

Xcel Energy

Comprehensive Process and Impact
Evaluation of the Colorado Motor and
Drive Efficiency Program

FINAL

March 18, 2011





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EXECUTIVE SUMMARY

Xcel Energy is seeking meaningful ways to improve the elements of demand side management (DSM) business programs, customer-reach capabilities, and the operation efficiency of programs so that they can successfully meet program goals and objectives. To assist Xcel Energy in this aim, in May 2010, Xcel Energy selected through a competitive Request for Proposals (RFP) process a third party vendor (comprised of Tetra Tech, ECONorthwest, and Michaels Energy—hereafter the “Tetra Tech team”) to conduct objective evaluations of a total of four of their demand side management (DSM) business programs in Minnesota and Colorado, of which the Colorado Motor and Drive Efficiency program is one.

This Executive Summary provides an overview of the 2010 process and impact evaluations of the Colorado Motor and Drive Efficiency Program.

PROGRAM OVERVIEW

Xcel Energy, the fourth-largest combination electricity and natural gas company in the United States, offers a comprehensive portfolio of energy-related products and services to 3.4 million electricity and 1.9 million natural gas customers. In Colorado, Xcel Energy has 195,169 commercial customers and 4,415 industrial customers. These include electric only, gas only, and electric and gas customers.

Xcel Energy’s Colorado Motor and Drive Efficiency Program is mature, offered since 2006. The program has consistently met or exceeded program goals. Xcel Energy offers rebates for prescriptive motor, custom motor, and drive purchases. These are used throughout customers’ facilities for pumps (water), heating and cooling (fans and air handlers), process, and other applications. Prescriptive rebates are available for motors 1–500 hp that meet or exceed the NEMA premium efficiency standards and for adjustable speed/variable frequency drives from 1–200 hp that control motors that operate fans or pumps. Custom rebates are available for non-prescriptive eligible motor or drives and/or implementation of proposed overall process improvement resulting in energy and demand savings.

Two main activities increase participation in the Motor and Drive Efficiency Program: outreach to trade allies (manufacturers, distributors, retailers and installers) and customer communications. The program leverages new and existing relationships with trade allies (or “vendors”) who recommend and specify energy efficient motors and drives for customers. Customers also learn about program equipment through Xcel Energy workshops, webinars, business customer expos, and general media advertising. After purchasing efficient drives and motors, customers submit rebate applications, invoices and motors specifications sheets to receive their rebates (custom projects must be pre-approved by the program).

EVALUATION METHODOLOGY

The Tetra Tech team conducted a comprehensive evaluation of the program. The evaluation scope of work included: 12 Xcel Energy internal staff interviews (29 total covering all four programs), 98 participant surveys, 67 nonparticipant surveys (94 overall in Colorado), ten qualitative trade ally interviews, 11 surveys with influential vendors, a benchmarking study of 19 other utility programs including eight program manager interviews, and 20 on-site measurement and verification visits.

The evaluation activities that directly address the process evaluation objectives are the internal review, participant and nonparticipant surveys, trade ally interviews, and peer utility benchmarking study. The tasks that directly support the impact evaluation are developing net-to-gross ratios through a triangulation method (participant surveys, nonparticipant surveys, trade ally surveys and interviews, and benchmarking study results) and verifying baseline and technical assumptions through a thorough



engineering and documentation review and on-site measurement and verification. The completion of these impact tasks support gross and net savings recommendations.

SUMMARY OF KEY FINDINGS

Overall, Xcel Energy's Motor and Drive Efficiency Program has achieved high satisfaction ratings among program participants while meeting program savings goals. In 2009, the program achieved 24.4 GWh of savings (118 percent of goal), with the majority of savings coming through the drives component of the program. Through the third quarter of 2010, the program had achieved 19.06 GWh of savings, or 92 percent of the annual goal. The majority of program savings continue to come through the drives element of the program.

Key findings resulting from the multiple research activities conducted for this evaluation are presented next in the areas of program impacts, program design, program outreach, program implementation and delivery, and program satisfaction.

PROGRAM IMPACTS

Measure persistence is very high. All but one surveyed participant reported that the incentivized program equipment is installed and still operating.

The program's baseline and technical assumptions are sound, reasonable and well documented. The proposed motor efficiency used to determine the savings is the actual installed motor efficiency. This "quasi-custom" approach allows greater flexibility in estimating savings for a project and should be continued. The savings associated with the drive installations are reasonable when compared to other sources. The effective useful life values of 20 years used appear to be greater than used for other programs, which are consistently around 15 years.

The evaluation research team recommends a net-to-gross ratio of .65 for the Motor and Drive Efficiency Program. The program applied a net-to-gross ratio (NTGR) of 0.87 in 2010. The evaluation net-to-gross research, detailed in the full report, resulted in a recommended decrease in the applied NTGR. The evaluators' recommended NTGR for the program is .65. This is primarily a result of the evaluation research finding a lower NTGR for drives, which are the majority of program savings, and for managed accounts, which to date have been the majority of participants.

The NTGR should continue to be revisited and revised as program modifications are made that would have an upward or downward effect on the NTGR. While the evaluation research with 2009 – 2010 program participants indicates a .65 NTGR for the program, recent changes in program marketing strategies could affect the NTGR going forward. The reorganization of the Business Solutions Center (BSC) discussed in detail in the internal review report section will likely increase the percentage of customers participating in the program that are non-managed accounts. The program period covered through the evaluation research included almost all managed account participants. A qualitative look at the difference in NTGR between managed and non-managed accounts indicates that non-managed accounts' NTGR may be as much as 20 percent higher than managed accounts. In addition, the program is planning on increased promotion of enhanced motors. The NTGR for projects that included enhanced motors was also substantially higher than that found for other projects. We recommend a tracking system analysis be done to determine if non-managed account participants and enhanced motor projects have increased. If there is an upward trend, we recommend the NTGR be adjusted upward to .70 for the 2011 program. If there is not an upward trend, we recommend the recommended NTGR of .65 be set for the 2011 program.

Ineligible equipment found in on-site inspections is decreasing ex-ante to ex-post savings. The impact evaluation's desk review of projects found ex-ante to ex-post savings as 100%. However, when additional information was collected during on-site inspections, the ex-ante to ex-post savings



decreased to 81.1% for peak demand reduction and 78.1% for energy savings. The largest adjustment decreases were due to ineligible measures. More specifically, the largest amount of ineligible equipment found on-site were VFDs operating without automatic controls, as required by the program.

PROGRAM DESIGN

Xcel Energy's program design is fairly consistent with other benchmarked programs, although there are some key differences. The primary differences are that the Xcel Energy program includes a greater range of equipment in its prescriptive track and has somewhat lower rebate levels. The peer utility benchmarking review conducted for the evaluation revealed that Xcel Energy's Motor and Drive Efficiency Program is generally consistent with most of the programs that were reviewed. The qualifying motor models and VFD end-uses are generally similar, and the application/participation process is similar to programs with both prescriptive and custom components.

Xcel Energy's program has some key differences, however. Xcel Energy accommodates larger motors in its prescriptive program component (up to 500 horse power, HP); most other programs only have prescriptive rebates for motors up to 200 HP. Xcel Energy's rebates for prescriptive motors are on the low side of the range of rebates offered by the programs. This appears to be because Xcel Energy has separate rebate levels for New versus Upgrade motors, which is a different design than the other programs. Xcel Energy's distinct and higher rebates for Upgrade motors give the program more design flexibility to fine-tune rebate levels to optimize cost-effectiveness. Similarly, Xcel Energy's higher rebate levels for "Enhanced" NEMA Premium motors further incents energy savings; other programs do not include this distinction. The benchmark research also found that Xcel Energy's rebates for VFDs are relatively low.

Results from the participant and trade ally interviews indicate the program design is working well, with no major changes needed. In explaining the reasons for their high program satisfaction ratings, program participants often noted that the program is well conceived, conceptually easy to understand and valuable to them because it helps them to install a wide range of energy efficient measures. Similarly, trade allies interviewed for the evaluation noted that the program is "straightforward," easy to understand, and easy to use. While some customers may struggle to complete their first rebate application, they usually have little difficulty with subsequent applications. The trade allies also reported that the program measures were inclusive and appropriate; there was no consensus to add new measures or eligible end uses. That being said, the upcoming changes in federal standards will necessitate program design changes for the program to continue to realize motors savings. These are discussed later in the evaluation's recommendations.

PROGRAM OUTREACH

Participant and trade ally interviews indicate that the program's multi-pronged marketing strategies are working, but lack of program awareness remains a barrier for participation among non-participants. Participating customers become aware of the Motor and Drive Efficiency Program from a wide range of sources, including online resources, program vendors, previous experience with other programs, and in particular, telephone calls and/or personal meetings with Xcel Energy account managers. The program's trade allies perceive that Xcel Energy's DSM programs marketing is pervasive and effective in raising customer awareness of motors and drives rebates. Going forward, the trade allies stated that future marketing efforts should focus on small and medium sized customers, although some of these customers are aware of the program too. This is consistent with the program's participation data as most participating customers are large managed accounts.

Lack of awareness of the program is a primary barrier for nonparticipating customers. Nonparticipants who had implemented (or considered implementing) motors most frequently mentioned not being aware of the program's existence as their reason for not participating. Twenty-eight percent of nonparticipants were aware of the Motor and Drive Efficiency Program. Of those who were aware, it



was nearly an even split between managed and unmanaged accounts (ten were managed and nine were unmanaged accounts). Nonparticipants also frequently received information on the program from Xcel Energy; however, they also reported receiving information on the program from vendors.

Program support and information provided by Xcel Energy to customers and trade allies is effective. Participating customers gave high satisfaction ratings for Xcel Energy's handling of questions/complaints and their overall customer support. The interviewed trade allies are also generally satisfied with communications with Xcel Energy and specifically with Xcel Energy's Trade Relations or Account Management staff. Trade allies said that Xcel Energy has useful program information on its website that is not too difficult to find, and noted that the email updates they currently receive are usually sufficient to keep them abreast of program developments and possible design changes. Some trade allies would prefer more personal interactions (phone calls, meetings) to enhance rapport with Xcel Energy staff and/or to discuss unique project challenges.

PROGRAM IMPLEMENTATION AND DELIVERY

Xcel Energy's prescriptive applications for the program are not overly burdensome when compared to other programs, although they remain difficult for some participants to complete. The peer utility benchmarking found that Xcel Energy's Motors and Drives prescriptive application forms provide good guidance to customers (e.g., example product documentation and corresponding customer entries) and do not require an excessive amount of information to be recorded in comparison to other programs. Actually completing the prescriptive application was identified by some participants as being the most challenging aspect of the program, because equipment information is sometimes difficult to determine, and/or because a fair amount of time may be required to enter the information. The most commonly mentioned suggestion for program improvement was a simplified and/or completely electronic process for data entry and replication (e.g., customer information) when filling out the rebate applications. In addition, the interviewed trade allies noted that an important component of the application process is the option of customers receiving the rebate directly or buying down the project (i.e. taking a discount and having the vendor complete the forms and receive the rebate). This option puts more of the administrative burden on technical experts who are most familiar with the program equipment and was preferred by some customers. Not all of the interviewed trade allies, however, were aware of this option.

The prescriptive rebates process is working well. Participating customers gave high satisfaction ratings for the amount of time it took to receive their prescriptive rebates, and 89 percent received the rebate amount they were expecting. One trade ally particularly noted that Xcel Energy had noticeably improved its prescriptive rebates processing over time.

The custom project pre-approval process is the program area identified as most in need of improvement. Although the program serves few custom projects, the evaluation research indicated that this aspect of the program is the area most in need of improvement. Trade allies specifically noted that custom projects need faster reviews by Xcel Energy; the rebate payments need to be more consistent and predictable across similar projects; and the rebates may need to be increased to justify customer and contractor staff time needed to prepare the applications. Among the surveyed participants, the lowest satisfaction rating was given for the custom projects pre-approval process. The program staff interviews completed as part of the internal review also consistently identified the need to improve the pre-approval process for custom projects. Xcel Energy is working on this process.

