mechanisms

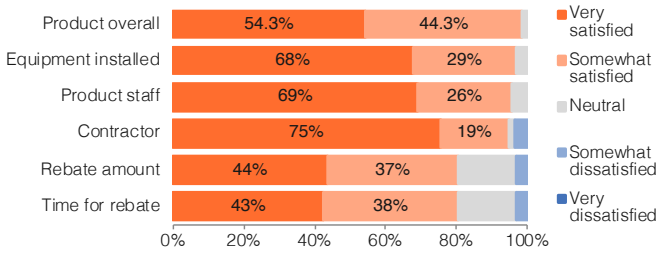
Both trade partners and customers had **little experience with installations of PMAC motors**, and were typically not familiar with the technology.

No peer utilities offered prescriptive rebates for PMACs, though they offered rebates for smaller synchronous motors.

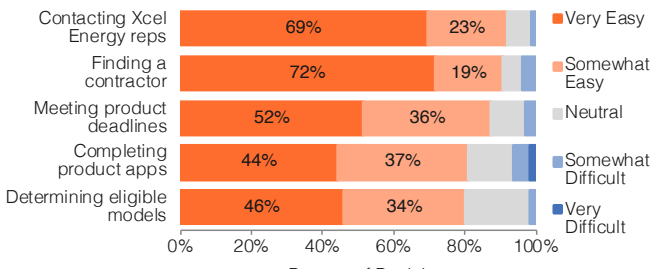
Midstream motor or drive offerings were rare, as peer utilities had **concerns about being able to collect all of the parameters needed to calculate savings** for motor and drive equipment.

Product Satisfaction

Satisfaction with the Program



Ease of Participating



Participants were generally very satisfied with the product, across all elements. The elements with slightly lower satisfaction were due to more "neutral" responses, not dissatisfied responses.

Both participating customers and trade partners reported **high satisfaction with Xcel Energy.**

Customers found the product's processes easy to complete, and also most commonly said that the ease of participating in the product was their favorite part of the product.

Trade partners most commonly liked the high rebates from the product and the ease of participating in the product.

Process Conclusions & Recommendations

Xcel Energy staff play a key role in educating customers about the technology and rebates, as well as in influencing their decisions to participate in the product.

Recommendation 2a: Continue to utilize Xcel Energy staff for awareness, education, and influencing projects. Customers and trade partners both appreciated the education and awareness provided by Xcel Energy staff, and staff were key drivers of energy efficiency projects. Where possible, the evaluation team recommends continuing to use Xcel Energy staff to engage customers for both downstream and midstream/upstream offerings.

Recommendation 2b: Broaden and deepen relationships with VFD trade partners (including both contractors and distributors) prior to launching the midstream or upstream offering. Customers currently are educated and motivated most frequently by Xcel Energy staff, followed by trade partners. As equipment moves upstream, relationships with trade partners will become more crucial, as they will be the actors that predominantly drive product savings.

Participating customers were highly satisfied with Xcel Energy. It is likely that the positive experiences customers are having through the product are also having a positive impact on customers' perceptions of Xcel Energy as a whole.

Recommendation 3: Identify ways to highlight Xcel Energy's role in the midstream or upstream offerings. Midstream and upstream products tend to have lower barriers to entry, and may result in cases where the customer is unaware of Xcel Energy's role in discounting their equipment. Xcel Energy staff should review lessons learned and key successes from their other midstream offerings and look to apply those to the midstream or upstream VFD rebates.

Some customers find it difficult to assess what equipment is eligible for rebates. When asked for suggestions for improving the product, customers most commonly cited a desire for more clarity on eligibility. Additionally, identifying eligible equipment received the lowest score related to ease of participation.

Recommendation 4: Identify ways to clarify what types of equipment are eligible for rebates. Xcel Energy staff may already have materials made that could be used to clarify eligibility. If this is the case, the evaluation team recommends making those items easier to access and to consider providing some of the items to trade partners and Xcel Energy account managers to be used during the sales process. If Xcel Energy is looking to create new materials, one potential option is to create a one-page visual document to indicate eligibility requirements. Other options include additional trade partner trainings and ensuring customers know what phone number to call with questions. As a note, this barrier would also diminish with a midstream or upstream offering.

For midstream or upstream offerings, it is important to have a simple, well-defined calculation for energy savings. Benchmarked utilities noted that midstream and upstream programs work best when the savings are simple to calculate.

Recommendation 5: When considering the transition to midstream or upstream rebates, ensure that the method for calculating savings are relatively simple. When prioritizing measures to move to midstream or upstream channels, focus on the simplest measures and continue to use downstream channels for the more complex equipment.

For midstream or upstream offerings, it is important to understand the supply channel prior to launching the offering. One benchmarked utility noted that knowledge of the supply chain is key to midstream and upstream products, and specifically noted challenges with mapping the VFD supply chain.

Recommendation 6: When considering the transition to midstream or upstream rebates, ensure that the product staff have a clear understanding of the supply channel and a clear map of how the product will impact that channel. Product staff should review the previous market characterization research to catalog any lessons learned and consider additional research if necessary. Additionally, product staff should consider mapping the supply chain and the product's influence on that chain prior to launching the product.

1. INTRODUCTION

Xcel Energy offers a comprehensive array of demand side management (DSM) and other energy services and products to its customers. For the evaluations of its 2017 and 2018 products, Xcel Energy sought to improve the customer experience, understand the roles their products have in changing the marketplace, analyze the product influences on customer choices, and ensure industry-leading program performance. To accomplish this, Xcel Energy contracted with EMI Consulting and its partners: Evergreen Economics, Apex Analytics, and Ridge & Associates (hereafter 'the evaluation team'). This team undertook evaluations of nine products offered in Colorado and Minnesota in 2018, including the Motor and Drive Efficiency Product in Minnesota, discussed in this report.[1] This introduction includes an overview of the product and the evaluation approach, and describes the organization of this report.

1.1 Product Overview

The MN Motor and Drive Efficiency Product offers prescriptive and custom rebates to Xcel Energy commercial and industrial (C&I) customers who install qualifying motor and drive equipment in existing or new buildings. Rebates are offered to encourage C&I customers to purchase energy-efficient motors and drives by lowering the upfront premium costs associated with this equipment. From January to September 2017, the Motor and Drive Efficiency Product claimed over 16.6 GWh in energy savings from prescriptive rebates provided in Minnesota (Table 1-1).

[1] The products selected for evaluation in 2018 include: Custom Efficiency (CO), Evaporative Cooling (CO), School Education Kits (CO), Home Lighting (CO), Lighting Efficiency (CO), Motor and Drive Efficiency (MN), Multi-Family Building Efficiency (MN), Business New Construction (MN), Water Heater Rebates (MN).

Table 1-1. Motor and Drive Efficiency Savings, by Measure, January – October, 2017

Measure	Units		kWh	
	Quantity	% of total	Quantity	% of total
New Motor - Enhanced	1	<1%	3,625	<1%
Upgrade Motor - Enhanced	3	<1%	52,754	<1%
Upgrade Motor	128	20%	260,563	2%
Water Well Pump VFDs	16	3%	416,097	3%
Variable Frequency Drive	480	76%	15,837,927	96%
TOTAL	**628**	**100%**	**16,570,966**	**100%**

[a] This is the population of participating customers receiving rebates between January and September 2017. These numbers are based on aggregated data provided to EMI Consulting in February 2018.

The Motor and Drive Efficiency Product includes rebates for both energy-efficient motor equipment and for variable frequency drives (VFDs). The product offers rebates for four types of motor improvements: constant speed motor controllers, enhanced new motors (i.e., installation of motors that exceed DOE standards where one never existed), enhanced upgrade motors (i.e., replacement of functional inefficient motors with motors that exceed DOE standards), and motor upgrades (i.e., replacement of functional inefficient motors with motors that meet DOE standards). Enhanced motors can include both induction motors and permanent magnet alternating current (PMAC) motors. Additionally, the product offers rebates for VFDs for HVAC and non-HVAC equipment, and for VFDs for water well pumps.

The product is also considering several modifications for future cycles:

- Based on market research showing potential to expand the number of participating distributors, product staff may consider adding midstream incentives for the product to influence the stocking practices of distributors and vendors in the state.
- Depending on feasibility of implementation, product staff may consider adding rebates for integrated equipment to influence sales of this equipment and capture savings through the product.
- Due to lower participation in the product among non-managed accounts (since those accounts participate in other products, such as Turn Key Services), product staff may increase education and outreach to trade partners, with an emphasis on how the product can support customers with non-managed accounts.
- Finally, the PMAC motor product will be promoted as a higher efficiency alternative to traditional induction motors.

The MN Motor and Drive Efficiency Product relies heavily on an active trade partner network, as well as active involvement from account managers in selling motor and drive upgrades to their customers. While Xcel Energy does not actively endorse or promote individual trade partners, this group plays an integral part in advancing the product. Internally, Xcel Energy relies on channel managers to maintain these relationships.

1.2 Evaluation Overview

The evaluation team designed a comprehensive evaluation of the Motor and Drive Efficiency Product to provide information on six key research topics:

- Product influence (net-to-gross ratio)
- Product awareness
- Barriers to participation
- Satisfaction
- Product design
- Portfolio influence

Table 1-2 presents an overview of the research topics and data sources used in this evaluation of the MN Motor and Drive Efficiency Product.

Table 1-2. Motor and Drive Efficiency Product Evaluation Framework

Research objectives	Customer Survey (n=70)	Trade Partner In-Depth Interviews (n=20)	Peer Utility Benchmarking Interviews (n=5)	Portfolio Data Analysis
Product Influence (NTGR)	X[a]	X	X	
Product Awareness	X			
Barriers to Participation	X	X	X	
Satisfaction	X	X		
Product Design		X	X	
Portfolio Influence				X

[a] This research effort also included 3 follow-up interviews to clarify inconsistencies in the net-to-gross responses.

1.3 Report Organization

The following chapters organize the evaluation findings into two components: process and impact evaluation results. As illustrated in Table 1-2, each data collection activity may have contributed to multiple evaluation objectives. Further detail on the evaluation approach is presented in the following chapters. Chapter 2 reviews the approach and results of the net impact evaluation and the attribution of product impacts using a standard net-to-gross ratio (NTGR) analysis. Chapter 3 discusses the process evaluation components, which addressed customer and trade partner awareness, motivators of and barriers to participation, product experience and satisfaction, and the potential for expanding the product through additional measures or delivery mechanisms. Conclusions and recommendations are presented in Chapter 4. Detailed, descriptive methodology information, evaluation plans, and survey instruments can be accessed in this report's appendices.

2. IMPACT FINDINGS

A central component of this evaluation was the estimation of the net-to-gross ratio (NTGR) for the Xcel Energy Motor and Drive Efficiency Product in Minnesota. For demand-side management (DSM) programs, the NTGR is a metric that estimates the influence of the program on the target market. It is used to adjust reported gross energy savings to account for energy efficiency that would occur in the absence of a program, and it is also used as a benchmarking indicator of program effectiveness. NTGR results can indicate opportunities for Xcel Energy to adjust the design and implementation of its products to increase the cost-effectiveness of individual products and the entire portfolio. The NTGR includes several factors that create differences between gross and net savings, such as free-ridership and spillover. The evaluation team estimated a retrospective NTGR based on data provided by customers and trade partners, and then recommended prospective NTGRs based on potential changes to the product's design. Note that, while a NTGR of 1.0 is often seen as desirable, it may not be appropriate for all product designs depending on a variety of factors (including the maturity of the product and the technologies it promotes, product intervention strategies, and cross-product coordination strategies). The evaluation team has taken care to present our NTGR results with this context in mind.

This chapter presents:

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

2.1 Key Impact Findings

This section presents key findings from the impact evaluation for the MN Motor and Drive Efficiency Product, including retrospective and prospective NTGR recommendations. The evaluation team estimated retrospective NTGRs based on the quantitative and qualitative results of the customer and trade partner research. Then, the team recommended three prospective NTGRs based on potential future changes to the product design, as presented in the following section.

Retrospective Net-to-Gross Ratio

The evaluation team estimated a retrospective NTGR of 0.86 for the Motor and Drive Efficiency Product, based on results from customer and trade partner responses. To estimate this NTGR, the evaluation team took the following steps:

- The evaluation team first estimated an overall free-ridership ratio of 0.22 (unweighted average), based on participant surveys and follow-up interviews with customers (to determine whether to classify factors as related to the product).

    - These results were weighted to be representative of the population[2], and decreased to 0.16 for kWh and 0.17 for kW.
    - The evaluation team reviewed answers for consistency and found relative consistency across the scores, and therefore did not make qualitative adjustments.
- The evaluation team estimated 2% spillover for kWh and 3% spillover for kW, bringing the NTGR to 0.86 for both kWh and kW.
    - No market effects were added, as the evaluation team could not identify strong evidence of market effects during the trade partner interviews.

Prospective Net-to-Gross Ratio

As the future design and delivery of the Motor and Drive Efficiency Product is uncertain (given that the product staff are considering moving some of the measures to a midstream or upstream delivery), the evaluation team developed recommendations for three prospective net-to-gross ratios:

- If the product design remains the same (downstream rebates for both motor and drive equipment), the evaluation team recommends using the retrospective NTGR of 0.86 for both kWh and kW. The evaluation team recommends this NTGR for any year in which the product is offering a similar mix of both motor and drive downstream rebates.
- If the product begins to offer midstream or upstream rebates for drives, the evaluation team recommends using a preliminary NTGR of 0.86 for the midstream or upstream drives only. This NTGR represents the weighted average for the 55 customers who installed drives equipment. While it is the most representative NTGR available, it is based on a downstream delivery mechanism, which is a very different product design. Thus, this ratio should be treated as a preliminary number, and Xcel Energy staff should re-evaluate the product approximately two years after the product launches to account for the change in delivery mechanism.
- If the product begins to offer downstream rebates for motors only (and not drives), the evaluation team recommends using a preliminary NTGR of 0.78. This NTGR is based on the unweighted average for the 15 customers who installed motors equipment.[3] The evaluation team had a low sample for motors only, which was not sufficient for 90% confidence +/- 10% precision at the strata-level (as the survey was designed for precision at the product-level). Thus, this ratio should be treated as a preliminary number, and Xcel Energy staff should re-evaluate the product after the first year of implementation, should this product design occur.

[2] The evaluation team applied two weights. First, the evaluation team determined a weighted average within each stratum (i.e., VFDs and motors) based on project size, so that larger projects were weighted more heavily. Second, the evaluation team combined the two strata-level weighted averages to estimate a product-level weighted average, based on the proportion of savings each stratum contributes to the total savings for the product (i.e., VFDs were weighted more heavily because they make up a greater portion of the product's savings.)

[3] The unweighted average is recommended for the motors-only score to eliminate the potential for a single outlier to skew the small sample dramatically, as this stratum had only 15 participants. When weighted, the average was heavily skewed by one very large project. The recommended VFD-only score is weighted, as there were 55 participants in that stratum, and the score was not dramatically influenced by an outlier project.

2.2 Net-to-Gross Approach

The evaluation team developed the NTGR for the MN Motor and Drive Efficiency Product using a self-report approach, based on participating customer survey results in combination with additional research data inputs. 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*.

The data inputs to the NTGR analysis included:[4]

- Participant surveys – focused on project-level effects, including free-ridership and participant spillover
- Follow-up interviews with participating customers – sought to clarify any conflicting information in the original surveys
- Trade partner interviews – focused on overall market effects
- Benchmarking interviews – intended to compare the NTGR to industry averages[5]
- Known product changes in upcoming years – factors any known implications for future changes in product design

The evaluation team used self-reported data from participating customers to develop an initial NTGR. Data from the additional sources listed above were then used in constructing a logical narrative of product attribution, and in finalizing the prospective NTGR for the product.

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.

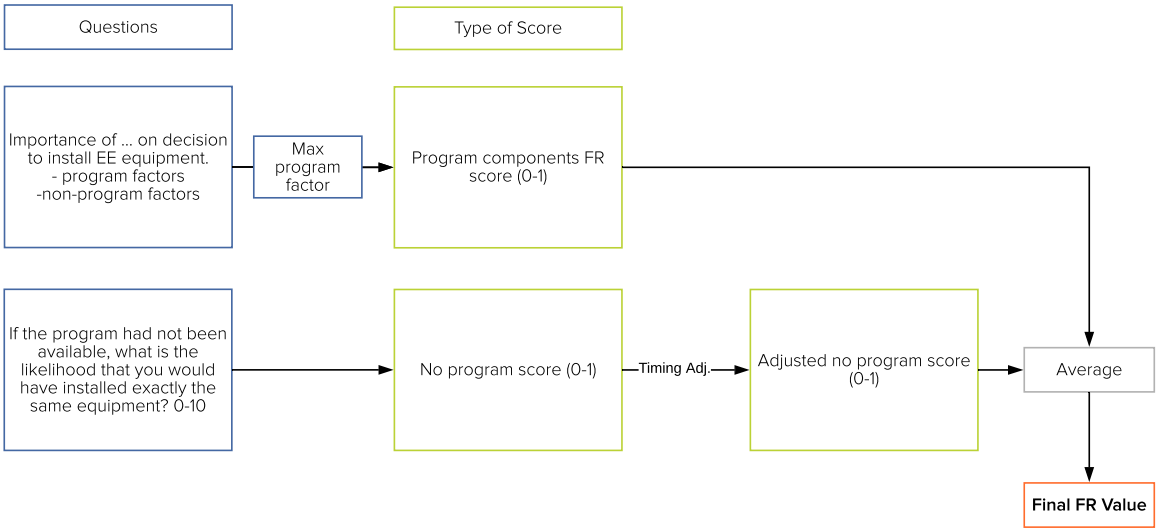
To determine free-ridership, the evaluation team started with the Core Nonresidential Protocol from the Illinois TRM, and wrote specific questions to assess three free-ridership components:

- A **Program Components Score**, based on the participating customer's perception of the importance of various product components in their decision to carry out the energy-efficient project;
- A **No-Program Score**, based on the participating customer's intention to carry out the energy-efficient project without product funds; and
- A **Timing Adjustment**, based on the participating customer's perception of when they would have carried out the project in the absence of the product.

[4] Additional descriptive detail on these research activities appears in Chapter 3 and in the appendices.
[5] Though the evaluation team asked utilities for NTGRs, no benchmarked utilities measured NTGRs for motor and drive equipment separately from other prescriptive rebates. Most utilities included motor and drive equipment in a larger C&I prescriptive program and did not have relevant comparisons available.

When scored, these components assess the likelihood of free-ridership on a scale of 0 to 10, with the two scores averaged and the timing adjustment applied to create a final free-ridership score (Figure 2-1).

Figure 2-1. Free-ridership Calculation Methodology



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 additional data required to estimate non-participant spillover effects.

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

Determination of Net-to-Gross Ratio

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

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

Finally, the evaluation team utilized all the information collected about the product (through customer surveys and follow-up interviews, trade partner interviews, and known product changes) to construct a logical, internally consistent, and coherent narrative of product attribution that attempted to identify all possible pathways of Xcel Energy influence. In addition to free-ridership

and participant spillover, the evaluation team also considered whether any adjustment was warranted due to the presence of market effects. Based on these results, a final summative NTGR value that is consistent with this narrative was recommended.

2.3 Net-to-Gross Ratio Inputs

As described in the approach section, the recommended NTGR is based on three primary data inputs: free-ridership, spillover, and market effects. This section explores each of these results in more detail, including qualitative data that supports the results.

Free-Ridership Results

Free-ridership is a measure of the proportion of the product's claimed energy efficiency savings that would have occurred in the absence of the product. To estimate free-ridership, the evaluation team estimated three metrics:

- A **Program Components Score**, based on the participant's perception of the importance of various product components in their decision to carry out the energy-efficient project;
- A **No-Program 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.

Overall, customers found the product to be highly influential. The Program Components Score was extremely low, with an unweighted average of 0.04. This score was driven by Xcel Energy's focus on the financial benefits of the equipment, including minimizing operational cost, the payback period, and reducing the upfront costs with the rebate. Customers often reported that Xcel Energy staff had provided them with key information on these factors. One customer said the information provided by Xcel Energy on the simple payback period "was very important because it allowed [them] to convince company heads to install the new equipment." These results reinforce the findings from the process evaluation, which indicate that the personal interactions with Xcel Energy staff are key drivers of customer decision-making and of positive customer experiences.

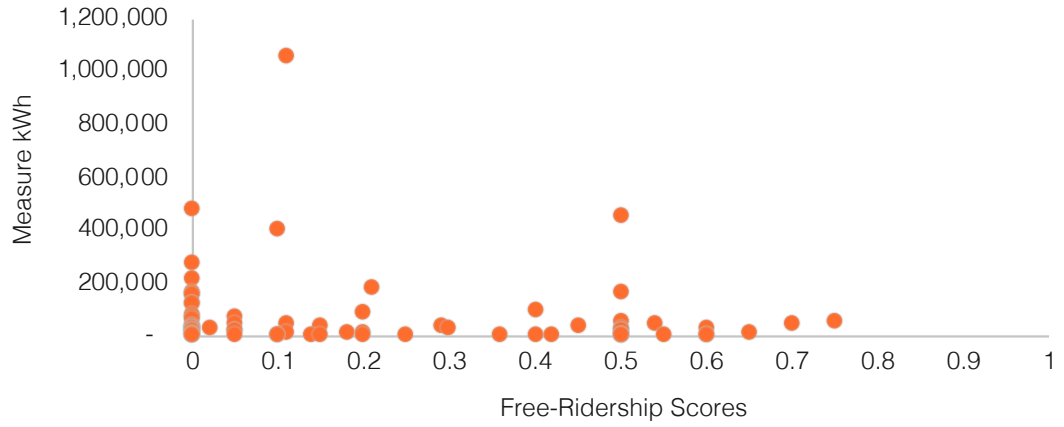
The Adjusted No-Program Score (which combines the No-Program Score and the Timing Adjustment) also showed the relatively high levels of influence from the product, with an unweighted average of 0.36. Across all NTGR research, this score tends to overestimate free-ridership, while the Program Components Score tends to underestimate free-ridership. The overall free-ridership score is an average of the Program Components Score and the Adjusted No-Program Score to balance these two biases.

The evaluation team found that the Timing Adjustment was heavily influential in decreasing the estimated free-ridership from the Adjusted No-Program Score. The results of the adjustment indicated that Xcel Energy staff were helping customers complete projects sooner than they would have without the product's influence. One customer noted that without the product, they "probably would not have done all four at once, but because of the rebate [they] were able to do all four at once." These results are reinforced by the trade partner interviews, in which trade partners noted that without the product, they likely would have a harder time selling new installations, and some of their projects might be delayed. One trade partner noted that they would "do more repairs instead of

new installs" without the product, and that it "would decrease the attractiveness of doing projects, [and] might delay them."

Finally, the evaluation team averaged the Program Components Score and the Adjusted No-Program Score and applied sampling weights to estimate free-ridership. With sampling weights applied, the free-ridership score decreased slightly (indicating high product influence) to 0.16 for kWh and 0.17 for kW. As shown in Figure 2-2, larger projects had a lower free-ridership, on average. This was largely driven by a few very large projects that had little or no free-ridership estimated. These projects have a greater impact on the product's savings as a whole, so they also have a larger influence on the product's free-ridership score.

Figure 2-2. Distribution of Free-Ridership Scores by Measure-Level kWh (n=70)



Additionally, the evaluation team also looked at free-ridership based on the type of measure installed. The evaluation team grouped measures into two categories: motors and VFDs. These categories were not designed to achieve 90% confidence +/- 10% precision, because the evaluation was designed to achieve confidence and precision at the product-level. However, we did examine the differences in motor and drive scores, as Xcel Energy staff are considering moving some of the measures to an upstream or midstream delivery, which may impact the appropriate NTGR to apply. Table 2-1 shows the average free-ridership scores for each measure category weighted by project size.

Table 2-1. Free-ridership by Measure Category

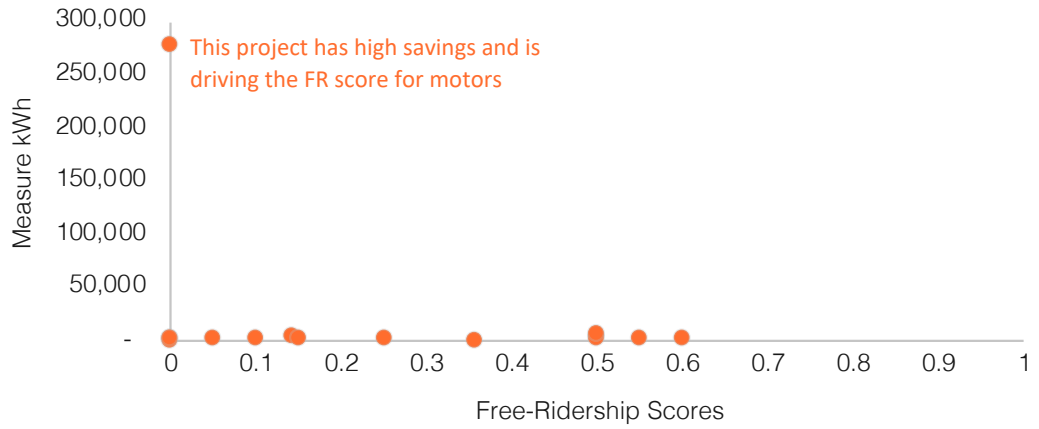
Measure Category	Number of Respondents	Percent of Total Product Savings	kWh Free-ridership score	kW Free-ridership score
VFDs	55	98%	0.16	0.17
Motors	15	2%	0.03	0.04
Total	**70**	**100%**	**0.16**	**0.17**

Note: While the survey had 71 respondents, only 70 were used for the net-to-gross research, as one indicated they were not involved in the decision-making and thus could not accurately answer the net impacts questions.

As shown in the table above, motors had very low-weighted averages for free-ridership. The evaluation team decided to look at this score more closely, as the score was based on a small number of participants and was significantly lower than the Product Component Score. Additionally, two benchmarked utilities expressed qualitatively that they had removed rebates for motor equipment due to worries about high free-ridership.

When looking at the individual free-ridership scores for motors-only projects, the evaluation team found that the motors-only free-ridership score is heavily influenced by one very large project with no free-ridership (as shown in Figure 2-3). Given the small sample size, the evaluation team does not recommend weighting the motors-only score, as the single outlier is having an undue impact on the weighted score. Unweighted, the motors-only free-ridership score was a 0.25. If the product eliminates all downstream drives rebates, and only offers downstream rebates for motors, the evaluation team recommends using this free-ridership score as an input into the preliminary NTGR.

Figure 2-3. Distribution of Free-Ridership Scores for Motor Equipment Only (n=15)



Spillover Results

Spillover is a measure of the amount of energy savings that occur due to the product that are *not* captured in the product's claimed energy savings. To be eligible for spillover, customers must have:

1. Installed additional efficient[6] motor or drive equipment after participating in the product;
2. Not received rebates for this equipment (and not be in the process of applying for rebates); and
3. Been influenced to install this equipment by the Motor and Drive Efficiency Product.

Three customers installed five spillover-eligible measures, including both motor and drive measures. The evaluation team then identified savings estimates for each measure based on the average savings listed for those measures within the Xcel Energy product data. Then, the evaluation team divided the spillover-eligible savings by the total sample savings for each measure category and weighted the results by the proportion of product savings attributed to each measure category. Ultimately, the evaluation team estimated 2% spillover savings for kWh and 3% spillover savings for kW.

[6] Efficient motors and drives were defined as equipment that would qualify for rebates from the product.

Market Effects

The evaluation team was unable to identify strong evidence for market effects from the trade partner interviews. Trade partners indicated that their stocking and sales practices had not been affected by the existence of the rebate, and many said they do not stock any equipment. Trade partners also noted there were other factors (outside of the product's influence) that affect what equipment they stock. When asked why the product did not influence their stocking practices, one trade partner noted: "I only stock a certain couple brands. I only go to a couple different brands that are reputable that I feel comfortable selling…We're not willing to drop our quality for cost. We would stock the same products." As this quotation illustrates, this trade partner is influenced by factors outside of the product's influence, and choose to stock equipment based on the quality of the equipment rather than based on a recommendation from the product or whether the equipment is eligible for a rebate. This sentiment was echoed by a number of trade partners, indicating that outside market forces and trade partner preferences are the primary driver of stocking practices, not the product or its rebates. To be conservative, the evaluation team has not added an extra market effects adder to the retrospective or prospective NTGR.

3. PROCESS EVALUATION

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

- Assess customer and trade partner awareness of motor and drive technology and rebates.
- Characterize key motivators and barriers in the customer decision-making process related to motor and drive purchases.
- Assess customer and contractor experiences, including ease of participation, experience with the product application, and satisfaction with their experience.
- Understand the potential for increasing the product's savings through adding additional measures, increasing participation of PMAC motors, or switching to midstream or upstream rebates.

To accomplish these objectives, the evaluation team elicited feedback from product staff, participating customers, market actors in the Xcel Energy Minnesota territory (including contractors), and other utilities with similar products. The evaluation team also conducted an analysis of historic participation data. 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 final chapter.

3.1 Key Findings

The evaluation team found that, overall, customers and trade partners are very satisfied with the current product operations, and staff report product processes are running smoothly. Customers and trade partners both noted that the product was easy to participate in, and that they were happy with their experiences. Additional key findings from the process evaluation research included:

- **Key Finding 1: Xcel Energy staff play a key role in educating customers about the technology and rebates, as well as in influencing their decisions to participate in the product.** Customers reported that Xcel Energy staff were highly influential in their decisions, and that they provided crucial information on the equipment, energy savings, and payback. Customers also most commonly heard about the equipment and the rebates through Xcel Energy staff. Trade partners liked the education that Xcel Energy provides for customers, as it enables customers to make decisions on that equipment.

- **Key Finding 2: Participating customers were highly satisfied with Xcel Energy.** Almost all participating customers (99%) were somewhat or very satisfied with the product overall, and 94% of participating customers were somewhat or very satisfied with Xcel Energy. As such, it is likely that the positive experiences customers are having through the product are also having a positive impact on customers' perceptions of Xcel Energy as a whole.

- **Key Finding 3: Some customers find it difficult to assess what equipment is eligible for rebates.** When asked for suggestions for improving the product, customers most commonly cited more clarity on equipment eligibility. Additionally, "identifying eligible equipment" received the lowest score related to ease of participation.

- **Key Finding 4: For midstream or upstream offerings, it is important to have a simple, well-defined calculation for energy savings.** Benchmarked utilities noted that midstream and upstream programs work best when the savings are simple to calculate (i.e., measures that have fewer parameters that could affect the savings calculations). When utilities typically prioritize measures to move to midstream or upstream channels, they focus on the simplest measures and continue to use downstream channels for the more complex equipment.

- **Key Finding 5: For midstream or upstream offerings, it is important to understand the supply channel prior to launching the offering.** One benchmarked utility noted that knowledge of the supply chain is key to midstream and upstream programs. This utility specifically mentioned challenges they had experienced due to an inadequate understanding of the VFD market; they highly-recommended spending time formally mapping that market prior to launching offerings targeted at it.

In Section 3.2, we describe the overall approach used for the process evaluation research activities and, beginning in Section 3.3**Error! Reference source not found.**, we provide detailed results from each of these activities.

3.2 Approach

To accomplish the evaluation objectives for the Motor and Drive Efficiency Product, the evaluation team completed a suite of intersecting and complementary research activities in 2018. Detailed information on the sampling approach used for the research can be accessed in Appendix A.1. The following discussion highlights the research topics contributed by each research activity: staff interviews, participant surveys, trade partner interviews, and benchmarking interviews.

Staff Interviews

The evaluation team conducted five in-depth group interviews of 11 Xcel Energy personnel involved with the MN Motor and Drive Efficiency Product early in the course of this evaluation, including one Product Manager/Team Lead, four Account Managers, one Business Solutions Center (BSC) Account Manager, three Channel Managers, and two Sales Representatives. The staff interviews covered the following topics:

- Assess the extent to which the product design supports product objectives and customer service/satisfaction objectives
- Determine 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

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

Participant Surveys

The evaluation team conducted telephone surveys with participating customers using customer records from Xcel Energy for the sample frames. The evaluation plan used for this project can be found in Appendix A.1. Sample sizes for the participant surveys were set at levels adequate to provide a 90% level of confidence with a minimum of +/- 10% relative precision.