PROGRAM SATISFACTION

Participants are extremely satisfied with the program and trade allies are fairly satisfied. The vast majority of program participants (91 percent) rated their satisfaction with the overall program an eight or higher on a scale of zero (lowest) to ten (highest). Specific reasons for the high satisfaction ratings include: ease of participation, high need for equipment cost defrayment (i.e., adequate rebates),



quick rebate turnaround, and high quality customer service. Although lower satisfaction ratings were given for the rebate application process (i.e., filling in the forms), the high overall ratings suggest that the process is not unduly onerous and that customers do not expect difficulties participating in the future. Among the interviewed trade allies, four reported that they are “very satisfied” with Xcel Energy’s program, while two said they were “generally satisfied”, one was “neutral” and two were “not really satisfied” (mainly because they erroneously believed that they cannot complete the applications on behalf of customers as discussed above).

RECOMMENDATIONS

The evaluation findings show that Xcel Energy’s Colorado Motor and Drive Efficiency Program is well designed, has achieved its savings goals, and has resulted in high participant satisfaction. Going forward, the main challenges for the program will be retaining high savings in light of federal changes mandating the manufacture of NEMA Premium motors, reducing free ridership, and improving customer ease of participation. Within that overall context, we offer the following recommendations for Xcel Energy’s consideration.

Recommendation #1: Focus on enhanced motors with efficiency levels above NEMA Premium.

The program is likely to eliminate prescriptive incentives for NEMA Premium motors sometime in 2011 after these motors become the standard specification for manufacturers and the existing inventory of non-NEMA motors has been depleted. In addition, VFDs, which are the primary driver of program savings, are reported as becoming a standard technology due to building codes requirements, demonstrated high energy savings, declining costs, and performance benefits (e.g., allowing companies to fine-tune some processes). All of these factors are contributing to the measure’s relatively high free-ridership as evidenced in the NTG research. Conversely, the free-ridership that was estimated for enhanced motors with efficiency levels greater than standard NEMA Premium is very low. Going forward, we recommend that the program focus its promotions on the next level of enhanced motors to further move the market and increase its claimable savings.

Recommendation #2: Simplify the prescriptive measures application process.

The evaluation research indicates a simplified application process would help to improve customer satisfaction and potentially reduce the number of applications with inaccurate information. This recommendation focuses on the prescriptive component of the program, while the next recommendation addresses the custom component of the program. At the same time, it is important the applications collect sufficient information to verify the energy savings. Options suggested during the evaluation research for a streamlined application process included:

- Utilizing check boxes to confirm product/end-use eligibility and/or select equipment types
- Requiring only the equipment make/model, and retrieving the manufacturer specifications from a dynamic database (or Xcel Energy staff that maintain a set of hard copies)
- Electronic application tools, that do the above, and automatically calculate incentives and populate customer information
- Only require customers to provide evidence of equipment eligibility (i.e. NEMA efficiency, make, model number, hp, RPM) instead of entering all the information themselves. Vendors can help them identify this information on relevant product documentation.

Recommendation #3: Reduce custom projects pre-approval times or better manage turn-around time expectations.



Custom projects, though few in number, can continue to offer the program large savings opportunities. To improve customer and trade ally satisfaction, these types of projects need to be processed and approved more quickly by Xcel Energy, so that customers do not “give up” on future custom projects and/or spread critical opinions in the market. During the internal review, Xcel Energy staff were aware of this need and were working on improving the process. If processing times cannot be reduced, we recommend Xcel Energy explicitly and proactively communicate expected project timelines to manage customer expectations.

Recommendation #4: Increase outreach to small and mid-sized customers. These customer groups have lower levels of free ridership, are least aware of the program and least able to fill out program applications without assistance.

Most of the program’s customer participants are large managed accounts. The participant survey found many of them have corporate policies to purchase (proven) energy efficient equipment. We believe this may be increasing the program’s free ridership. Xcel Energy has already taken steps to increase the participation of non-managed accounts through its BSC group, and should continue to focus on this market segment. In particular, this group is expected to have lower levels of free ridership as found in the NTG evaluation research. According to trade allies, this group is also least aware of the program and least able to fill out program applications without assistance (other recommendations are offered to address this latter issue).

Recommendation #5: Increase trade ally program involvement. In particular, provide more vendor education so they can complete more program applications and promote the buy down option to customers.

Trade allies, or vendors, are in frequent, direct contact with customers and are well positioned to recruit participants of all sizes and from all sectors. The nonparticipant survey found that vendors are the first source of information customers turn to when looking to make equipment purchases. In addition, many participants said they prefer that vendors fill out program applications, and vendors can often do this more accurately than the customers. In particular, administrative staff for smaller customers have increased workload demands and little time to devote to completing rebate application forms. As program marketing strategies focus on smaller to medium sized customers, efforts should be made to reduce the program participation burden by simplifying the application process (discussed earlier) and/or having vendors do more of the application. Other program managers that participated in the benchmarking study noted that recurring application problems can be more quickly rectified by having vendors complete applications and working with a relatively small group of specific vendors. Importantly, the program must ensure that all vendors know that they can complete applications for customers, and periodic personal “check-ins” by program staff would be useful to confirm that vendors are fully aware of the ways in which they can assist customers. In addition, the vendor interviews found that not all vendors were aware of the program option to “buy down” projects for customers. Given that several customers and vendors said they prefer this option, we recommend increased education on buy-downs to vendors.

Recommendation #6: Consider offering additional program services to increase opportunities for claimed savings.

Program managers around the country report that “green” motor re-winds (which restore motors near to their original efficiency levels) and motor inventories are good program elements to respond to current economic conditions, characterized by reduced capital investment opportunities. In particular, comprehensive motors inventories may lead to more immediate replacements of inefficient, operable motors. However, additional research may be needed to understand if customer staff will maintain the inventories and value them over time.



Recommendation #7: Consider an upstream, vendor-driven design to promote enhanced motors projects.

One of the larger peer utility programs included in the benchmarking study has successfully utilized motors vendors to “up-sell” NEMA premium motors to customers for several years. For this program, vendors receive the program rebates. According to the interviewed program manager, vendors are more motivated to research and recommend NEMA efficient motors than customers are to research and select these motors. Reported advantages of this program design are: high motors sales with comparatively reduced rebate levels (paid to the vendors); reduced customer administrative burden; and improved utility data quality and reduced administrative burden. With the changes in the federal standards for motors that begin in 2011, an upstream vendor-driven design may help Xcel Energy move more enhanced motors projects into the market. Xcel Energy could investigate this option in 2011 for possible inclusion in the 2012 program.

Recommendation #8: Continue to use the current peak coincidence factor, and propose 2012 funding to investigate the validity of changing this value. Include funding to investigate the impact of developing a dual track for heating and cooling.

For drive installations a peak coincidence factor of 0.78 is currently used. This results in a peak coincidence demand savings of approximately 0.14 kW for fans and 0.16 kW for pumps (depending on motor size, enclosure, and rpm). Peak coincidence demand savings, however, can vary significantly depending on the input assumptions, application, if the utility has a summer or winter peak, and the time of day the peak occurs. Xcel Energy should conduct additional research on peak coincidence demand savings for VFD installations to tailor them specifically for Colorado customers.

Recommendation #9: Use the existing motor life of 20 years, and propose funding in the next filing plan to investigate the reasonableness of the motor life.

The claimed savings for motor projects are currently based on an expected useful life of 20 years. The results of the literature review, however, show that the effective useful life for motor projects with standard efficiency motors is more typically 15 years. There are minor derivations within the literature; therefore, Xcel Energy could further explore the reasonableness of the motor useful life in their next plan. However, premium efficiency motors, due to lower operating temperature, are expected to have an expected useful life of 20 years. Since the new efficiency standards will require premium efficiency motor installation in the future, we recommend that Xcel Energy retain the effective useful life of 20 years.

Recommendation #10: Reduce the life of VFD projects to 15 years, and propose funding in the next filing plan to investigate the reasonableness of the drive life.

While there does appear to be some variability within the literature regarding the effective useful life for VFD projects, all of the programs reviewed suggested an effective useful life in the range of 10 years to 16 years, depending on the program and the application. There are some indications within the literature reviewed that process VFDs may have shorter useful lives; therefore, Xcel Energy could further explore the reasonableness of the process VFD useful life in their next plan. However, because this correlation is less clearly defined, we suggest that the effective useful life for all types of VFDs be reduced to 15 years to be consistent with reviewed programs and literature.

Recommendation #11: Utilize a Net-to-Gross Ratio of .65.

If the percentage of non-managed accounts and enhanced motors projects increases, we recommend that the NTGR be adjusted upwards to .70 for 2011.



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1. INTRODUCTION

Xcel Energy is seeking meaningful ways to improve the elements of demand side management (DSM) business programs, customer-reach capabilities, and program operation efficiency in order to successfully meet program goals and objectives. To assist Xcel Energy in this aim, in May 2010, Xcel Energy selected through a competitive Request for Proposals (RFP) process a third party vendor (comprised of Tetra Tech, ECONorthwest and Michaels Energy—hereafter the “Tetra Tech team”) to conduct objective evaluations of a total of four of their demand side management (DSM) business programs in Minnesota and Colorado, of which the Colorado Motor and Drive Efficiency program is one.

This report presents the results of the 2010 process and impact evaluations of the Motor and Drive Efficiency Program in Colorado.

1.1 PROGRAM OVERVIEW

Xcel Energy, the fourth-largest combination electricity and natural gas company in the United States, offers a comprehensive portfolio of energy-related products and services to 3.4 million electricity and 1.9 million natural gas customers. In Colorado, Xcel Energy has 195,169 commercial customers and 4,415 industrial customers. These include electric only, natural gas only, and electric and natural gas customers.

Xcel Energy’s Motor and Drive Efficiency Program in Colorado is a mature program, offered since 2006, and has consistently met or exceeded program goals. Xcel Energy offers rebates for prescriptive motor, custom motor, and drive purchases. These are used throughout customers’ facilities for pumps (water), heating and cooling (fans and air handlers), process, and other applications. Prescriptive rebates are available for motors 1–500 hp that meet or exceed the NEMA premium efficiency standards and for adjustable speed/variable frequency drives from 1–200 hp that control motors that operate fans or pumps. Custom rebates are available for non-prescriptive eligible motor or drives and/or implementation of proposed overall process improvement resulting in energy and demand savings.

In 2011, the minimum efficiency standards for manufacturer motors will increase; therefore, Xcel Energy will not be able to offer its current rebate on new motors because the high efficiency offer will become the national standard requirement. To date, the program’s success has come primarily from adjustable or variable frequency drives, which contributes 80 to 98 percent of the energy savings impact annually.