For the purposes of this evaluation, a participating customer was defined as any customer that closed a Motor and Drive Efficiency opportunity in 2017 or the first half of 2018. The participant sample was stratified and populated proportional to kWh savings to ensure that the sample was representative across measure type. Additionally, we selected 3 customers from the surveys who provided conflicting answers in the net-to-gross battery. We conducted in-depth interviews with these customers so that the evaluation team could dive deeper into their decision-making and clarify their free-ridership. The participant survey was designed to address the following process objectives:

- Assess customer perceptions and awareness of motor and drive technologies to better understand how these factors may hinder greater product participation.
- Characterize the motivations and barriers in the customer decision-making process for purchasing and upgrading motors and drives.
- Understand customers' experiences and satisfaction with the product, including experiences with the application process.

Appendix B.3 contains the questionnaire used for the participating customer survey.

Trade Partner Interviews

In addition to the surveys with participating customers, the evaluation team conducted in-depth interviews with trade partners (i.e., contractors, vendors, and distributors). The trade partner research addressed the following process topics:

- Assess contractor perceptions and awareness of motor and drive technologies (including PMAC motors) to better understand how this may hinder greater product participation from trade partners and their customers.
- Identify the tools trade partners find most helpful in motivating customers to purchase motors and drives equipment, as well as any barriers they experience.
- Characterize trade partners' product experiences, including the application process, and identify where opportunities may exist to facilitate greater participation.

Appendix B.2 presents the interview guides used for the trade partner research.

Benchmarking Interviews

The evaluation team examined 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 five

staff members of these utility programs (including implementer staff) to address the following topics:

- Understand how other utilities structure and evaluate their motor and drive offerings (both in terms of overall achievement and net-to-gross methodology).
- Identify any measures offered by other utilities that could be applicable to the MN motor and drive market.
- Identify challenges faced by other utilities in promoting motor and drive technologies.
- Examine perceptions of how the motor and drive market is changing, and what may be challenging in the future.
- Identify successes of other utility programs, and how those might be applied to the MN Motor and Drive Efficiency Product.
- Examine successes and challenges of midstream offerings for motors or drives, and identify any lessons learned.

To provide important contextual information, additional descriptive program information was collected where possible, including eligible measures and customers, product implementation strategies and engagement practices, and participation levels. Appendix B.4 contains the interview guide used for the benchmarking interviews.

Data on all 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 Customer and Trade Partner Awareness of Motor and Drive Technology and Rebates

The first process evaluation research objective was to assess customer and trade partner awareness of the product and motor and drive technology generally. The evaluation team drew from participant surveys and trade partner interviews to understand 1) if customers were aware of the technology prior to participating, 2) how customers became aware of the technology, and 3) how customers and trade partners became aware of the rebates for the equipment. Our research indicates that customers are typically aware of the technology before participating in the product; however, Xcel Energy staff play a significant role in that education. Nearly a quarter (23%) of customers reported that they learned about the technology through Xcel Energy staff, and an additional 11% said they learned about it through previous participation in the product. Xcel Energy staff also play a critical role in increasing awareness of the product; 28% of customers said they heard of the rebates through their account manager, and another 8% heard through other Xcel Energy staff. These results indicate the Xcel Energy staff play critical roles in the customers' decision-making; both in educating customers about the technology and in promoting participation in the product.

In the following section, we provide more detailed results on customer and trade partner awareness of motor and drive technologies and rebates. Table 3-1 shows which sources informed the findings related to this research objective.

Table 3-1. Data Sources Used to Assess Customer and Trade Partner Awareness of Motors and Drives Technologies and Rebates

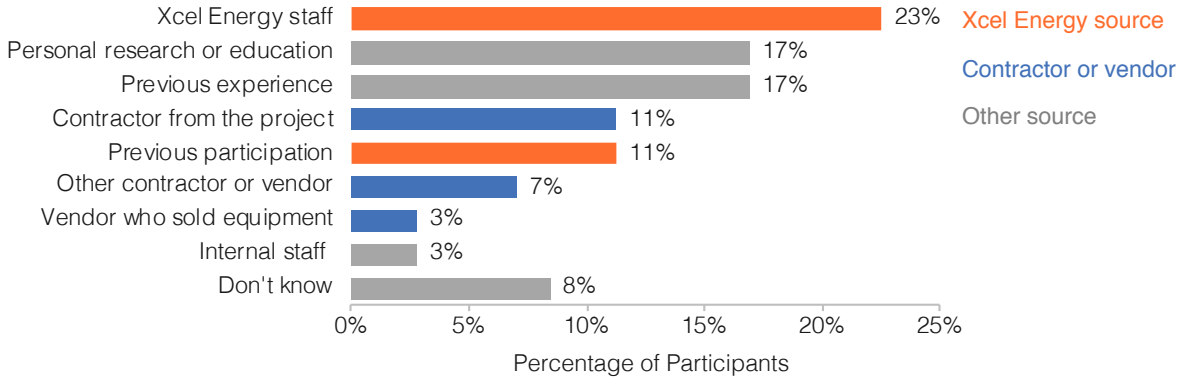
Research Questions	Data Source		
	Participant Surveys	Trade Partner Interviews	Peer Program Interviews
Were customers aware of motor and drive technology prior to completing their project?	X		
How do customers become aware of the use of efficient motors and drives to save energy?	X		
How do customers become aware of the rebates for the product?	X		
How do trade partners stay updated on changes to the rebates for the product?		X	

In the rest of this section, we present more detailed results on customer and trade partner experiences, including the following areas: awareness of the technology and Xcel Energy's rebate, customer and trade partner decisions to participate, barriers to increased participation, and points of satisfaction and suggestions for improvement.

Awareness of Motor and Drive Technology

Xcel Energy staff played a key role in educating customers about motor and drive technology. Most participating customers (87%) were aware of the technology they installed prior to their project. About one-third first learned about the equipment from Xcel Energy staff or previous participation in the product (as shown via the two orange bars in Figure 3-1), indicating that Xcel Energy is an important source of education about motor and drive equipment. Additionally, about one-fifth of customers heard about the product through trade partners (as shown via the blue bars in the figure below). These results indicate that while trade partners are an important driver of education, they are not currently the primary source of awareness. As Xcel Energy staff consider moving measures to a midstream or upstream delivery mechanism, it is important to either maintain Xcel Energy staff interactions or to work on developing trade partner materials to help replace the important educational outreach that Xcel Energy is conducting. Additionally, if Xcel Energy wants increase participation with non-managed accounts (which are currently participating primarily within other Xcel Energy products), trade partners would likely be leading those interactions, and may need additional training or materials to educate customers about using motor and drive technology as an energy-saving resource.

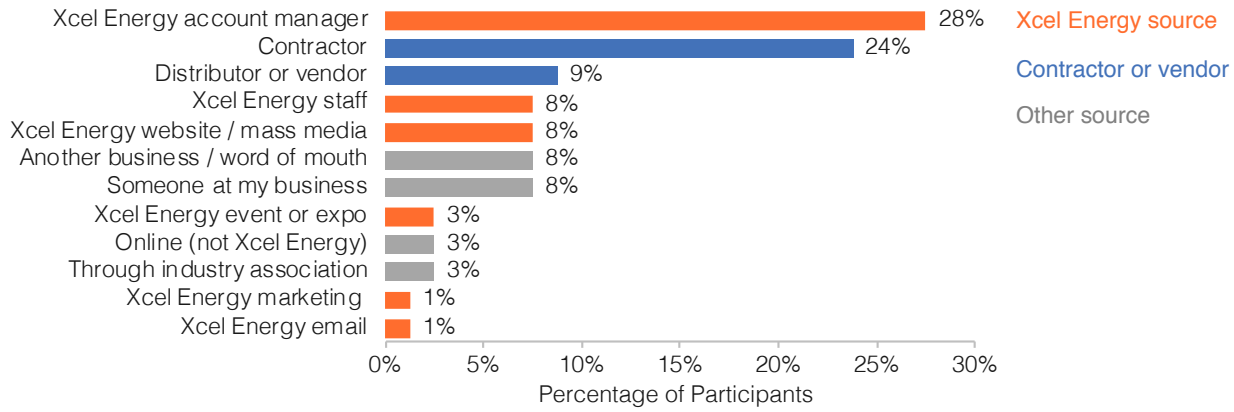
Figure 3-1. Sources of Customer Awareness of Motor and Drive Equipment (n=71)



Awareness of the Motor and Drive Efficiency Product

Xcel Energy was also the most common source of customer awareness about the Motor and Drive Efficiency Product rebates. Over a quarter (28%) of customers heard about the product through their Xcel Energy account manager, which matches with the product's design as described in the staff interviews and influence mapping. In all, customer awareness due to Xcel Energy sources makes up about half of the responses, as shown by the orange bars in Figure 3-2. This indicates that Xcel Energy is playing a key role in driving participation in the product. In addition, one-third of participating customers became aware of the product through contractors and vendors (as show by the blue bars in the figure below), which reinforces the importance of engaging trade partners.

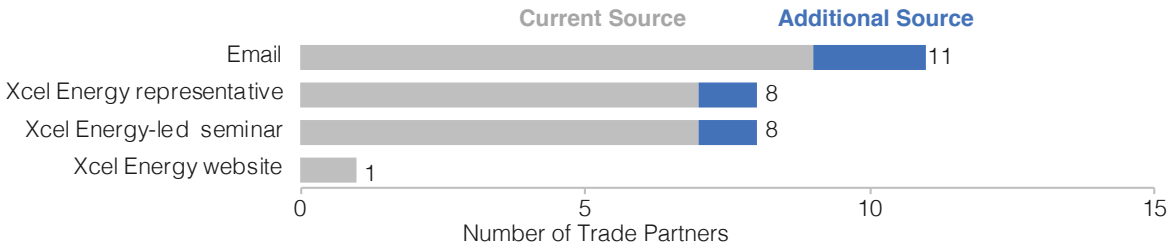
Figure 3-2. Sources of Customer Awareness of Xcel Energy Motor and Drive Efficiency Rebates (n=71)



The evaluation team also asked trade partners how they become aware of updates to the product. Email was the primary method by which trade partners stayed up-to-date on product changes, followed by correspondence with Xcel Energy representatives and attendance of Xcel Energy-led seminars, including trainings and annual meetings. In Figure 3-3, the gray bars represent how interviewed trade partners have heard about changes to the product. The blue bars in the graph represent additional sources of awareness that trade partners expressed interest in. When asked about their preferred source for hearing about product updates, 13 of 14 trade partners said their

current source was preferred.[7] Three trade partners provided additional preferred methods of contact, and one trade partner provided a source they would like to hear from instead of their current source. As shown in Figure 3-3, trade partners most commonly preferred to be contacted via email (with regard to updates to the product). However, Xcel Energy sources, including personal contact via an Xcel Energy representative and Xcel Energy-led seminars, were also important sources for learning about product updates.

Figure 3-3. Sources of Trade Partner Awareness of Updates to the Xcel Energy Motor and Drive Efficiency Product (n=14)



Note: Multiple responses accepted.

To gather more information on trade partners' experiences with product updates, the evaluation team asked trade partners what information has been the most useful to receive within the updates. Most commonly, trade partners reported that the most useful information was a summary of the latest changes to the product (as reported by 8 of 13 trade partners). One trade partner noted they wanted to know "if there's going to be any new information or if the rebate amounts change so that I make sure that I look at it maybe a little closer." Additional feedback included:

- "What is the rebate? What's the bottom line to the customers? How is the rebate changing?"
- "In person is nice if it's a significant change just so that we can educate ourselves on maybe why is this changing? What does this mean for our customers? If it's something minor, I don't think it's too big an issue. But if there's something that's a major change to a program, I think it's important to have that face-to-face conversation."
- "If I can get a clear, concise maybe a chart that's usually one of the first things to notice on an email so you know what's changed and what hasn't changed may be the easiest rather than a bunch of advertisement garbage."

Overall, the evaluation team found that Xcel Energy staff were extremely influential in driving awareness of both motor and drive technology and of the rebates available. These interactions are key to driving participation in the program and should be maintained where possible. However, trade partners also played an important role in driving awareness, particularly for customers who do not have an account manager. As the program considers new delivery channels that may rely less on Xcel Energy account managers, these trade partner interactions will become increasingly important.

[7] The interviewee who said they did not prefer their current source of awareness was a high-participating trade partner who wanted to hear by email instead of by Xcel Energy-led seminars.

3.4 Key Motivators and Barriers in the Customer Decision-Making Process

The second process evaluation research objective was to characterize the key motivators and barriers in the customer decision-making process for motors and drives. The evaluation team drew from trade partner interviews to understand 1) what motivates customers and trade partners to install efficient equipment and participate in the product, 2) what barriers prevent increased participation, and 3) whether trade partners are discussing rebates early enough for the incentive to influence projects. Our research indicates that time, effort, and awareness are key barriers to increased participation for both trade partners and customers. When asked about motivations for installing efficient equipment, customers most commonly referenced financial decision-making factors, as well as previous experience with and age of the equipment. Trade partners perceive the rebates and energy savings are motivational for customers, and they typically bring up conversations about rebates in their first conversation with the customers, indicating they have the potential to influence customer decision-making.

In the following section, we provide more detailed results on customer and trade partner motivators and barriers, with particular focus on what prevents additional participation in the product. Chapter 2 also provides additional information on the influence of the product and what motivates customers to install the equipment more generally. Table 3-2 shows which sources informed the findings related to this research objective.

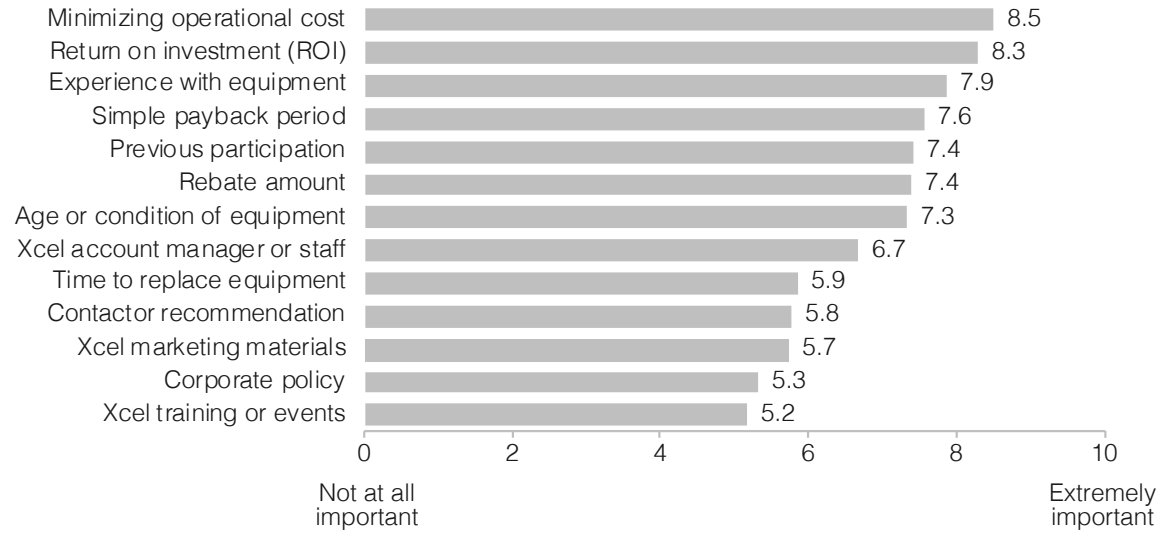
Table 3-2. Data Sources Used to Characterize Key Motivators and Barriers in the Customer Decision-Making Process

Research Questions	Data Source		
	Participant Surveys	Trade Partner Interviews	Peer Program Interviews
What motivates customers and trade partners to install efficient equipment and participate in the product?	X	X	
What barriers prevent increased participation in the product?		X	
Who initiates conversations about rebates? When do these conversations occur?		X	

Customer and Trade Partner Decision-Making

One key aim of the Motor and Drive Efficiency Product is to increase participation (both from customers and trade partners) and expand the product's influence in the market. To better understand how the product might expand to reach more customers, the evaluation team first asked customers about important factors in their decisions to install new equipment. Customers rated a variety of decision-making factors on a scale from 0 to 10, where 0 indicates the factor was not at all important, and 10 indicates it was extremely important. As shown in Figure 3-4, financial decision-making factors—including minimizing operating costs, return on investment, payback periods, and the rebate—were rated as important motivators by most customers. Other important motivators included previous experience with the equipment, previous participation in the product, the age of the equipment, and Xcel Energy account managers or staff.

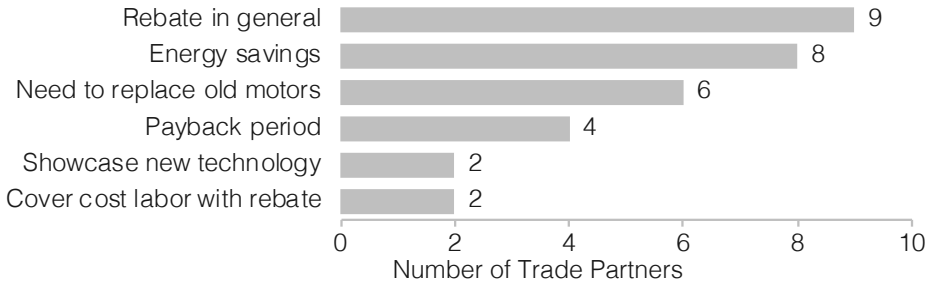
Figure 3-4. Motivators in Customers' Decisions to Install Energy-Efficient Equipment (n=70)



To better understand trade partners' decisions to participate in the product (in addition to installing the efficient equipment), the evaluation team asked them about why they believe their customers participated in the product. As shown in Figure 3-5, trade partners most commonly reported that the rebate was the customers' primary motivator for participating in the Motor and Drive Efficiency Product. The following quotes are examples from two of the nine trade partners that credited Xcel Energy's rebates for motivating their customers' decisions to participate in the product:

- "They want to know on the quote up front if there's any rebates available. That's one of the questions they ask when you meet with them."
- "It's almost just part and parcel of the conversation whenever we are talking about the drives, is the rebate that comes along with it."

Figure 3-5. Trade Partner Characterization of Customers' Decisions to Participate in Motor and Drive Efficiency Product (n=18)



Note: Multiple responses accepted.

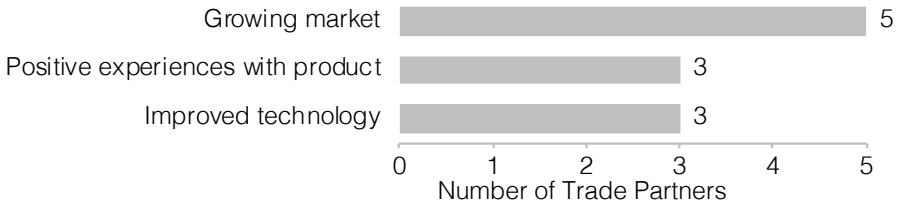
Trade partners also perceived that energy savings (specifically recurring savings on monthly bills) and age of the existing equipment were important motivators for customers; age of equipment was noted most commonly for motor equipment. These results, combined with those from the customer surveys, indicate that financial motivators (both in terms of reducing upfront costs and long-term

savings) are key in promoting new motor and drive equipment, but that additional non-monetary factors (such as the age of the equipment) may play an important role in the decision for some customers.

Barriers to Increased Participation

To better understand what barriers to participation trade partners face, the evaluation team first asked trade partners about their current participation levels and how that has changed over time. Most trade partners (8 of 10) said they have increased or maintained the same level of participation in the product over time. As shown in Figure 3-6, trade partners cited a growing market for motors and drives, improved technology, and positive experiences with the product as their reasons for increasing participation.

Figure 3-6. Trade Partner Reasons for Increased Involvement in Product (n=9)



Note: Multiple responses accepted.

The following quotes provide more detailed insight for these reasons:

- Growing market for motors and drives
  - "Growing market. Technology is getting better. Prices are coming down."
  - "People are more aware of VFDs; it's just kind of the knowledge is out there."
- Improved technology
  - "Well the increase in size is because of the technology as far as the controls that are being used … there is more we can do."
  - "Equipment's getting better. VFDs have gotten better. Motors can handle 'em better."
- Positive experiences with the Motor and Drive Efficiency Product
  - "People have realized the money savings that VFDs provide. Then with the rebates, it makes it a little bit easier to move forward with that."

Only two trade partners said their involvement in the product had decreased over time. One of them attributed this to the strict Minnesota state energy code: "A lot of the rebates will follow Minnesota energy code. You almost always have to meet the rebates." This trade partner was indicating that the energy code in Minnesota is already so strict that they are already selling the more efficient equipment, so the rebate does not affect that decision. The other attributed it to fluctuations in the market: "Oh, it's just the market… there's a lot of variability," indicating that their participation is dependent on fluctuating customer demand. Both of these responses that the decrease in participation was due to outside forces, and not due to a lack of satisfaction with the product.

Next, the evaluation team asked trade partners if they had ever sold projects without the Motor and Drive Efficiency Product rebate as a sales tool, to understand if there were key barriers that were preventing those customers from participating in the product. Almost two-thirds (7 out of 11) of trade partners said they had sold eligible projects without the rebates as a sales tool. Their reasons included:

- Customer was unaware of rebates (n=2)
- Customer did not care about rebates for small projects (n=2)
- Other key actors (including manufacturers) were not aware of rebates (n=1)
- Customer did not want to take the time to pursue rebates (n=1)
- Customer was going to proceed with project regardless of the rebate (n=1)

These results indicate that limited customer time and lack of awareness of the rebates may be important barriers to increased participation in the product. If Xcel Energy decides to move some of the equipment to midstream or upstream rebates, these barriers would likely decrease, as participation would require less time and knowledge from customers.

To dig further into potential barriers to increased participation in the product, the evaluation team next asked trade partners about what prevented them from participating in the product more frequently. Out of 14 trade partners who spoke to any barriers they face with the Motor and Drive Efficiency Product, 5 (36%) said there were no barriers preventing them from participating more frequently. The most commonly reported barriers were that the product takes too much effort and that trade partners need more information on the application and rebate status, as shown in Figure 3-7. Currently, trade partners do not have access to an online method for checking the status of their applications, but Xcel Energy staff have noted that it is under development.

Figure 3-7. Trade Partner Reported Barriers to Increased Involvement with Product (n=16)

Note: Multiple responses accepted.

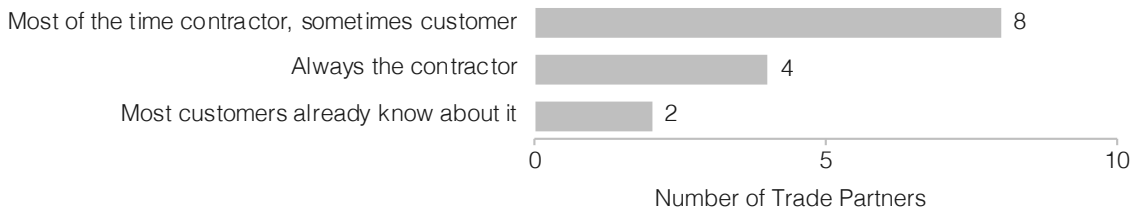
The following quotes illustrate a few of the barriers reported:

- Participating in the product is too much effort
  - "I know general contractors don't want to use it, because it adds time and some evaluation. But they don't want to wait for that. That's the biggest hurdle."
  - "This is just one more detail, one more paperwork push that people are just disinterested in… and it's not one of their concerns."
- Trade partners need more information on application/rebate status
  - "Not only do I not know if my client received the approval copy, I don't know when he approved it, or she. I don't know when the program manager got it. I also don't know when it actually got to the account manager."
  - "I wish there was better communication if a contractor is filing that somebody let's us know that that rebate check was sent because we don't ever get notice."

Trade Partner Sales Processes

Finally, to better understand if trade partners were using the rebate to motivate sales of projects, the evaluation team asked trade partners about when they bring up product rebates in their conversations with customers. The evaluation team asked trade partners who initiates their conversations about the Motor and Drive Efficiency Product rebate with customers. As shown in Figure 3-8, over half of trade partners said that the trade partner most commonly initiates conversations about the incentives, with the customer initiating on occasion. A little under a third of trade partners say they always initiate the conversation, and only 14% of trade partners said that, most of the time customers, already know about the rebates. These results indicate that the contractors are playing an important supplementary role in educating customers about the rebates (at least for customers that do not become aware through Xcel Energy staff). While these results differ from the results of the participant surveys, it is important to note that not all customers utilize trade partners to install equipment, and that the evaluation team only spoke to a subset of trade partners, which does not capture all customer experiences.

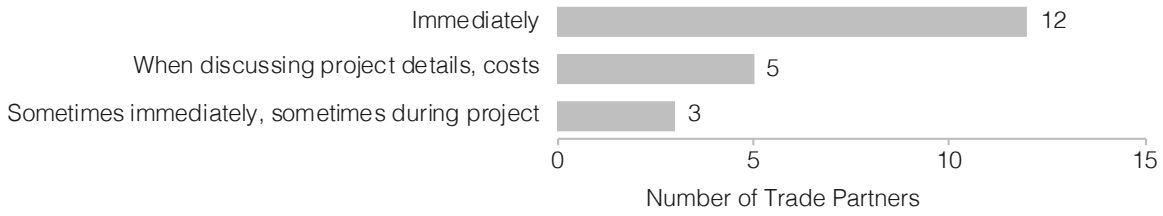
Figure 3-8. Frequency of Customer or Contractor Initiating Conversation About Rebates (n=14)



Next, the evaluation team asked trade partners to estimate when this conversation with customers about the rebate usually happens, in the context of the full timeline of the project. As shown in Figure 3-9, most contractors (60%) reported that they discuss rebates with customers immediately, in the beginning of the first conversation with potential clients. A quarter of trade partners discuss the product rebates when talking about the project details and costs, and about 15% of contractors said the timing varied across projects. These results indicate that trade partners are bringing up the rebate in time for it to influence customer decision-making. If, alternatively, trade partners had reported that they only brought up the rebate after the project had been sold, then it is unlikely that

the rebate could have influenced the customer's decision to install that equipment. More information about the influence of the Motor and Drive Efficiency Product on customers' decision-making can be found in Chapter 2, detailing the impact evaluation findings.

Figure 3-9. Timing of Trade Partner-Customer Conversation About Motor and Drive Efficiency Rebates (n=20)



3.5 Customer and Contractor Experiences with the Product

The third process evaluation research objective was to assess customer and contractor experiences with the Motor and Drive Efficiency Product. The evaluation team drew from trade partner and customer interviews to understand 1) how satisfied customers were with their experience, 2) how easy or difficult it was for customers to participate, 3) what customers and trade partners liked best about the product, and 4) what suggestions customers and trade partners had for improvement. Our research indicates that both customers and trade partners are very satisfied with the product, and customers find it very easy to participate in the product. Almost all (99%) of customers were satisfied with their experiences with the product. Xcel Energy staff appear to be driving positive customer experiences, with 95% of customers stating they were satisfied with their interactions with their Xcel Energy representatives and 22% saying interactions with Xcel Energy staff were their favorite part of the product. Customers also said it was very easy to get in touch with Xcel Energy staff, indicating that staff are responsive and that their contact information is clear. Additionally, both trade partners and customers said the product was easy to participate in, noting high rebates as a key driver of their satisfaction. Overall, the aspects of the product that were most challenging—including determining eligibility for rebates—would likely be significantly easier under a midstream or upstream design (as is being considered by the product staff).

In the following section, we provide more detailed results on customer and trade partner experiences with the product. Table 3-3 shows which sources informed the findings related to this research objective.

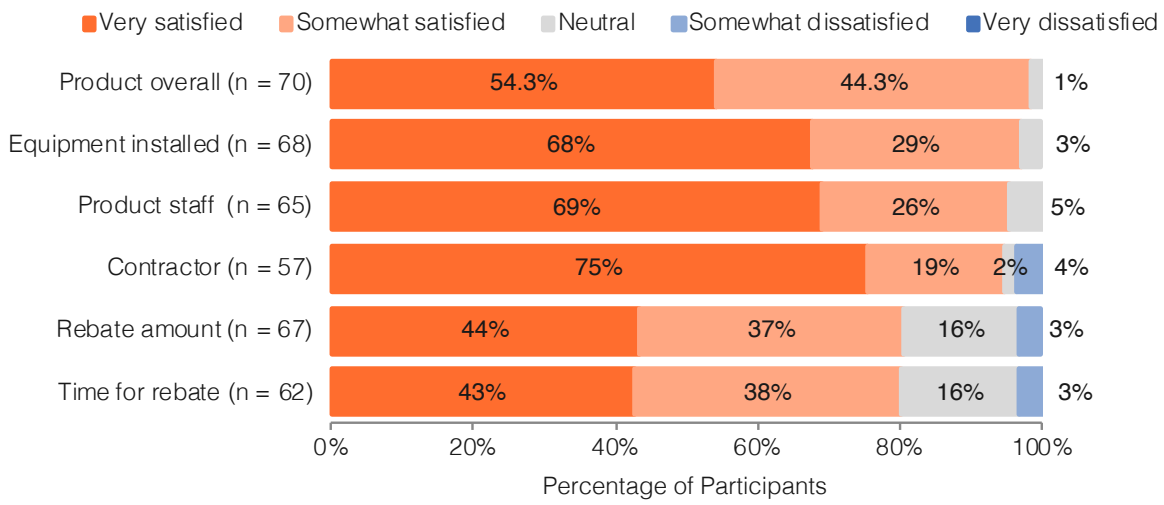
Table 3-3. Data Sources Used to Assess Customer and Contractor Experiences with the Product

Research Questions	Data Source		
	Participant Surveys	Trade Partner Interviews	Peer Program Interviews
How satisfied are customers with their experience with the product and Xcel Energy?	X		
How easy or difficult do customers find the product's processes to complete?	X		
What do customers and trade partners like best about participating in the product?	X	X	
What do customers and trade partners suggest improving?	X	X	

Customer Satisfaction

The Motor and Drive Efficiency Product received very high satisfaction ratings from customers, indicating that the product provides positive customer experiences for those who participate. As shown in Figure 3-10, an overwhelming 99% of participating customers were somewhat or very satisfied with the Motor and Drive Efficiency Product. No customers said they were dissatisfied with their experience with the product overall.

Figure 3-10. Customer Satisfaction with Motor and Drive Efficiency Product



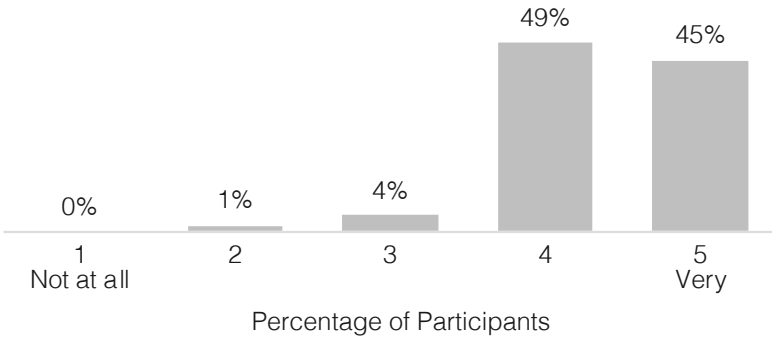
Note: Numbers may not add up to 100% due to rounding.

Participating customers were also very satisfied with all aspects of the product. In particular, participants were especially satisfied with the equipment installed and their interactions with product staff. These results reinforce the findings that Xcel Energy staff not only play a significant role in educating customers about the technology and rebates, but also in providing positive customer experiences throughout the project. Customers also highly satisfied with their interactions with contractors, although a few were dissatisfied with their contractor. The two customers who were dissatisfied with their contractor interactions reported that they had some communication problems

with their contractors. As the Motor and Drive Efficiency Product considers new deliver mechanisms that may rely less on account managers, it is likely that contractors and other trade partners will assume a larger role in projects for those customers, and Xcel Energy staff should consider how to ensure that trade partners provide the same high-level customer experience that product staff and account managers are currently providing.

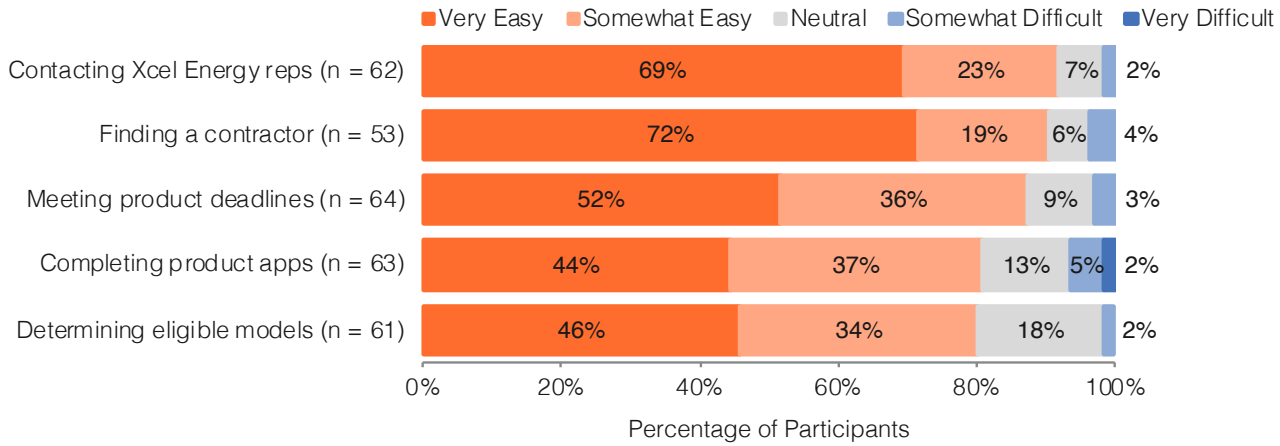
Customers were also very satisfied with Xcel Energy as a service provider, with 94% of customers saying they were somewhat or very satisfied (see Figure 3-11). The evaluation team did not measure satisfaction with Xcel Energy among the general population of customers, but conversations with Xcel Energy staff have indicated that participants are more satisfied than the general population. It is likely that the positive experiences that customers have with Xcel Energy during their participation has an impact on their satisfaction with Xcel Energy as a company. As the product considers moving some measures to midstream or upstream delivery mechanisms, it is possible that some customers will participate without knowing about Xcel Energy's role in providing them discounted equipment, and thus would not receive the same increase in satisfaction with Xcel Energy.

Figure 3-11. Participating Customer Satisfaction with Xcel Energy (n=71)



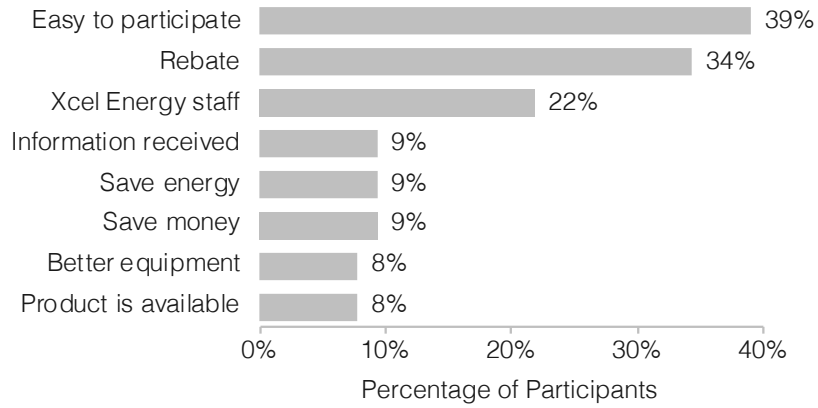
To better understand customer experiences, the evaluation team next asked about the ease of participating in the product. The majority of customers found product processes easy to complete, with over 80% rating all processes either somewhat or very easy to complete. In particular, customers found it very easy to get in touch with Xcel Energy representatives and to find a contractor to complete the work, as shown in Figure 3-12. Customers found completing product applications and determining what equipment was eligible for rebates to be slightly more difficult, indicating there may be room to provide streamlined instructions and eligibility information. As a note, a midstream or upstream offering would likely make these two processes much easier for customers, as the rebates could be applied automatically upon purchase.

Figure 3-12. Customers on the Ease of Participating in Motor and Drive Efficiency Product



When asked what they liked best about the product, customers most commonly cited the ease of participating, the rebate they received, and the positive interactions with Xcel Energy staff (as shown in Figure 3-13). One customer, who liked the ease of the product, said that "it was a very easy process. Applications were easy and quick; nothing was difficult." Another customer who liked the interactions with Xcel Energy staff said, "it goes back to our Xcel Energy representative. He stays in contact and knows what kind of things we're looking for and helps us with filling out the forms." These results are consistent with the results from the rest of the survey, emphasizing the key role Xcel Energy staff are having in customer experiences.

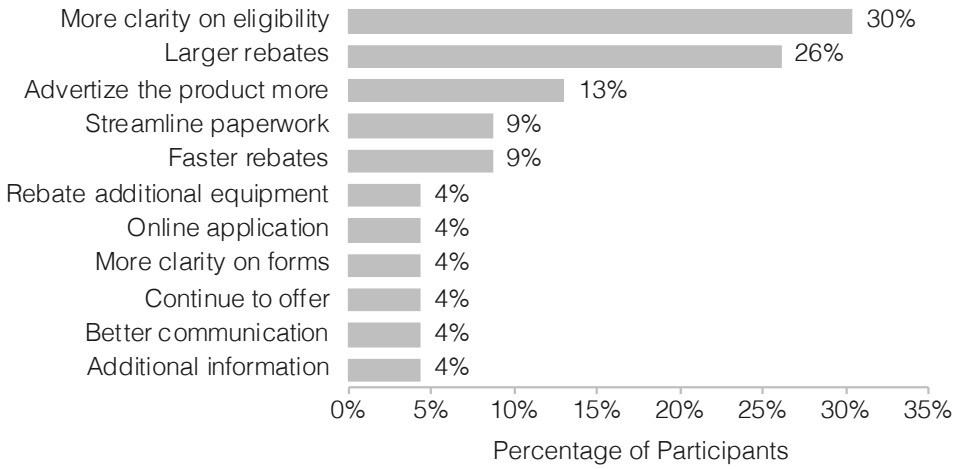
Figure 3-13. What Participating Customers Liked Best About the Product



Note: Multiple responses accepted.

Lastly, customers were asked for suggestions to improve their experience with the product. Of the 70 customers interviewed, only 23 (33%) provided any suggestions, with the others indicating the product was already meeting all of their needs. Three of the top five customer suggestions for the Motor and Drive Efficiency Product—more clarity on eligibility, streamlining paperwork, and faster rebates—refer to pain points in the product processes that would disappear or greatly diminish if product delivery moved midstream or upstream. Figure 3-14 shows the full list of suggestions from customers.

Figure 3-14. Customer Suggestions to Improve Product (n=23)



Note: Multiple responses accepted.

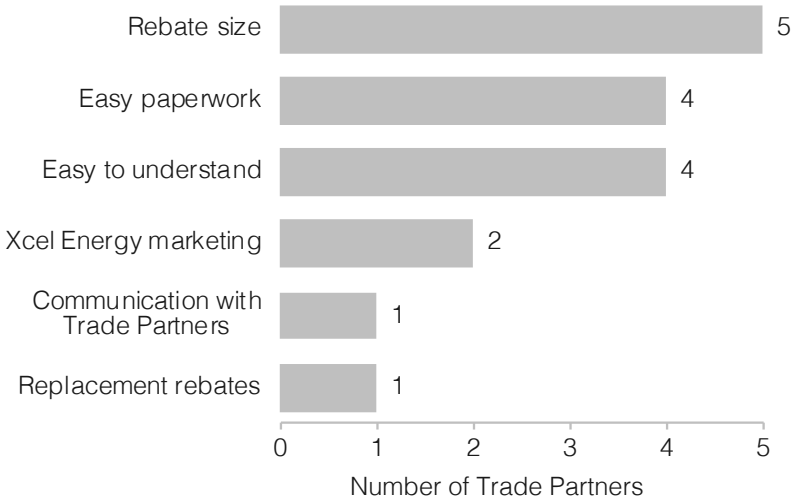
Customers' most common suggestion for improvement aligns with the processes that customers found more difficult (determining eligible equipment). Though most customers found that process easy to complete, there is a subset of customers who reported more difficulty, and who would have liked more clarity on what equipment is eligible for rebates. Two customers who asked for clarity on eligibility said:

- "I'd recommend one-on-one meetings with a representative from Xcel to go over the program requirements and to verify the requirements."
- "Our company installs a lot of ECM, and there isn't any information available on whether we can receive rebates for those."

Trade Partner Satisfaction and Suggestions for Improvement

As trade partners play a crucial role in the delivery of the Motor and Drive Efficiency Product, the evaluation team also asked trade partners about their experience with the product. First, the evaluation team asked trade partners what they liked best about the product. Most commonly, trade partners cited high rebates and that the product was easy to participate in, as shown in Figure 3-15. These were also noted by customers, indicating that the processes are working well for all key actors.

Figure 3-15. What Trade Partners Liked Best About the Product (n=10)



Note: Multiple responses accepted.

The following quotes provide more detailed insights on what trade partners liked best:

- Rebate size
  - "You guys are offering 60% of install. I think it's a fantastic rebate."
  - "The rebate, the dollar amount is awesome. I don't see that going up but definitely don't lower it."
- Easy to understand and complete paperwork
  - "It's easy to use and understand… I think it's all pretty basic, pretty straightforward."
  - "It's simple to understand. And like I said, most of the people locally understand it and can explain it and know how much your rebate's going to be, etc."

While a number of trade partners offered suggestions for improving the product, suggestions varied substantially, indicating there were no pervasive issues. Suggestions mostly related to:

- Rebates
  - Decrease time to deliver rebate (n=1)
  - More communication about rebate timing after submittal (n=2)
  - Increase rebate size (n=2)
- Expanding prescriptive measures
  - Expand measures to include what would otherwise go through custom (n=1)
  - Add a pump drive measure (n=1)
- Additional sales support from Xcel Energy
  - Provide more print marketing (n=1)
  - Send Xcel Energy reps on sales visits with trade partner staff (n=1)
  - Train manufacturers in product offerings (n=1)

3.6 Additional Measures and Delivery Mechanisms

The fourth process evaluation research objective was to understand the potential for increasing the product's savings through adding additional measures (with particular focus on PMAC motors) or switching to midstream or upstream rebates. The evaluation team drew from trade partner and utility interviews to understand 1) what additional measures trade partners would like the product to include, 2) trade partner and benchmarked utility perceptions of and experience with PMAC motors and 3) benchmarked utility experience with and lessons learned from midstream or upstream offerings.

The evaluation team found that PMAC motors are still an emerging technology, with little trade partner and customer awareness in Minnesota. Two benchmarked utilities claimed they had experience with PMAC installations; however, after further review, it appears these utilities were talking about efficient smaller, fractional motors, and not true PMAC installations. The discussions with benchmarked utilities indicate that these motors are smaller synchronous motors that would replace ECMs, and not the larger motors covered under the Motor and Drive Efficiency Product.

Only one utility had experience with midstream rebates for motors or drives and had experienced less success than expected. This utility also noted the importance of understanding the VFD market prior to launching a midstream product. Several other utilities had experience with midstream rebates for other equipment and mentioned that midstream rebates work best for relatively simple measures with easy, well-defined savings calculations. Ultimately, these results indicate that the product staff should carefully map the motor and drive market (and how the product will influence that market) prior to launching midstream or upstream rebates within the market.

In the following section, we provide more detailed results on the potential for increasing the product's savings through additional measures or delivery mechanisms. Table 3-4 shows which sources informed the findings related to this research objective.

Table 3-4. Data Sources Used to Understand the Potential for Expanding the Product through Adding Additional Measures or Delivery Mechanisms

Research Questions	Data Source		
	Participant Surveys	Trade Partner Interviews	Peer Program Interviews
What additional equipment could the product offer?		X	X
What are trade partner and benchmarked utility perceptions of and experience with PMAC motors?		X	X
What is the opportunity for a midstream or upstream product design, including lessons learned from peer utility programs?			X

Equipment Offered

The Xcel Energy product staff asked the evaluation team to explore which technologies might be candidates to add as new measures to the Motor and Drive Efficiency Product. To understand this question further, the evaluation team asked trade partners about suggestions for additional rebates

for motors and drives. Six trade partners provided suggestions, listed below. As a note, some of these measures may be covered under other existing Xcel Energy products, including the custom offering. Additionally, some of these suggestions may be under development by Xcel Energy, and some may not be feasible for the product to incorporate.

- Fans:
  - Half-horsepower fans
  - Efficient fans (based on the Fan Energy Index)
- Pumps:[8]
  - Small pumps (5 horsepower) and constant torque drives
  - Pumps with internal VFDs
- Other:
  - Rooftop units with VFDs[9]
  - Installations on generators that are not connected to grid[10]

As evident by this list, there were no suggestions that were pervasive across the trade partners that were interviewed. Most suggestions were fairly specific and involved either smaller horsepower requirements (which may not be cost-effective to rebate) or packaged units (including pumps and rooftop units with internal VFDs). Additionally, the evaluation team did not find any additional measures suggested by benchmarked utilities that were not already included in the Motor and Drive Efficiency Product. Overall, it appears that the product provides a comprehensive book of rebates.

PMAC Motors

During the staff interviews, Xcel Energy staff identified PMAC motors as an emerging technology that they had interest in promoting. To understand the potential for expanding the number of PMAC motors rebated by the product, the evaluation team first talked to trade partners about their experience with and perceptions of the motors. Of the 10 trade partners we talked to about PMAC motors, four had completed some PMAC installations. Three of the four said they had completed very few installations, and two said installations were increasing.

Trade partner familiarity with PMAC motors varied, with only one stating they were very familiar. When asked about customer familiarity and interest in PMACs, trade partners again provided a variety of responses, but indicated that customers are not very familiar with PMAC motors. Some trade partners also noted difficulty with promoting PMAC projects. For example, one trade partner said: "Very often, getting that energy efficiency like the [PMAC] offers is not always a priority of theirs."

The evaluation team also asked benchmarked utilities about their experience with PMAC motors to identify any lessons learned. Two benchmarked utilities (Utility A and Utility B) reported having experience rebating PMACs. However, after further review, the evaluation team and Xcel Energy

[8] Xcel Energy is currently developing an offering for this measure.
[9] Xcel Energy is currently considering adding rebates for this measure.
[10] This suggestion is not feasible, as generators that are not connected to the grid would not receive electricity service from Xcel Energy and thus could not receive incentives.

concluded that these utilities were likely referring to efficient fractional motors, which would replace ECMs (which are not rebated through the Motor and Drive Efficiency Product). Overall, these results indicate that PMAC motors are still an emerging technology, with limited experience in Minnesota and with peer utilities.

Midstream Delivery

The evaluation team and product staff have talked extensively about how the product might benefit or struggle from changing the delivery method to midstream or upstream rebates. During the benchmarking interviews, the evaluation team discussed midstream rebates with Utility A, which was the only utility that offered midstream rebates for motors or drives. Utility A has extensive experience with midstream offerings for different equipment, but has had less success than expected with motors:

- "I would say we've had moderate success, not nearly as good as we should, and I'm not entirely clear why. I don't know. Compared to a lot of the other stuff that we have going. That has been just not as exciting. I'm not sure why. We do circulators through the midstream. We have heat pump, water heaters, Douglas heat pumps. All of those are, I would say, probably best-in-class nationwide. Our evaporator fan motors have been . . . not as vibrant as I would expect… There's very few organizations or very few companies that actually sell these products. It's just a tricky market."

The program manager for Utility A's program also cautioned that extensive knowledge of the supply channel is key to successful midstream motor and drive programs, and specifically for the VFD market.

- "I think it's really critical to understand the VFD supply channel. We thought we had a grasp of it, and it turned out I think that we were really unaware of a lot of the way VFD is actually coming into them into the market. The big one that we missed was that these often go through with the . . . value-added resellers, VAR. The VARs end up doing a lot of the design and installation, and act almost like a vendor direct from the . . . manufacturer. . . . If you can establish a relationship with them, you can get a long way toward really having a successful offering, rather than going customer by customer. . . . Really thoroughly mapping out the supply channel is one thing that we missed. We've been working on that since, but I think we should have done that on the front end. That would have made a big, big difference. That's really specific to the VFDs. We did that very well with some of our other programs and have reaped the benefits, but we didn't do it as well with the VFDs as we should've, so I would highly recommend that."

Additionally, several utilities that had midstream offerings for other types of equipment mentioned that midstream rebates work best for simple, widget measures with few factors affecting savings, and warned against midstream programs for drives. Program managers said:

- "[Midstream] programs have been successful when it's really a simple widget-type thing, where you just say, "Don't buy this one; buy that one." It's an easy midstream versus something more complex and systems-based, which is what almost all of HVAC and refrigeration is."
- "Because there's a number of particulars in what the drive is actually [going to] be controlling. . . Lighting works because everyone knows what a light's [going to] be used for.

> . . . And we know how long a day is, and we can make some pretty good assumptions around that. When you install a drive, it can be on a motor that's used ten hours a year. It can be on a motor that's used 8,000 hours a year."

Overall, these results indicate that product staff should be cautious as they move rebates upstream to ensure that 1) the savings calculations are clear and well-defined, and 2) product staff have a documented understanding of the market and how the product will influence actors within the market.

Future of Motors Rebates

Though the Motor and Drive Efficiency Product is performing well, it is important for product staff to understand how the market is moving in other states and what challenges the product may face in the future. Several utilities noted concern about the future of motor rebates and said that increasing standards have made it difficult to incentivize motors.

- "For meeting goals in Minnesota, the really big challenge for us was the federal government adopting NEMA Premium as the new energy efficiency standard for all motors being manufactured."
- "Yeah, a new motor now, under Minnesota SIP rules, would have to exceed NEMA Premium by one full efficiency band, and the manufacturers, I feel like they're finally starting to catch up and offer motors that do exceed NEMA Premium."
- "My understanding is that the motors requirements are already pretty damn good. So, the odds of finding an inefficient motor out in the wild are slim to none."
- "The conclusion was reached that the standard efficiencies that are out there are already so high that it's just not worth incentivizing. The program would be hit with a pretty bad net-to-gross ratio on that. It was just taken off as a potential measure."

In fact, Utility B has stopped all prescriptive motors programs because of increased standards.

- "Seems like every three years when the code cycle changes, it kinda kicks the technology in the teeth. . . . It seems like the code is always on the heels of technology. If not sometimes in front of it. We had a problem with the 2013 cycle coming in too fast and furious. And manufacturers couldn't catch up for six months. So they delayed it. But anyway, yeah, it seems like technology gets out there, it's really nice, it's incentible [SIC], and then the next code cycle adopts it as standard, and so the savings and the incentives dry up quickly. That doesn't mean there's not energy savings. Energy savings by itself is still attractive in many applications, it doesn't have to have an incentive behind."

Overall, these results demonstrate the challenges faced by several peer utilities in continuing to offer motor rebates. Though the Xcel Energy Motor and Drive Efficiency rebates have not experienced the same challenges faced by some of their peers, it is important for product staff to understand general trends in motor rebates, and prepare for changes in the market.

4. CONCLUSIONS AND RECOMMENDATIONS

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

Overall, the evaluation team found that the Motor and Drive Efficiency Product is operating smoothly, with high levels of satisfaction among participating customers and trade partners. There is corresponding evidence from this evaluation that the product has had a positive net impact on energy efficiency within the Xcel Energy Minnesota service area. Specific findings and recommendations follow.

- **Key Finding 1: The product shows strong influence in the market, with retrospective NTGRs at 0.86 for both kWh and kW.** Key drivers of product influence include Xcel Energy staff interactions, conversations about the monetary savings, and the rebate. Additionally, the product has been successful in pulling projects forward in time and influencing customers to change out equipment sooner than they would have without the product.
    - **Recommendation 1a: If the product design remains the same (downstream rebates for both motor and drive equipment, the evaluation team recommends using the retrospective NTGR of 0.86 for both kWh and kW.** The evaluation team recommends this NTGR for any year in which the product is offering a similar mix of both motor and drive downstream rebates.
    - **Recommendation 1b: If the product begins to offer midstream of upstream rebates for drives, the evaluation team recommends using a preliminary NTGR of 0.86 for the midstream or upstream drives only.** This NTGR represents the weighted average for the 55 customers who installed drives equipment. While it is the most representative NTGR available, it is based on a downstream delivery mechanism, which is a very different product design. Thus, this ratio should be treated as a preliminary number, and Xcel Energy staff should re-evaluate the product approximately two years after the product launches to account for the change in delivery mechanism.
    - **Recommendation 1c: If the product begins to offer downstream rebates for motors only (and not drives), the evaluation team recommends using a preliminary NTGR of 0.78.** This NTGR is based on the unweighted average for the 15 customers who installed motor equipment.[11] The evaluation team had a low sample for motors only, which was not sufficient for 90% confidence +/- 10% precision at the strata-level (as the survey was designed for precision at the product-level). Thus, this ratio should be treated as a preliminary number, and Xcel Energy

[11] The unweighted average is recommended for the motor-only score to eliminate the potential for a single outlier to skew the small sample dramatically, as this stratum had only 15 participants. When weighted, the average was heavily skewed by one very large project. The recommended VFD-only score is weighted, as there were 55 participants in that stratum, and the score was not dramatically influenced by an outlier project.

staff should re-evaluate the product after the first year of implementation, should this product design occur.

-

- **Key Finding 2: Xcel Energy staff play a key role in educating customers about the technology and rebates, as well as in influencing their decisions to participate in the product.** Customers reported that Xcel Energy staff were highly influential in their decisions, and that they provided crucial information on the equipment, energy savings, and payback. Customers also most commonly heard about the equipment and the rebates through Xcel Energy staff. Trade partners liked the education that Xcel Energy was providing for customers, as it enabled customers to make decisions on that equipment.
    - **Recommendation 2a: Continue to utilize Xcel Energy staff for awareness, education, and influencing projects.** Customers and trade partners both appreciated the education and awareness provided by Xcel Energy staff, and staff were key drivers of energy efficiency projects. Where possible, the evaluation team recommends continuing to use Xcel Energy staff to engage customers for both downstream and midstream/upstream offerings.
    - **Recommendation 2b: Broaden and deepen relationships with VFD trade partners (including both contractors and distributors) prior to launching the midstream or upstream offering.** Customers currently are educated and motivated most frequently by Xcel Energy staff, followed by trade partners. As equipment moves upstream, relationships with trade partners will become more crucial, as they will be the actors that predominantly drive product savings.

- **Key Finding 3: Participating customers were highly satisfied with Xcel Energy.** Almost all participating customers (99%) were somewhat or very satisfied with the product overall, and 94% of participating customers were somewhat or very satisfied with Xcel Energy. As such, it is likely that the positive experiences customers are having through the product are also having a positive impact on customers' perceptions of Xcel Energy as a whole.
    - **Recommendation 3: Identify ways to highlight Xcel Energy's role in the midstream or upstream offerings.** Midstream and upstream products tend to have lower barriers to entry, and may result in cases where the customer is unaware of Xcel Energy's role in discounting their equipment. Xcel Energy staff should review lessons learned and key successes from their other midstream offerings and look to apply those to the midstream or upstream VFD rebates.

- **Key Finding 4: Some customers find it difficult to assess what equipment is eligible for rebates.** When asked for suggestions for improving the product, customers most commonly cited a desire for more clarity on eligibility. Additionally, identifying eligible equipment received the lowest score related to ease of participation.
    - **Recommendation 4: Identify ways to clarify what types of equipment are eligible for rebates.** Xcel Energy staff may already have materials made that could be used to clarify eligibility. If this is the case, the evaluation team recommends making those items easier to access and to consider providing some of the items to trade partners and Xcel Energy account managers to be used during the sales

process. If Xcel Energy is looking to create new materials, one potential option is to create a one-page visual document to indicate eligibility requirements. Other options include additional trade partner trainings and ensuring customers know what phone number to call with questions. As a note, this barrier would also diminish with a midstream or upstream offering.

- **Key Finding 5: For midstream or upstream offerings, it is important to have a simple, well-defined calculation for energy savings.** Benchmarked utilities noted that midstream and upstream programs work best when the savings are simple to calculate (i.e., measures that have fewer parameters that could affect the savings calculations).
    - **Recommendation 5: When considering the transition to midstream or upstream rebates, ensure that the method for calculating savings are relatively simple.** When prioritizing measures to move to midstream or upstream channels, focus on the simplest measures and continue to use downstream channels for the more complex equipment.

- **Key Finding 6: For midstream or upstream offerings, it is important to understand the supply channel prior to launching the offering.** One benchmarked utility noted that knowledge of the supply chain is key to midstream and upstream products. This utility specifically mentioned challenges they had experienced due to an inadequate understanding of the VFD market, and highly recommended spending time formally mapping that market prior to launching offerings targeted at it.
    - **Recommendation 6: When considering the transition to midstream or upstream rebates, ensure that the product staff have a clear understanding of the supply channel and a clear map of how the product will impact that channel.** Product staff should review the previous market characterization research to catalog any lessons learned and consider additional research if necessary. Additionally, product staff should consider mapping the supply chain and the product's influence on that chain prior to launching the product.

EMI CONSULTING

Xcel Energy
MN Motor and Drive Efficiency Product 2018 Evaluation

November 6th, 2018

DRAFT
APPENDICES

Presented To:

Nicholas Minderman
DSM Policy & Strategy Consultant
Xcel Energy
414 Nicollet Mall
Minneapolis, MN 55401

Presented By:

Jeremy Kraft
Project Director
EMI Consulting
83 Columbia St. Suite 400
Seattle, WA 98104

APPENDIX A: EVALUATION PLANNING DOCUMENTS

A.1 Evaluation Plan

To support the process and impact evaluation of the 2017 Xcel Energy efficiency programs, the EMI Consulting evaluation team will be conducting a process and impact evaluation of the Xcel Energy MN Motor and Drive Efficiency product. This memo provides an updated plan for the 2018 Xcel Energy MN Motor and Drive Efficiency product evaluation based on the original scope of work, staff feedback during the evaluation kick-off meetings, the product's influence map, and staff interview findings.[1] This evaluation plan includes the following sections:

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

Product Overview

The MN Motor and Drive Efficiency product offers prescriptive and custom rebates to Xcel Energy commercial and industrial (C&I) customers who install qualifying motor and drive equipment in existing or new buildings. Rebates are offered to encourage C&I customers to purchase energy efficient motors and drives by lowering the upfront premium costs associated with this equipment. From January to September 2017, the Motor and Drive Efficiency product claimed over 16.6 GWh in energy savings from prescriptive rebates provided in Colorado (**Error! Reference source not found.**).

Table 1. MN Motor and Drive Efficiency Savings by Measure, January – September 2017

Measure	Units		kWh	
	Quantity	% of total	Quantity	% of total
New Motor - Enhanced	1	<1%	3,625	<1%
Upgrade Motor - Enhanced	3	<1%	52,754	<1%
Upgrade Motor	128	20%	260,563	2%
Water Well Pump VFDs	16	3%	416,097	3%
Variable Frequency Drive	480	76%	15,837,927	96%
TOTAL	**628**	**100%**	**16,570,966**	**100%**

[a] This is the population of participants receiving rebates between January and September 2017. These numbers are based on aggregated data provided to EMI Consulting in February 2018. The evaluation will receive additional data for the end of 2017 and beginning of 2018 to use in the evaluation.

The Motor and Drive Efficiency product includes rebates for both energy-efficient motor equipment and for variable frequency drives (VFDs). The Product offers rebates for four types of motors improvements:

[1] The original scope of work is included in the evaluation team's contract with Xcel Energy for the 2017-2018 DSM evaluations.

constant speed motor controllers, enhanced new motors (i.e. installations of motors that exceed DOE standards where one never existed), enhanced upgrade motors (i.e. replacements of functional inefficient motors with motors that exceed DOE standards), and motor upgrades (i.e. replacements of functional inefficient motors with motors that meet DOE standards). Enhanced motors can include both induction motors and permanent magnet alternating current (PMAC) motors. Additionally, the Product offers rebates for VFDs for HVAC and non-HVAC equipment and for VFDs for water well pumps.

The Product is also considering several possible modifications for future cycles:

- Based on market research showing a potential to expand the number of distributors participating in the program, the Product may consider adding midstream incentives for the product to influence the stocking practices of distributors and vendors in the state.
- Depending on feasibility of implementation, the Product may consider adding rebates for packaged VFD measures to influence sales of this equipment and capture savings through the Product.
- The Product may consider modifying the rebate structure for motors to increase participation and reduce first-cost barriers. Potential changes to the rebate structure could include reducing the minimum motor size requirement or tiering the incentive value based on the motor's size.
- Based on lower participation in the Product among non-managed accounts, the Product may increase education and outreach to trade partners, with an emphasis on how it can support customers with non-managed accounts.
- Finally, the Product may have an increased focus on PMAC motors projects as an alternative to traditional induction motors.

The MN Motor and Drive Efficiency product relies heavily on an active trade partner network, as well as active involvement from account managers in selling motor and drive upgrades to their customers. While Xcel Energy does not actively endorse or promote individual trade partners, this group plays an integral part in advancing the product. Internally, Xcel Energy relies on channel managers to maintain these relationships.

Evaluation Overview

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

Process Evaluation

The evaluation team discussed process evaluation priorities during the kickoff meeting[2], influence mapping workshop[3], and staff interviews.[4] During those conversations, several themes emerged, primarily around customer perceptions/awareness of motors and drives, trade partner experiences with the Product (and how to encourage greater participation), and the potential to expand savings through the Product.

- The first topic, **customer perceptions and awareness**, is seen as a potential barrier preventing greater uptake of motor and drive technology in the Minnesota market. In particular, program staff are interested in understanding customer perceptions of PMAC motors and of the savings potential

[2] Held at the Xcel Energy Minneapolis office on February 12, 2017.
[3] Held at the Xcel Energy Minneapolis office on April 5, 2017.
[4] Staff interviews took place in April 2017.

for VFDs. Additionally, program staff are interested in understanding customer awareness of the program, particularly among non-managed accounts.

- The second topic, **trade partner experience**, relates to the importance of trade partners in driving savings in the program. In particular, the evaluation team will ask trade partners about what support motivates or assists them to engage with the product, and about what additional support they may need to increase engagement. Additionally, the evaluation team may speak to distributors within the state of Minnesota to understand what support would motivate them to engage in the program, and whether an upstream or midstream component would be well-received within this group.

- The third topic—**potential for Product expansion**—represents a need to understand the Product's potential for additional savings, either through changes to the Product or through decreasing barriers for customers.

These topics are mapped to the following **objectives of the process evaluation**:

- Assess customer and trade partner awareness and perceptions of motor and drive technology, with particular focus on perceptions of PMAC motors and of VFD savings potential.
- Characterize key barriers in the customer decision-making process related to motor and drive purchases: What are the most common barriers for adoption and how can Xcel Energy overcome them? How are other utilities encouraging the adoption of motor and drive technologies? Which of these barriers are most prevalent for non-managed accounts?
- Assess contractors' experiences: How can contractors be motivated to sell more motors and drives? What current activities are working well to motivate contractors? How can Xcel Energy make sure all eligible units are being submitted for rebates?
- Understand the potential for increasing the Product's savings through offering a packaged VFD measure, decreasing minimum eligible motor size, or switching to upstream rebates. How do other programs around the country structure their motor and drive rebates, and what are their offerings?
- Characterize the role of distributors in the market for motors and drives within Minnesota: What barriers to increases sales of motor and drive equipment do these market actors observe? What would motivate these actors to increase their engagement with the program?
- Optional: Understand how customer and trade ally participation varies by geography.
- Optional: Understand how the Product supports Xcel Energy's energy efficiency portfolio. How much energy savings are due to motor and drive equipment across the portfolio?