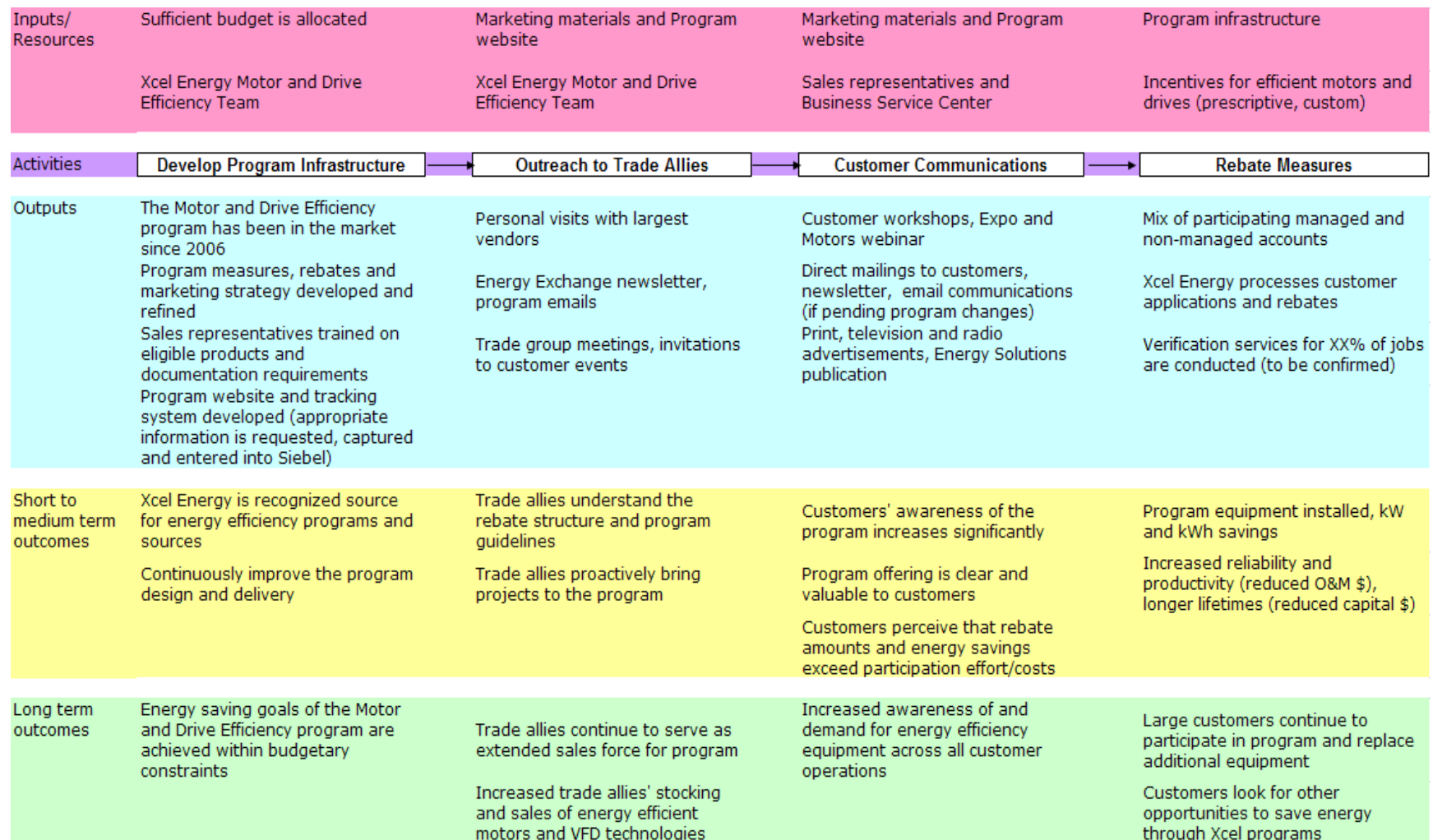
1.2 PROGRAM LOGIC MODEL

Evaluators drafted the Motors and Drives logic model at the beginning of the evaluation process based on a review of program documentation and interviews with program staff. The logic model presented in Figure 1-1 includes edits based on product manager feedback.

Two main activities increase participation in the Motor and Drive Efficiency Program: outreach to trade allies (manufacturers, distributors, retailers and installers – also referred to as ‘vendors’) and customer communications. The program leverages new and existing relationships with trade allies who recommend and specify energy efficient motors and drives for customers. Customers also learn about program equipment through workshops, webinars, business customer expos, and general media advertising. After purchasing efficient drives and motors, customers submit rebate applications, purchase invoices and motors specifications sheets to receive their rebates (custom motor purchases must be pre-approved by the program).



Figure 1-1. Motor and Drive Efficiency Program Logic Model





1.3 EVALUATION METHODOLOGY

The Tetra Tech team conducted a comprehensive evaluation of the program. The process evaluation provides Xcel Energy with a thorough understanding of participating and nonparticipating commercial customer and trade ally awareness, attitudes and behaviors. The impact evaluation ensures that the estimated energy savings resulting from the evaluation are sound and defensible. In addition, the impact evaluation's net-to-gross calculations used to estimate net energy savings employ triangulation methods for best estimates of program attribution.

The evaluation scope of work consisted of the following evaluation tasks:

- Task 1: Start-up meeting and evaluation plan
- Task 2: Internal review/development of logic model (included interviews with 12 Xcel Energy staff (29 total covering all four programs))
- Task 3: Customer surveys (included 98 participant surveys and 67 nonparticipant surveys (94 overall in Colorado))
- Task 4: Trade ally interviews (included ten qualitative trade ally interviews and 11 influential vendor surveys)
- Task 5a: Gross and net savings (included 20 on-site measurement and verification visits)
- Task 5b. Net to gross recommendations
- Task 5c: Verify technical and baseline assumptions
- Task 6: Peer utility benchmarking (included secondary research on 19 other utility programs and in-depth interviews with eight program managers)
- Task 7: Progress reporting
- Task 8: Reporting and results presentation.

The evaluation activities that directly address the process evaluation objectives are the internal review, participant and nonparticipant surveys, trade ally interviews, and peer utility benchmarking studies. The tasks that directly support the impact evaluation are: 1) developing net-to-gross ratios through a triangulation method (participant surveys, nonparticipant surveys, trade ally surveys and interviews, and benchmarking study results) and, 2) verifying baseline and technical assumptions through engineering and documentation review and on-site inspections and metering. These impact evaluation tasks resulted in the development of gross and net savings recommendations.

1.4 REPORT ORGANIZATION

Section 2 of the report synthesizes overall key findings across all of the evaluation activities. Sections 3 through 10 detail results from each of the evaluation activities as follows: internal review, trade ally interviews, participant surveys, nonparticipant surveys, peer utility benchmarking, and the impact evaluation including gross and net savings, net-to-gross analysis and verification of technical and baseline assumptions. Section 11 discusses the recommendations resulting from the evaluation research. A detailed technical appendix contains all data collection instruments used for the evaluation as well as survey response rates.



2. SUMMARY OF KEY FINDINGS

Overall, Xcel Energy's Motor and Drive Efficiency Program has achieved high satisfaction ratings among program participants while meeting program savings goals. In 2009 the program achieved 24.4 GWh of savings (118 percent of goal), with the majority of savings coming through the drives component of the program. Through the third quarter of 2010, the program had achieved 19.06 GWh of savings, or 92 percent of the annual goal. The majority of program savings continue to come through the drives element of the program.

Next we overview key evaluation findings in the following topic areas: program impacts, program design, program outreach, program implementation and delivery and program satisfaction.

2.1 PROGRAM IMPACTS

2.1.1 Gross and Net savings

Measure persistence is very high. All but one surveyed participant reported that the incentivized program equipment is installed and still operating.

Ineligible equipment found in on-site inspections is decreasing ex-ante to ex-post savings. The impact evaluation's desk review of project found ex-ante to ex-post savings as 100%. However, when additional information was collected during on-site inspections, the ex-ante to ex-post savings decreased to 81.1% for peak demand reduction and 78.1% for energy savings. The largest savings adjustment decreases were due to ineligible measures. More specifically, the largest amount of ineligible equipment found on-site were VFDs operating without automatic controls, as required by the program.

2.1.2 Net to Gross

The evaluation research team recommends a net-to-gross ratio of .65 for the Motor and Drive Efficiency Program. The program applied a net-to-gross ratio (NTGR) of 0.87 in 2010. The evaluation net-to-gross research, detailed in the full report, resulted in a recommended decrease in the applied NTGR. The evaluators' recommended NTGR for the program is 0.65. This is primarily a result of the evaluation research finding a lower NTGR for drives, which are the majority of program savings, and for managed accounts, which to-date have been the majority of participants.

The NTGR should continue to be revisited and revised as program modifications are made that would have an upward or downward effect on the NTGR. While the evaluation research with 2009 – 2010 program participants indicates a .65 NTGR for the program, recent changes in program marketing strategies could affect the NTGR going forward. The re-organization of the Business Solutions Center (BSC) discussed in more detail in the internal review results will likely increase the percentage of customers participating in the program that are non-managed accounts. The program period covered through the evaluation research included almost all managed account participants. A qualitative look at the difference in NTGR between managed and non-managed accounts indicates that non-managed accounts' NTGR may be as much as 20 percent higher than managed accounts. In addition, the program is planning increased promotion of enhanced motors. The NTGR for projects that included enhanced motors was also substantially higher than other projects. We recommend a tracking system analysis be done to determine if non-managed account participants and enhanced motor projects have increased. If there is an upward trend, we recommend the NTGR is adjusted upward to .70 for the 2011 program. If there is not an upward trend, we recommend the recommended NTGR of .65 is set for the 2011 program.



2.1.3 Technical and Baseline Assumptions

The program's baseline and technical assumptions are sound, reasonable and well documented. The proposed motor efficiency used to determine the savings is the actual installed motor efficiency. This "quasi-custom" approach allows greater flexibility in estimating savings for a project and should be continued. The savings associated with the drive installations are reasonable when compared to other sources. The effective useful life values of 20 years used appear to be greater than used for other programs, which are consistently around 15 years.

2.2 PROGRAM DESIGN

Xcel Energy's program design is fairly consistent with other benchmarked programs, although there are some key differences. The primary differences are that the Xcel Energy program includes a greater range of equipment in its prescriptive track and has somewhat lower rebate levels. The peer utility benchmarking conducted for the evaluation revealed that Xcel Energy's Motor and Drive Efficiency Program is generally consistent with most of the programs that were reviewed. The qualifying motor models and VFD end-uses are generally similar, and the application/participation process is similar to the programs with both prescriptive and custom components.

Xcel Energy's program has some key differences, however. Xcel Energy accommodates larger motors in its prescriptive program component (up to 500 horse power, HP); most other programs only have prescriptive rebates for motors up to 200 HP. Xcel Energy's rebates for prescriptive motors are on the low side of the range of rebates offered by the programs. This appears to be because Xcel Energy has separate rebate levels for New versus Upgrade motors, which is a different design than the other programs have. Xcel Energy's distinct and higher rebates for Upgrade motors give the program more design flexibility to fine-tune rebate levels to optimize cost-effectiveness. Similarly, Xcel Energy's higher rebate levels for "Enhanced" NEMA Premium motors further incents energy savings; other programs do not include this distinction. The benchmark research also found that Xcel Energy's rebates for VFDs are relatively low.

Results from the participant and trade ally interviews indicate the program design is working well, with no major changes needed. In explaining the reasons for their high program satisfaction ratings, program participants often noted that the program is well conceived, conceptually easy to understand and valuable to them because it helps them to install a wide range of energy efficient measures. Similarly, trade allies interviewed for the evaluation noted that the program is "straightforward," easy to understand and easy to use. While some customers may struggle to complete their first rebate application, they usually have little difficulty with subsequent applications. The trade allies also reported that the program measures were inclusive and appropriate; there was no consensus to add new measures or eligible end uses. That being said, the upcoming changes in federal standards will necessitate program design changes for the program to continue to realize motors savings. These are discussed later in the evaluation's recommendations.

2.3 PROGRAM OUTREACH

Participant and trade ally interviews indicate that the program's multi-pronged marketing strategies are working, but lack of program awareness remains a barrier for participation among non-participants. Participating customers become aware of the Motor and Drive Efficiency Program from a wide range of sources, including online resources, program vendors, previous experience with other programs and in particular, telephone calls and/or personal meetings with Xcel Energy account managers. The program's trade allies perceive that Xcel Energy's DSM programs marketing is pervasive and effective in raising customer awareness of motors and drives rebates.



Going forward, the trade allies stated that future marketing efforts should focus on small and medium sized customers, although some of these customers are aware of the program too. This is consistent with the program's participation data as most participating customers are large managed accounts.

Lack of awareness of the program is a primary barrier for nonparticipating customers. Nonparticipants who had implemented (or considered implementing) motors most frequently mentioned not being aware of the program's existence as their reason for not participating. Twenty-eight percent of nonparticipants were aware of the Motor and Drive Efficiency Program. Of those who were aware, it was nearly an even split between managed and unmanaged accounts (10 were managed and nine were unmanaged accounts). Nonparticipants also frequently received information on the program from Xcel Energy; however, they also reported receiving information on the program from vendors.

Program support and information provided by Xcel Energy to customers and trade allies is effective. Participating customers gave high satisfaction ratings for Xcel Energy's handling of questions/complaints and overall support to customers. The interviewed trade allies are also generally satisfied with communications with Xcel Energy and specifically with Xcel Energy's Trade Relations or Account Management staff. They perceived that Xcel Energy has useful program information on its website that is not too difficult to find, and noted that the email updates they currently receive are usually sufficient to keep them abreast of program developments and possible design changes. Some trade allies would prefer more personal interactions (phone calls, meetings) to enhance rapport with Xcel Energy staff and/or to discuss unique project challenges.

2.4 PROGRAM IMPLEMENTATION AND DELIVERY

Xcel Energy's prescriptive applications for the program are not overly burdensome when compared to other programs, although they remain difficult for some participants to complete. The peer utility benchmarking found that Xcel Energy's Motors and Drives prescriptive application forms provide good guidance to customers (e.g., example product documentation and corresponding customer entries) and do not require an excessive amount of information to be recorded in comparison to other programs. Actually completing the prescriptive applications was identified by some participants as being the most challenging aspect of the program, because equipment information is sometimes difficult to determine, and/or because a fair amount of time may be required to enter the information. The most commonly mentioned suggestion for program improvement was a simplified and/or completely electronic process for data entry and replication (e.g., customer information) when filling out the rebate applications. In addition, the interviewed trade allies noted that an important component of the application process is the option of customers receiving the rebate directly or buying down the project (i.e. taking a discount and having the vendor complete the forms and receive the rebate). This option puts more of the administrative burden on technical experts who are most familiar with the program equipment and was preferred by some customers. Not all of the interviewed trade allies, however, were aware of this option.

The prescriptive rebates process is working well. Participating customers gave high satisfaction ratings for the amount of time it took to receive their prescriptive rebates, and 89 percent received the rebate amount they were expecting. One trade ally particularly noted that Xcel Energy had noticeably improved its prescriptive rebates processing over time.

The custom project pre-approval process is the program area identified as most in need of improvement. Although the program serves few custom projects, the evaluation research indicated that this aspect of the program is the area most in need of improvement. Trade allies specifically noted that custom projects need faster reviews by Xcel Energy; the rebate payments need to be more consistent and predictable across similar projects; and the rebates may need to be increased to justify customer and contractor staff time needed to prepare the applications. Among the surveyed participants, the lowest satisfaction rating was given for the custom projects pre-approval process. The



program staff interviews completed as part of the internal review consistently identified the need to improve the pre-approval process for custom projects. Xcel Energy is working on this process.

2.5 PROGRAM SATISFACTION

Participants are extremely satisfied with the program and trade allies are fairly satisfied. The vast majority of program participants (91 percent) rated their satisfaction with the overall program an eight or higher on a scale of zero (lowest) to ten (highest). Specific reasons for the high satisfaction ratings include: ease of participation, high need for equipment cost defrayment (i.e., adequate rebates), quick rebate turnaround and high quality customer service. Although lower satisfaction ratings were given for the rebate application process (i.e., filling in the forms), the high overall ratings suggest that the process is not unduly onerous and that customers do not expect difficulties participating in the future. Among the interviewed trade allies, four reported that they are “very satisfied” with Xcel Energy’s program, while two said they were “generally satisfied”, one was “neutral” and two were “not really satisfied” (mainly because they erroneously believed that they cannot complete the applications on behalf of customers and discussed above).

2.6 CONCLUSION

The Motor and Drive Efficiency Program appears to be well designed and useful to participants, as evidenced by high satisfaction among participants and trade allies and favorable comparisons to benchmarked motors and drives programs. However some areas for improvement were identified. Specific recommendations for program improvements are presented at the end of this report.



3. EVALUATION RESULTS—INTERNAL REVIEW

This section of the report provides high-level key findings and recommendations resulting from internal review interviews with 12 Xcel Energy staff (29 total covering all four programs).

3.1 INTRODUCTION

Evaluators interviewed a range of Xcel Energy staff that are involved in the design and delivery of the Business DSM programs. Interviewees included: product managers (1), marketing assistants (1), rebate processors (2), Business Solutions Center (BSC) representatives (2), trade relations managers (1), account managers (1), energy efficiency engineers (2), regulatory affairs (1) and marketing managers (1).

Evaluators conducted these interviews over a six-week period from the end of May through early July 2010. The interviews discussed a variety of issues, including:

- Roles and responsibilities of the staff
- Communication and interaction with others in the program
- Program design
- Resources to do their job
- Program marketing efforts
- Issues unique to the groups they interact with (e.g., customers and trade allies)
- Program operations
- Customer and trade ally satisfaction with the program
- Areas where the programs are working well
- Past, current, and future challenges of the program(s)
- Issues they would like the evaluation to research further
- Internal Review Overview.

Multiple internal staff positions support Xcel Energy's DSM programs: product managers, marketing managers, regulatory affairs staff, marketing assistants, energy efficiency engineers, Trade relations managers, account managers, BSC representatives and rebate processors. Product managers oversee each program ("product") and are ultimately responsible for the program design and goals, monitoring goals and developing contingency plans, pursuing effective marketing and communication strategies and reporting to the marketing managers in each state. Marketing managers monitor overall program performance and make adjustments as needed to ensure the overall DSM portfolio meets its goals by state. Marketing managers also work with two directors on strategy and policy directions for the DSM programs. There are two marketing managers, one for Colorado and one for Minnesota. Marketing managers also interact with regulatory affairs staff. Regulatory affairs staff interface with the states' Public Utility Commissions and related stakeholders to ensure that the programs are in compliance with the regulatory framework in Colorado and Minnesota.



Marketing assistants support product managers, and interact with engineers, account managers and the BSC, and customers during the project pre-approval and approval processes. Energy efficiency engineers are responsible for technical reviews, pre-approvals of custom measures and program energy savings calculations. Account Managers are the first point of contact for managed accounts, as well as a conduit between managed customers and the marketing and product teams. BSC representatives handle a wide variety of customer service tasks and are a key point to which customers can be funneled into the program; BSC representatives have also recently taken on the new role of energy-efficiency and rebate advisors. Trade relations managers oversee the relationships between the DSM products and trade allies or vendors. Trade relations managers both identify and train new vendors as well as work with established vendors to market Xcel Energy's DSM products. Trade relations managers also engage trade allies in Advisory Councils that meet periodically to provide advice and input on Xcel Energy's DSM products. Rebate processors complete program documentation to ensure the participant receives their rebate.

Communication is important to the success of any program. It is especially important for the business programs given the dispersion of program staff across states and many staff working across multiple programs. Currently the programs employ several methods of communication to staff working on the programs. The company maintains an intranet that provides documentation and information for all programs administered by Xcel Energy. The company also communicates program updates and information via email to relevant parties. Last, the company distributes quarterly Energy Exchange newsletters which provide program-specific updates. Several individuals interviewed commented on the need to receive information regarding program changes more formally. In addition, it was mentioned that periodic conference calls or group meetings for all those involved with the programs would be helpful.

Xcel Energy has standard marketing materials that they use for all business customers. The marketing materials provide an overview of the program offerings and discuss the benefits of energy efficiency. Examples of marketing materials include the Summer Cooling Savings Guidebook and seven Steps to Lower Summer Energy Bills. Xcel Energy also provides information about their programs on their website as well as through email communications such as Xcel Energy's Product Update. Interviewees indicate the marketing materials distributed to customers and available to program staff are fairly generic and there may be a need for more specific materials to be distributed to targeted customer groups. Interviews with program staff confirm that the customer sectors they each serve are unique from each other. In addition, interviewees also indicated that active marketing (e.g., calling or visiting customers) is much more effective than more passive marketing efforts (e.g., bill inserts).

There are established tracking systems that assist in the effective tracking and monitoring of the programs. The Siebel system tracks all programs from project leads to completions. There are also project specific tracking systems. Most staff indicated that the tracking systems they use, Siebel in particular, works well and serves their needs. At the beginning of the process, leads are tracked in Siebel, which carries them all the way through the programs to the rebate processors.

3.2 KEY FINDINGS

3.2.1 Areas that are working well

- In general, it is thought that the programs are a positive opportunity and touch point for customers. Staff find customers are generally satisfied and appreciative of Xcel Energy's DSM programs, including both incentives and technical information.
- In general, staff report that relationships with other internal staff supporting the DSM programs are functioning well.



- Dedicated trade relations managers are an important part of Xcel Energy's DSM programs and their inclusion in staffing plans recognizes this. These positions greatly facilitate trade ally engagement in the programs.
- Account managers are an extremely effective vehicle to promote program participation for larger customers. In many cases, they not only promote the program but provide "handholding" throughout the application process.
- The BSC's recent re-organization to include dedicated energy efficiency specialists is viewed as a positive change that should increase the DSM programs' ability to market to and engage small-to-medium customers. This has been a difficult sector for the programs to reach in the past. In addition, interviewees believe this change is greatly increasing trade ally and customer satisfaction with Xcel Energy. BSC representatives are also helping customers complete the application process.
- Program incentives available to customers are generally viewed as effective, especially recent increases in incentive levels.

3.2.2 Opportunities for improvement

- The interviews indicate an overall sense of understaffing to support the programs. This feeling permeates across different positions that work with the programs from marketing to engineering to rebate processing. A suggestion from the interviews was to limit the number of programs that staff support. This seemed to be particularly true for energy efficiency engineers who are needed for the pre-approval process for custom projects.
- The consensus of staff is that the application and pre-approval processes are not working well for the programs being evaluated in 2010.
- Some staff reported that the tracking systems could be streamlined and redundant or unnecessary information could be eliminated. Similarly, several staff pointed out the importance of increased focus on quality control during the application process.
- There are some areas of the program design that may be confusing customers and limiting participation and satisfaction. Customer confusion regarding rebate levels (i.e., they receive a smaller rebate than expected) was reported. Program eligibility was also identified as an area of confusion because of frequent changes in program plans and eligible equipment.
- While there are multiple general marketing campaigns to support the business programs, some interviewees thought more program-specific marketing may be needed.
- The current economic downturn presents a participation barrier across the board. Staff would like evaluation feedback on the effectiveness of increased incentive levels to overcome participation barriers in the current economic state as well as any other strategies that may assist.
- While staff generally reported positive relationships with other internal staff as noted above, some interviewees felt that collaboration between staff could be strengthened, by gaining a better understanding of the responsibilities and day-to-day processes of staff in different roles and developing a more formalized process for collaboration.

3.2.3 Program-specific findings

Staff reported that recent changes to the Motor and Drive Efficiency Program have been successful. The program continues to achieve its savings goals. Xcel Energy staff that interact with equipment vendors report high customer satisfaction with the rebate levels, which were increased in early 2009.



Drives sales continue to propel overall program savings, and sales of upgrade motors appear to be increasing. This is important because in 2011 the minimum efficiency standards for manufacturer motors will increase. Xcel Energy will not be able to offer a rebate on new motors because the high efficiency offer will become the national standard requirement. Furthermore, there is some concern that the market for drives is becoming saturated. Thus the program focus will shift to upgrade motors in the future.

While the program is on target to hit its savings goals, participation has declined somewhat due to the poor economy and constrained customer capital improvement budgets. In addition, while the program's increased rebates have helped to moderate this decline, program-required paperwork is still a barrier to participation for customers and vendors, according to interviewees. While the prescriptive applications have been improved with additional guidance and examples, many customers still require assistance filling them out.

3.3 CONCLUSION

The internal review interviews provided a considerable amount of rich and detailed information that helped form and shape the additional evaluation activities.



4. EVALUATION RESULTS—TRADE ALLY FINDINGS

This section of the report presents results from ten qualitative interviews conducted with trade allies for the Motor and Drive Efficiency Program.

4.1 INTRODUCTION

The evaluation team conducted interviews with trade allies that have participated in the program within the last two years. This includes both trade allies that have been fairly active in the program as well as ‘informed’ non-participants. Informed non-participants are trade allies that have completed projects through the program, but have had relatively limited involvement.

Evaluators interviewed a total of ten trade allies—seven active and three informed nonparticipating trade allies using a semi-structured in-depth interview guide approved by Xcel Energy. The evaluation team conducted interviews with trade allies in August through September 2010. This research with the trade allies provided meaningful process insights into the program’s operations, their interactions with the program, the customers the program is serving, and barriers to customers’ participation in the program. In summary, the research focused on gathering the following types of information: provider interactions with Xcel Energy, the application and preapproval processes, rebate levels, marketing, and customer awareness and barriers to participation.

Xcel Energy provided sample information from the program’s participant database. The data for the trade ally sample included which year(s) the trade ally completed a project in the program, trade ally type (for some vendors – e.g., installing contractors, distributors, ESCOs) and contact information.

Next, this report section summarizes the key findings from the trade ally interviews. These are followed by detailed findings.

4.2 KEY FINDINGS

We spoke with a variety of trade allies, including installing contractors that conduct regular facilities maintenance; energy efficiency specialists; one energy service company (ESCO); and product wholesalers and distributors. Most of the interviewed allies work with their customers directly, while a few also have teams of account managers or subcontractors that they have trained on Xcel Energy’s Motor and Drive Efficiency Program. All of the interviewed allies except one have integrated the Xcel Energy program into their sales process with customers.