Impact Evaluation

The objective of the impact evaluation of the Motor and Drive Efficiency product is to develop a net-to-gross (NTG) ratio documenting the extent to which program activities influenced customer evaporative cooling purchasing decisions. The evaluation team proposes to use participant self-report surveys to estimate the Motor and Drive Efficiency product NTG, along with additional qualitative input from trade partners. Additionally, the evaluation team will also conduct a small number of in-depth interviews with the largest projects from 2017, since these will have the largest impact on the overall NTG ratio. Accordingly, the **objectives of the impact evaluation** include:

- Estimate a NTG ratio documenting the program's influence on customers' decisions.
- Identify major drivers of free ridership.
- Assess market effects of the Motor and Drive Efficiency product.

Data Collection Activities and Sampling Plans

To meet the above objectives, we will conduct a variety of data collection activities. These are listed in Table 2 and explored more in this section. The evaluation team has already conducted interviews with Xcel Energy staff members (task reference A in Table 2) and an influence mapping workshop to help understand specific needs for this evaluation (task reference B).

For customer research, the evaluation team will conduct phone surveys with participating customers (task reference C), as well as follow-up interviews with any customers who provide conflicting information during the survey research (task reference D). These surveys and interviews will inform prospective and retrospective NTG estimates, as well as research questions around perceptions/awareness, customer decision making, and general product experiences.

For trade partner and distributor research, the evaluation team will conduct phone interviews with trade partners (task reference E) to understand how these market actors participate in and are impacted by the Motor and Drive Efficiency product, as well as how the product can increase this engagement.

We will also benchmark the program against four to six peer utilities, assessing plans for future program designs and NTG estimates (task reference F). Lastly, we will perform an additional analysis and visualization of the Product's influence on other Xcel Energy products, including the amount of energy savings that are produced through motor and drive equipment across the portfolio (task reference G). Table 2 outlines each research task and the associated research objectives; details on each data collection activity are provided in the sections that follow. Differing size or scope are marked as "enhanced scope" in the table below. The enhanced scope tasks have been approved by Xcel Energy.

Table 2. Motor and Drive Research Summary

Task Ref.	Research Task		Sample Size	Enhanced Scope?	Research Objective(s)
A	Staff Interviews		5		Inform evaluation plan, NTG
B	Influence Mapping				Inform evaluation plan, NTG
C	Participant Surveys (telephone)		70		Perceptions/awareness, customer decision making & barriers, product experience/satisfaction, NTG
D	Participant Interviews		10		Perceptions/awareness, customer decision making & barriers, product experience/satisfaction, NTG
E	Trade Partner Interviews	Contractors, distributors or vendors	30		Perceptions/awareness, customer decision making & barriers, product experience/satisfaction, potential for product expansion, NTG
F	Peer Utility Benchmarking		4-6 utilities		Best practices, NTG, potential for product expansion
G	Internal Product Influence Analysis		-	✓	Data analysis and visual of how the product's measures and outreach influence other Xcel Energy products

A. Staff Interviews

In April 2017, the evaluation team conducted six interviews with eleven Xcel Energy staff to inform this evaluation plan, discuss program goals, and review program processes, challenges, and successes. Those interviewed included the current product manager, the current director of nonresidential programs in Minnesota, two engineers, one channel manager, five account managers, and two sales support staff. These

interviews were conducted over the telephone or in person, and took between 30 minutes and one hour to complete. These meetings, combined with the kickoff meeting and influence mapping (task B), allowed the evaluation team to create a focused evaluation plan and data collection activities.

B. Influence Mapping

In April 2017, the evaluation team held a 3-hour workshop with product staff to develop an influence map for the program. This workshop was conducted to document the Product's goals, understand barriers to those goals, and identify current and potential activities that could help overcome those barriers. Additionally, the workshop was conducted to understand areas where the evaluation could provide insight into barriers or potential activities, and identify potential research questions. This workshop, combined with the kickoff meeting and program staff interviews (task A), allowed the evaluation team to create a focused evaluation plan and data collection activities.

C/D. Participant Surveys and Interviews

The evaluation team will utilize participant telephone surveys and interviews to meet both process and impact objectives. These surveys and interviews will focus on the following three topics: perceptions/awareness, customer decision-making and barriers, potential for product expansion.

- Perceptions/Awareness: The evaluation team will assess customer perceptions and awareness of motor and drive technologies to better understand how this may hinder greater product participation.
- Customer Decision-Making and Barriers: The evaluation team will discuss the motivation behind purchasing motor and drive products as well as barriers to pursuing efficient upgrades or new equipment.
- Product Experience/Satisfaction: The evaluation team will discuss customers' experience with and satisfaction with the product, including experience with the application process.
- NTG: The team will ask questions on program attribution, or the impact the program had on their decision to purchase high efficient motor and drive equipment and potential non-program measures installed because of the Xcel Energy Motor and Drive Efficiency product (spillover).

The evaluation team will stratify the participant survey by measure type, with particular focus on the measures that account for the greatest amount of the Product's savings. Additionally, we will select up to 10 customers from the surveys who provide conflicting answers in the net-to-gross battery and conduct in-depth interviews with these customers so that the evaluation team can dive deeper into their decision-making and clarify their free-ridership.

E. Trade Partner Interviews

The evaluation team will utilize trade partner interviews to meet both process and impact objectives. These interviews are integral for the following five evaluation objectives: perceptions/awareness, customer decision-making and barriers, trade partner experience, potential for product expansion, and NTG impacts.

- Perceptions/Awareness: The evaluation team will assess contractor perceptions and awareness of motor and drive technologies to better understand how this may hinder greater product participation from trade partners and their customers.
- Customer Decision-Making and Barriers: The evaluation team will discuss the tools trade partners find most helpful in motivating customers to purchasing motor and drive equipment, as well as any barriers they experience.

- Product Experience/Satisfaction: The evaluation team will discuss trade partners' product experience, including the application process, and where opportunities may exist to facilitate greater participation.
- Potential for Product Expansion: The evaluation team will discuss ways to decrease barriers to participation, and assess contractors' perceptions of potential changes to the Product.
- NTG: Finally, the team will ask questions on program attribution, or the impact the program had on their decision to recommend motor and drive technologies because of the Xcel Energy motor and drive program. The evaluation team will discuss how the program impacts their product recommendations as a whole.

The evaluation team plans to interview 30 contractors as part of this effort, as shown in Table 3. The evaluation team plans to select up to 10 contractors as a follow-up to the participant surveys or interviews. These contractors will be selected for customers who said the contractor was highly influential on their project, but exhibited high free-ridership in other questions. For these contractors, the evaluation team will look to identify the Product's influence on their business practices, and will use this qualitative information to directly adjust the free-ridership scores for the customers they worked with. The remaining 20 contractors will be split between high- and low-participating VFD and motors contractors; the exact number of contractors in each group will be set after receiving contractor data from program staff.

Table 3. Motor and Drive Efficiency Contractor Target Interviews, by Survey Strata

Trade Partner Type	Strata	Population	Target Surveys
Contractors	Survey follow-ups	TBD	10
	Highly active	TBD	5
	Less active	TBD	5
	Total	TBD	10

F. Peer Utility Benchmarking

The objective of the peer utility benchmarking task is to understand how motor and drive programs are approaching key issues by comparing the Xcel Energy Motor and Drive Efficiency product with four to six similar peer utility programs. The evaluation team will strive to select a comparable cohort so that Xcel Energy has an "apples-to-apples" comparison, and evaluate the set of circumstances (such as regulation, retail channels, demographics) that impact program plans at the peer utilities (including context for the NTG values). The interviews will generally focus on the same discussion topics being explored in the interviews and surveys with Xcel Energy customers and market actors.

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

F. Internal Product Influence Analysis (Optional – Enhanced Scope)

The evaluation team will also conduct an analysis of the Product's influence on the Xcel Energy portfolio as a whole. This analysis will include identifying all portfolio savings that occur from motor and drive measures, as

well as an analysis of how trade partners and customers who have been engaged by Motor and Drive Efficiency staff participate in other Xcel Energy products. The output of this analysis will be a visual one to two-page document detailing the Product's influence on the portfolio.

Net-to-Gross Approach

The NTG assessment aims to estimate the percent of savings achieved that can be attributed to program actions, or a NTG ratio. The NTG value includes multiple metrics, which are described in sections below. To do so, the evaluation team will primarily use participant self-report surveys and trade partner interviews to assess program attribution, including free ridership, spillover and market effects metrics. The team will base its methodology on the most recent Illinois Technical Reference Manual (TRM)[5] as this type of approach is used extensively in other jurisdictions both by our team and outside industry experts, and it was the basis of the NTG approach for the evaluations of the 2017 Xcel Energy product evaluations.

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

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

Retrospective NTG

The evaluation team will estimate a retrospective NTG by examining free ridership, spillover, and market effects. The evaluation team will rely primarily on data collected from customers, along with additional qualitative input from trade partners. It will then synthesize these results, along with data from peer utilities, to estimate NTG ratios for measure types within the product. This section describes how the evaluation team will estimate these components of the retrospective NTG ratios.[6]

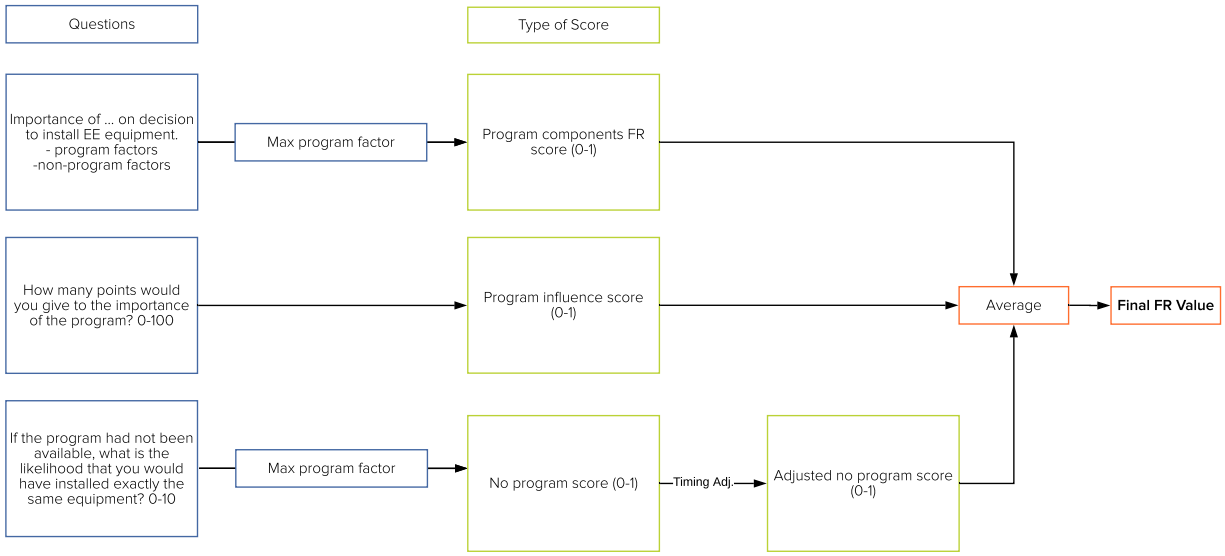
Free ridership. The free-ridership estimate represents the percent of savings that would have occurred in absence of program intervention. The evaluation of free ridership will include multiple factors: 1) Program Components Score (based on the participant's perception of the program's influence on the decision to carry out the energy-efficient project; 2) Program Influence Score (based on the relative importance of various program components on their decision, compared to non-program influences); and 3) No-Program Score[7] (based on the participant's intention to carry out the energy-efficient project without program funds). Figure 4 describes the logic used for calculating free ridership.

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

[6] Note that the evaluation team may revise the questions and algorithm based on the Participant Cognitive Interview findings.

[7] As past research indicates that customers occasionally have a difficult time interpreting this set of questions, the evaluation team may choose to not include this pathway in the NTG algorithm depending on the results of internal pre-testing conducted as part of this evaluation.

Figure 4. Free Ridership Calculation Methodology[8]



For the Program Components score, the evaluation team envisions including the following items as Program Factors and Non-Program Factors:

Program Factors:

- The availability and amount of the rebate
- The contractor who performed the work
- Technical assistance from Xcel Energy staff
- Information provided to the customer through program marketing or educational materials
- Information provided to the customer from Xcel Energy staff, including program staff and account managers
- Previous participation in an Xcel Energy program
- Payback on the investment, *including* the incentive

Non-Program Factors:

- Age or condition of the old equipment
- Previous experience with this type of equipment
- Corporate policy or guidelines
- Minimizing operating cost
- Scheduled time for routine maintenance
- Payback on the investment, *without* the incentive

The evaluation team will assess free ridership primarily using participant self-report surveys, and will integrate trade partner interviews where applicable. Specifically, when participants rate the trade partner as a highly influential on the decision to install a measure but indicates free-ridership elsewhere in the survey, the evaluation team will attempt to recruit those trade partners for the interviews and assess the program's influence on their practices. The purpose of the interview is to determine if the program's influence was directed at the trade partner, rather than the customer, and to appropriately track that influence on the project overall. As it may not be possible to conduct these interviews for all customers, the evaluation team will focus

[8] As depicted in the IL TRM Version 6, Volume 4, Figure 3-1, page 29.

on the projects with the largest impact on the program's NTG, and will then use qualitative adjustments for the rest of the customers.

Participant Spillover. The spillover metric represents additional savings achieved as a result of program activities, outside of rebated measure savings, by program participants. The evaluation team will incorporate two measure attribution scores; the first incorporates the influence the program had on the purchase of this additional measure (measure attribution score #1), the second incorporates likely actions taken in absence of program participation (measure attribution score #2). The spillover score, as calculated below,[9] must be greater than five in order for the additional measure to qualify for spillover. When this criterion is met, the savings are added to program attributable savings.

$$Spillover\ Score = \frac{Measure\ Attribution\ Score_1 + (10 - Measure\ Attribution\ Score_2)}{2}$$

Market Effects. The contractor interviews will offer important insights into market effects of the Motor and Drive Efficiency product. Our interviews with trade partners will ask about what portion of customers install energy-efficient (or program-qualifying) motors and drives, but do not receive an Xcel Energy rebate. These additional energy efficient purchases will be considered as program impacts through the market effects assessment. The prospective NTG (described below) may also provide valuable insights into the remaining savings potential of the evaporative cooling market.

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

- Participant surveys
- Contractor interviews
- Program benchmarking data for points of comparison

Based on these results, we then may adjust the NTG to create a final recommended NTGR that is consistent with this narrative, and is informed by product theory.[10] The final NTG recommendation is based on the professional judgment of our team after considering all available quantitative and qualitative data.

Prospective NTG

Given the fast-changing conditions of the motor and drive market, the team will attempt to adjust the retrospective NTG estimate to provide a more accurate forward-looking, or prospective value. Trade partners will be asked about the importance of the rebates in driving purchases of motor and drive equipment in Minnesota. Their responses, coupled with our understanding of the broader market for motors and drives in Minnesota, will provide the evaluation team with a program and no-program baseline that can inform a prospective NTG value. Additionally, we will use input from the staff interviews to inform potential future changes to the product, and incorporate those into the final NTG estimate. We may also incorporate results from the benchmarking research into prospective NTG values used in other states to inform the estimate.

[9] IL TRM Version 6, Volume 4, page 35-36.
[10] To the extent possible, the evaluation team will tie findings to product theory via the influence map for this product.

A.2 Influence Map

To support the process and impact evaluation of the 2017 Xcel Energy efficiency programs, EMI Consulting created an influence map documenting the influences the Motor and Drive Efficiency Efficiency Product is intended to have on the market, the barriers that may impede these influences, and the activities intended to influence these market changes. To create this influence map, the research team identified key topics drawn from the product evaluation kick-off meeting and staff interviews, and facilitated a workshop on April 5, 2018 with key product staff to identify the specific influences, activities and barriers to represent in the map. This memorandum documents the outputs of that workshop.

The remainder of this memorandum contains:

- an introduction to influence mapping
- an overview of the Motor and Drive Efficiency Product that includes a visual influence map (see Figure 1)
- analysis of the influence map
- a narrative describing in more detail the influences, activities, and barriers described in the map
- the evaluation priorities identified via the influence mapping process

Introduction to Influence Mapping

Demand side management energy efficiency programs seek to reduce customer energy consumption by either directly influencing customers to engage in specific behaviors (e.g., replace devices they operate with more energy efficient equivalents) or indirectly influencing these behaviors by causing customers to modify their attitudes or awareness (e.g., develop favorable attitudes toward a specific technology). A utility's influence on customers can occur either directly or through other market actors like trade partners. *An influence map describes the influences that such a program seeks to have on market actors (including customers, trade partners, contractors, and/or distributors), the barriers that are theorized to oppose these desired influences, and the activities the program engages in to create these influences.*

Influence maps describe desired influences, barriers, and program activities on a theoretical level — rather than prove a program's influence on market actors, an influence map describes a program's intent and theorized operation. Mapping a program's intended influences on the market provides a tool with which program staff and evaluators can examine assumptions made related to the foundation of a program's design, identify opportunities to test these assumptions, and identify opportunities to evaluate the accuracy of assumptions or effectiveness of program activities. An influence map is a "living" document that, if it is to represent the understanding and intent of program staff on an ongoing basis, needs to be periodically revisited and updated to reflect changes in activities, barriers, and desired influences.

Product Overview

The Minnesota Motor and Drive Efficiency Product offers prescriptive and custom rebates to Xcel Energy commercial and industrial (C&I) customers who install qualifying motors and drives equipment in existing or new buildings. Rebates are offered to encourage customers to purchase energy efficient motors and drives by lowering the upfront premium costs associated with this equipment. From January to September 2017, the Motor and Drive Efficiency Product claimed over 16.6 GWh in energy savings from prescriptive rebates provided in Minnesota.

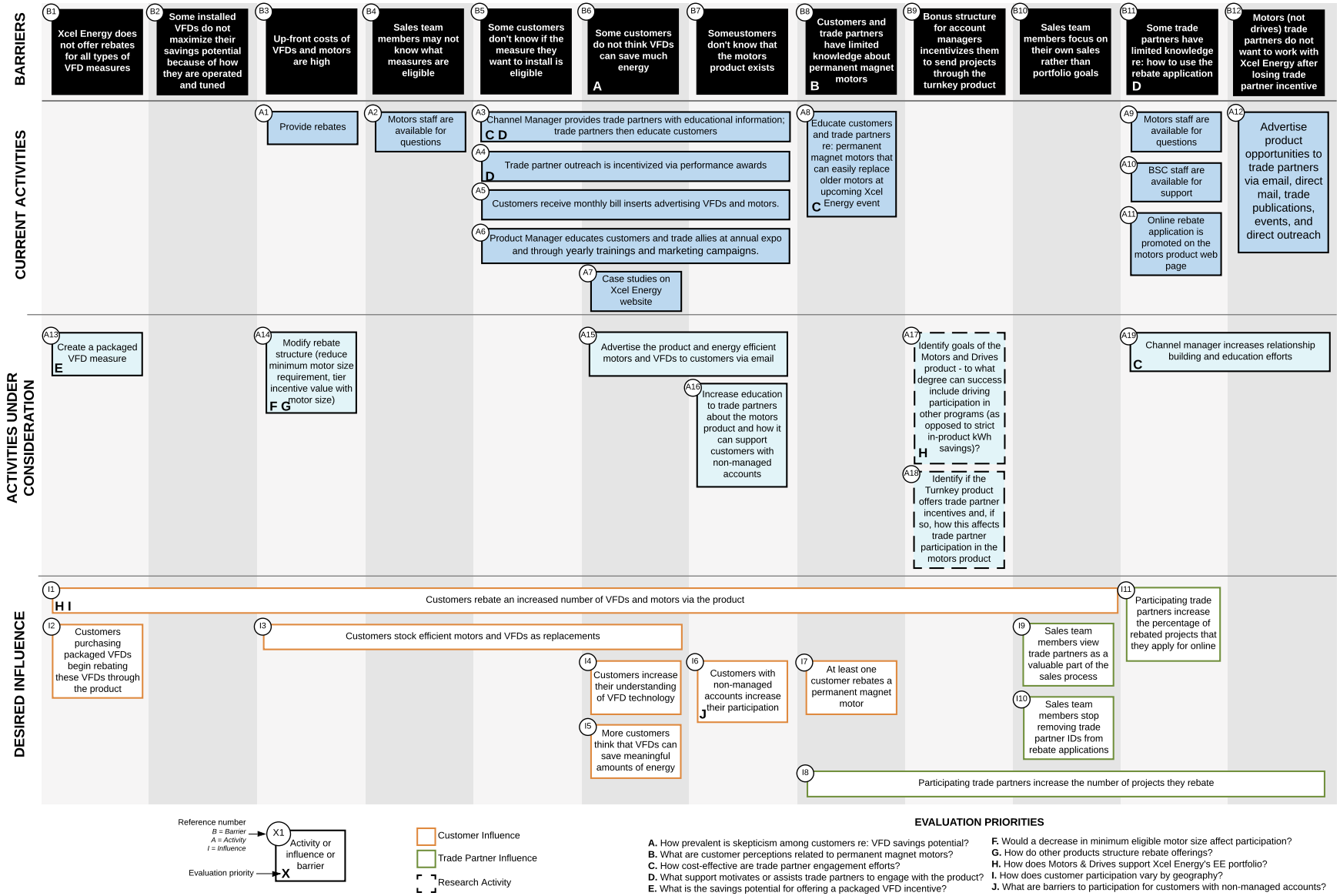
The Motor and Drive Efficiency Product includes rebates for both energy-efficient motor equipment and for variable frequency drives (VFDs). The Product offers rebates for four types of motors improvements: constant speed motor controllers, enhanced new motors (i.e. installations of motors that exceed DOE

standards where one never existed), enhanced upgrade motors (i.e. replacements of functional inefficient motors with motors that exceed DOE standards), and motor upgrades (i.e. replacements of functional inefficient motors with motors that meet DOE standards). Enhanced motors can include both induction motors and permanent magnet alternating current (PMAC) motors. Additionally, the Product offers rebates for VFDs for HVAC and non-HVAC equipment and for VFDs for water well pumps.

The MN Motor and Drive Efficiency Product relies heavily on an active trade partner network, as well as active involvement from account managers in selling motors and drives upgrades to their customers. While Xcel Energy does not actively endorse or promote individual trade partners, this group plays an integral part in advancing the product. Internally, Xcel Energy relies on channel managers to maintain these relationships.

All desired influences, product activities, and barriers identified by the product team (as well as the relationships between these elements) are represented in the influence map (see Figure 1).

Figure 1. Influence Map, Motor and Drive Efficiency Product



Analysis of Influence Map

This section identifies key findings from the influence mapping process. These findings may be used to inform the development of other research activities, or to call attention to structural elements of the product that Xcel Energy staff may wish to examine in detail. *Note: The evaluation team will analyze product processes and impacts within the scope of the evaluation plan. The analysis in this memo highlights findings strictly from the influence mapping process itself.*

The influence mapping process revealed that Xcel Energy is not addressing all barriers identified by the product team as associated with increased completion of motors and drives projects though the Motor and Drive Efficiency Product. While it is beyond the scope of this analysis to recommend whether or not the product should add activities to address these barriers, product staff may want to examine these barriers in order to make an active choice of whether or not adding product activities to address these barriers is a priority.

The following barriers are currently unaddressed by product activities:

- **B1. Xcel Energy does not offer rebates for all types of VFD measures.**
- **B2. Some installed VFDs do not maximize their savings potential because of how they are operated and tuned.**
- **B9. Bonus structure for account managers incentivizes them to send projects through the turnkey product.**
- **B10. Sales team members focus on their own sales rather than portfolio goals.**

Other barriers affect relatively large numbers of desired influences or may be of particular relevance to product success. The product team may want to give these barriers particular consideration, either by confirming that their assumptions about the presence and nature of these barriers are accurate, or by examining the activities designed to address these barriers to ensure that the activities are having their intended effect.

The following barriers either affect a relatively large number of desired influences or may be particularly impactful to program outcomes:

- **B4. Sales team members may not know what measures are eligible.**
- **B5. Some customers don't know if the measure they want to install is eligible.**
- **B6. Some customers have limited or inaccurate knowledge re: VFDs.**
- **B7. Some customers don't know that the Motor and Drive Efficiency Product exists.**
- **B10. Sales team members focus on their own sales rather than portfolio goals.**

Barriers 4 and 5 (Sales team members may not know what measures are eligible; Customers don't know if the measure they want to install is eligible) may operate in tandem to prevent customers from rebating measures through the product. Sales team members are likely to be a primary contact for customers with questions about measure eligibility. However, product staff report that these sales team members may not have the knowledge about measure eligibility to address customer questions. However, program marketing staff are also available to answer questions for the sales team and may be able to fill this role internally.

While trade partners may be also able to step in to fill this role of eligibility expert, product staff report some challenges in the interactions between sales team members and trade partners that may limit the potential of trade partners to address customers' questions about measure eligibility. Barrier 10 (Sales team members focus on their own sales rather than portfolio goals) and the related report from product staff that sales team members sometimes remove trade partner identification numbers from rebate applications (see details under Influence 10), could be causing significant missed opportunities to drive projects through the Motor and Drive Efficiency Product. Beyond the immediate potential for this removal of trade partner identifications from applications to reduce trade partners' incentive to complete projects through the product, it may also foster a negative relationship between trade partners and Xcel Energy. This has the potential to spill over into other products, reducing trade partners' interest in partnering with Xcel Energy. Within the Motor and Drive Efficiency Product, this hypothetical negative relationship may reduce the effectiveness of certain activities. In particular, the effectiveness of Activity 9 (BSC staff are available with support, to help trade partners overcome challenges related to using the online application) may be undercut if trade partners hold negative attitudes toward sales team members. If indeed these sales team members are removing trade partner identification numbers from rebate applications, it seems unlikely that trade partners would reach out to these same sales team members for support in completing an online rebate application. It is beyond the scope of an influence mapping process to assess the accuracy or impact of these reports. However, the potential outcomes from these reports barriers and actions are significant enough that they may warrant further investigation.

Detailed Influence Map Narrative

Each following sub-section of this memorandum represents an influence that the Motor and Drive Efficiency Product seeks to have on a group of market actors (including customers, trade partners, contractors, and/or distributors). Each influence is summarized in its sub-section header and labeled with an alpha-numeric value (e.g., I1 for Influence 1) that corresponds to its location in Figure 1. A brief description of this influence follows each header. The memorandum then lists the barriers that market actors are theorized to face related to engaging in the desired behavior, each of which is labeled to correspond with its position in Figure 1 (e.g., B1 for Barrier 1). These barriers are followed by activities identified by product staff as addressing these barriers to create the desired influence. Current product activities are listed first, followed by product activities that the team is considering implementing in the future. Both current product activities and activities under consideration are identified with an alpha-numeric value (e.g., A1 for Activity 1) that correspond with their position in Figure 1.

I1. Customers purchasing packaged VFDs begin rebating these VFDs through the product

Members of the Motor and Drive Efficiency Product team indicated that they would like the product to influence customers to rebate packaged VFDs through the Motor and Drive Efficiency Product.

Barriers

Product staff identified the following key barrier to influencing market actors in the manner described above.

- **B1. Xcel Energy does not offer rebates for all types of VFD measures.** At the time of the influence mapping workshop, the Motor and Drive Efficiency Product offered no rebates for packaged VFDs and therefore had no mechanism through which financially incentive or claim savings from packaged VFDs.

Activities Intended to Influence Market Actors

Current Product Activities

- None currently

Activities Under Consideration

- **A12. Create a packaged VFD measure.** To create this influence in the market, Xcel Energy must develop a packaged VFD rebate opportunity. After creating such an opportunity, the product team would have to develop education activities to inform customers or trade partners that this opportunity was available.

I2. Customers operate their VFDs in ways that maximize their energy saving potential

Xcel Energy would like customers not only to install VFDs but also to operate them in ways that achieve these devices' energy savings potential. The product team reports that some customers may install VFDs to achieve goals other than energy savings (e.g., to allow them to start equipment operation gradually). These instances may represent missed opportunities for energy savings.

Barriers

Product staff identified the following key barrier to influencing market actors in the manner described above.

- **B2. Some installed VFDs do not maximize their savings potential because of how they are operated and tuned.** Customers may prioritize non-energy-related goals (e.g., starting equipment operation gradually) when choosing to install VFDs. In these instances, customers are operating and tuning their VFDs to achieve these goals rather than the energy-saving goals of the Motor and Drive Efficiency Product.

Activities Intended to Influence Market Actors

Current Product Activities

- None currently

Activities Under Consideration

- None currently

I3. Customers rebate an increased number of projects via the product

Product staff would like customers to increase their participation in the product. This includes both influencing customers to purchase an increased number of energy efficient motors and drives, and to influence customers to rebate an increased number of motors and drives projects through the product.

Barriers

Product staff identified the following key barrier to influencing market actors in the manner described above.

- **B3. Up-front costs of VFDs and motors are high.** These initial investment costs may prevent customers from purchasing VFDs and energy efficient motors.
- **B4. Sales team members may not know what measures are eligible.** This barrier affects customers who rely on sales team members as an informational resource. Sales team members limited knowledge of what measures are eligible for incentives through the Motors and Drive Product may 1) lead customers for whom up-front cost is a strong barrier to not purchase measures, and 2) lead customers who would purchase measures regardless of up-front cost to not pursue rebates through the Motor and Drive Efficiency Product.
- **B5. Customers don't know if the measure they want to install is eligible.** Similar to Barrier 4, this may lead to some customers choosing to not purchase measures at all due to their uncertainty about the availability of a rebate, and may lead to other customers purchasing measures but choosing to not pursue an incentive so as to avoid the challenge of determining eligibility.
- **B6. Customers have limited or inaccurate knowledge re: VFDs.** This prevents customers who may benefit from installing VFDs (and pursuing a rebate through the product) from doing so.
- **B7. Customers don't know that the motors product exists.** This prevents customers from completing projects through the product.
- **B9. Bonus structure for BSC staff incentivizes BSC staff to send projects through the turnkey product.** This incentive structure may cause BSC staff to suggest that customers complete their project through the turnkey product rather than the holistic product regardless of which is the most cost-effective pathway.

Activities Intended to Influence Market Actors

Current Product Activities

- **A1. Provide rebates.** Rebates reduce barriers related to up-front costs and payback that some customers have regarding purchasing and installing energy efficiency equipment.
- **A2. Motor and Drive Efficiency staff are available for questions.** Product staff are available for sales team members to ask questions about measure eligibility. The availability of product staff in this context is intended to address Barrier 4 (Sales team members may not know what measures are eligible).
- **A3. Channel Manager provides trade partners with educational information; trade partners then educate customers.** The Motor and Drive Efficiency Product seeks to increase customer awareness of the product, measure eligibility, and the energy-saving potential of VFDs through education provided by trade partners.
- **A4. Trade partner outreach is incentivized via performance awards.** Trade partners are not only provided with educational materials (as per Activity 3), they are incentivized to leverage their training to drive customer participation in the product via performance awards for completing projects through the product.
- **A5. Customers receive monthly bill inserts advertising VFDs, motors and PMAC motors.** These advertisements promote VFD and motor technology as beneficial and educate customers on opportunities for rebates for VFDs and motors through the product as a means to increase participation.
- **A6. Product Manager educates customers and trade allies at annual expo and trainings on motors & VFDs.** This outreach addresses barriers related to customer and trade ally awareness of the product, VFD and motor technology, and measure eligibility.

- **A7. Case studies on Xcel Energy website.** These case studies provide an opportunity for customers and trade partners to learn about energy efficient motors and drives through examples showing how these technologies have been deployed by other customers.