About half of the allies complete most of their projects for large customers, while the other half work mostly with small and medium sized firms.¹ Several of the interviewed allies also work with other Xcel Energy programs. In comparison, they find the Motor and Drive Efficiency Program one of the most straightforward and easy to use.

The trade allies interviewed vary in the types of projects they complete. Three allies only distribute or install drives, one only works with motors, and six allies work with both motors and drives. Some motors installers primarily install motors of less than 50 or 100 horsepower (HP), while others work with

¹ For purposes of these interviews, the vendors were instructed to classify small businesses as those with 100 or less employees. Medium businesses have over 100 employees, and large businesses have an Xcel Energy account manager.



motors of all sizes. One ally that has many maintenance contracts tries to conduct motors inventories for all their customers. The other allies have completed motors inventories only occasionally (if asked) or not at all.

Following are some of the key findings from the interviews:

- *Xcel Energy communications and information* – Allies are satisfied with Xcel Energy communications and specifically with Xcel Energy's Trade Relations or Account Management staff. Most allies reported that email updates are generally sufficient to keep them abreast of program developments and possible changes. Some allies would prefer more personal interactions (phone calls, meetings) to enhance rapport with Xcel Energy and/or to discuss unique program or project challenges. Motors Decisions Matter spreadsheet tools for return-on-investment (ROI) calculations and program fact sheets are regularly used by some allies. Two allies are unaware of Xcel Energy program resources.
- *Program applications* – The allies generally think the prescriptive motors program applications are easy to understand and complete. An important component of the program application process appears to be the option of customers receiving the rebate directly or buying down the project (i.e. taking a discount and allowing the vendor to receive the rebate). Allies report about half of the customers take the rebate directly and half prefer the project buy down. The larger and more active allies fill out the rebate applications for 30 to 100 percent of their customers, and one ally estimated that about half of their customers received the rebates directly versus buying down the project
- *Custom project applications* – Allies reported the most room for improvement with custom projects. They said these projects need faster reviews by Xcel Energy; the rebate payments need to be more consistent and predictable across similar projects; and the rebates may need to be increased to justify customer and contractor staff time needed to prepare the applications.
- *Trade ally incentives* – Although one ally would like to see these implemented, the responses generally indicate that most trade allies will help complete the applications for customers without them, as a customer service.
- *Program equipment* – The allies reported that the program measures were appropriate; there was no consensus to add new measures or eligible end uses.
- *Rebate levels* – There was no consensus among the allies that specific rebate levels need to be increased. Instead, the allies generally thought that the incentive levels were appropriate. Allies said they would like Xcel Energy to try to defray incremental costs as much as possible, particularly in an economy characterized by constrained capital budgets. Higher rebate levels are perceived to be the most effective way to increase customer participation.
- *Program marketing* – Xcel Energy's DSM programs marketing is perceived by allies to be pervasive and generally effective in raising customer awareness of motors and drives rebates. Allies said future marketing efforts should focus on small and medium sized customers, although many of these customers are aware of the program too. In addition, more focus might be placed on drives, as three drives vendors reported relatively low customer awareness and understanding of drives.
- *Future program participation* – The interviewed allies expect program participation to remain level or increase. While the sluggish economy is still hindering capital investment and new construction, some companies need to implement deferred projects and there is increased awareness and acceptance of energy efficient business practices. While one ally perceived that the market for drives may be reaching saturation, all other interviewed allies perceive continued opportunities for drives sales.



4.3 DETAILED FINDINGS

Detailed findings are presented in the following topic areas: Program awareness and involvement; Customer interactions; Program procedures and Commercial market.

4.3.1 Program awareness and involvement

The interviewed trade allies have a wide range of experience with the program. Some of the larger motors/drives installing contractors have worked in the Colorado market for nearly ten years, and have been involved with Xcel Energy's program since its inception. Some of the other motor/drives distributors and installers have worked with the program for only 1.5 to 2.5 years. The drives distributors and installation contractor we spoke with generally had less program experience than the allies that work with motors too, and typically have participated in the program for two years.

Collectively, the allies learned about Xcel Energy's program from a wide variety of sources, including: account managers and personal contacts at Xcel Energy (in Minnesota also), mass email invitations to an Xcel Energy program presentation, other equipment vendors, program website information, a local trades union, attendance at an Xcel Energy Programs Expo, and their business customers. The allies have similar reasons for deciding to participate in the program, which are: to provide better customer service (i.e., save them money, give customers more product options); and to differentiate themselves from competitors, and thereby increase their own business revenues. The larger and more active allies fill out the rebate applications for 30 to 100 percent of their customers, and one ally estimated that about half of their customers received the rebates directly versus buying down the project (i.e. taking a discount and allowing the vendor to receive the rebate).

Regarding the allies' activity level, all of the allies except one reported that they usually complete a project each month or bi-weekly, although sometimes there are peaks and troughs of activity. Only one ally (a VFD distributor) has completed no projects, and they believe that this is because customers think the VFD rebate application is a hassle, and the program does not allow the ally to fill out the form and get the rebate instead (which would benefit the customer).

Going forward, the allies expect the number of projects to either remain level or increase. The primary factors retarding market growth are the sluggish economy characterized by reduced capital spending and little new construction. On the other hand, new motors and drives projects are expected due to: growing awareness of energy efficiency and green building practices, Xcel Energy's increased rebates for motors/drives, and increased facility retrofits integrating energy efficiency. Two allies expect that mainly VFD projects will increase. One noted that NEMA Premium motors will be required by federal regulations and they expect Xcel Energy may terminate these rebates. The other ally noted that VFD projects tend to be less expensive than motors projects, and are more feasible in the slow economy. Two other allies said they plan to promote the program more to capitalize on more broad based energy efficiency education and campaigns.

When asked to describe additional ways the program could assist them, the allies noted that Xcel Energy's program marketing is generally sufficient, and that perhaps the rebate levels could be increased. Subsequent sections of this chapter describe recommended changes to the rebate levels and participation process. One very active motors/drives installer has noticed that Xcel Energy has expedited its processing of prescriptive rebates. This is a needed change and makes it easier for them to market the program to customers. Another ally suggested making the Motor and Drive Efficiency Program information more prominent on Xcel Energy's website – currently it is too "buried" for some customers to find. A different ally would like the project number included on the rebate check to



facilitate payments accounting. Lastly, one ally suggested providing vendors with sales incentives, and listing top selling vendors on the program website.²

Three large motors/drives distributors reported that they primarily interact with Xcel Energy's Trade Relations staff. They typically do so to ask high level questions about potential program changes and get contact information for detailed questions about other programs as the Motor and Drive Efficiency program is easy for them to understand and participate in. These allies reported that Trade Ally staff were very responsive and helpful. Another ally works primarily with the account manager for many of their customers (and themselves) to inquire about the status of rebates payment and to distinguish between prescriptive and custom projects (not for motors and drives); this relationship is also working well. The other allies primarily interact with other Xcel Energy staff (they could not recall names or functions) to forward unique application or custom project questions from customers that they cannot answer themselves. These interactions are generally infrequent, although one ally had made 15 calls to Xcel Energy in the past year. None of these allies mentioned any problems in getting responses to their questions, and a few said that Xcel Energy staff had been helpful. Interestingly, one ally has *no* contact with Xcel Energy staff regarding specific project questions, because they would need signed power of attorney from their customers. Instead, the ally tells their customers which Xcel Energy staff to work with and this system appears to be working fine.

Regarding the effectiveness of program communications, most allies reported that they typically receive broadcast email updates about the program. These emails are generally sufficient to keep them abreast of program developments and possible changes. One ally commented that these communications are more informative than what they receive from other business oriented programs. Half of the allies would prefer email communications from the program, while the other half would prefer phone calls or personalized emails so they can discuss specific issues they may have encountered. Two allies said that program communications have been inadequate. In particular, one ally has had no program contact since they were initially recruited to participate in the program through a broadcast email, and thinks the program should proactively follow up with newly recruited trade allies to inquire about potential problems. The other ally would like the program to provide a program contacts sheet (e.g., for rebates status, technical engineering questions, the Colorado program manager) and a simple PDF document listing the program's website content. Lastly, a different ally reported that they had not received any emails or program mailings in awhile, and wondered if they needed to subscribe to receive this information.

4.3.2 Customer interactions

Three allies that sell drives primarily to small and medium customers reported that 20 percent or less of their customers knew about the drives component of the program before working with them. In comparison, allies that have completed more projects or work with both motors and drives typically reported that at least 50 percent of their customers knew of Xcel Energy's program before initiating projects. Although the allies were not sure how the customers became aware of the program, they speculated that awareness sources include: Xcel Energy account managers and customer Expos, Xcel Energy radio advertising, other contractors, independent research on energy efficiency (larger customers) and general word of mouth. One ally estimated that 20 percent of his customers had

² One ally that also works extensively with automation/controls equipment said that Xcel Energy needs to focus more on how EMS equipment is actually implemented, so that, for instance, all of a building's HVAC stages do not start up simultaneously (which leads to demand spiking). In addition, more DLCs could be implemented to shift building set points and eliminate cyclic swings. This ally would also like to have a phone call with staff to discuss Xcel Energy's plans for automatic demand response initiatives.



misinformation about Xcel Energy's programs, however (e.g., EMS rebates are being terminated, all Xcel Energy rebates will end in two months).

All of the allies except one actively promote Xcel Energy's motors and/or drives rebates to their customers. (One does not, because they perceive that their customers will not fill out the VFD application forms, and they are not allowed to do this for them.) Larger firms that provide regular maintenance or energy efficiency services have trained their own account representatives and contractors to promote program measures during regular customer visits and/or project scoping meetings. One large distributor regularly uses Motor Decisions Matter spreadsheet tools to calculate payback periods and return-on-investment (ROI), and these tools are very helpful in scoping projects for customers. This ally also gives program fact sheets to customers during project scoping. Two other contractors rely primarily on standard program brochures and the program application forms; one of these allies (a large installing contractor) is also developing a monthly company newsletter that will describe Xcel Energy rebates. Another large installing contractor does not utilize Xcel Energy materials, noting that Xcel Energy's resources are very good for laypersons, and that the program is very simple for motors professionals and facilities staff (i.e. "everyone understands motors"). Two allies were unaware of Xcel Energy program resources, and use online energy calculator tools developed by others (e.g., General Electric). Lastly, one ally doesn't use any energy savings calculation tools, believing customers only care about the program rebates.

Most of the allies work with a wide range of customer contacts to discuss and finalize motors and drives projects, ranging from facility general maintenance staff to chief financial officers (CFOs). Smaller projects typically begin through discussions with property managers or chief building engineers, and in some cases upper management are subsequently engaged for more detailed project scoping and funding approvals. One ally works exclusively with CFOs on large packaged projects with many measures, while his account executives tend to work with facility engineers for smaller motors/drives projects. Most customers require similar (mostly financial) information when considering new projects: equipment costs, Xcel Energy rebates, estimated energy savings, applicable tax incentives, ROI, and payback period. One ally noted that their customers typically require a payback period of 12-18 months unless the project is very large, and then up to three years is acceptable.

Consistent with the findings above, key customer participation drivers are: reduced project costs and energy bill savings. Large customers are the most motivated to "package up" large projects to obtain Xcel Energy program rebates, as the cost savings can be substantial and easily outweigh the administrative costs of the applications process. Two allies noted that many customers are not aware that they are already paying into state DSM programs, and leverage this information to encourage customers to obtain financial benefits from Xcel Energy's programs. Secondarily, some customers also want to obtain LEED or other green building certifications, or are generally concerned about the environmental impacts of electricity generation.

Allies report that the main reason customers do not participate in the Motor and Drive Efficiency Program is that they currently have little or no available budget for capital projects, or other measures offer higher energy savings and rebates.³ A variety of secondary non-participation reasons were also mentioned: lack of understanding of motors/drives performance, corporate "silo-ing" (i.e. energy savings accrue to another department), and plans to sell company buildings. One ally reported that small light industrial customers are most inclined to be skeptical of VFD savings and also require very short payback periods, while another drives vendor believes that some customers are skeptical that they won't receive the rebate payments "without a huge hassle" after the applications are submitted.

³ No specific measure examples were given, and some allies noted that the motors and drives rebates are more generous than other Xcel Energy rebates.



When asked to rate the difficulty of selling program equipment to customers on a scale from one (“very difficult”) to five (“not at all difficult”), most of the allies gave scores of three to four. The main factors that would help to increase sales are a stronger economy and/or higher program rebates to reduce first-cost outlays. One ally noted that many customers believe that efficient equipment rebates should cover 100 percent of incremental costs; in response, the ally reminds the customers that they would usually replace failed equipment anyway.

The trade allies generally believed that the customer tools and services offered through the Motor and Drive Efficiency Program are sufficient to meet most customers’ needs. One ally suggested that Xcel Energy could offer motors audits as a pilot program to see if there is sufficient demand for this service. To provide additional financial assistance to customers, one ally suggested that Xcel Energy offer on-bill financing of projects, while another ally suggested that Xcel Energy provide equipment pre/post sub-metering assistance for large custom projects.

Regarding program marketing, most of the allies perceived that Xcel Energy DSM programs marketing is “already everywhere” (i.e. in newspapers, radio, magazines) and sufficient, and that there is high program awareness due to this marketing and customer outreach conducted by the trade allies themselves. Large customers are very aware of the Motor and Drive Efficiency Program and going forward the program should focus on small to medium sized customers (although many of these customers are aware of the program too). One way to do this is to do cross-promotions with other Xcel Energy programs targeting small business customers. Some allies, however, believed that more direct, personal customer contact by Xcel Energy staff would be most effective to recruit these customers. Other suggestions for program marketing included: more marketing to vendors instead of customers, a program video that customers can order, more technical information on *why* VFDs can achieve high energy savings, success stories with typical payback information, listing official trade allies on the program website, and giving allies co-branded glossy program handouts.

4.3.3 Program procedures

Four allies reported that they are “very satisfied” with Xcel Energy’s program, while two said they were “generally satisfied”, one was “neutral” and two were “not really satisfied” (one did not respond due to time constraints).

When asked to rate the program’s administrative burden on a scale from one (“very difficult”) to five (“not at all difficult”), seven of the allies gave scores of 4 or higher or said the prescriptive applications are “easy to complete.” These were generally allies that had completed relatively more projects through the program and are active in filling out the applications for some or all of their customers. One of these allies noted that initially some customers are “daunted” by the prescriptive rebate forms, but usually find them easy to complete after they actually finish an application. Another ally noted that customer difficulties arise because some firms assign rebates processing to administrative staff who do not have appropriate technical knowledge to complete the forms (and they must then request this information from other company staff). Among the allies that gave lower ratings, one motors/drives distributor with few completed projects was dissatisfied specifically because they believed that they are not allowed to complete the applications and give customers immediate equipment discounts, which they want to do. Small customers comprise 25 percent of this ally’s business, and this ally is convinced that small customers will not spend an hour of their time to complete applications that will (only) earn a rebate of \$50 for them. Two other allies that distribute only drives gave process ratings of “two to three,” and perceived that customers view the application as a “hassle”; one of these allies also wanted the ability to receive the rebates (within 30 days) instead of the customer.

Two allies had worked on custom motors projects, and both of these allies gave ratings of “two to three” for the administrative process. One ally explained that custom projects often get delayed because of the project re-evaluation or re-design that is sometimes necessary after Xcel Energy’s review, and sometimes the ally struggles to move fast enough to meet the customer’s schedule. For



one project, however, this ally secured a higher custom rebate for a customer after discussions with Xcel Energy, although none of the project specifications had changed. The other trade ally who had completed custom motors projects did not provide details to explain their rating due to time constraints. Lastly, one drives distributor that is familiar with the custom approvals for drives perceived that the application/approvals process is “a hassle that scares away customers.”⁴

Most of the interviewees reported that the prescriptive applications content is easy to understand and provide. On the custom side, one ally commented that the VFDs application is challenging because they cannot easily know how often customers will regularly run motors at low speed. Another ally reported that “life cost percent” (an element of the payback calculation) is confusing and seems to lead to reduced rebates. Overall there were few suggestions for improving the applications process. Two allies would like the ability to complete and submit applications completely online; one currently writes over all the fields in a PDF document but still requires a customer signature. One of these allies would also like the ability to submit “batched” motors and drives applications for each customer online. Another ally said that providing the motor model number (and not the cut sheet) should be sufficient, while another ally urged that custom projects be processed faster and rebate payments be made more consistent.

Regarding the program’s rebate levels, roughly equal percentages of allies believed that the rebate amounts are currently sufficient, should generally be increased (to always cover 100 percent of marginal capital cost), or that specific rebates should be increased. In this last group, one ally recommended higher rebates for upgrade motors and new rebates for “incremental” motors less than one HP. Conversely, two allies recommended higher rebates only for new motors. A third ally suggested different prescriptive rebate “tracks” to make the program more flexible (e.g., for motors utilized high/low amounts during the year, for VFDs that allow dialing down motors more or less). Notably, higher rebate amounts were most commonly mentioned as the best way to increase program participation.

The trade allies were satisfied with the specific equipment that is eligible for program rebates. Only one ally recommended adding new types of motors – less than one HP and 3600 RPM models (note: 3600 RPM motors *are* eligible for program rebates).

4.3.4 Commercial market

The trade allies that had completed motors and/or drives projects believe that Xcel Energy has been effective in persuading customers to purchase more energy efficient products, and thought that the program rebates in particular were a key motivator for many projects. A few allies noted that some projects would have occurred anyway because customers need to periodically replace failed equipment, and the program rebates do not affect all sales.

None of the trade allies perceived any specific challenges in the commercial market for energy efficiency in Colorado during the next two years. Instead, most of the allies expect opportunities to install energy efficient equipment to remain level or increase. Many motors and drives projects have been deferred for one or two years, but are now likely to be installed since key decision makers do not

⁴ One ally that has completed custom projects only for other Xcel Energy programs stated that the custom approvals process generally takes too long and the application/approval process does not justify rebates that may only amount to \$500. Another ally contacted the evaluation team long after being recruited for an interview and in a brief conversation conveyed that custom projects were the most problematic part of Xcel Energy’s program. One project that replaced a motor V-belt with a synchronous belt took three months to obtain approval and required 120 hours of the ally’s time to assist the customer.



expect the economic recession to worsen significantly (the allies did not give a specific timeframe for expected new projects). In addition, energy efficiency is more broadly understood and publicly visible due to extensive Xcel Energy marketing. There should be more project opportunities now that the economy has stabilized or may be improving and “customers have heard the message 15 times now.” Allies said LEED and other green buildings are growing in popularity, and will also provide opportunities to install energy efficient measures.

Regarding VFD sales specifically, three allies expect their sales volumes to remain stable since economic growth is still sluggish, while another ally expects their VFD projects to decline because most new buildings have VFDs and many existing buildings have been retrofitted. The other allies expect VFD installations to increase for a variety of reasons. One ally expects VFD sales to increase commensurate with an improving economy, especially since initial skepticism about product performance has eroded. Another ally personally had several “stale” VFD proposals that they expect to “go live,” while another speculated that customers will pursue more drives projects if Xcel Energy terminates rebates for new motors, and customers want to recoup their spending into energy efficiency programs. Lastly, one ally claimed that more customers perceive the value of VFDs and the market is growing for very specialized drives especially (e.g., fractional drives for hotel bathroom fans on sensors).

The allies that distribute or specify motors described a range of changes they expect to make after NEMA Premium motors become the new federal standard in December 2010. One ally plans to stop stocking low efficiency motors, while another will increase their stocking of NEMA Premium models. Another ally that stocks motors (only up to five HP) will wait to see how the market (including Xcel Energy’s rebates) changes before making new stocking decisions. Allies that only specify motors noted that they will only specify products that meet federal or Xcel Energy standards (for rebates), and one ally will generally encourage their clients to exceed NEMA Premium thresholds if it is not prohibitively expensive.

4.4 CONCLUSION

Trade allies were fairly consistent in describing the program’s strength, which is its simple design and ease of use. Importantly, the program rebates *are* motivating new customer projects and send a strong, validating message that energy efficiency is appropriate to pursue. One ally was particularly praiseworthy of the two rebate levels for new and upgrade motors, while another was very pleased by Xcel Energy’s fast processing of prescriptive rebates.

The most commonly mentioned program feature requiring improvement is the custom projects participation process. Specifically, these projects need faster reviews by Xcel Energy, the rebate payments need to be more consistent across similar projects, and the rebates may need to be increased to justify customer and contractor staff time needed to prepare that applications. Other improvement areas, mentioned by a minority of interviewees, include: more program promotion of VFDs specifically, improved program visibility on Xcel Energy’s website, and more personal interaction between Xcel Energy staff and program trade allies.

Notably, all of the interviewed trade allies said that they have or would recommend the program to other industry market actors, because the program goals and overall design are well-conceived, even while some of the implementation details can be further improved.



5. EVALUATION RESULTS—PARTICIPANT FINDINGS

This section presents the results of 98 quantitative surveys of Motor and Drive Efficiency Program participants.

5.1 INTRODUCTION

The 98 participant surveys represent 63 unique businesses that participated in the Motor and Drive Efficiency Program (“participants”) from July 1, 2009 through July 1, 2010.⁵ Overall, 22 percent of the surveyed customers had completed only motors projects, while 29 percent had completed both motors and drives projects and 49 percent had completed only drives projects. The research was conducted using telephone surveys implemented from August 9, 2010 to September 17, 2010.

Two businesses had completed custom projects, and the remainder had completed projects eligible for prescriptive rebates.⁶ Only two respondent businesses were unmanaged accounts. Except for one customer whose new program equipment had failed, all of the other customers’ program equipment was still installed and operating.

The participant surveys collected information to inform program design, program administration, program implementation and delivery, market response and program attribution (note: net-to-gross impact results were reported in a separate interim memo the week of October 11).

The participant surveys included questions regarding participant characteristics and firmographics, decision-making processes, sources of and preferences for program information, satisfaction with key aspects of the program and the application process, barriers to participation, the effect of the program on their decision to install qualifying equipment, and suggestions for program improvements.

First we highlight key findings from the participant surveys. Then we present detailed findings in the following categories: Program Awareness, Program Design and Procedures, Program Satisfaction, Participation Factors and Customer Profile.

5.2 KEY FINDINGS

Overall, Xcel Energy’s Motor and Drive Efficiency Program appears to be resulting in high participant satisfaction. In particular, there is high satisfaction with the program rebate levels. This is critical since lack of customer funding remains a primary barrier to program participation. In addition, there is an overall perception that the program is well conceived, valuable to customers, and conceptually easy to understand. Some customers would still like to see the rebate application forms further simplified and/or electronic data entry utilized to allow data replication (across multiple applications).

Key findings from the participant survey include:

⁵ Some businesses participated in the program at multiple locations. Additionally, some cases were flagged as multiples across other Xcel Energy demand side management programs.

⁶ The participation dates for these two custom projects were January 1, 2009 through July 1, 2010. Data were weighted based on whether they were custom or prescriptive.



- **Awareness** – Program participants are learning about the program from a wide variety of sources, and their account managers in particular, including account manager communications via email, telephone or in-person. In the future, they would prefer program-specific emails and/or stand-alone mail pieces to get more information about the program.
- **Application process** – Over 60 percent of customers reported that they completed the applications themselves as opposed to the equipment vendor. A fairly large number of participants that tried to fill out the applications on their own had specific questions or desired general assistance. In addition, more than half of customers who reported completing applications themselves said they had to contact Xcel Energy for assistance. This was especially true for those purchasing drives.⁷
- **Program satisfaction** – Customer satisfaction is high for the Motor and Drive Efficiency Program overall. This suggests that program elements that received slightly lower satisfaction scores (e.g., overall application process) were not unduly onerous and possibly that customers do not expect similar difficulties if they participate in the future. Some of the main reasons given for high customer satisfaction were: ease of participation, high need for equipment cost defrayment, quick rebate turnaround, and high quality customer service. Xcel Energy’s customer support received the highest satisfaction scores.
- **Desired changes** - The most commonly suggested area for program improvement was a simplified and/or automated process for data entry and replication when filling out the prescriptive rebate applications.
- **Program rebates** – While approximately half of customers reported no barriers to program participation, the primary barrier identified by about a quarter of customers is customer lack of funding. Xcel Energy’s financial assistance (i.e. rebates) was reported to be key motivator for program participation for these customers. In addition, participants are finding out their rebate amounts primarily through Xcel Energy staff and secondarily through equipment vendors. A third are calculating the rebate amounts on their own. Overall, almost all customers report receiving the rebate amount they expected.