Activities Under Consideration

- **A13. Modify rebate structure (reduce minimum motor size requirement, tier incentive value with motor size).** The product team speculates that making these changes to the rebate structure may incentivize increased levels of participation.
- **A14. Advertise the product and energy efficient motors and VFDs to customers via email.** This would provide an avenue for direct education about the product and energy efficient measures.
- **A15. Increase education to trade partners about the motors product and how it can support customers with non-managed accounts.** The product is interested in identifying opportunities for increasing engagement with customers who do not have managed accounts. Promoting opportunities with these customers to trade partners could provide a means to increase trade partner engagement with this customer group, thereby leading to increased participation in the product.
- **A16. Identify goals of the Motor and Drive Efficiency Product – to what degree can success include driving participation in other programs (as opposed to strict in-product kWh savings)?** This would be a research activity in which Xcel Energy staff reconsider the role of the Motor and Drive Efficiency Product within the energy efficiency portfolio. Product staff report that the product's education and outreach efforts are driving participation not only in the Motor and Drive Efficiency Product, but also in other Xcel Energy energy efficiency products. As such, it may be appropriate to consider that participation in other products as an outcome (and a metric of success) of the Motor and Drive Efficiency Product.

I4. Customers stock efficient motors and VFDs as replacements

One goal of the Motor and Drive Efficiency Product is to influence customers to purchase energy efficient equipment regardless of the time line on which they intend to install it. The product team reports that customers sometimes purchase motors and drives to have on hand as replacements for failed equipment. The team would like these customers to choose energy efficient options when making these backup purchases.

- **B3. Up-front costs of VFDs and motors are high.** These initial investment costs may prevent customers from purchasing VFDs and energy efficient motors, especially PMAC motors.
- **B4. Sales team members may not know what measures are eligible.** This barrier affects customers who rely on sales team members as an informational resource. Sales team members limited knowledge of what measures are eligible for incentives through the Motors and Drive Product may 1) lead customers for whom up-front cost is a strong barrier to not purchase measures, and 2) lead customers who would purchase measures regardless of up-front cost to not pursue rebates through the Motor and Drive Efficiency Product.
- **B5. Customers don't know if the measure they want to install is eligible.** Similar to Barrier 4, this may lead to some customers choosing to not purchase measures at all due to their uncertainty about the availability of a rebate, and may lead to other customers purchasing measures but choosing to not pursue an incentive so as to avoid the challenge of determining eligibility.
- **B6. Customers have limited or inaccurate knowledge re: VFDs.** This prevents customers who may benefit from installing VFDs (and pursuing a rebate through the product) from doing so.

Activities Intended to Influence Market Actors

Current Product Activities

- **A1. Provide rebates.** Rebates reduce barriers related to up-front costs when stocking replacement equipment.
- **A2. Motors staff are available for questions.** Product staff are available for sales team members to ask questions about measure eligibility. The availability of product staff in this context is intended to address Barrier 4 (Sales team members may not know what measures are eligible).
- **A3. Channel Manager provides trade partners with educational information; trade partners then educate customers.** The Motor and Drive Efficiency Product seeks to increase customers' knowledge of VFDs and motors through education provided by trade partners.
- **A4. Trade partner outreach is incentivized via performance awards.** Trade partners are not only provided with educational materials (as per Activity 3), they are incentivized to leverage their training to drive customer participation in the product via performance awards for completing projects through the product.
- **A5. Customers receive monthly bill inserts advertising VFDs.** These advertisements promote VFD technology as beneficial and educate customers on opportunities for rebates for VFDs through the product as a means to drive purchases of VFDs as replacement equipment.
- **A6. Product Manager educates customers and trade allies at annual expo.** This outreach addresses barriers related to customer and trade ally awareness of the product, VFD technology, and measure eligibility so as to encourage stocking VFDs as replacement equipment.
- **A7. Case studies on Xcel Energy website.** These case studies provide an opportunity for customers and trade partners to learn about VFDs through examples showing how VFDs have been deployed by other customers.

Activities Under Consideration

- **A13. Modify rebate structure (reduce minimum motor size requirement, tier incentive value with motor size).** The product team speculates that making these changes to the rebate structure may incentivize increased levels of participation, including for purchasing replacement equipment.
- **A14. Advertise the product and energy efficient motors and VFDs to customers via email.** This would provide an avenue for direct education about energy efficient motors and VFDs.

I5. Customers increase their understanding of VFD technology and their perception that VFDs can save meaningful amounts of energy

Customers may have limited or inaccurate understandings of VFD and motor technology. The product team would like to influence customers to improve their understanding of this technology in general and, in particular, increase their perception that VFDs can save meaningful amounts of energy.

- **B6. Customers have limited or inaccurate knowledge re: VFDs.** This prevents customers who may benefit from installing VFDs (and pursuing a rebate through the product) from doing so.

Activities Intended to Influence Market Actors

Current Product Activities

- **A3. Channel Manager provides trade partners with educational information; trade partners then educate customers.** The product relies on trade partners as one avenue of education for customers. By promoting VFDs and motors to trade partners, the product may drive these trade partners to in turn promote VFDs and motors to customers.
- **A4. Trade partner outreach is incentivized via performance awards.** Trade partners are not only provided with educational materials (as per Activity 3), they are incentivized to leverage their training to drive customer participation in the product via performance awards for completing projects through the VFD product.
- **A5. Customers receive monthly bill inserts advertising VFDs, motors, and PMAC motors.** These advertisements promote the program technologies as beneficial and educate customers about these technologies and its benefits.
- **A6. Product Manager educates customers and trade allies at annual expo.** This outreach addresses barriers related to customers' limited or inaccurate understanding of VFD technology.
- **A7. Case studies on Xcel Energy website.** These case studies provide an opportunity for customers and trade partners to learn about VFDs through examples showing how VFDs have been deployed by other customers.

Activities Under Consideration

- **A14. Advertise the product and energy efficient motors and VFDs to customers via email.** This would provide an avenue for direct education about VFDs.

I6. Customers with non-managed accounts increase their participation

Currently, a majority of the projects completed through the Motor and Drive Efficiency Product come from customers with managed accounts. Members of the product team would like customers who fall under the non-managed accounts to complete projects to participate more through the product.

- **B7. Customers don't know that the Motor and Drive Efficiency Product exists.** Customers with managed accounts have a designated account manager who can promote participation in products like Motor and Drive Efficiency. Customers without an account manager do not have this single point of contact with Xcel Energy, and may not be aware the product exists.

Activities Intended to Influence Market Actors

Current Product Activities

- **A3. Channel Manager provides trade partners with educational information; trade partners then educate customers.** Trade partners may comprise a particularly significant portion of the active outreach that customers without managed accounts receive.
- **A4. Trade partner outreach is incentivized via performance awards.** Trade partners are not only provided with educational materials (as per Activity 3), they are incentivized to leverage their training to drive customer participation in the product via performance awards for completing projects through the product.

- **A5. Customers receive monthly bill inserts advertising VFDs.** These inserts provide direct education about VFDs (and rebate opportunities for them) to customers, including customers without managed accounts.
- **A6. Product Manager educates customers and trade allies at annual expo.** This outreach provides direct contact with members of this customer group, and with trade partners who work with this customer group.

Activities Under Consideration

- **A14. Advertise the product and energy efficient motors and VFDs to customers via email.** This would provide an avenue for direct education about the product and energy efficient measures to customers without managed accounts.
- **A15. Increase education to trade partners about the motors product and how it can support customers with non-managed accounts.** The product is interested in identifying opportunities for increasing engagement with customers who do not have managed accounts. Promoting opportunities with these customers to trade partners could provide a means to increase trade partner engagement with this customer group, thereby leading to increased participation in the product.

I7. At least one customer rebates a permanent magnet motor

Xcel Energy introduced an incentive for permanent magnet motors that has yet to be used. The product team would like at least one customer to use this incentive.

- **B8. Customers and trade partners have limited knowledge about permanent magnet motors.** Customers and trade partners may not be aware of this technology or how it can be beneficial for their needs.

Activities Intended to Influence Market Actors

Current Product Activities

- **A8. Educate customers and trade partners re: permanent magnet motors that can easily replace older motors at upcoming Xcel Energy event.** The product team has in place a plan to educate customer and trade partners about permanent magnet motor technology and rebates at an upcoming event.

Activities Under Consideration

- None

I8. Participating trade partners increase the number of projects they rebate

The product intends to influence trade partners to increase the number of motors and drives projects they complete through the product.

- **B8. Customers and trade partners have limited knowledge about permanent magnet motors.** This may prevent some customers and trade partners from installing, and pursuing rebates for, permanent magnet motors.

- **B9. Bonus structure for BSC staff incentivizes BSC staff to send projects through the turnkey product.** This incentive structure sometimes encourages BSC staff to suggest that customers complete their project through the turnkey product rather than the holistic product. This may create missed opportunities for the Motor and Drive Efficiency Product to claim savings.
- **B10. Sales team members focus on their own sales rather than portfolio goals.** This barrier relates primarily to a specific behavior reported by the product team. Motor and Drive Efficiency Product staff report that some sales team members remove trade partners' identification numbers from rebate applications, thereby disallowing these trade partners from receiving credit for the project. This may disincentivize these trade partners from completing future projects through the product.
- **B11. Trade partners have limited knowledge re: how to use the rebate application.** They may therefore avoid pursuing rebates through the product so as to avoid the challenge of completing the rebate application.
- **B12. Motors (not drives) trade partners do not want to work with Xcel Energy after losing trade partner incentive.** These trade partners may hold negative feelings toward the product and, as such, may choose not to participate.

Activities Intended to Influence Market Actors

Current Product Activities

- **A8. Educate customers and trade partners re: permanent magnet motors that can easily replace older motors at upcoming Xcel Energy event.** This education may increase product participation for permanent magnet motors.
- **A9. BSC staff are available for support.** This activity is intended to address the barrier of trade partners' limited knowledge of how to use the rebate application – BSC staff are tasked to be available as a resource for assisting trade partners in navigating the application.
- **A10. Online rebate application is promoted on the motor and drive product web page.** The online application is intended to streamline the application process, making it less of a barrier to trade partners completing projects through the product.
- **A11. Advertise product opportunities to trade partners via email, direct mail, trade publications, events, and direct outreach.** These advertising efforts are intended to drive trade partner participation via education and increased awareness of the product.

Activities Under Consideration

- **A16. Identify goals of the Motor and Drive Efficiency Product – to what degree can success include driving participation in other programs.** This would be a research activity in which Xcel Energy staff reconsider the role of the Motor and Drive Efficiency Product within the energy efficiency portfolio. Within the context of this desired influence, outputs of this research could affect how trade partner projects (including those related to motors and drives but completed via other products) are counted toward successful implementation of the Motor and Drive Efficiency product.
- **A17. Channel Manager increases relationship building and education efforts.** Were this activity to be implemented, it would involve the Channel Manager increasing focus on engaging trade partners to participate in the Motor and Drive Efficiency Product.

I9. Sales team members view trade partners as a valuable part of the sales process

Motor and Drive Efficiency Product staff report that some sales team members do not consider trade partners to be a valuable part of the sales process. Product staff would like to change the attitudes of these sales team members. Such an attitude change could conceivably lead to improved relationships between sales team members and trade partners that could, in turn, help to resolve previously discussed challenges, e.g., Barrier 11 (trade partners have limited knowledge re: how to use the rebate application) may be reduced if trade partners feel more welcome to pursue assistance from sales team members.

- **B10. Sales team members focus on their own sales rather than portfolio goals.** Some sales team members may focus primarily on their own contributions to promoting participation in the product. In doing so, they may not accurately consider the degree of impact trade partners have in driving participation.

Activities Intended to Influence Market Actors

Current Product Activities

- None

Activities Under Consideration

- None

I10. Sales team members stop removing trade partner IDs from rebate applications

Product staff report that some sales team members remove trade partners' identification numbers from rebate applications when they do not perceive that these trade partners played a significant role in driving the project to be completed through the Motor and Drive Efficiency Product. This prevents these trade partners from receiving credit for the project. This may disincentivize these trade partners from completing future projects through the product. This desired influence is closely linked to Influence 9 (Sales team members view trade partners as a valuable part of the sales process).

- **B10. Sales team members focus on their own sales rather than portfolio goals.** It may be that the primary driver for the removal of trade partner identification numbers from rebate applications may be the overemphasis on the part of some sales team members of their own role in the process.

Activities Intended to Influence Market Actors

Current Product Activities

- None

Activities Under Consideration

- None

I11. Participating trade partners increase the percentage of rebated projects that they apply for online

Xcel Energy recently added an online rebate application process. Product staff would like trade partners to increase their use of the online option.

- **B11. Trade partners have limited knowledge re: how to use the rebate application.** Trade partners may be used to using the paper application and unaware of how to use the online application.

Activities Intended to Influence Market Actors

Current Product Activities

- **A9. BSC staff are available for support.** BSC staff are tasked to be available as a resource for assisting trade partners in navigating the application.
- **A10. Online rebate application is promoted on the motor and drive product web page.** This promotion is intended to build awareness of the online application that may lead to trade partners using it more.

Activities Under Consideration

- **A17. Channel Manager increases relationship building and education efforts.** Were this activity to be implemented, it would involve the Channel Manager increasing focus on engaging trade partners to participate in the Motor and Drive Efficiency Product.

Evaluation Priorities

At the end of the influence mapping workshop, the facilitator asked product staff to assess the map in order to identify key questions related to the influences, activities, and barriers that the group had identified. A number of these priorities had been identified organically through the creation of the map (e.g., a product staff member requested a topic raised during the mapping session be noted as a potential evaluation priority). Others were added through this process of explicitly developing evaluation priorities.

The following questions were identified as evaluation priorities during the influence mapping workshop. The evaluation team will balance these priorities with the priorities identified during the evaluation kick-off meeting and staff interviews to determine the final priorities and research questions that the 2018 evaluation will address, and thus are not listed in priority order.

A. How prevalent is skepticism among customers re: VFD savings potential?
B. What are customer perceptions related to permanent magnet motors?
C. How cost-effective are trade partner engagement efforts?
D. What support motivates or assists trade partners to engage with the product?
E. What is the savings potential for offering a packaged VFD incentive?
F. Would a decrease in minimum eligible motor size affect participation?
G. How do other products structure rebate offerings?
H. How does Motor and Drive Efficiency support Xcel Energy's EE portfolio?
I. How does customer participation vary by geography?
J. What are barriers to participation for customers with non-managed accounts?

These priorities are mapped to boxes in Figure 1, as indicated by the presence of a capital letter that correlates with an evaluation priority in the lower-left-hand corner of the box. These connections between an evaluation priority and a box in the influence map are present in instances where findings related to the evaluation priority have the potential to inform development of an activity, or to provide insights into the nature or accuracy of the barrier, activity, or influence in question. For example, this could include checking assumptions made about the presence of a barrier or gathering data to inform the development of an activity under consideration.

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 programs as part of the EMI Consulting 2017 evaluation of the Xcel Energy DSM programs. The interviews will be semi-structured, with these questions serving as a basic guide for experienced EMI Consulting staff during one-on-one phone interviews.[11] As a guide for semi-structured interviews, these questions will not necessarily be asked verbatim, but will serve as a roadmap during the conversation.

Staff Interview Research Questions or Objectives

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

Interview

Section A: Introduction

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

[ALL] Thank you for taking the time to speak with me today. My objective for this meeting today is to gain a deeper understanding of this program, what Xcel hopes to achieve through implementing this program how it operates, and a bit about your experiences with the <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 program. I have a set of questions that should take approximately 45 - 60 minutes, depending upon your experiences and involvement with the program. All the

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

information provided is anonymous, we will be weaving it together with information gleaned from other interviews.

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

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

Probes:

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

A2. [IF NOT KNOWN] What role do third party implementers play in program implementation?

Section B: Program Goals

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

[TAILOR BASED ON WHAT IS ALREADY KNOWN]

B1. Can you take me through the key goals for <PROGRAM NAME>?

B1a. Can you describe any savings goals? Do you have specific goals for individual components of the program (e.g., upstream vs. downstream, by measure type)?

B1b. Any other, non-energy goals?

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

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

B2. What are "indicators of success"?

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

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

B3a. What was the rationale for changing them?

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

B4. What influences do you think this program has had on the market? On other Xcel products?

Section C: Program Activities

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

[TAILOR BASED ON WHAT IS ALREADY KNOWN]

C1. What are the different components of the program?

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

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

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

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

C1d. What are the participation steps from a customer perspective?

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

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

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

C4a. What was the rationale for changing them?

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

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

Section D: Resources

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

D1a. Program, implementer, sales staff?

D1b. Management and program direction?

D1c. IT tools and data tracking tools?

D1d. Other resources?

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

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

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

D3a. What was the rationale for changing them?

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

D4. How do you expect the program to change in the future? (reference KO meeting)

Section E: Program Tracking and Reporting

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

[TAILOR BASED ON WHAT IS ALREADY KNOWN]

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

E2. What kinds of data are collected for <PROGRAM>?

E2a. Does the data reflect savings going to other programs?

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

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

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

E6. [For Engineering Staff] What kind of baseline does the program use to estimate energy savings? [PROBE FOR CODE VS. COMMON PRACTICE]

Section F: Strengths and Challenges

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

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

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

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

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

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

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

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

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

Section G: Closing

G1. Based on the kickoff meeting, we are planning to prioritize <RESEARCH PRIORITIES>, does 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 program that we didn't discuss that you would like to make sure I know about?

Thank you very much for taking the time in assisting us with this evaluation. If I come up with any additional questions that come from this interview, do you mind if I send you an email or give you a quick call? I will also follow up with you shortly to identify peer utilities and performance indicators to kick-of the benchmarking task.

B.2 Contractor Interview Guide

To support the process and impact evaluation of the 2017 Xcel Energy efficiency programs, members of the EMI Consulting evaluation team are conducting in-depth telephone interviews with Trade Partners. This guide presents the questions to be covered in the in-depth interviews of trade partners who have participated in the Minnesota Motors and Drives Efficiency Product.

The evaluation team plans to interview 30 contractors as part of this effort, as shown in Table 5. The evaluation team plans to select up to 10 contractors as a follow-up to the participant interviews. These contractors will be selected for customers who said the contractor was highly influential on their project, but exhibited high free-ridership in other questions. For these contractors, the evaluation team will look to identify the Product's influence on their business practices, and will use this qualitative information to directly adjust the free-ridership scores for the customers they worked with. The remaining 20 contractors will be split between high- and low-participating VFD and motors contractors; the exact number of contractors in each group will be set after receiving contractor data from program staff.

Table 5. Motor Efficiency Contractor Target Interviews, by Interview Strata

Trade Partner Type	Strata	Population	Target Interviews
Contractors	Survey follow-ups	TBD	10
	Highly active	TBD	5
	Less active	TBD	5
	Total	TBD	10

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 Minnesota Motor and Drive Efficiency Product evaluation are to:

- Assess customer and trade partner awareness and perceptions of motors and drives technology, with particular focus on perceptions of PMAC motors and of VFD savings potential.
- Characterize key barriers in the customer decision-making process related to motors and drives purchases: What are the most common barriers for adoption and how can Xcel Energy overcome them? How are other utilities encouraging the adoption of motors and drives technologies? Which of these barriers are most prevalent for non-managed accounts?
- Assess contractors' experiences: How can contractors be motivated to sell more motors and drives? What current activities are working well to motivate contractors? How can Xcel Energy make sure all eligible units are being submitted for rebates?
- Understand the potential for increasing the Product's savings through offering a packaged VFD measure, decreasing minimum eligible motor size, or switching to upstream rebates. How do other programs around the country structure their motors and drives rebates, and what are their offerings?
- Characterize the role of distributors in the market for motors and drives within Minnesota: What barriers to increases sales of motors and drives equipment do these market actors observe? What would motivate these actors to increase their engagement with the program?
- Optional: Understand how customer and trade ally participation varies by geography.
- Optional: Understand how the Product supports Xcel Energy's energy efficiency portfolio. How much energy savings are due to motors and drives equipment across the portfolio?

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

Table 6. Motors and Drives Research Summary

Research Task		Sample Size	Enhanced Scope?	Research Objective(s)
Staff Interviews		5		Inform evaluation plan, NTG
Influence Mapping				Inform evaluation plan, NTG
Participant Surveys (telephone)		70		Perceptions/awareness, customer decision making & barriers, product experience/satisfaction, NTG
Participant Interviews		10		Perceptions/awareness, customer decision making & barriers, product experience/satisfaction, NTG
Trade Partner Interviews	Contractors, distributors or vendors	30		Perceptions/awareness, customer decision making & barriers, product experience/satisfaction, potential for product expansion, NTG
Peer Utility Benchmarking		4-6 utilities		Best practices, NTG, potential for product expansion
Internal Product Influence Analysis		-	✓	Data analysis and visual of how the product's measures and outreach influence other Xcel Energy products

The evaluation team will utilize trade partner interviews to meet both process and impact objectives. These interviews are integral for the following five evaluation objectives: perceptions/awareness, customer decision-making and barriers, trade partner experience, potential for product expansion, and NTG impacts.

- Perceptions/Awareness: The evaluation team will assess contractor perceptions and awareness of motors and drives technologies to better understand how this may hinder greater product participation from trade partners and their customers.
- Customer Decision-Making and Barriers: The evaluation team will discuss the tools trade partners find most helpful in motivating customers to purchasing motors and drives equipment, as well as any barriers they experience.
- Product Experience/Satisfaction: The evaluation team will discuss trade partners' product experience, including the application process, and where opportunities may exist to facilitate greater participation.
- Potential for Product Expansion: The evaluation team will discuss ways to decrease barriers to participation, and assess contractors' perceptions of potential changes to the Product.
- NTG: Finally, the team will ask questions on program attribution, or the impact the program had on their decision to recommend motors and drives technologies because of the Xcel Energy motors and drives program. The evaluation team will discuss how the program impacts their product recommendations as a whole.

Table 7 presents the link between each evaluation objective, research question, and interview question.

Table 7. Interview Questions by Research Question Addressed

Evaluation Objective	Research Question	Interview Question Number(s)
Perceptions / Awareness	Assess trade partner perceptions and awareness of motors and drives technology	E5-E6, E8-E10, E11
Perceptions / Awareness	How does trade partner awareness of technology impact trade partner and customer participation?	E5-E6, E8-E9
Customer Decision-Making and Barriers	What tools do trade partners find most helpful in driving sales?	D1-D5
Customer Decision-Making and Barriers	What barriers do trade partners experience to driving sales?	E2-E4
Customer Decision-Making and Barriers	What knowledge and attitudes do customers have related to VFD technology?*	E5-E7
Customer Decision-Making and Barriers	What knowledge and attitudes do customers have related to permanent magnet motors?*	E9-E13
Customer Decision-Making and Barriers	What are barriers to participation for customers with non-managed accounts?*	E3
Product Experience / Satisfaction	Characterize trade partners' experience with the product and application process	A1-A6, B1-2, E1-E2, F1, G1-G3
Product Experience / Satisfaction	Identify opportunities to increase participation	A5, B1, C1, E2-E4
Product Experience / Satisfaction	How cost-effective are trade partner engagement efforts?*	A5, A6, B1, C1, E2, G1
Potential for Product Expansion	Identify opportunities to decrease barriers to participation	C2, E2-E4
Potential for Product Expansion	Identify opportunities for product improvements	C2, F4-F6, G2-G3
Potential for Product Expansion	Would a decrease in minimum eligible motor size affect participation?*	E13
Net-to-gross	Assess impact of the product on customer decisions to install efficient motors and drives	F1-F3

* Research question identified through influence mapping process

Fielding Instructions

We will attempt to schedule interviews via email if email addresses are available. We will supplement email recruiting efforts with telephone calls as needed.

The following fielding guidelines should be used for trade partner/contractor recruiting and interviews:

- Attempt to reach each trade partner/contractor six times on different days of the week and at different times.
- Leave messages on the first and fourth attempt.

- Experienced interviewers should attempt to convert "soft" refusals [e.g., "I'm not interested", immediate hang-ups] at least once.
- Calling hours are 7 AM to 5 PM CST.
- Record interviews
- Definitions:
  COMPANY NAME = Update COMPANY NAME with Trade Partner's/Contractor's company name

Telephone Recruiting Dialog/Message Script

[INTRO:] Hi, this is **NAME** from EMI Consulting, calling on behalf of Xcel Energy. We're contacting professionals that have worked on projects in the Xcel Energy Motor and Drive Efficiency Program to learn how Xcel Energy can improve this program. May I please speak with <CONTACT> or the person most familiar with your company's participation in Xcel Energy's Motor and Drive 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 Motor and Drive Efficiency Program. I'd appreciate the opportunity to schedule a quick half-hour interview with you to discuss your experience. This is the best opportunity you will have to influence the program's design. 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 their Motor and Drive Efficiency Program. I am contacting professionals that have worked on projects in the Xcel Energy Motor and Drive Efficiency Program to learn how Xcel Energy can improve their program. Regardless of how many projects you've completed through the Motors and Drives Program, I'd appreciate the opportunity to schedule a quick half-hour interview with you to discuss your experience. This is the best opportunity you will have to influence the program's design. We are offering a $25 incentive as a thank you for your time.

Below I have listed available times 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.

[LIST TIMES AVAILABLE FOR INTERVIEW]

Interview

Section A: Introduction/Background Information

Thank you for agreeing to talk with me today. I expect this conversation to take about half an hour. To help me capture your responses accurately, is it okay if I record this call? The recording will be used for my note-taking purposes only. It won't be shared with Xcel Energy.

Do you have any questions before I start?

First, I want to take 5 minutes to better understand your role and set the stage for the rest of the questions.

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

A2. What are your primary responsibilities at COMPANY NAME?

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

A4. What 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. [**IF YES:**] Has your company's participation in Xcel Energy's Motors and Drives Program influenced any changes in the services you deliver or the customers you serve?

A5. Is your company registered as a Motors and Drives Program Trade Partner?

1. [**IF A5=YES**]: Approximately how long has COMPANY NAME been a registered Trade Partner for the Motors and Drives program?
2. [**IF A5=YES**]: Why did your company register as a Motors and Drives Program Trade Partner? [**PROBE:** Eligibility for trade partner incentive, brand affiliation with Xcel Energy, promotion on Xcel Energy website, etc.]
3. [**IF A5=YES**]: Under what circumstance would you drop your affiliation as registered Trade Partner?
4. **[IF NO / NO RECOLLECTION OF REGISTRATION:]** Why has your company not registered as a trade partner in the Motors and Drives Program?

A6. Why do you complete projects through Xcel Energy's Motors and Drives Program?

Section B: Awareness of Program

B1. How did you initially learn about opportunities to participate in the Motors and Drives Program?

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 Motors and Drives Program? [**PROBE:** incentive levels, materials, application process]

Section C: Motivations/Barriers to be a Trade Partner

C1. Throughout your participation with Xcel Energy's Motors and Drives Program, what have been your primary reasons for completing projects through the program?

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

2. If yes, how so?

Section D: Trade Partner Marketing

D1. What sales techniques do you use to attract new motors and drives customers? [**PROBE**: brochures, cold calls, ads, door to door]

D2. At what point in the project do you talk to your customers about the Motors and Drives Program?

D3. What aspects of Motors and Drives 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 Motors and Drives 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 Motors and Drives 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. Have you ever sold any eligible projects without using the incentives/rebates as a sales tool?

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. Is it you or the customer who completes the rebate application?
3. Can you please describe the rebate application process? [**PROBE** for satisfaction with application process and opportunities to improve]
4. Do the rebates go directly to customers or are they sent to you?

E2. **(IF PARTICIPATED MORE THAN ONE YEAR)** About how many projects do you submit per year, on average?

1. Thinking back to 2017, 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. Xcel Energy would like to know about your experience working with large and with small customers.

1. Approximately what percent of the projects you complete through the Motors and Drives Program are with large customers?
2. Approximately what percent of the projects you complete through the Motors and Drives Program are with small customers?
3. Do small customers face different barriers to completing projects in the Motors and Drives Program? How are the barriers different?

    PROBE: Barriers related to not having an Xcel Energy account manager?
4. **[IF E3.3=YES]** What would help these small customers to participate in the Motors and Drives Program?

E4. Are there (other) challenges related to selling energy efficient motors and drives?

1. What messages resonate best with customers when selling motors and drives equipment?

Xcel Energy is investigating the potential benefits of, and customer interest in, different technologies.

E5. Have you installed Variable Frequency Drives (VFDs)?

1. **[IF E5=YES]** Approximately how much of your work involves VFDs?
2. **[ASK ALL]** How familiar are you with VFDs?

E6. Are customers interested in installing VFDs?

1. **[IF E7=YES]** What do customers like about VFDs?
2. **[IF E7=YES]** Under what circumstances are customers interested in installing VFDs?
3. **[IF E7=NO]** How familiar are customers with VFDs?

   PROBE: Aware of energy savings potential?
4. **[IF E7=NO]** Under what circumstances might these customers be interested in installing VFDs?

E8. What would cause you to install more VFDs than you currently do?

E9. Have you installed permanent magnet motors?

1. **[IF E9=YES]** Approximately how much of your work involves permanent magnet motors?
2. **[ASK ALL]** How familiar are you with permanent magnet motors?

E10. Can permanent magnet motors create energy savings for customers?

1. **[IF E10=YES]** Under what circumstances? Are permanent magnet motors a better fit in some situations than others?
2. **[IF E10=NO]** What prevents permanent magnet motors from creating energy savings?

E11. Are customers interested in installing permanent magnet motors?

1. **[IF E11=YES]** What do customers like about permanent magnet motors?
2. **[IF E11=YES]** Under what circumstances are customers interested in installing permanent magnet motors?
3. **[IF E11=NO]** How familiar are customers with permanent magnet motors?

   PROBE: Aware of energy savings potential?
4. **[IF E11=NO]** Under what circumstances might these customers be interested in installing permanent magnet motors?

E12. What would cause you to install more permanent magnet motors than you currently do?

E13. Have you ever had a customer who would have liked to participate in the Motors and Drives Program, but who was installing too small of a motor to be eligible for an incentive?

1. **[IF E13=YES]** How often does this happen?
2. **[ASK ALL]** Would offering an incentive for smaller motors increase your sales of these motors?

Section F: Evolving Market Place

F1. About what percent of the equipment you sell is eligible for a rebate under the Motors and Drives Program?

F2. 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 do you think would be energy efficient?

1. What other effects would this have on your business? **[PROBE:** employees, sales techniques, number of clients, time it takes to sell projects]

F3. Do you do any work outside of Minnesota? In what states/regions? About what percent of the equipment you sell in this state/region is considered energy efficient?

F4. What do you see as new/emerging energy efficiency opportunities for Motors and Drives Program customers?

F5. What do you see as trends in the market place for motors and drives? [**PROBE:** trends for measures]

Section G: Satisfaction

G1. What is the Motors and Drives 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 Motors and Drives Program that you think Xcel Energy should know?

Section H: Closing

H1. Is there anything we didn't cover that you'd like to mention or discuss about your experiences working with the Motors and Drives Program?

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

[THANK AND TERMINATE]

B.3 Participant Survey Guide

Introduction

To support the process and impact evaluation of the 2018 Xcel Energy energy efficiency programs, the EMI Consulting evaluation team will conduct telephone surveys with participants. The evaluation team defined a participating customer as any customer that closed a project in 2016 or 2017. The research will be conducted to assess key process and impact evaluation objectives, including customer satisfaction, product awareness, motivations for participating, free-ridership, and spillover.

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

Evaluation Objectives

The objectives for the MN Motor and Drive Efficiency product evaluation are to:

- Assess product design and administration and document any recent changes in delivery that may impact the evaluation research.
- Assess customer perceptions and awareness of motors and drives technologies to better understand how this may hinder greater product participation.
- Understand customer motivations behind purchasing motors and drives products as well as barriers to pursuing efficient upgrades or new equipment.
- Understand customers' experience with and satisfaction with the product, including experience with the application process.
- Assess product free-ridership and spillover to inform the development of net-to-gross ratios.
- Assess how financial and technical assistance given to customers has influenced the motors and drives marketplace.
- Gain insight into trade partners' satisfaction with the product, 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 motors and drives equipment.
- Benchmarking free-ridership and spillover levels against other motors and drives programs across the country.
- Understand how other high-performing motors and drives programs are designed, if there are any additional measures that have been successful, and how other utilities are planning for the future of motors and drives program.
- Provide insight into the influence of the motors and drives program on the other Xcel Energy programs.

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

Evaluation Objective	Research Activity
Assess product design and administration and document any recent changes in delivery that may impact the evaluation research	Program staff interviews, influence map
Assess customer perceptions and awareness of motors and drives technologies to better understand how this may hinder greater product participation	Participant survey
Understand customer motivations behind purchasing motors and drives products as well as barriers to pursuing efficient upgrades or new equipment	Participant survey
Understand customers' experience with and satisfaction with the product, including experience with the application process	Participant survey
Assess product free-ridership and spillover to inform the development of net-to-gross ratios	Participant survey, participant interviews, trade partner interviews
Assess how financial and technical assistance given to customers has influenced the motors and drives marketplace	Trade partner interviews
Gain insight into trade partners' satisfaction with the product, 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 motors and drives equipment	Trade partner interviews
Benchmarking free-ridership and spillover levels against other long-running heating retrofit programs across the country	Program benchmarking
Understand how other high-performing motors and drives programs are designed, if there are any additional measures that have been successful, and how other utilities are planning for the future of motors and drives program	Program benchmarking
Provide insight into the influence of the motors and drives program on the other Xcel Energy programs	Internal product influence analysis

Specific research questions which this participant survey 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 survey question.

Evaluation Objective	Research Question	Survey Question Number(s)
Assess customer perceptions and awareness of motors and drives technologies to better understand how this may hinder greater product participation	What types of customers participate in the program? How many have participated in other energy efficiency programs?	A1 – A6
Assess customer perceptions and awareness of motors and drives technologies to better understand how this may hinder greater product participation	How do customers hear about the program? How do customers hear about the motors and drives technology?	B2, D1a – D1b,
Understand customers' experience with and satisfaction with the product, including experience with the application process	How well are the program's processes working for customers? What aspects of the program are easy / challenging for customers, and what is challenging?	E1-E5, E7
Understand customer motivations behind purchasing motors and drives products as well as barriers to pursuing efficient upgrades or new equipment	What are customers' primary motivations for participating in the program? What barriers do they face in pursuing additional projects?	E6-E6b, E7
Assess product free-ridership and spillover to inform the development of net-to-gross ratios	What level of free-ridership exists in the program?	TBD
Assess product free-ridership and spillover to inform the development of net-to-gross ratios	Does the program influence additional energy savings OUTSIDE of what is captured through the program (spillover)?	TBD
Understand customers' experience with and satisfaction with the product, including experience with the application process	Are customers satisfied with their experience with the program, including all elements of program design? If not, why were they dissatisfied?	S1-S5
Understand customers' experience with and satisfaction with the product, including experience with the application process	Are customers satisfied with their experience with Xcel Energy as a utility?	S6

Sample Variables

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

Sample Variable	Variable Description	Potential Codes
Interviewer Name	Name of interviewer from Ewald and Wasserman	e.g. Donna Whitsett
Organization	Organization name	e.g. EMI Consulting
Contact	Contact at organization	e.g. Katie Cary
Month	Month customer completed project through program	e.g. May
Year	Year customer completed project through program	e.g. 2017
Program	Program name	e.g. “Drive Efficiency program” or “Motor Efficiency program"
Participation Description	Short description of customers’ participation in program	e.g. “8 VFDs”
Phone	Phone number for contact at organization	e.g. 555-555-5555
Measure	Measure installed through program (note: if multiple installed, this is the primary measure in terms of % of savings)	1= VFDs 2 = Water well pump VFDs 3 = Motors
Measure_count	Number of measure installed	Numeric, 0 - 100
Measure_Description	Measure installed through program (note: if multiple installed, this is the primary measure in terms of % of savings)	e.g. “VFD”, “motor”
Dollar_Amount	Amount of rebate for the measure installed through the program	Numeric

Fielding Instructions

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

Survey Sections

- **Intro.** Introduction and Screening
- **Gen.** Firmographics, Operations, Participation

- **D.** Free-ridership, spillover, and market effects
- **A.** Program Implementation and Processes
- **C.** Motivations for Participation
- **B.** Awareness and Satisfaction (Programs and Components)
- **F.** Net Promoter

Survey

Section Intro: Introduction and Screening

Intro1. Hello, this is **<INTERVIEWER NAME>** calling from Ewald and Wasserman, a national research firm working with Xcel Energy. I'm hoping to speak to someone at your organization who would be familiar with your participation in the Xcel Energy **<PROGRAM>** in **<MONTH> <YEAR>.** Our records show that you received a rebate from this program for installing **<PARTICIPATION DESCRIPTION>.** May I speak with **<CONTACT>?**

1. Yes, that would be me.
2. Yes, let me transfer you to the correct person **[IF NAME GIVEN, ENTER AS <CONTACT>; REPEAT QUESTION INTRO1 WITH NEW RESPONDENT]**
3. No, they are not available right now.
4. No, they are no longer employed by this organization.
5. No, other reason (SPECIFY).

DK **[TERMINATE]**
REF **[TERMINATE]**

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

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

DK **[TERMINATE]**
REF **[TERMINATE]**

[ASK IF INTRO2=4]
Intro3. Is there someone else that is knowledgeable about your participation in the Motor and Drive Efficiency program?

1. Yes.
2. No **[TERMINATE]**

DK **[TERMINATE]**
REF **[TERMINATE]**

[ASK IF INTRO2=2-3 OR INTRO3=1]
Intro4. What is this person's name?

1. [RECORD CORRECT PERSON'S NAME AS **<CONTACT>**]

DK **[TERMINATE]**
REF **[TERMINATE]**

[ASK IF INTRO4=1]
Intro4. Would I reach that person by dialing the same number I used to connect with you: **<PHONE>**?

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

PROGRAMMER NOTE: Only those for whom Intro1=1 or Intro2=1 should get to this screen; the rest would end at Intro5 as they will need to be made into new sample cases and called back at a later time.

[ASK IF INTRO1=1 OR INTRO2=1]
Intro6. Great! (IF NEEDED: Again, we're Ewald and Wasserman, a national research firm calling on behalf of Xcel Energy). I would like to invite you to participate in a short survey that will help Xcel Energy improve the Motor and Drive Efficiency program to best suit the needs of businesses like yours. The survey takes about 20 minutes on average, and as a small token of appreciation, we are offering a $25 gift card that you will receive after completing the survey. Your responses will remain confidential, meaning that your name and company name will not be attributed to your answers.

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

1. No objection – fine to continue
2. Objection **[RESOLVE AND RESCREEN AS NECESSARY]**
REF **[TERMINATE]**

Section A: Firmographics, Operations, Participation

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

A1. What is your occupational title within your company? **(ASK OPEN END, PROBE FOR SPECIFICS / VERIFY SELECTION AS NEEDED)**

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

9. Other ____
99. Prefer not to answer
DK

A2. Approximately how many full-time equivalent (FTE) employees does your organization currently have in the state of Minnesota?

1. Less than 20
2. 20 - 49
3. 50 - 99
4. 100 - 249
5. 250 - 499
6. 500 - 999
7. 1,000 - 2,500
8. More than 2,500

DK
REF / Prefer not to say

A3. Has your organization previously participated in this or any other Xcel Energy energy efficiency program for your business?
1. Yes
2. No
DK
REF

A4. Did a contractor install the equipment you had rebated as part of the Xcel Energy Motor and Drive Efficiency program, or did you install the equipment with in-house staff?
1. Used a contractor
2. Installed equipment with in-house staff
DK
REF

A5. Were you the primary contact between your facility and the Xcel Energy program staff?
1. Yes
2. No
DK
REF

[If A5 = 2]
A5a. Who was the primary contact?
1. **<SHOW IF A4=1>** Contractor
2. Someone else at my firm (title) _____
3. Other _____
DK
REF

Section B: Awareness

B1a. Next, I'd like to understand a little more about how you became aware of **<MEASURE_DESCRIPTION>**. Were you aware of this technology as an energy saving measure prior to your decision to participate in this program?
1. Yes
2. No
DK
REF

B1b. How did you **[SHOW IF B1A=1:** first] become aware of the potential to use **<MEASURE_DESCRIPTION>** to save energy at your facility? (DO NOT READ. ASK OPEN END, PROBE TO CATEGORIZE. SELECT ONE. IF RESPONDENT MENTIONS MULTIPLE, ASK FOR THE PRIMARY SOURCE OF AWARENESS)
1. Through Xcel Energy staff (including account managers, engineers, or program staff)
2. Through the contractor who completed this project
3. Through the distributor or vendor who sold you this equipment
4. Through another contractor or vendor (NOTE: Please verify this is not through the same contractor who completed their project / sold them equipment for the project)
5. Through previous participation in the program

6. Through the Xcel Energy website, TV ads, or other promotional materials
7. Through the internet or personal research
8. Through internal staff (NOTE: Please verify this is staff internal to the customers' company, not Xcel Energy or their contractor)
9. Other _____
DK
REF

B2. And how did you first become aware of Xcel Energy's rebates for Motors and Drives equipment? (DO NOT READ. ASK OPEN END)

1. Contractor
2. Distributor, vendor, or electrical mechanical contractor
3. Xcel Energy staff
4. Xcel Energy account manager
5. Xcel Energy website or other promotional materials (TV, mass media ads)
6. Xcel Energy event, expo, or demonstration
7. Xcel Energy marketing materials or flyer
8. Another business / word of mouth
9. Someone at my business
10. Online (not Xcel Energy)
11. Social media (e.g. Facebook, Twitter, LinkedIn)
12. Television advertisement
13. Other _____

88. DK
99.REF

Section D: Free-ridership

D0. In your own words, how would you describe the influence that the Xcel Energy <PROGRAM> had on your decision to purchase/install this <MEASURE_Description>?
1. [RECORD VERBATIM]
DK
REF

D1. [INTERVIEWER: PLEASE READ THE FOLLOWING SLOWLY AND CAREFULLY]
Making decisions can sometimes be relatively simple, involving one major factor, like price. Or, they can be relatively complex involving multiple factors such as price, information provided by your contractor or utility, and concerns about high electricity bills.

As part of this project, Xcel Energy provided you with:

- An incentive of [INSERT <DOLLAR_AMOUNT>]
- Information through marketing or informational and educational materials about the benefits of installing <MEASURE_Description>
- An endorsement or recommendation by your Xcel Energy account representative or other Xcel Energy staff
- Engineering or other technical assistance provided by Xcel Energy or by a third party that was funded through Xcel Energy, and
- **[SHOW IF A4=1:** Recommendations or information provided from a program-affiliated contractor or vendor]

In addition, you may have received support from prior participation in an Xcel Energy program.

There might be other things, not related to the program that might also have influenced your decision to install <MEASURE_Description> For example, maybe

- High electric bills,
- Company policies,
- Your own experiences with energy efficient equipment, or
- Your own research on energy efficiency equipment.

There are of course many other possible reasons.

Next, I'm going to ask a few questions about your decision to install <MEASURE_Description>. Please rate the importance of each of the following factors on your decision to install <MEASURE_Description> using a scale from 0 to 10, where 0 means "not at all important" and 10 means "extremely important". The bigger the number, the greater the influence. If you don't know, just say "I don't know". Now, how important was…
(RANDOMIZE D1a-D1l, REPEAT SCALE AS NECESSARY)
1. [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
DK
REF

D1a. A contractor recommendation [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
D1b. The dollar amount of the rebate [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
D1c. An endorsement or recommendation by your Xcel Energy account manager or other Xcel Energy staff [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
D1d. Information from Xcel Energy marketing or informational materials [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
D1e. Your previous participation in an Xcel Energy program [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
D1X. Information received from any training or events conducted by Xcel Energy [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
D1f. Previous experience with this type of equipment [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]

[ASK IF D1f>5]
D1f_1. Was this experience through an Xcel Energy program?
1. Yes
2. No
DK
REF

D1g. The age or condition of the old equipment [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
D1h. The simple payback period, which is the amount of time until equipment has paid for itself [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]

[ASK IF D1h>5]
D1h_1. Did Xcel Energy provide you with information on the simple payback period?
1. Yes
2. No
DK
REF

[ASK IF D1h_1=1]
D1h_2. In your own words, how important was the information provided by Xcel Energy on the simple payback period in your decision to install this equipment?
1. [RECORD VERBATIM]
DK
REF

D1i. Corporate policy or guidelines [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
D1j. Minimizing operating cost [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
[ASK IF D1j>5]
D1j_1. Did Xcel Energy provide you with information on minimizing operating costs?
1. Yes
2. No
DK
REF

[ASK IF D1j_1=1]
D1j_2. In your own words, how important was the information provided by Xcel Energy on minimizing operating costs in your decision to install this equipment?
1. [RECORD VERBATIM]
DK
REF

D1k. Predetermined timeline or schedule for replacing equipment [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
D1l. Total amount of money saved over lifetime of the equipment, otherwise known as the return on investment or "ROI" [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]

D1m. Were there any other factors that were important to your decision to participate in the program? **(ASK OPEN END)**
1. Yes (SPECIFY, RECORD OPEN END)
2. No additional factors
DK
REF

[ASK IF D1m=1]
D1m_1. On the same scale from 0 to 10, how would you rate the importance of that factor? [NUMERIC OPEN END, 0 – 10, 77=NA 88=DK, 99=REF]
1. [NUMERIC OPEN END, 0 - 10]
DK
REF

CREATE INTERNAL VARIABLE: Max_ProgramFactor.
IF D1f_1=1, SET Value = max(D1a, D1b, D1c, D1d, D1e, D1f).
ELSE, SET Value= max(D1a, D1b, D1c, D1d, D1e).

D2. Thinking about this differently, I would like you to compare which of those factors were most important in your decision to install <MEASURE_Description>. We have two groups: the first group is the program factors, which are all of the things related to the program. For instance, you just told me…

[IF D1f_1=1, READ BACK ANY D1a-D1f >7, OR IF NO ITEMS GREATER THAN 7, READ TOP 3 FROM D1a-D1f.

ELSE, READ BACK ANY D1a-D1e >7, OR IF NO ITEMS GREATER THAN 7, READ TOP 3 FROM D1a-D1e.]

(were/was) the most important program factor(s). And then the second group is the non-program factors, which are those things we just discussed that were ***not*** part of the program. You just told me…

[IF D1f_1=1, READ BACK ANY D1g-D1l >7, OR IF NO ITEMS GREATER THAN 7, READ TOP 3 FROM D1g-D1l.

ELSE, READ BACK ANY D1f-D1l >7, OR IF NO ITEMS GREATER THAN 7, READ TOP 3 FROM D1f-D1l.]

…(were/was) the most important non-program factor(s).

I'm going to ask you to split 100 points between the overall influence of program factors and the overall influence of non-program factors on your decision to install <MEASURE_Description>. So there are two groups here – the first group is the program factors and the second group is the non-program factors. Thinking about that decision, how many of those 100 points would you assign to the overall influence of program factors, considered *as a group*? And how many would you assign to the non-program factors?

PROGRAMNUM
1. [NUMERIC OPEN END, 0 - 100]
DK
REF

NONPROGRAMNUM
1. [NUMERIC OPEN END, 0 - 100]
DK
REF

[PROGRAMNUM + NONPROGRAM NUM = FACTORIMPORTANCE]
[FACTORIMPORTANCE MUST EQUAL 100, or 888 or 999 ELSE RE-ASK]

D5a. If the incentive, information, and support from the Xcel Energy **<PROGRAM>** was not available, would you have installed the *exact same number, type, model, and efficiency* of **<Measure_Description>**? If you are not sure, please let me know.

1. Yes
2. Maybe / not sure
3. No
77. Would not have installed <MEASURE_Description> at all
REF

[ASK IF D5a=1,2,REF, ELSE SKIP TO S1]

D5b. Using a scale from 0 to 10, where 0 means "not at all likely" and 10 means "extremely likely", please rate the likelihood that you would have installed the *exact same number, type, model, and efficiency* of **<MEASURE_Description>** if the Xcel Energy **<PROGRAM>** was not available.

1. [NUMERIC OPEN END, 0 - 10]
DK
REF
PROGRAMMING NOTE:
if (ans = 0) skp D5e
if (ans = 1) skp D5e
if (ans = 2) skp D5e
if (ans = 3) skp D6c
if (ans = 4) skp D6c
if (ans = 5) skp D6c
if (ans = 6) skp D6c
if (ans = 7) skp D5d
if (ans = 8) skp D5d
if (ans = 9) skp D5d
if (ans > 76) skp D6c

[ASK IF D5b=10]

D5c. To clarify, you just told me that it is extremely likely that you would have installed the exact same number, type, model, and efficiency equipment if you did not have any support, information, or rebates from the Xcel Energy Motor and Drive Efficiency program.

Is that correct, or do you want to change the likelihood that you would have installed the same equipment without support from Xcel?
1. Yes, rating is correct [skp D6c]2. No, rating is incorrect, want to change likelihood **[LOOP BACK TO D5b**
DK [skp D6c]
REF [Skp D6c]

[ASK IF D5b = 7-9 and Max_ProgramFactor > 7]

D5d. You just rated your likelihood to install **<MEASURE_Description>** without any support or incentives from the Motor and Drive Efficiency program as a(n) **<RESTORE RESPONSE FROM D5b>** out of 10, suggesting that the program was not very important. Earlier, when I asked you to rate the importance of each program factor on your decision, the highest rating you gave was a **<Max_ProgramFactor>** out of 10, suggesting that the program was very important. Is this correct or should I go back and change one of your answers?

1. Correct – leave answers as is [D6c]
2. Change the likelihood of installing **<MEASURE_Description>** without the program **[RETURN TO D5b]**
3. Change the influence of the program factors **[D6c]**
DK [skp D6c]
REF [skp D6c]

[ASK IF D5b < 3 and Max_ProgramFactor < 3]

D5e. You just rated your likelihood to install **<MEASURE_Description>** without any support incentives from the Motor and Drive Efficiency program as a(n) **<RESTORE RESPONSE FROM D5b>** out of 10, suggesting that the program was very important. Earlier, when I asked you to rate the importance of each program factor on your decision, the highest rating you gave was a **<Max_ProgramFactor>** out of 10, suggesting that the program was not very important. Is this correct or should I go back and change one of your answers?

1. Correct – Leave answers as is [skp D6c]
2. Change the likelihood of installing **<MEASURE_Description>** without the program **[RETURN TO D5b]**
3. Change the influence of the program factors

DKREF [skp D6c]

D5FactorUpdate.
[ASK IF D5d = 3 OR D5e = 3]

You said you would like to change the influence of program factors. Which factor(s) would you like to change and what would you like to change them to? (Lower # = Lower importance, Higher # = Higher importance)

1. A contractor recommendation (you said %D1a%/10):
2. The dollar amount of the rebate (you said %D1b%/10):
3. An endorsement or recommendation by your Xcel Energy account manager or other Xcel Energy staff (you said %D1c%/10):
4. Information from Xcel Energy marketing or informational materials (you said %D1d%/10):
5. Your previous participation in an Xcel Energy program (you said %D1e%/10):

[ASK IF D5a=1,2,REF]

D6c. In absence of the Xcel Energy program, <u>when</u> would you have installed the *exact same number, type, model, and efficiency* of **<Measure_Description>** you installed through the **<PROGRAM>**? Would it have been… [READ CODES 1-99]

1. Within one year of installation?
2. Between 1 and 2 years later
3. Between 2 years and 3 years later
4. Between 3 years and 4 years later
5. Greater than 4 years later

77. Or would you not have installed the exact same equipment

DK
REF

D6d. Asking this same question in a different way -- using a scale from 0 to 10, where 0 means "not at all likely" and 10 means "extremely likely", what is the likelihood that you would have installed the *exact same number, type, model, and efficiency* of the <MEASURE_Description> you installed <u>within 12 months of <MONTH> <YEAR></u> if the program was not available.

1. [NUMERIC OPEN END, 0 - 10]

DK
REF

Section S: Spillover

S1. Since your participation in the **<PROGRAM>** in **<MONTH> <YEAR>,** has your company installed any efficient Motors or Drives products at this facility <u>without</u> a rebate from Xcel Energy? When I say "efficient Motors and Drives products", I mean equipment that is eligible for an Xcel Energy discount.

1. Yes
2. No

DK

REF

[ASK IF S1=1, ELSE SKIP TO S7]

S1a. Why did you not apply for an Xcel Energy rebate for purchasing these efficient Motors or Drives products?

1. OPEN END
DK
REF

S2. Did your experience with the efficient Motors or Drives products you installed through the Xcel Energy **<PROGRAM>** influence your decision to install some or all of the additional efficient equipment on your own?

1. Yes
2. No
DK
REF

[ASK IF S2=1, ELSE SKIP TO S7]

S3. What type of Motors or Drives equipment did you install? For example, was it… LIST ALL TYPES, ALLOW MULTIPLE]

1. Efficient motors
2. Permanent magnet alternating current (P-MAC) motors
3. Variable Frequency Drives (V-F-Ds)
4. Or something else? **<SPECIFY>**
DK
REF

[ASK IF S3=1-4, ELSE SKIP TO S7]

S4a. Approximately how many of each type did you install? How many…[READ TYPES LISTED IN S3]

S4a_1. Efficient motors
S4a_2. Permanent magnet alternating current (P-MAC) motors
S4a_3. Variable Frequency Drives (V-F-Ds)
S4a_4. **<SPECIFY>**

1. NUMERIC OPEN END

DK
REF

[ASK IF S3=1-4, ELSE SKIP TO S7]

S4b. What was the horsepower of the… [READ TYPES LISTED IN S3]

S4b_1. Efficient motors
S4b_2. Permanent magnet alternating current (P-MAC) motors
S4b_3. Variable Frequency Drives (V-F-Ds)
S4b_4. **<SPECIFY>**
DK

REF

[ASK IF S3=1-4, ELSE SKIP TO S7]

S5. How important was your experience in the **<PROGRAM>**, including the equipment you installed through the program, in your decision to install the additional equipment on your own? Please use a scale from 0 to 10, where 0 is "not at all important" and 10 is "extremely important".

1. NUMERIC OPEN END (0-10)
DK
REF

[ASK IF S3=1-5, ELSE SKIP TO S7]

S6. If you had not participated in the **<PROGRAM>**, how likely is it that your organization would have installed these additional efficient Motors or Drives products, using a scale from 0 to 10, where 0 means you definitely WOULD NOT have installed and 10 means you definitely WOULD have installed them?

1. 1. NUMERIC OPEN END (0-10)
DK
REF

S7. Since your participation in the <PROGRAM>, have you installed any additional energy efficient equipment, <u>other than</u> Motors or Drives, at this or other facilities in Xcel Energy's territory?

1. Yes
2. No
DK
REF

[ASK IF S7=1]

S8. Did you receive a rebate for any or all of this equipment through Xcel Energy or any other energy efficiency program?

1. Yes, we received a rebate for **all** of the equipment
2. Yes, we received a rebate for **some** of the equipment
3. No
DK
REF

[ASK IF S8=2-3, ELSE SKIP TO E1]

S9. **[IF S8=2:** Thinking only about the equipment for which you did **NOT** receive a rebate,] Did your experience with the Xcel Energy **<PROGRAM>**, including the equipment you installed through the program, influence your decision to install some or all of these efficient products?

1. Yes
2. No
DK
REF

[ASK IF S9=1, ELSE SKIP TO E1]

S10. What equipment did you install? Please provide as much detail as you can. (PROBE FOR NUMBER INSTALLED, EQUIPMENT TYPE, EFFICIENCY, SIZE)

1. (OPEN END)
DK [SKP E1]
REF [SKP E1]

[ASK IF S9=1, else skip to E1]

S11. How important was your experience in the <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"?

1. [NUMERIC OPEN END, 0 – 10]
DK
REF

[ASK IF S9=1]

S12. If you had not participated in the **<PROGRAM>**, how likely is it that your organization would have installed these additional efficient products, using a scale from 0 to 10, where 0 means you definitely WOULD NOT have installed and 10 means you definitely WOULD have installed them?
1. [NUMERIC OPEN END, 0 – 10]
DK
REF

Section E: Program Implementation and Processes

Next, I want to ask you a few questions about your experience with the program, and how the program's processes worked for you.

E1. I am going to ask you to rate how easy or difficult the following tasks associated with the **<PROGRAM>** were to complete, using a scale from 1 to 5, where 1 is "very difficult" and 5 is "very easy". You may also tell me if something was not applicable to your experience. How would you rate the ease of… **(PAUSE AFTER EACH FOR RESPONSE. REPEAT SCALE IF NEEDED).**

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

(RANDOMIZE)

E1a. Completing program applications or rebate forms
E1b. Meeting program deadlines
E1c. Getting in touch with an Xcel Energy representative
E1d. Determining equipment / models that are eligible
E1e. <SHOW IF A4=1> Finding a contractor to complete the work

[For any E1 < 3]
E2a – E2e. Why was it not easy to **<RESTORE QUESTION WORDING FROM E1A – E1E>**

_____

E3. Would you have liked more contact, less contact, or about the same amount of contact from Xcel Energy during your Motor and Drive Efficiency project?

1. More
2. Less
3. About the same
DK
REF

[ASK IF E3=1]
E4. What would you have liked Xcel Energy to contact you about more?
1. [OPEN END]
DK
REF

E5. From the time work started to the time you received your rebate, did the project take less or more time than you expected to complete? Please answer using a scale from 1 to 5, where 1 means the project took "much less time than expected" and 5 means it took "much more time than expected".
1. [NUMERIC OPEN END, 1 – 5]
77. Have not completed project / received rebate
DK
REF

[ASK IF S1=2 AND S7=2]
E6. To what extent did you consider installing additional motors and drives equipment beyond the equipment you installed through the **<Program>**?
(1) Not at all - (3) - (5) Very much DK REF

[If E6> 3]
E6a. What else did you consider having done? _____

[If E6> 3]
E6b. Why did you decide not to pursue this additional equipment? **(ASK OPEN END, ALLOW MULTIPLE)**
1. Capital budget constraints
2. Lack of knowledge about Xcel Energy energy efficiency programs
3. Lack of knowledge regarding equipment cost
4. Lack of knowledge regarding eligibility for Xcel Energy energy efficiency programs
5. Lack of knowledge regarding rebate amounts
6. Amount of time it takes to install equipment
7. Getting upgrades approved by internal stakeholders
8. Finding a trustworthy contractor to perform installation
9. Amount of paperwork
10. Program requirements
11. Other ____

[If multiple responses to E6b]
E6c. Which of those factors was the most important in your decision not to pursue the additional equipment? **(SELECT ONE)**
1. Capital budget constraints
2. Lack of knowledge about Xcel Energy energy efficiency programs
3. Lack of knowledge regarding equipment cost
4. Lack of knowledge regarding eligibility for Xcel Energy energy efficiency programs
5. Lack of knowledge regarding rebate amounts
6. Amount of time it takes to install equipment
7. Getting upgrades approved by internal stakeholders
8. Finding a trustworthy contractor to perform installation
9. Amount of paperwork
10. Program requirements
11. Other ____

Section F: Satisfaction (Programs and Components) and Net Promoter

F1. Thank you for your patience; we have only a few questions left. I'm going to ask you to rate your satisfaction with various aspects of the program. For each, please rate your satisfaction on a scale from 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied", or let me know if it is not applicable to your project. How would you rate your satisfaction with: **[RANDOMIZE, PAUSE AFTER EACH FOR RATING, REPEAT SCALE IF NECESSARY]**

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

(RANDOMIZE)

F1a. The equipment installed
F1b. <ASK IF A4=1> The contractor who performed the work
F1c. The amount of time it took to receive your rebate
F1d. The dollar amount of the rebate
F1e. Your interactions with program staff
[For any F1 < 3]
F2a – F2e. Why weren't you satisfied with **<RESTORE QUESTION WORDING FROM F1A – F1E>**

_____

F3. Thinking about your experience from start to finish, how would you rate your satisfaction with the **<PROGRAM>** as a whole? (IF NEEDED: Please use the same scale from 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied")

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

[ASK IF F3 <3]
F3a. Why weren't you satisfied with your experience with the **<PROGRAM>?**

1. [OPEN END]
DK
REF

[ASK IF F3 = 3-4]
F3b. What else could Xcel Energy do to improve your satisfaction with the **<PROGRAM>?**

1. [OPEN END]
DK
REF

F4. What did you like most about your experience with the **<PROGRAM>?**

1. [OPEN END]
77. Not applicable
DK
REF

F5. What recommendations do you have for improving the **<PROGRAM>?**

1. [OPEN END]

77. No recommendations
DK
REF

F6. Using the same scale from 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied", how would you rate Xcel Energy as an energy provider?

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

Closing

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

[COLLECT CONTACT INFORMATION]

B.4 Peer Program Benchmarking Guide

Introduction

To support the process and impact evaluation of the 2017 Xcel Energy efficiency programs, the EMI Consulting evaluation team will benchmark the Xcel Energy products against peer utilities. The objective of the benchmarking is to identify opportunities to improve the Xcel Energy products 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 product in context with the performance of other utilities. To conduct the benchmarking, the evaluation team will conduct secondary research on the peer utilities identified and perform in-depth interviews with program managers at the peer utilities.

This document presents the in-depth interview guide for peer utility Motor and Drive programs. Table 8 identifies the interview questions related to each key performance indicator. Table 9 identifies the interview questions related to each contextual theme.

This interview is being conducted with a set of approximately 5 of Xcel Energy's peer utilities. Target utilities include:

- Mass Saves (MA): Included based on current midstream program offerings (as part of HVAC offering) and leadership in the EE field.
- Efficiency Vermont (VT): Included based on leadership in the EE field, experience with other midstream (non-motors) offerings.
- Ameren Illinois (IL): Midwest utility with similar motors and drives offerings, good benchmark for NTG.
- San Diego Gas & Electric (SDG&E): Leading utility and completed a study on PMAC motors in 2016; would be interesting to see what they've done with PMAC motors since then.
- Focus on Energy: Included at the product manager's request.
- Otter Tail Power: Included at the product manager's request.

Target respondents are managers of commercial motor and drive energy efficiency programs, or the programs that offer rebates for motors and drives.

Table 8: Mapping of interview questions to indicators

Key Performance Indicator	Data Needed	Interview Question
Savings calculations	• Savings method- estimated, deemed, combination • Measures with deemed vs. calculated savings	A3c
Program energy savings goals	• 2017 program energy savings goals (kWh) • 2017 program savings (kWh) • 2017 total energy efficiency portfolio goal (kWh)	B2, B4, B5
Net-to-gross ratios (NTGRs)	• NTG values, and are they estimated at program level, measure level, or both.	B3
Program budget cost of acquisition (e.g., $/kWh)	• 2017 program budget • 2017 total gross energy savings for each peer program	B4, B6
Total resource cost test (TRC) values	• TRC values	B7

Table 9: Mapping of interview questions to contextual themes

Contextual themes	Data Needed	Interview Question
Program context	• Circumstances that impact program plans (regulation, retail channels, demographics)	Background research
Program description	• Overall program objectives, implementation strategies, customer types targeted for participation • Program staffing, the length of time of program operation, any recent changes that have been made to the program, and future outlook.	A1, A2, A4, C1
Measure types and incentives	• List of measures and their efficiency levels, incentive levels, and (if available) incremental costs	A3
Customer participation levels	• Number of incentive applications submitted in 2017	B1
Net-to-gross (NTG) savings approach	• NTG approach, ratio applied, and calculation details.	B3
Customer engagement practices	• Methods used to engage customers	C1
Trade partner engagement practices	• Methods to engage trade partners, including contractors and distributors	C2
Perceptions/Awareness	• Customer perceptions and awareness of motors and drives technologies • Contractor perceptions and awareness of motors and drives technologies	C1, C2
Customer Decision-Making and Barriers	• Motivations/barriers behind purchasing motors and drives products • Tools trade partners find most helpful in motivating customers to purchasing motors and drives equipment	C1, C2
Product Experience/Satisfaction	• Customers' and trade partners' experience with and satisfaction with the product • Where opportunities may exist to facilitate greater participation	C1, C2

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 MN Motor and Drive 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 commercial/industrial motor efficiency programs. As part of this study, we are reaching out to leaders of commercial/industrial motor efficiency programs to learn about innovative programs 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. How long has the program been operating?

b. What are the program's overall objectives?