5.3 DETAILED FINDINGS

Detailed findings are presented in the following topic areas: Program Awareness, Program Design and Procedures, Program Satisfaction, Participation Factors, and Customer Profile.

5.3.1 Program awareness

Table 5-1 shows the different channels through which participants learned about the Motor and Drive Efficiency Program. Customers are gaining program awareness through a wide variety of sources. In particular, online resources, telephone calls, personal meetings with Xcel staff, and previous experience with Xcel programs have increased awareness. The vast majority of phone calls to customers have originated from Xcel account representatives (one came from a trade ally), and most customer inquiries have also been directed to Xcel Energy, as opposed to a program trade ally. Regarding online resources, which is the most common method customers learned of the program, these have primarily been emails from Xcel Energy (79 percent), although some customers have also queried Xcel Energy’s website. No respondents claimed that they learned of the program through mass

⁷ BSC staff interviews conducted earlier found that customers often call with questions that can be answered by reading the application information thoroughly, but that some customers simply prefer to be talked through the application process.



media advertising campaigns; however, this is not surprising as the mass media campaigns have been general energy efficiency outreach versus program specific marketing.⁸

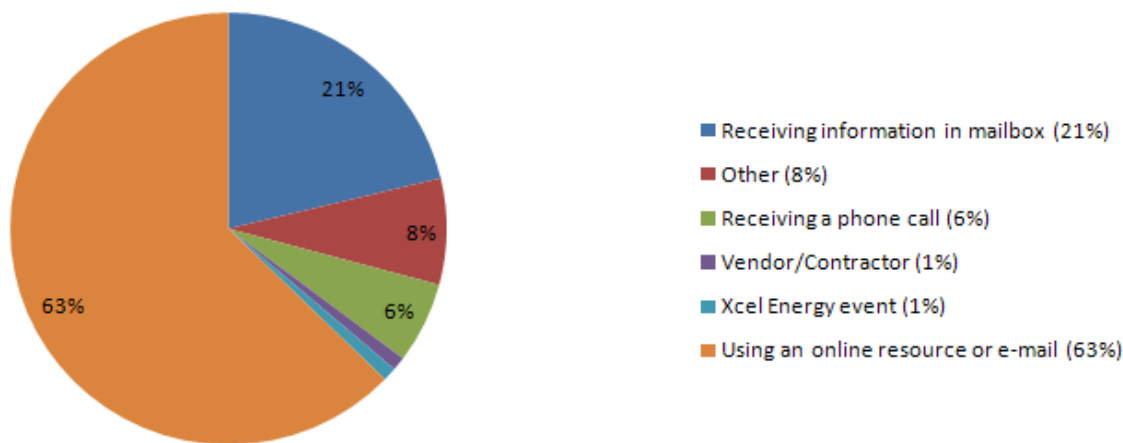
Table 5-1. How respondent first heard of program

How respondent first heard of program	Responses (n=98)	Percent
An online resource	20	21%
Phone call to customer	19	20%
Previous experience	18	18%
In person meeting with Xcel rep	17	17%
Other	13	13%
Customer made phone call	11	11%
Xcel Energy event	11	12%
Xcel Energy representative, method of communication unknown	10	10%
Vendor or contractor	6	6%
Information in mailbox	5	5%
Don't know	1	1%

Source: Participant Survey, question PA1

As shown in Figure 5-1, regarding future program communications, most of the respondents would prefer to receive program information via an online resource (63 percent), followed by program mailings (21 percent).

Figure 5-1. Preferred Method of Receiving Program Information (n=98)



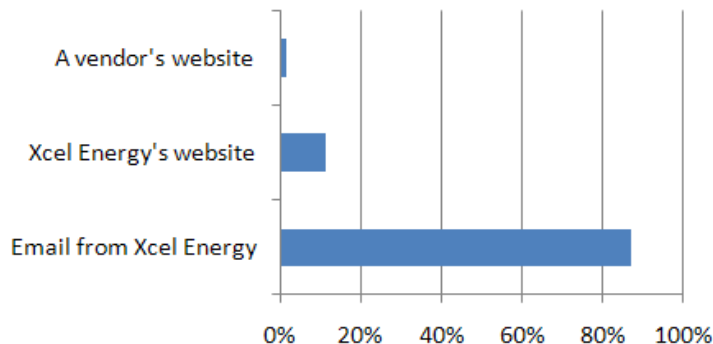
⁸ Many responses in the “Other” category also indicate that an Xcel Energy account representative was a primary source of awareness, although it is not clear who initiated phone contact and/or if there was a personal meeting. In some cases information was also mailed electronically or as hard copy before or after the interactions.



Source: Participant Survey, question PA2

Of those who indicated that they preferred to learn about the program via online resources or email, almost 90 percent preferred to receive an email directly from Xcel Energy (see Figure 5-2 below). Of those who would like to receive information in their mailboxes, stand-alone mail pieces are preferred to energy bill inserts.

Figure 5-2. Preferred Online Resources (n=62)

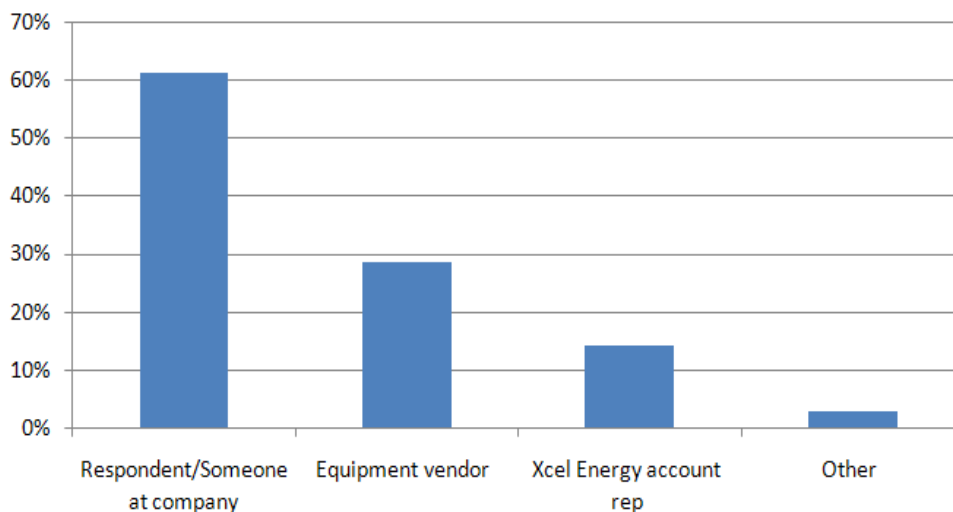


Source: Participant Survey, PA2D

5.3.2 Program design and procedures

All of the respondents were asked to identify who completed the program rebate applications, and the results are shown in Figure 5-3 below. Over 60 percent of the applications were completed by the survey respondents themselves or another person at their company; while not quite a third (28 percent) were completed by program equipment vendors. These percentages were fairly consistent regardless if the customer had completed motors projects, drives projects or both types.

Figure 5-3. Who Filled Out Program Rebate Application (n=98)





Source: Participant Survey, question SA1C

Among the 50 respondents who completed the applications themselves, 37 (74 percent) required assistance from Xcel staff or an equipment vendor. Customers that had completed only motors projects were less inclined to require assistance (39 percent), while customers that completed drives projects or both types were somewhat more inclined to require assistance (over 80 percent).

Table 5-2 shows that various application elements required assistance, including confirming the equipment model number and manufacturer specifications. Thirty-five percent of respondents indicated that they wanted general assistance in filling out the applications. Two customers had specific questions about the total rebate allowed, and two had questions about the most recent rebate level changes. (*Note: Xcel Energy increased its rebates for motors and drives on January 1, 2009.*) Of those who selected “Other,” several respondents reported that they merely wanted confirmation that they had entered the information correctly.

Regarding the two customers that had completed custom projects, one indicated that their account manager had completed the application paperwork, while the other did this on their own and required no assistance.

Table 5-2. Type of Assistance Needed

Type of assistance needed	Responses (n=37)	Percent
Completing application	13	35%
Other	10	27%
Model number	5	14%
General specifications	5	14%
Custom process info/operations worksheet	4	11%
Confusion with program/rebate changes	2	5%
Total rebate allowed	2	5%
Motor type	1	3%
Don't know	2	5%

Source: Participant Survey, question SA1E

Table 5-3 shows that 46 percent of the respondents had their rebate amounts confirmed by Xcel Energy staff, whereas 33 percent calculated the rebate amounts on their own. Although Xcel account representatives are completing some applications on behalf of their customers and would determine the rebates during this process (see Figure 5-3), this suggests that a large proportion of the customers that required general application assistance had difficulty determining their rebate amounts in particular. Most respondents (89 percent) subsequently received rebates amounts that they were expecting.



Table 5-3. Rebate Information

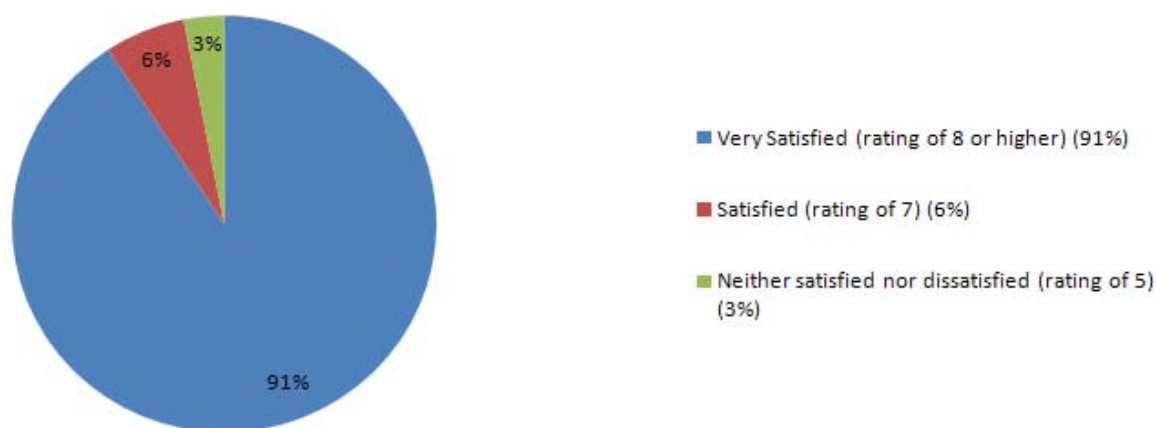
Who informed respondent of rebate amount	Responses (n=98)	Percent
Xcel Energy representative	45	46%
No one, respondent figured it out	32	33%
Contractor/vendor	19	19%
Other	11	11%
Pre-approval letter	1	1%
Don't know	1	1%
Actual rebate amount compared to original estimate	Responses (n=93)	Percent
The same	83	89%
More	7	8%
Less	3	3%

Source: Participant Survey, questions SA2B and SA3B

5.3.3 Program Satisfaction

All of the respondents were asked to rate their overall satisfaction with the Motor and Drive Efficiency Program on a scale from one (very dissatisfied) to ten (very satisfied), and the results are shown in Figure 5-4. Ninety-one percent of the program participants, including the two with custom projects, gave scores of eight or higher, indicating that most program participants have high levels of general satisfaction. Some of the main reasons given for high customer satisfaction were: ease of participation, high need for equipment cost defrayment, quick rebate turnaround, and high quality customer service. The relatively few negative comments pertained to: excessive paperwork requirements, misplaced applications, and (unspecified) complications related to project verifications.

Figure 5-4. Satisfaction with Program Overall (0-10) (n=98)



Source: Participant Survey, question SA4

Table 5-4 shows the respondents' mean satisfaction levels with various program elements, including: equipment eligibility, the application process and rebate amounts - and for custom projects, the pre-approval process and length of time for project completion. As shown in the table, most program elements attained average scores of eight, and Xcel Energy's customer support received the highest satisfaction scores. Lower satisfaction scores were given for the rebate application process in general, and the pre-approval process and project duration for custom projects.