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

d. Is the program considered down or mid-stream or upstream?

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

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

a. What are the steps a customer would go through to participate in your program? [**PROBE:** trade partner involvement, length of application, inspection requirement]

b. What is the regulatory environment in which the program is operated in? For instance do interveners play a role in how the program is able to take credit for projects as well as the types of products that are offered?

c. Does your utility have an incentive mechanism tied to the savings goals achieved by the program offered?

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

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

a. Do you require preapproval for the custom projects?

i. What types of technology fall under the custom portion of the program for motors and drives?

ii. What are the program requirements for prescriptive VFDs and motors?

iii. What if any requirements do you have for new construction VFDs?

iv. What is the length of time for a customer to apply for a rebate, 12 months or 24 months? Is the same time frame applicable to both prescriptive and custom rebates?

v. Do you exclude any facility types from participating in the prescriptive rebate program? For example do you offer rebates for commercial type customers such as retail, education, hospital, office, etc. Or is this program geared only for industrial customers?

vi. Does the program have limited rebate funds subject to the number of participating customers? Has the program ever "shut down" due to lack of rebate dollars available?

b. What specific measures are offered? [**PROBE:** VFDs, motors, PMAC]

a. Do you offer both new and retrofit rebates?

i. Under the VFD product or measure what types of VFD rebates do you offer? For example HVAC, non-HVAC and or water well pump VFDs, etc? If you offer rebates for HVAC and non-HVAC are there requirements for the types of fans or pumps that qualify for a prescriptive rebate?

ii. Do you calculate savings for VFDs differently based on the end use such as refrigeration, data centers, fans, etc?

b. Do you offer prescriptive rebates for integrated motor & drive equipment?

c. Are you developing any new measures or products for pumps in relationship to the Department of Energy's pump efficiency standards that go into effect in 2020?

c. What hp range do you offer rebates for VFDs and motors? Do you offer rebates for the full range of VFD which is typically 1 – 200 hp or motors which is typically 1 – 500 hp.

d. For motors do you have prescriptive rebates restrictions based on;

a. Enclosures ODP, TEFC, explosion, submersible, other?

b. RPMS; 900, 1200, 1800 and 3600?

c. AC motors or DC motors?

d. 60 hertz or 50 hertz?

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

a. What measures have deemed vs. calculated savings?

f. If you are calculating the savings what factors are used to calculate the savings?

g. What are the incentive levels for each measure? (**NOTE:** Ask if there is a sheet they can send over email rather than reading each over phone)

a. Do the rebates changed based on the hp of the VFD or motor?

b. Do you offer rebates for early retirement motor?

h. What are the incremental costs for each measure? (**NOTE:** Ask if there is a sheet they can send over email rather than reading each over phone)

a. What kinds of costs are accepted for or can be included for costs associated with installation of VFDs and motors. For example do you allow installation costs, trip charges, etc?

i. What measures are the most popular / most frequently utilized by customers? What measure(s) make(s) up the highest percentage of your program's energy savings?

a. What portion of the programs savings come from motors versus VFDs?

A4. Do you offer any rebates for permanent magnet alternating current (PMAC) motors?

a. IF NO: Have you ever considered adding rebates for PMAC motors? Why did you decide not to?

b. IF YES: Have you had any projects completed for PMAC motors? What types of customers installed those projects? What made those successful?

a. Do you offer PMAC motors as standalone motor product and not necessarily combined with another technology such as cooling?

b. What is the efficiency range requirement for PMAC motors?

c. How does the efficiency rating for the PMAC motors compare to the NEMA Premium motors regarding what qualifies for a prescriptive rebate?

i. Do you promote the PMAC motor rebates differently than the NEMA Premium motor rebates?

d. What end uses were the rebates for? For example; extruders, HFAC, etc.

A5. Do you offer any midstream or upstream rebates for motors or drives?

e. IF YES: What measures do you offer upstream?

f. Do you offer a trade incentive to the distributors or manufacturers for participating in the upstream program?

g. Do you offer an incentive to the sales teams (if applicable) as part of the upstream program?

i. How long have you been offering those rebates?

ii. Why did you make the change to midstream or upstream rebates? What were the challenges? What has been successful?

h. Do you have any information regarding the increase (if applicable) on the savings the program was able to achieve by going upstream / midstream as compared to downstream?

i. How has the change to midstream or upstream affected the savings you've seen through the program? How has it affected the cost of the program?

i. IF NO: Have you ever considered adding midstream or upstream rebates? Why did you decide against offering midstream or upstream rebates?

A6. Are your motors and drives rebates included in a separate program, or as part of a larger commercial and industrial rebate program?

b. Are motors and drives rebated through any other programs (including holistic or industry-specific programs)? How are the goals set for those programs?

A7. Have there been any recent changes to the program in how it is implemented or the measures that are included?

a. Are you considering adding any new measures or making other changes?

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 projects were completed in 2017?

B2. What were the program's energy savings goals in 2017? (kWh)?

Are there other programs in the portfolio that offer VFDs or motors? If so where the do the savings for VFDs and motors roll up to?

Do you have M&V (measurement & verification) of the prescriptive and custom projects that customers install? Is the M&V program implemented or performed by a third party or internally? What is the outcome for the M&V if an issue or discrepancy is found?

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 the NTG ratio?

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

a. Is the NTG filed with the state in which the program is managed or offered in?

e. Do you use a net benefit ratio of any kind to determine the types of products, rebates or how the program is structured?

B4. How much net and gross energy savings did the program report in 2017 (kWh)?

a. Have your goals and/or achievement changed over the last few years?

i. What market factors have caused the achievement to increase or decrease over the years? Was this caused by a shift into the regulatory environment? Or something else?

b. How do you expect the market will change in the next few years?

B5. What was the total energy efficiency portfolio goal in 2017 (kWh)?

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. What is the promotional budget?

i. Do you ever partner with an external trade association or manufacturer to offer training for customers?

c. What types of promotions do you do in a year for motors & VFDs? Do you promote one technology over another?

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

a. If TRC, what was the TRC in 2017?

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 potential program participants?

a. What has been the most effective?

b. Do you target certain customer types?

c. What motivates customers to participate?

d. What if any efforts or engagement strategies do you have for non-participating customers?

e. IF OFFERS PMAC MOTORS: What are customer impressions of permanent magnetic motors?

f. What are customer perceptions of VFD savings potential? Any skepticism around savings potential?

g. What are customer experiences with the program? What do customers like about it? Where do you see opportunities for greater participation from customers?

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

a. What activities do program staff conduct to engage trade allies? How effective are these activities at motivating trade allies to participate? Approximately how many trade allies are active in the program?

b. Do you have a dedicated utility person who works with the trade?

h. What types of trade outreach do you do in regards to distributors, manufacturors, or electrical contractors?

a. Do you have a trade incentive?

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 supporting trade allies in driving participation in the program? Are there any specific tools that trade allies find effective when selling drives and motors to customers?

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 2017 Xcel Energy efficiency products, the EMI Consulting evaluation team conducted telephone interviews with key staff managing and implementing the Minnesota Motor and Drive 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 Minnesota Motor and Drive Efficiency Product:

- Product Manager / Team Lead
- Four Account Managers
- One BCS Account Manager
- Two Engineers
- One Channel Manager
- Two Sales Representatives

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 MN Motors product. These key takeaways provide a summary of the product context and feedback received during both the kick-off meeting and the subsequent staff interviews.

- The product is a key element of Xcel Energy's portfolio. Achievement from the product has historically been high, but has dropped significantly in the past 10 years. However, the product also provides measures and savings for the holistic products, which has posed some recent challenges for achievement. Understanding this influence on the portfoilio is an important goal of the evaluation.
- Motors and drives equipment is popular among large customers, and the incentives appear to be high enough to influence new projects. Account managers mention that motors and drive equipment is easy to sell to their customers.
- The product is planning for the future, and staff want to understand how other utilities are designing successful motors and drives programs. There is increasing interest in midstream and upstream measures.
- The product influences customers through a variety of channels, including their account managers, information provided by product staff, and trade partners. The evaluation will need to account for all of these channels when looking at free ridership, spillover, and market effects.

1.2 Product Activities, Goals, and Resources

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

Activities

- The Motor and Drive Efficiency Product in Minnesota promotes efficiency upgrades in electric motors and drive systems. The product offers custom and prescriptive rebates in HVAC, non-

HVAC, water pump VFDs, induction and PMAC motors and constant speed motor controllers for commercial and industrial end-users.

- The product's open rebate may be submitted by customers or trade allies.
- The rebate is based on horsepower. Prescriptive rebates for drives vary from $400 for 1 Motor HP to $8,000 for 200 HP. Drives of more than 200 HP require custom rebate evaluation. Prescriptive rebates for motors range from $30 to $13,500, based on HP and whether the motor is new under the Enhanced program or upgrade or early retirement. Motor rebates are available for induction and PMAC motors. The program also offers constant speed motor controllers.
- Xcel Energy pays a trade partner incentive equal to 5% of the customer's rebate for HVAC, non-HVAC and water well pump VFDs to trade partners that help complete the application form, with a maximum $5,000 per project. Most participating distributor trade partners are larger companies.
- The product allows customers a 24 months to submit thier rebate application – many customers buy equipment, and store it so they can replace it upon failure. . This is a key element of the product, as customers need to replace equipment immediately when it fails.
- Xcel Energy account managers engage participation from managed account customers, with support from the sales support team. The BSC engages participation from non-managed customers. Managed customers tend to be larger customers, that participate much more frequently than non-managed customers.
- Xcel Energy promotes this product on its website, promotional activities, trade publications, trainings, TV and radio advertising. The program is also a sponsor of the Consortium for Energy Efficiency's Motors Decisions Matter (MDM) initiative., Trade partners, product management and Xcel Energy managed and non-managed account managers provide direct outreach to customers and trade partners considering changes in motor and drives systems.

Goals

- The Motor and Drive Efficiency Product has historically been at or near the top in Xcel Energy's commercial portfolio for energy savings achievement. Staff acknowledged a potential for improvement in pushing motors equipment, but mainly want to maintain the product's success.
- The product's primary goal is based on energy savings achievement (kWh and kW).
- Account managers have kWh targets; however, those targets are not broken out by product.
- The product has not met its goals in 2016 and 2017. Achievement has dropped significantly (from 40 to 18 GWh) in the last 10 years. Staff explain that this is due in large part to the product losing measures to other programs, such as the transfer of furnace ECMs to the heating product. In addition, holistic products (such as the turnkey, CE, PE and EEB products) use the motors and drives measures and the savings for these measures are attributed to the holistic products. The popularity of the holistic products has meant that the Motor and Drive Efficiency Product has had lower achievement, as the achievement for Motor and Drive Efficiency does not encompass all of the portfolio savings attributable to motors and drives measures.
- Cost-effectiveness is becoming a more relevant goal marker. As a company, Xcel Energy is beginning to place a larger weight on net benefits from measures than in previous years.

1.3 Product Strengths and Challenges

During interviews, staff identified the following strengths and barriers to implementing this product in 2017. 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 members identified the Motor and Drive Efficiency Product as a top performer compared to other Xcel offerings. The equipment is ubiquitous in the commercial and industrial world, which allows the product to cover a large share of the market. Account managers noted that it is some of the easiest equipment to sell to their customers.
- The product has aided the growth of other products in the portfolio that utilize motors and drives measures.
- The channel manager reported strong participation among trade partners. They have seen trade partners' sales increase due to participating in the product, as well as change their stocking to include more if not only energy efficiency equipment. The channel managers do not believe that trade partners would sell as much energy efficient equipment if the rebates did not exist.
- Account managers, channel managers, engineers, and the sales teams highlighted the versatility of the rebate criteria, which makes the product easier to sell.
- Customers can claim savings from any qualifying purchase from 24 months from the date of invoice. Customers can apply again for replacement equipment, even if they already received a rebate for the original motor or drive. This allows customers to stock up on efficient equipment before it breaks.
- The last evaluation of the product, conducted in 2011, found that participant and vendor satisfaction were high, and awareness among non-participants was good. It also found that impact estimates were generally on target.

Challenges

- Holistic efficiency products bundle measures that would otherwise be processed by the Motor and Drive Efficiency Product. The intent of Process Efficiency and Custom Efficiency (two of the holistic products) is to create relationships with customers who have a long-term commitment to sophisticated energy efficiency. The holistic products offer bonus incentives that outcompete the Motor and Drive Efficiency Product.
- Staff reported that non-managed customers don't know the equipment or rebate procedures very well.
- Many customers do not know that equipment qualifies after 24 months of purchase or upon replacement of a rebated equipment. In these circumstances, motors and drives are potentially being sold but the paperwork is not being turned in, and thus Xcel Energy may be missing savings for units sold in Xcel territory. However, the evaluation team notes that expanding to these customers would most likely increase free ridership, as they are already completing projects without an incentive.
- Some staff mentioned concern around the ease of completing the application, especially for multi-part applications and well pumps. Some account managers reported losing opportunities because the burden of paperwork.
- Some account managers worry that the efficiency levels for motor rebates are too high and thus disqualify some new motors on the market, as well as low cost drives. However, the evaluation team notes that the efficiency levels must pass national standards, which increased in 2012.
- Sales staff noted that market prices are dropping, which may call for reconsideration of rebate amounts.
- Although some distributors and retailers are very active with the product, this activity is concentrated within a small number of firms. Understanding why some distributors do not participate more may be helpful in expanding product reach.

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 2017 MN Motor and Drive Efficiency Product.

- Getting to the right contact is key. Xcel Energy will work with EMI Consulting to confirm that we have the correct contact information for each project.
- The survey was too long in 2011, and set incorrect expectations. The previous evaluators told customers that the survey would take 20 minutes, but when it extended past that time, customers were frustrated because they did not have the time to complete it.
- Staff are interested in understanding how peer utilities handle customers that purchase equipment but do not install until equipment fails, as well as how other utilities run upstream or midstream VFD (or motors) products.
- Staff are interested in understanding how integrated VFDs and motor equipment is rebated prescriptively.
- From customers, staff are interested in understanding whether the application is a barrier, and the magnitude of that barrier. In addition, staff would like to understand how much customers and trade partners understand the application and product rules.
- Because the product provides measures for many holistic products, staff are interested in understanding the influence of Motor and Drive Efficiency on the C&I portfolio more generally. This would include understanding the outreach with trade partners the product does that benefits other products.
- Lastly, staff would like to understand how the product can maximize influence on the marketplace.

APPENDIX D: PARTICIPATING CUSTOMER SURVEY RESULTS

This appendix presents results from the participating customer survey.

Section A: Firmographics, Operations, and Participation

Gen 4: What is your occupational title within your company?

	Frequency	Percent	Valid Percent
Other	18	25.4	25.4
Other facilities management / maintenance position	16	22.5	22.5
Other manager / assistant manager	13	18.3	18.3
Facilities Manager	12	16.9	16.9
Proprietor / Owner	6	8.5	8.5
Vice President / Director / Assistant Director / Department Head	4	5.6	5.6
Energy Manager	1	1.4	1.4
President / CEO	1	1.4	1.4
Total	71	100	100

A3: Has your organization previously participated in this or any other Xcel Energy energy efficiency program for your business?

	Frequency	Percent	Valid Percent
Yes	51	71.8	81.0
No	12	16.9	19.0
DK	8	11.3	NA
Total	71	100	100

A4: Did a contractor install the equipment you had rebated as part of the Xcel Energy Motor Efficiency program, or did you complete the work with in-house staff?

	Frequency	Percent	Valid Percent
Used a contractor	59	83.1	84.3
Installed equipment with in-house staff	11	15.5	15.7
DK	1	1.4	NA
Total	71	100	100

Section B: Awareness

B1a: Next, I'd like to understand a little more about how you became aware of <MEASURE_DESCRIPTION>. Were you aware of this technology as an energy saving measure prior to your decision to participate in this program?

	Frequency	Percent	Valid Percent
Yes	62	87.3	87.3
No	9	12.7	12.7
Total	71	100	100

B1b: How did you [SHOW IF B1A=1: first] become aware of the potential to use <MEASURE_DESCRIPTION> to save energy at your facility?

	Frequency	Percent	Valid Percent
Xcel Energy staff	16	22.5	24.6
Personal research or education	12	16.9	18.5
Previous experience	12	16.9	18.5
Contractor from the project	8	11.3	12.3
Previous participation	8	11.3	12.3
Other contractor or vendor	5	7.0	7.7
Vendor who sold equipment	2	2.8	3.1
Internal staff	2	2.8	3.1
Don't know	6	8.5	NA
Total	71	100	100

B2. And how did you first become aware of Xcel Energy's rebates for Motors and Drives equipment?

	Frequency	Percent	Percent of Cases
Xcel Energy account manager	22	27.5	27.5
Contractor	19	23.8	23.8
Distributor or vendor	7	8.8	8.8
Xcel Energy staff	6	7.5	7.5
Xcel Energy website / mass media	6	7.5	7.5
Another business / word of mouth	6	7.5	7.5
Someone at my business	6	7.5	7.5
Xcel Energy event or expo	2	2.5	2.5
Online (not Xcel Energy)	2	2.5	2.5
Through industry association	2	2.5	2.5
Xcel Energy marketing	1	1.3	1.3
Xcel Energy email	1	1.3	1.3
Total	80	100	119

Section D: Free-ridership

D0: In your own words, how would you describe the influence that the Xcel Energy <PROGRAM> had on your decision to purchase/install this <MEASURE_Description>?

"Xcel Energy provides a great opportunity to save money for businesses."
"We would have done it anyway."
"Very positive influence to go ahead with purchase."
"Very influential."
"It's really a benefit to what we're doing here. The rebate was an added benefit."
"It pushed is to participate."
"It greatly influenced our decision."
"I think it helped and was critical. The funding allowed it to happen."
"Contractor made the recommondation to save us money. So that was the influence it had, to help us buy the specific product."
"A big part of the reason why we chose to do it."
"The program was the deciding factor."
"Very influential."
"It worked out well. Good system."
"It pushed our company to go more energy efficient for the dollars we were spending."
"We probably would not have done all 4 at once but because of the rebate we were able to do all four at once."
"It provided more access to the equipment with the help of the rebate program. It was less likely for us to do it if that program was not available."
"It helped me get it done faster for management. Management saw the ROI through the rebate."
"Probably made us do it sooner."
"The program had a great influence."
"None"
"It's always helpful when you feel like you are going to get money back, so I feel it was very helpful in the decision."
"The greatest was cost savings and efficiency."
"It had a lot to do with it."
"A lot of the communication from Xcel helped make the decision faster."
"It was a major part of the decision."
"Very influential"
"The rebate brings down the payback."
"The incentive program is very helpful to pay down ROI quickly, so it happened a little sooner, but we still would've done it anyway."
"Getting a rebate was a benefit, but not a decision maker."
"We would've done it anyways but knew about rebates which is why we participated."
"To be honest, it didn't have a lot of influence because the equipment needed to be changed. Rebate was like icing on the cake."
"None"
"More about hearing it from contractor"
"It was basically a bonus. We were going to install it anyways, but the rebate was a huge factor."
"I think it's all about timing and when we need to replace things."
"Cost calculations and ROI are what influenced our decision."
"It did help having the information. We were able to complete the project faster."
"None"
"The rebate helped pay for it."
"None"
"It had nothing to do with it, but was an added feature or bonus."
"Extra incentives."
"The rebates helped defer the cost and made it a much more viable choice."
"It was highly influential"
"Had great influence."

"Don't know"
"I think it was a good incentive."
"The motors we had were old and using the program was a good way to start budgeting and changing them before they were no longer usable."
"The plan had a positive impact on our decision to go forward with it faster than we would have."
"Highly likely"
"It helped"
"Don't know"
"The subsidy/rebate helped making the decision of upgrading the equipment easier."
"The rebate was helpful in making the decision"
"Had a big influence still because of the rebate and our budget."
"Helped with knowledge of a time frame but did not directly influence purchase."
"It helped with our budget and made it more cost efficient."

D1: Making decisions can sometimes be relatively simple, involving one major factor, like price. Or, they can be relatively complex involving multiple factors such as price, information provided by your contractor or utility, and concerns about high electricity bills.

As part of this project, Xcel Energy provided you with:

- An incentive of [INSERT <DOLLAR_AMOUNT>]
- Information through marketing or informational and educational materials about the benefits of installing <MEASURE_Description>
- An endorsement or recommendation by your Xcel Energy account representative or other Xcel Energy staff
- Engineering or other technical assistance provided by Xcel Energy or by a third party that was funded through Xcel Energy, and
- **[SHOW IF A4=1:** Recommendations or information provided from a program-affiliated contractor or vendor]

In addition, you may have received support from prior participation in an Xcel Energy program.

There might be other things, not related to the program that might also have influenced your decision to install <MEASURE_Description> For example, maybe

- High electric bills,
- Company policies,
- Your own experiences with energy efficient equipment, or
- Your own research on energy efficiency equipment.

There are of course many other possible reasons.

Next, I'm going to ask a few questions about your decision to install <MEASURE_Description>. Please rate the importance of each of the following factors on your decision to install <MEASURE_Description> using a scale from 0 to 10, where 0 means "not at all important" and 10 means "extremely important". The bigger the number, the greater the influence. If you don't know, just say "I don't know". Now, how important was…

D1a. A contractor recommendation

	Frequency	Percent	Valid Percent

0 - Not at all important	9	12.7	14.3
1	2	2.8	3.2
2	4	5.6	6.3
3	5	7.0	7.9
4	3	4.2	4.8
5	1	1.4	1.6
6	2	2.8	3.2
7	7	9.9	11.1
8	17	23.9	27.0
9	5	7.0	7.9
10 - Extremely important	8	11.3	12.7
Not applicable	7	9.9	NA
Don't know	1	1.4	NA
Total	71	100	100

D1b. Dollar amount of rebate

	Frequency	Percent	Valid Percent
0 - Not at all important	2	2.8	2.9
1	0	0.0	0.0
2	3	4.2	4.4
3	0	0.0	0.0
4	7	9.9	10.3
5	4	5.6	5.9
6	6	8.5	8.8
7	9	12.7	13.2
8	5	7.0	7.4
9	7	9.9	10.3
10 - Extremely important	25	35.2	36.8
Don't know	3	4.2	NA
Total	71	100	100

D1c. Endorsement / recommendation by Xcel Energy account manager / Xcel staff

	Frequency	Percent	Valid Percent
0 - Not at all important	5	7.0	7.9
1	1	1.4	1.6
2	3	3.2	4.8
3	0	0.0	0.0
4	4	5.6	6.3
5	4	5.6	6.3
6	4	5.6	6.3
7	8	11.3	12.7
8	18	25.4	28.6
9	6	8.5	9.5
10 - Extremely important	10	14.1	15.9
Not applicable	6	8.5	NA
Don't know	2	2.8	NA
Total	71	100	100

D1d. Information from Xcel Energy marketing or informational materials

	Frequency	Percent	Valid Percent
0 - Not at all important	7	9.9	10.3
1	0	0.0	0.0
2	4	5.6	5.9
3	5	7.0	7.4
4	1	40.0	1.5
5	11	15.5	16.2
6	9	12.7	13.2
7	9	12.7	13.2
8	13	18.3	19.1
9	3	4.2	44.0
10 - Extremely important	6	8.5	8.8
Not applicable	2	2.8	NA
Don't know	1	1.4	NA
Total	71	100	100

D1e. Previous participation in an Xcel Energy program

	Frequency	Percent	Valid Percent
0 - Not at all important	4	5.6	6.8
1	0	0.0	0.0
2	3	4.2	5.1
3	1	1.4	1.7
4	1	1.4	1.7
5	1	1.4	1.7
6	2	2.8	3.4
7	11	15.5	18.6
8	11	15.5	18.6
9	7	9.9	11.9
10 - Extremely important	18	25.4	30.5
Not applicable	9	12.7	NA
Don't know	3	4.2	NA
Total	71	100	100

D1x. Information received from any training or events conducted by Xcel Energy

	Frequency	Percent	Valid Percent
0 - Not at all important	13	18.3	21.7
1	0	0.0	0.0
2	6	8.5	10.0
3	4	5.6	67.0
4	1	1.4	1.7
5	4	5.6	6.7
6	3	4.2	5.0
7	8	11.3	13.3
8	9	12.7	15.0
9	3	4.2	5.0
10 - Extremely important	9	12.7	15.0
Not applicable	9	12.7	NA
Don't know	2	2.8	NA
Total	71	100	100

D1f. Previous experience with this type of equipment

	Frequency	Percent	Valid Percent
0 - Not at all important	2	2.8	3.3
1	1	1.4	1.7
2	1	1.4	1.7
3	0	0.0	0.0
4	2	2.8	3.3
5	4	5.6	6.7
6	2	2.8	3.3
7	4	5.6	6.7
8	14	19.7	23.3
9	11	15.5	18.3
10 - Extremely important	19	26.8	31.7
Not applicable	6	8.5	NA
Don't know	5	7.0	NA
Total	71	100	100

D1g. Age or condition of the old equipment

	Frequency	Percent	Valid Percent
0 - Not at all important	7	9.9%	10.4%
1	0	0.0%	0.0%
2	1	1.4%	1.5%
3	0	0.0%	0.0%
4	2	2.8%	3.0%
5	2	2.8%	3.0%
6	3	4.2%	4.5%
7	8	11.3%	11.9%
8	15	21.1%	22.4%
9	12	16.9%	17.9%
10 - Extremely important	17	23.9%	25.4%
Not applicable	3	4.2%	NA
Don't know	1	1.4%	NA
Total	71	100	100

D1h. Simple payback period / amount of time until equipment has paid for itself

	Frequency	Percent	Valid Percent
0 - Not at all important	1	1.4%	1.4%
1	1	1.4%	1.4%
2	0	0.0%	0.0%
3	0	0.0%	0.0%
4	6	8.5%	8.7%
5	7	9.9%	10.1%
6	5	7.0%	7.2%
7	8	11.3%	11.6%
8	12	16.9%	17.4%
9	10	14.1%	14.5%
10 - Extremely important	19	26.8%	27.5%
Don't know	2	2.8%	NA
Total	71	100	100

D1i. Corporate policy or guidelines

	Frequency	Percent	Valid Percent
0 - Not at all important	12	16.9%	20.0%
1	1	1.4%	1.7%
2	6	8.5%	10.0%
3	0	0.0%	0.0%
4	2	2.8%	3.3%
5	7	9.9%	11.7%
6	4	5.6%	6.7%
7	5	7.0%	8.3%
8	10	14.1%	16.7%
9	5	7.0%	8.3%
10 - Extremely important	8	11.3%	13.3%
Not Applicable	8	11.3%	NA
Don't know	3	4.2	NA
Total	71	100	100

D1j. Minimizing operating costs

	Frequency	Percent	Valid Percent
0 - Not at all important	1	1.4%	1.5%
1	0	0.0%	0.0%
2	0	0.0%	0.0%
3	2	2.8%	2.9%
4	0	0.0%	0.0%
5	0	0.0%	0.0%
6	2	2.8%	2.9%
7	8	11.3%	11.8%
8	16	22.5%	23.5%
9	13	18.3%	19.1%
10 - Extremely important	26	36.6%	38.2%
Not Applicable	1	1.4%	NA
Don't know	2	2.8%	NA
Total	71	100	100

D1k. Predetermined timeline or schedule for replacing equipment

	Frequency	Percent	Valid Percent
0 - Not at all important	6	8.5%	9.5%
1	0	0.0%	0.0%
2	6	8.5%	9.5%
3	5	7.0%	7.9%
4	1	1.4%	1.6%
5	6	8.5%	9.5%
6	5	7.0%	7.9%
7	9	12.7%	14.0%
8	14	19.7%	22.2%
9	7	9.9%	11.1%
10 - Extremely important	4	5.6%	6.3%
Not Applicable	5	7.0%	NA
Don't know	3	4.2%	NA
Total	71	100	100

D1l. Total amount of money saved over lifetime of the equipment / ROI

	Frequency	Percent	Valid Percent
0 - Not at all important	1	1.4%	1.5%
1	1	1.4%	1.5%
2	0	0.0%	0.0%
3	0	0.0%	0.0%
4	1	1.4%	1.5%
5	4	5.6%	6.1%
6	2	2.8%	3.0%
7	6	8.5%	9.1%
8	13	18.3%	19.7%
9	15	21.1%	22.7%
10 - Extremely important	23	32.4%	34.8%
Not Applicable	1	1.4%	NA
Don't know	4	5.6%	NA
Total	71	100	100

D1m. Were there any other factors that were important in your decision to participate in the program?

	Frequency	Percent	Valid Percent
Yes	18	25.4%	25.7%
No	52	73.2%	74.3%
DK	1	1.4%	NA
Total	71	100.0%	100.0%

D5a. If the incentive, info, and support from the Xcel Energy program wasn't available, would you have installed the exact same number, type, model and efficiency of ....?

	Frequency	Percent	Valid Percent
Yes	32	45.1%	45.7%
Maybe / not sure (Don't know)	19	26.8%	27.1%
No	18	25.4%	25.7%
Would not have installed ... at all	1	1.4%	1.4%
Refused	1	1.4%	NA
Total	71	100.0%	100.0%

D5b. Rate the likelihood you would have installed the exact same number, type, model and efficiency of ... If the program wasn't available

	Frequency	Percent	Valid Percent
0	18	0%	28%
1	0	0%	0%
2	0	0%	0%
3	3	4%	5%
4	1	1%	2%
5	7	10%	11%
6	1	40%	2%
7	2	3%	3%
8	9	13%	14%
9	8	11%	13%
10	15	1%	23%
DK	6	8.5%	NA
System Missing	19	26.8%	NA
Total	71	100.0%	100.0%

D6c. In the absence of the program, when you would have you installed the same number, type, model, and efficiency of the equipment you installed through the program?

	Frequency	Percent	Valid Percent
Within one year of installation	24	33.8%	51.1%
Between 1 and 2 years later	7	9.9%	14.9%
Between 2 years and 3 years later	5	7.0%	10.6%
Between 3 years and 4 years later	2	2.8%	4.3%
Greater than 4 years later	8	11.3%	17.0%
Or you would not installed the exact same equipment	1	1.4%	2.1%
Don't know	5	7.0%	NA
System	19	26.8%	NA
Total	71	100.0%	100.0%

D6d. Likelihood you would have installed the exact same number, type, model, ad efficiency of the equipment you installed through the program within 12 months of when you installed it if the program wasn't available

	Frequency	Percent	Valid Percent
0 - Not at all likely	7	9.9%	15.2%
1	1	1.4%	2.2%
2	2	2.8%	4.3%
3	3	4.2%	6.5%
4	1	40.0%	2.2%
5	4	5.6%	8.7%
6	2	2.8%	4.3%
7	7	9.9%	15.2%
8	1	1.4%	22.0%
9	2	2.8%	4.3%
10 - Extremely likely	16	22.5%	34.8%
DK	6	8.5%	NA
System Missing	19	26.8%	NA
Total	71	100.0%	100.0%

Section S: Spillover

S1. Since your participation in the <PROGRAM> in <MONTH> <YEAR>, has your company installed any efficient Motors or Drives products at this facility without a rebate from Xcel Energy? When I say "efficient Motors and Drives products", I mean equipment that is eligible for an Xcel Energy discount.

	Frequency	Percent	Valid Percent
Yes	16	22.5%	25.8%
No	46	64.8%	74.2%
DK	9	12.7%	NA
Total	71	100.0%	100.0%

S1a. Why didn't you apply for an Xcel Energy rebate?

"Another 50 HP"
"Applied and denied"
"Didn't realize there was a one year time to apply for the rebate."
"Don't know"
"Don't think it was available"
"Haven't gotten around to it yet."
"Haven't started yet."
"I'm not aware of what is covered by Xcel rebate."
"Many questions to apply for the rebate and it is an inconvenience and hard to answer those questions."
"Not sure if we got a rebate for a vacuum pump."
"The guys who installed it did not let us know about any potential rebates."
"There was not one available"
"They were not eligible for rebates"
"Usually what the representative does is come out and confirm that we have the equipement and then he files the paperwork. The last time he came out it was cold and rainy, so he couldn't get on the roof to look at the unit. However, we are still scheduled to have a representative come out to look at the equipment."
"We did apply, but a rebate was not available."

"We haven't gotten that far yet."

S2. Did your experience with the efficient products you installed through the program influence your decision to install some / all of the additional efficient equipment on your own?

	Frequency	Percent	Valid Percent
Yes	7	9.9%	46.7%
No	8	1.3%	53.3%
DK	1	1.4%	NA
System Missing	55	77.5%	NA
Total	71	100.0%	100.0%

S3. What type of Motors or Drives equipment did you install? For example, was it…

	Frequency	Percent	Percent of Cases
Efficient motors	4	44.4%	57.1%
Permanent magnet alternating current (P-MAC) motors	1	11.1%	14.3%
VFDs	3	33.3%	42.9%
Other ("Baller Style")	1	11.1%	14.3%
Total	9	100.0%	128.6%

S4a. Approximately how many of each type did you install?

	Number Installed
Efficient motors	3
Efficient motors	8
Efficient motors	NA
P-MAC Motors	NA
VFDs	1
VFDs	8
VFDs	9
Other ("Baller Style")	40

S4b. What was the horsepower of the…?

Efficient motors:

	Frequency	Percent	Valid Percent
0.5	1	1.4%	25.0%
15-2	1	1.4%	25.0%
20	1	1.4%	25.0%
30-50	1	1.4%	25.0%
Total	4	5.6%	100.0%

PMAC motors:

	Frequency	Percent	Valid Percent
30-50	1	1.4%	100.0%
Total	1	1.4%	100.0%

VFDs:

	Frequency	Percent	Valid Percent
30	1	1.4%	33.3%
30-50	1	1.4%	33.3%
DK	1	1.4%	33.3%
Total	3	4.2%	100.0%

Other:

	Frequency	Percent	Valid Percent
DK	1	1.4%	100.0%
Total	1	1.4%	100.0%

S5. How important was your experience in the program, including the equipment you installed through the program, in your decision to install additional equipment?

	Frequency	Percent	Valid Percent
0 - Not at all important	0	0.0%	0.0%
1	0	0.0%	0.0%
2	0	0.0%	0.0%
3	0	0.0%	0.0%
4	0	0.0%	0.0%
5	1	1.4%	14.3%
6	0	0.0%	0.0%
7	2	2.8%	28.6%
8	0	0.0%	0.0%
9	1	1.4%	14.3%
10 - Extremely important	3	4.2%	42.9%
System Missing	64	90.1%	NA
Total	71	100.0%	100.0%

S6. If you had not participated in the program, how likely is it that your organization would have installed these additional efficient motors / drives products?

	Frequency	Percent	Valid Percent
0 - Not at all important	0	0.0%	0.0%
1	1	1.4%	14.3%
2	0	0.0%	0.0%
3	2	2.8%	28.6%
4	0	0.0%	0.0%
5	1	1.4%	14.3%
6	0	0.0%	0.0%
7	0	0.0%	0.0%
8	1	1.4%	14.3%
9	1	1.4%	14.3%
10 - Extremely important	1	1.4%	14.3%
System Missing	64	90.1%	NA
Total	71	100.0%	100.0%

E1. I am going to ask you to rate how easy or difficult the following tasks associated with the <PROGRAM> were to complete, using a scale from 1 to 5, where 1 is "very difficult" and 5 is "very easy". You may also tell me if something was not applicable to your experience. How would you rate the ease of…

E1a. Completing program applications or rebate forms

	Frequency	Percent	Valid Percent
1 - Very difficult	1	1.4%	1.6%
2	3	4.2%	4.8%
3	8	11.3%	12.7%
4	23	32.4%	36.5%
5 - Very easy	28	39.4%	44.4%
NA	8	11.3%	NA
Total	71	100.0%	100.0%

E1b. Meeting program deadlines

	Frequency	Percent	Valid Percent
1 - Very difficult	0	0.0%	0.0%
2	2	2.8%	3.1%
3	6	3.5%	9.4%
4	23	32.4%	35.9%
5 - Very easy	33	46.5%	51.6%
NA	4	5.6%	DK
DK	3	4.2%	DK
Total	71	100.0%	100.0%

E1c. Getting in touch with an Xcel Energy representative

	Frequency	Percent	Valid Percent
1 - Very difficult	0	0.0%	0.0%
2	1	1.4%	1.6%
3	4	5.6%	6.5%
4	14	19.7%	22.6%
5 - Very easy	43	60.6%	69.4%
NA	7	9.9%	DK
DK	2	2.8%	DK
Total	71	100.0%	100.0%

E1d. Determining equipment / models that are eligible

	Frequency	Percent	Valid Percent
1 - Very difficult	0	0.0%	0.0%
2	1	1.4%	1.6%
3	11	15.5%	18.0%
4	21	29.6%	34.4%
5 - Very easy	28	39.4%	45.9%
NA	8	11.3%	NA
DK	2	2.8%	NA
Total	71	100.0%	100.0%

E1e. <SHOW IF A4=1> Finding a contractor to complete the work

	Frequency	Percent	Valid Percent
1 - Very difficult	0	0.0%	0.0%
2	2	2.8%	3.8%
3	3	4.2%	5.7%
4	10	14.1%	18.9%
5 - Very easy	38	53.5%	71.7%
NA	5	7.0%	NA
DK	1	1.4%	NA
System Missing	12	16.9%	NA
Total	71	100.0%	100.0%

E3. Would you have liked more contact, less contact, or about the same amount of contact from Xcel Energy during your Motor and Drive Efficiency project?

	Frequency	Percent	Valid Percent
More	4	5.6%	5.9%
About the same	64	90.1%	94.1%
DK	3	4.2%	NA
Total	71	100.0%	100.0%

E4. What would you have liked Xcel Energy to contact you about more?

"About opportunities and what they offer."

"Future projects"
"Information on what the rebates consist of. It was confusing."
"What rebates are available and how to expedite the process."

E5. From the time work started to the time you received your rebate, did the project take less or more time than you expected to complete? Please answer using a scale from 1 to 5, where 1 means the project took "much less time than expected" and 5 means it took "much more time than expected".

	Frequency	Percent	Valid Percent
1 - Much less time than expected	9	12.7%	13.6%
2	6	22.5%	24.2%
3	31	43.7%	47.0%
4	7	9.9%	10.6%
5 - Much more time than expected	3	4.2%	4.5%
Haven't completed the project or received rebate	1	1.4%	NA
DK	4	5.6%	NA
Total	71	100.0%	100.0%

Section F: Satisfaction

F1. Thank you for your patience; we have only a few questions left. I'm going to ask you to rate your satisfaction with various aspects of the program. For each, please rate your satisfaction on a scale from 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied", or let me know if it is not applicable to your project. How would you rate your satisfaction with:

F1a. The equipment installed

	Frequency	Percent	Valid Percent
1 - Not at all	0	0.0%	0.0%
2	0	0.0%	0.0%
3	2	2.8%	2.9%
4	20	28.2%	29.4%
5 - Very	46	64.8%	67.6%
NA	2	2.8%	NA
DK	1	1.4%	NA
Total	71	100.0%	100.0%

F1b. <ASK IF A4=1> The contractor who performed the work

	Frequency	Percent	Valid Percent
1 - Not at all	0	0.0%	0.0%
2	2	2.8%	3.5%
3	1	1.4%	1.8%
4	11	15.5%	19.3%
5 - Very	43	60.6%	75.4%
NA	1	1.4%	NA
DK	1	1.4%	NA
System Missing	12	16.9%	NA
Total	71	100.0%	100.0%

F1c. The amount of time it took to receive your rebate

	Frequency	Percent	Valid Percent
1 - Not at all	0	0.0%	0.0%
2	2	3.3%	3.3%
3	10	16.4%	16.4%
4	23	37.7%	37.7%
5 - Very	26	42.6%	42.6%
Total	61	100.0%	100.0%

F1d. The dollar amount of the rebate

	Frequency	Percent	Valid Percent
1 - Not at all	0	0.0%	0.0%
2	2	2.8%	3.2%
3	10	14.1%	16.1%
4	23	32.4%	37.1%
5 - Very	27	38.0%	43.5%
NA	3	4.2%	NA
DK	6	8.5%	NA
Total	71	100.0%	100.0%

F1e. Your interactions with program staff

	Frequency	Percent	Valid Percent
1 - Not at all	0	0.0%	0.0%
2	0	0.0%	0.0%
3	3	4.2%	4.6%
4	17	23.9%	26.2%
5 - Very	45	63.4%	69.2%
NA	6	8.5%	NA
Total	71	100.0%	100.0%

F3. Thinking about your experience from start to finish, how would you rate your satisfaction with the <PROGRAM> as a whole? (IF NEEDED: Please use the same scale from 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied")

	Frequency	Percent	Valid Percent
1 - Not at all	0	0.0%	0.0%
2	0	0.0%	0.0%
3	1	1.4%	1.4%
4	31	43.7%	44.3%
5 - Very	3	53.5%	54.3%
NA	1	1.4%	NA
Total	71	100.0%	100.0%

[ASK IF F3 <3]
F3a. Why weren't you satisfied with your experience with the <PROGRAM>?

(No responses)

F4. What did you like most about your experience with the program?

"Glad the program was available."
"That it exists."
"That it is available."
"That it was available."
"They offer theses kinds of programs."
"Ugrading our equipment and the efficiency."
"Ease of applying for a rebate."
"Ease of doing it and information were easy to get."
"Ease of doing paperwork and finding a contractor."
"Ease of getting in touch with the representative."
"Ease of the program and being able to show payback to get project rolling."
"Easy to use."
"How easy it was to work with Xcel staff."
"It is easy to navigate the paperwork."
"It was a very easy process. Applications were easy and quick--nothing was difficult."
"It was easy and staff was helpful. Rebates went smoothly."
"It was easy to work with. Easy to get the rebate and not a lot of red tape."
"It was easy."
"It was very easy to do."
"It was very easy to fill out the forms and to work with a contractor. Everything worked smoothly."
"It's a pretty easy program."
"It's easy to use."
"It's very simple."
"Money and ease of applying. Very straight forward."
"The accessibility and ease of the forms."
"The ease of it."
"The ease of working with the Xcel representative helping with the application."
"The organization and being told all the information and the ease of communication."
"The program is pretty simple to take advantage of."
"The rebate was easy to get, forms were good."
"How much money the company saved."

"Best part was getting the rebates."
"It gave us more incentive to upgrade the drives."
"Money."
"Rebate, assistance by account representative for Xcel."
"Reduced our costs to put in a more efficient motor."
"The fact that it's available and provides rebate."
"The fact that we saved some money and got money off of the motor."
"The oppurtunity of getting a good rebate."
"The rebate and energy savings."
"The rebate and information to help understand the importance of efficiency."
"The rebate and the people we dealt with."
"The rebate and upgraded equipment."
"The rebate check amount."
"The rebate covered the cost of VFD."
"The rebate incentive."
"The rebate was 60% of the cost so good program. The Xcel Program representative was fantastic."
"The rebate."
"The rebates and how easy it is."
"It saves energy and cost sharing through a rebate."
"Saving energy."
"The oppurutnity it gave us to save energy."
"Saving money."
"Savings. I actually designed some these machines at the company I worked at before. Much less usage."
"That it saved energy and money in the end."
"The reduction of the costs."
"The savings on the electric bill, and also the life extention of the motors and not having to service them as often."
"Contact with representatives, information and support provided."
"It goes back to our Xcel representative. He stays in contact and knows what kind of things we're looking for and helps us with filling out the forms."
"My representative maintains regular contact regarding rebates and what we need."
"Our representative was very helpful."
"The information and contact from Xcel staff."
"The interaction with the Xcel representative."
"The knowledge of the Xcel representatives."
"Don't know"
"It's an essential part of controls."
"Not applicable"
"On the motor side and for VFD, they could put unknown on the application which makes the application easier."

F5. What recommendations do you have for improving the <PROGRAM>?

"A little better explanation on forms."
"Clarification of what's available for rebates."
"Don't know"
"Get it more out there so people don't forget to apply for the rebate; Should be more transparent."
"Get rebates out faster and clarify what is rebated."
"Give more money; but we were still happy with the rebate amount"
"Give more."
"I could always use more incentives. Incentivize contractors more to make it more efficient for the companies because the contractors will sell it more."

"I would look into AC drives with a very nice vector. Today's controllers are extremely efficient."
"I'd recommend one on one meetings with a representative from Xcel to go over the program requirements and to verify the requirements."
"Keep curent rate of rebates the same."
"Let people know about it."
"Make the paperwork simpler or streamlined."
"Maybe sending out more information about what rebates are available to companies."
"More coordination with communication."
"More rebate incentive."
"More seminars and more knowledge"
"No recommendations"
"Online application."
"Optimize the control aspect."
"Our company installs a lot of ECM and there isn't any information available on whether we can receive rebates for those."
"Rebates should come sooner."
"Simplify the information."
"The application process was lengthy. It should be easier."
"The bigger the rebate the better, expand to other products and advertise everything that is rebatable."
"The rebate should be 70 - 80 % of the the price. Larger rebates!"

F6. Using the same scale from 1 to 5, where 1 is "very dissatisfied" and 5 is "very satisfied", how would you rate Xcel Energy as an energy provider?

	Frequency	Percent	Valid Percent
1 - Not at all	0	0.0%	0%
2	1	1.4%	1%
3	3	4.2%	4%
4	34	47.9%	49%
5 - Very	31	43.7%	45%
NA	1	1.4%	NA
DK	1	1.4%	NA
Total	71	100.0%	100.0%

APPENDIX E: TRADE PARTNER INTERVIEW RESULTS

1.5 Key Themes and Results

Trade Partner Awareness

Email was the main method for trade partners to hear about updates for the motors and drives rebates. Thirteen of the fourteen trade partners asked about sources of awareness said that the way they were currently hearing about the product was preferred. Four listed additional sources of awareness – beyond their current method – that they would prefer.

Current Sources of Awareness and Additional Sources that Would be Useful

	Current Source	Additional Source
Email	9	2
Xcel Energy Representative	7	1
Xcel Energy-led seminars	7	1
Xcel Energy website	1	0

Trade partners also reported that the most useful information to receive in product updates was a summary of the latest changes to the product: "If there's going to be any new information or if the rebate amounts change so that I make sure that I look at it maybe a little closer."

What program information was the most useful for you when deciding to participate in the Motors and Drives Program?

	Frequency
Summary of latest changes	8
Other	3
I don't pay attention	2

Barriers and Decision to Participate

Most trade partners talk to customers about the product immediately, during the first conversations about the project. While contractors typically bring up the rebates, customers do sometimes initiate conversations about the incentives.

Who Initiates Conversations about Incentives?

	Current Source
Most of the time the contractor, sometimes the customer	8
Always the contractor	4
Most customers already know about it	2

At What Point Trade Partners Discuss the Product

	Current Source
Immediately	12
When discussing project details, costs	5
Sometimes immediately, sometimes during project	3

Trade partners commonly report that the rebate and energy savings are important in customers' decision-making.

- Rebates:
  - "They want to know on the quote up front if there's any rebates available. That's one of the questions they ask when you meet with them."
  - "It's almost just part and parcel of the conversation whenever we are talking about the drives is the rebate that comes along with it."
- Energy savings:
  - "I help them to understand the energy savings and how the rebates can help and get them more funding."

Trade Partner Perceptions of Why Customers Participate

	Current Source
Rebates	9
Energy savings	8
Replacing old motors	6
Payback period	4
Cover labor with rebate	2
Showcase new technology	2

Seven of eleven trade partners said they've sold eligible projects without the incentives or rebates as a sales tool. The reasons included:

- Customer was unaware of rebates (n = 2)
- Customer did not care about rebates for small projects (n = 2)
- Customer/contractor did not want to take the time to pursue rebates (n = 2)
- Customer was going to proceed with project regardless of the rebate (n = 1)

Most trade partners said they had increased or maintained the same level of participation in the program over time (8 of 10). Reasons their involvement increased included:

- Growing market (n = 4)
  - "Growing market. Technology is getting better. Prices are coming down."
  - "People are more aware of VFDs it's just kind of the knowledge is out there."
- Improved technology (n = 4)
  - "Well the increase in size is because of the technology as far as the controls that are being used … there is more we can do."
  - "Equipment's getting better. VFDs have gotten better. Motors can handle 'em better."
- Xcel Energy product (n = 2)
  - "The program definitely plays into it. It may not be the overriding factor."
  - "People have realized the money savings that VFDs provide. Then with the rebates it makes it a little bit easier to move forward with that."

Only two trade partners said their involvement had decreased over time. Reasons included:

- MN Energy Code: "A lot of the rebates will follow Minnesota energy code. You almost always have to meet the rebates."
- Fluctuating market: "Oh, it's just the market… there's a lot of variability."

Barriers to additional participation included:

- Takes too much effort (n = 4)
  - "I know general contractors don't want to use it because it adds time and some evaluation. But they don't want to wait for that. That's the biggest hurdle."
  - "This is just one more detail, one more paperwork push that people are just disinterested in… and it's not one of their concerns."
- Need more information on application or rebate status (n = 4)
  - "I think the online thing, it's not transparent, it wasn't transparent before either. When we submitted the application to the account manager hard copy, we still didn't have any transparency."
  - "Not only do I not know if my client received the approval copy. I don't know when he approved it or she. I don't know when… the program manager got it. I also don't know when it actually got to the account manager."
  - "I wish there was better communication if a contractor is filing that somebody let's us know that that rebate check was sent because we don't ever get notice."
- Trade incentive too small or unreliable (n = 3)
  - "If we could contact the Xcel Energy rep and say, 'We'd like to go in and promote putting VFD drives on their computer room cooling units, do you know who the right contact is that we could work with?' That would be helpful… You only have so much time in a day to prospect when you're in sales. You're gonna gravitate towards the larger projects or the ones that are easiest as possible to get in front of the right person."
  - "It's hard to establish it being priority with plant management and if you don't do that... I started with the financial controller. I think that's probably one of the most important places to start right there. ...I'm not gonna go up there and try to find all these other people."

Trade partners said the product helped customers decide to do projects sooner, and helped them install more projects:

- "The rebates have gotten me a lot more jobs because we talked to them with the rebates and stuff because it lessens that cost of that upgrade."
- "The rebate really helps to push it over the edge so the customer is willing to move forward with the whole project."
- "The rebate will… sweeten the deal, and makes it much more likely that somebody would go ahead."
- "There's no question about it, it's a big thing to customers. I would say probably 60-70% of our upgrades that we sell, if there was not rebate the customer would not take them."
- "It's a huge factor. Those rebates can be huge for pushing projects forward."

Market Effects

Though the product is long-running, we did not find strong evidence of market effects in the trade partner interviews. Trade partners indicated that their stocking practices would not change if the product did not exist; many do not stock equipment and those that do said they would stock the same items:

- "It really wouldn't change a whole lot, because it's a consumable products, it's something that the customer is going to need at some point in time."
- "I only stock a certain couple brands. I only go to a couple different brands that are reputable that I feel comfortable selling…We're not willing to drop our quality for cost. We would stock the same products."

Trade Partner Satisfaction

When asked what they liked most about the program, trade partners frequently cited high rebates and the program was easy.

- Easy to understand / easy paperwork (n = 8)
  - "It's easy to use and understand… I think it's all pretty basic pretty straightforward."
  - "It's simple to understand. And like I said, most of the people locally understand it and can explain it and know how much your rebate's going to be, etc."
- Strong rebate size (n = 5)
  - "You guys are offering 60% of install. I think it's a fantastic rebate."
  - "The rebate, the dollar amount is awesome. I don't see that going up but definitely don't lower it."
- Marketing (n = 2)
  - "I think they do a decent job of just sending out some marketing blurbs."
  - "The emails and stuff from Xcel. That's a good thing. The ... then it seems to be hopefully customer's getting the information and the contractors."

Additional Equipment, Including PMAC Motors

One trade partner interviewee reported not being able to do projects through the Motor and Drive Efficiency Product because the equipment was too small. Six trade partners suggested additional rebates for motors or drives. The suggestions were:

- Small pumps (5 horsepower) and constant torque drives
- Half-horsepower fans

- Installations on generators that are not connected to the grid
- Efficient fans (based on the Fan Energy Index)
- Pumps with internal VFDs
- Rooftop units with VFDs

Of the 10 trade partners we talked to about PMAC motors, four had completed some PMAC installations. Three of these said they had completed very few installations. Two of these said installations were increasing. Trade familiarity with PMAC motors varied. One trade partner said they were familiar with them, one said they were "a little bit familiar with them", and one said they did not know much about PMACs. When asked about customer familiarity / interest in PMACs, two trade partners said that customers were not interested, with only one saying that customers "see the benefits" of the PMAC motors.

APPENDIX F: BENCHMARKING RESEARCH RESULTS

1.6 Key Themes and Results

Midstream Programs

One utility (Utility A) of the five benchmarked utilities currently has a midstream motors measure. The midstream program has been running for one and a half years, working through the distribution channel. The utility decided to bring the motors and drives measures midstream based on its extensive experience in midstream program delivery, which usually increase participation dramatically when moved upstream. The utility reports that it was a relatively easy transition because it had existing agreements through other midstream programs, as well as established relationships with distributors that were already familiar with the midstream delivery structure.

- "We have extensive experience in midstream program delivery. We offer a lot of programs through those channels. I have seen some really, really dramatic results, more than 10 times the uptake when we've converted products from a traditional downstream to a midstream approach. It was a relatively easy addition because we had existing agreements and relationships with the refrigeration. Distributors are also carrying some of the other products that they're already participating with us in the midstream programs so they're familiar with it. They are psyched about how it works. It was in relatively easy kind of add on. That fits well, I think, into when those programs have been successful when it's really a simple widget-type thing, where you just say, "Don't buy this one, buy that one." It's an easy midstream versus something more complex and systems-based, which is what almost all of HVAC and refrigeration is. It was a good, really just a good fit all around I would say."
- Results: The interviewee reported that they have had "10 times the uptake in other programs, but for this one: I would say we've had moderate success, not nearly as good as we should, and I'm not entirely clear why. I don't know. Compared to a lot of the other stuff that we have going. That has been just not as exciting. I'm not sure why. We do circulators through the midstream. We have heat pump, water heaters, Douglas heat pumps. All of those are, I would say, probably best in class nationwide. Our evaporator fan motors have been really just limping, not limping along. They're doing better than that, but really not as vibrant as I would expect. That may have something to do with some internal staffing issues that we've had. There's very few organizations or very few companies that actually sell these products. It's just a tricky market. We had a rough start with the synchronous motors, with some people getting burned with some installations that didn't go well."

Additional information on midstream programs:

- Utility C is having high-level preliminary discussions about moving measures upstream, including motors and drives.
- Utility B had a midstream motors program five to ten years ago to influence dealers to stock high efficiency units. Then, new motors standards came into effect and disrupted the program.
    - "Seems like every three years when the code cycle changes it kind of kicks the technology in the teeth… manufacturers couldn't catch up for six months."
- Utility D operates midstream programs for other measures, but worries about them for drives technology, as drives are more complicated measures and it can be difficult to accurately estimate savings if the measure is midstream:

- "There's a number of particulars in what the drive is actually gonna [sic] be controlling the motor's use ... Lighting works because everyone knows what a light's gonna [sic] be used for… And we know how long a day is, and we can make some pretty good assumptions around that. When you install a drive, it can be on a motor that's used ten hours a year. It can be on a motor that's used 8,000 hours a year."

Permanent Magnet Alternating Current (PMAC) Motors

The program manager from Utility A (which had the most experience rebating PMAC motors) said that the most successful setting for PMAC installations was in grocery and convenience stores, especially whole-store swap-outs for larger grocery stores:

- "Yeah, we've done a lot with those. We have had some good luck in grocery for the the case motors on all the open cases. That's been a really very successful. We've done some whole grocery store swap outs, some good luck. We've done for convenience stores and large grocery as well. We've done a good amount of refrigerated warehouses, all those sorts of things. We've done a lot of the evaporator fan motor swap outs. We had some good luck with that."

Utility A also noted some challenges with PMAC motors. First, synchronous motors occasionally short themselves out and shut down. Here is a quote from the program manager elaborating on the challenge:

- "The synchronous motors . . . they run at a different speed than an ECM. . . . You have to change the blade stand pitch or you end up with . . . having too much air movement and you can freeze up coils and have all sorts of problems. In fact, the motors are pushing, trying to push so much air a lot of time. They'll just short themselves out and shut down. That's been kind of problematic."

The second challenge is that unlike ECMs, which are one size fits all, customers may need to install multiple PMAC motors for one end use function. The following quote elaborates:

- "There's a different one for different voltages. If it's 115 or 230, you have to get a different motor. You can't just wire it different. Then, if you're clockwise or counterclockwise, you have to get it. It's technically for motor possibilities all within the same-size class versus there are EC motors out there that you can just . . . It's one size fits all. You can just reverse the polarity, and you get the directional change. You can use an additional lag to get to 30 versus 115. A lot of the service guys are like, 'Screw that. I don't want to deal with carrying four motors on my truck.'"

Utility B has rebated PMAC motors through their custom program, and also mentioned grocery stores:

- "The permanent magnet synchronous motor had a little bit better efficiency than the ECM motors, and it's for refrigerator case applications. We had an emerging technology study done, and I think we had a bunch of Vons stores [a grocery story chain] that put in these motors through our custom incentive program. So these… are all small fractional horsepower motors."

Utility B also mentioned challenges with PMAC motors:

- "It's a lot of work at a grocery store because you gotta take all the food out of the cabinets and change out the motors and put 'em back in, put the new ones in. And motors, they're these little things that periodically burn out, so I guess it would be, it's a good application…Good application, but I think an economic analysis should need, gonna need to be done. If you did a bank of 'em, you'd probably have a better opportunity… you'd wanna do a whole store at a time."

Utility E had limited experience with PMAC motors but was considering them for their next filing:

- "We don't have prescriptive [rebates] for it. We could cover that through our grants program. And for the next filing, actually that's one that I probably should have mentioned that we will be at least researching a little bit and evaluating a possible prescriptive rebate program, or in addition to the existing program."

Overall, these results indicate that PMAC motors are still an emerging technology, with limited experience in Minnesota or nationally. When considering additional focus on PMAC motors, product staff should consider the challenges faced by their peers and develop strategies to proactively address those challenges. Additionally, product staff may want to consider targeting groceries and refrigerated warehouse when marketing the technology, as other utilities have experienced success in those facilities.

Outreach

Customer Outreach

Targeting customers:

- Utility B targets all commercial and industrial customers, most of whom are small commercial customers.
- Utility C only recently started outreaching to customers. Previously, all outreach was to trade partners (who then in turn sold the program to customers).
    - "Our approach has been to market the program to the trade allies…even in really relatively recent history, we had enough demand going through the program that we weren't trying to do outreach to customers. We were very trade ally focused. And it's not until these new goals… this year we're starting to do more customer outreach, but not really at the measure level. I think we do email? So we do an E-newsletter to our commercial and industrial customers, I think on a quarterly basis. We will pitch VSDs in those newsletters. We do that sort of thing, but we don't advertise about our VSD incentive or otherwise have specific outreach campaigns aimed at them. We're a little more broad based than that."
- Account representatives for Utility D target large customers and serve as the single point-of-contact for energy efficiency activity.
    - "For our large customers, which is most of what I deal with, we have a team of account representatives that work with our large customers… they work on everything. It's not like we have a drives guy, or a lights guy, or a HVAC guy. They are the point people for any energy efficiency activity the customer may do. So, they're working with them all the time. And in most cases, each rep has probably somewhere between 60 and 100 customers that they're responsible for. So, in theory they're calling them up every month or so just checking in, and seeing what's going on and all that. So, that's sort of our general outreach. On top of that, we do technology specific webinars and things like that."
- Utility E targets large commercial and industrial customers, but most outreach is through trade partners.

What motivates customers:

- Utility E:
    - "I think a lot of times, with motors, anyway, how far are they from end of life on their equipment, and it seems like with a motor it's hard to get a customer to take an operating motor out and replace it with a new one just to get the rebate, but once the motor fails, that rebate seems to greatly influence their decision to go to the NEMA Premium Plus… And with the drives, I do think energy savings is a really big one for drives. And for instance

HVAC systems, it gives the customer better control… It's just a more state-of-the-art way to go than a system without drives."

- Utility C:
  - "It's about connecting with the contact within customer orgs that already is motivated to participate…My thing is that I really believe there's always, as much as the terms is overused, an energy champion somewhere in that facility pushing things through because I've focused on market segments before and it's always interesting to see that you have 20 of the same facility, but five participate the other 15 don't. And the five that participate, it's always the one person. It might be from the accounting department, from the facilities engineering department, from wherever might be, but they're the person contacting you and they're the ones really driving those projects from whatever aspect they can."

Trade Partner Outreach

- Utility D mentioned that trade partners were important drivers of participation in their program.
  - "There's also a number of installation contractors that drives are kind of their bread and butter. And then there's other installation contractors that have more of a broad scope of what they do, and all of them are very aware of our programs and, frankly, drive our programs. So, a lot of our projects come out of that."
- Utility E does not have a formal trade partner network, but does outreach to local contractors and vendors. These contractors and vendors are the primary sources of customer outreach.
  - "We don't have a formal trade ally network, so to speak. We do have call it an informal one of local contractors and vendors that we're continuously working with. We bring motor manufacturing reps in to talk to our reps, who then in turn interface with our customers. Usually once every two years we put on what's called an electric technologies workshop at one or two locations in our service territory, and we make that available to large customers and to what would be trade allies, as well. That's one way we engage them… We've got newsletters going out continuously three or four times a year, anyway. We've also got an annual. We're working on it right now for 2019. It's a call it a calendar book. It's about a maybe six inch by eight inch calendar book that contractors can use as a planner, and then it's got information on all of our programs in it."
- Utility C outreaches to trade partners through emails:
  - "Emails ... if people are in our trade ally network, then we've got line of sight to them and we do outreach to them, but as you know, not all contractors choose to sign up for utility trade ally programs. So you'd always have a little problem there. Of course our website was updated for anybody who bothered to look there before they submitted an application."
- Utility B has daily classes to explain their programs and the latest technology:
  - "Yeah, we have daily classes, free classes at the Energy Innovation Center to explain our programs, the latest technology. We bring in speakers from across the state, sometimes from outside the state to talk about various things. Sometimes it's just fundamental basics, and sometimes it's in-depth into one particular type of technology. It's always going on at our EIC."

Future of Motors Rebates

Though the Motor and Drive Efficiency Product is performing well, it is important for product staff to understand how the market is moving in other states and what challenges the product may face in the future. Several utilities noted concern about the future of motor rebates and said that increasing standards have made it difficult to incentivize motors.

- "For meeting goals in Minnesota, the really big challenge for us was the federal government adopting NEMA Premium as the new energy efficiency standard for all motors being manufactured."
- "Yeah, a new motor now, under Minnesota SIP rules, would have to exceed NEMA Premium by one full efficiency band, and the manufacturers, I feel like they're finally starting to catch up and offer motors that do exceed NEMA Premium."
- "My understanding is that the motors requirements are already pretty damn good. So, the odds of finding an inefficient motor out in the wild are slim to none."
- "The conclusion was reached that the standard efficiencies that are out there are already so high that it's just not worth incentivizing. The program would be hit with a pretty bad net-to-gross ratio on that. It was just taken off as a potential measure."

In fact, Utility B has stopped all prescriptive motors programs because of increased standards.

- "Seems like every three years when the code cycle changes, it kinda kicks the technology in the teeth. . . . It seems like the code is always on the heels of technology. If not sometimes in front of it. We had a problem with the 2013 cycle coming in too fast and furious. And manufacturers couldn't catch up for six months. So they delayed it. But anyway, yeah, it seems like technology gets out there, it's really nice, it's incentible [SIC], and then the next code cycle adopts it as standard, and so the savings and the incentives dry up quickly. That doesn't mean there's not energy savings. Energy savings by itself is still attractive in many applications, it doesn't have to have an incentive behind."