**Table 5-4. Satisfaction with Various Program Components (n=98)**

Satisfaction with various program components (0-10)	Mean
Xcel Energy support	8.9
Equipment eligible for program	8.8
Rebate amount	8.6
Program's handling of questions/ complaints	8.6
Equipment eligibility requirements	8.4
Amount of time to receive rebate	8.2
Rebate application process	7.7
Length of project time ⁹	7.5
Pre-approval process ⁹	6.5

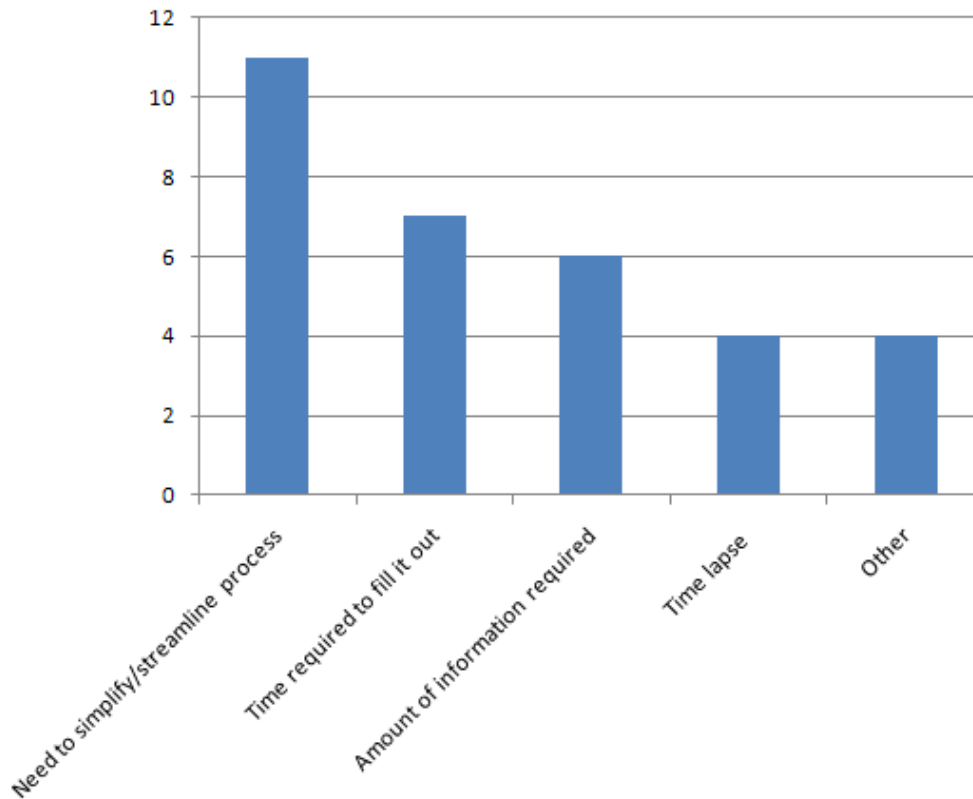
Source: Participant Survey, questions SA6A to SA6P

Twenty-three respondents that were less satisfied with the rebate application process were asked to describe the most difficult part of the process, and the results are shown in Figure 5-5. The most difficult parts of the application process were the time required and amount of information requested. Nearly half of respondents expressed a general desire for a simplified way to enter and replicate customer information, as some customers fill out many of these forms. In the "Other" category, a few respondents also indicated that they required assistance from their own engineering staff (and some did not actually fill out the applications themselves).

⁹ Satisfaction with the preapproval process and the length of project time were only asked of custom motors and drives (n=2), and therefore means calculated using those scores should be considered qualitative.



Figure 5-5. Reasons for Dissatisfaction with Rebate Process (n=23)



Source: Participant Survey, question SA6X

Table 5-5 shows the primary barriers customers faced when deciding whether or not to purchase program equipment. About half of the respondents, including the two customers with custom projects, indicated that they had no barriers, while a lack of project funding/financing was a key consideration for 26 percent of the respondents.

**Table 5-5. Barriers to Participation**

Barriers to Participation	Responses (n=98)	Percent
None	51	52%
Lack of financing/funds	26	26%
Other	10	10%
Unsure of energy savings potential	4	4%
Other priorities for capital spending	3	3%
Rebate application process demanding	3	3%
Upper management doesn't see benefit	2	2%
Contractors unfamiliar with program	1	1%
Amount of information needed for pre-approval process	1	1%

Source: Participant Survey, question SA7B

Sixty percent of the respondents could not name any specific element of the program that they would change, as seen in Table 5-6 below. After that, some respondents desired changes to: the application form (general simplification, electronic entry/data replication), the program rebate levels, and other specific elements. In the “Other” category, the comments generally called for easier ways to supply equipment data and submit the application forms, higher rebates for motors only (the drives rebates are sufficient), or higher rebates in general to cover 100 percent of marginal equipment costs.

Table 5-6. Recommended Changes to Program

Recommended Changes to Program	Responses (n=98)	Percent
No change	59	60%
Other	18	18%
Simplify program application process/form	8	9%
Increase rebate level	6	6%
Detailed instructions/examples on application	4	4%
Improve speed of pre-approval process	3	3%
Require less information	3	3%
Include additional type of equipment	2	2%
Made a web-based/online process	2	2%
Eliminate pre-approvals for custom motors/ VFDs	2	2%
Don't include motors specifications	1	1%
Don't know	1	1%

Source: Participant Survey, question SA8

Table 5-7 shows the respondents' satisfaction with Xcel Energy overall. Only 58 percent gave ratings of eight or higher, which is lower than the ratings received for the Motor and Drive Efficiency Program specifically. (The two customers with custom motors/drives projects gave ratings of five and 6.) Due to time constraints, the survey did not inquire about the reasons for these overall satisfaction ratings.



Table 5-7. Satisfaction with Xcel Energy

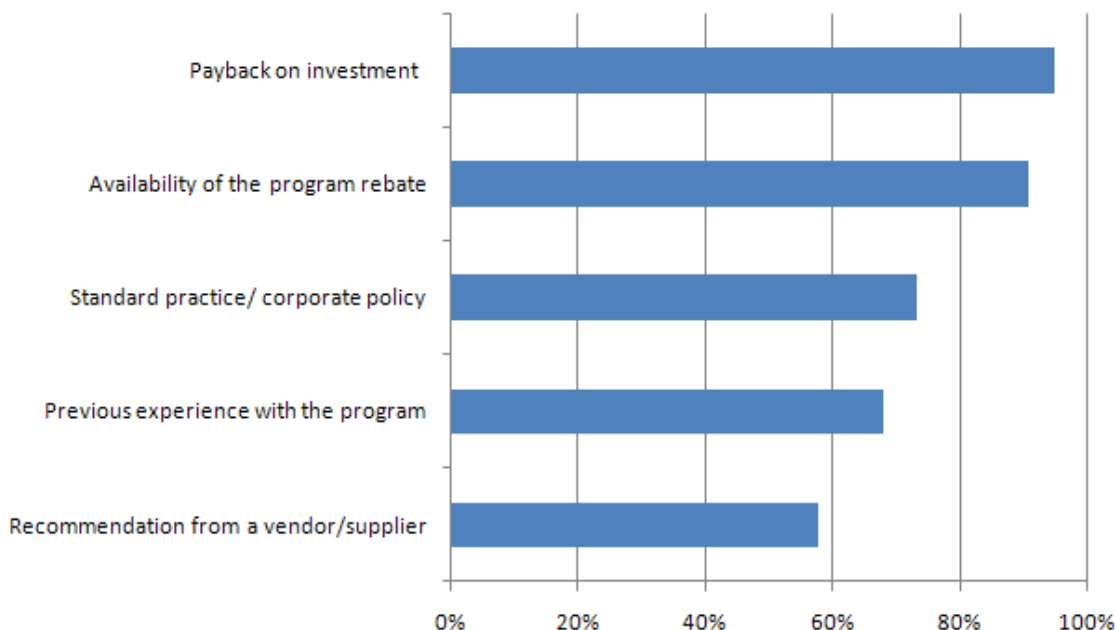
Satisfaction with Xcel Energy (0-10)	Responses (n=98)	Percent
8 or higher	57	58%
7	16	16%
6	20	21%
5	2	2%
4	3	3%

Source: Participant Survey, question SA9

5.3.4 Participation Factors

All of the respondents were asked to rate the importance of different factors that could have affected their decision to purchase program equipment on a scale of zero (not at all important) to ten (very important). Ratings of six or higher were considered to be “important”, and Figure 5-6 shows the percentage of respondents that said various decision factors were important to them. The vast majority of respondents indicated that Xcel Energy’s financial assistance was important to their projects, in particular because it reduces their investment payback period. Secondly, the respondents were influenced by their previous experience with the program (68 percent) and vendor recommendations (57 percent). Another very important influencer is company policy. About three-quarters of customers (73 percent) have business policies that require energy efficient equipment. This would cause a higher level of free-ridership if the efficient equipment is standard practice for these companies. Free-ridership findings are discussed in Section 9.

Figure 5-6. Importance of Various Factors in Decision to Implement Measures (n=97)





Source: Participant Survey, questions N3B, N3D, N3E, N3H, and N3I

Lastly, 82 percent of respondents became aware of the program before purchasing their program measures, and 16 percent said they had received a feasibility study or custom analysis through the program.

5.3.5 Participant Customer Profile

The vast majority of survey respondents (87 percent) own the space in which their projects were installed, while ten percent manage the project properties. The remainder (three percent) lease their space.

Table 5-8 lists other types of energy efficiency measures that respondents have installed in addition to efficient motors and drives, and shows that the most popular types of projects have been high efficiency lighting and lighting controls/occupancy sensors/time clocks. In addition, a relatively high proportion of customers (20 to 30 percent) have installed high efficiency heating, cooling and ventilation equipment and/or controls. In the “Other” response category, a wide range of measures and actions were reported, including: comprehensive building energy audits, energy management systems/schedule optimization, demand response/load shedding, recommissioning, and various types water conservation projects. This high percentage of other efficiency improvements is consistent with the previous statement that most participants have company policies supporting energy efficiency.

Only 11 respondents had not installed any energy efficient equipment besides motors and/or drives. When asked to explain their reasons for not making additional energy efficiency investments, four respondents reported that high first costs or budget constraints were a barrier, and two respondents indicated that they had no need to do so or lacked relevant equipment (two other respondents were unsure why their companies had not made these investments).

Table 5-8. Energy Efficient Measures Implemented

Energy efficient measures implemented	Responses (n=98)	Percent
High efficiency lighting equipment	58	59%
Lighting controls/ occupancy sensors/ time clocks	50	51%
Controls to HVAC systems	31	31%
High efficiency cooling equipment	30	30%
High efficiency heating equipment	28	28%
High efficiency ventilation equipment	22	22%
Participated in other Xcel programs	18	19%
Facility-wide energy awareness training	18	18%
Change to HVAC schedule	17	17%
None	11	12%
Changes to building envelope	6	6%
Other	51	52%

Source: Participant Survey, question F2

5.4 CONCLUSION

Overall, Xcel Energy’s Motor and Drive Efficiency Program processes appears to be working well, as evidenced by the high satisfaction ratings given by the program participants that were surveyed. In



particular, there is high satisfaction with Xcel Energy's program support and the program rebate levels. In addition, there is an overall perception that the program is well conceived, valuable to customers, and conceptually easy to understand. That said, some customers would still like to see the rebate application forms further simplified and/or electronic data entry utilized to allow data replication (across multiple applications). As far as who the program is reaching, in general, the program is primarily serving managed accounts who report having corporate policies promoting energy efficiency and have implemented other energy efficiency improvements in addition to motors and drives. This is negatively influencing the program's net-to-gross ratio, which is discussed in a separate memo.



6. EVALUATION RESULTS—NONPARTICIPANT FINDINGS

This section presents the results of 94 quantitative surveys conducted with nonparticipants in Colorado. Of those, 67 were eligible for participation in the Motor and Drive Efficiency program, but had not yet participated. We first present specific results pertaining to only Motor and Drive Efficiency program nonparticipants, and then present results detailing overarching issues affecting all Colorado program nonparticipants.

6.1 INTRODUCTION

The objectives of the nonparticipant survey are to understand program awareness, measure installation, decision-making factors, satisfaction with Xcel Energy, operating hours, and firmographics among customers who are eligible to participate in the Colorado Business DSM Programs evaluated in 2010, but have not yet done so. This includes the Recommissioning program as well as the Motor and Drive Efficiency Program. The research was conducted using telephone surveys implemented from September 24, 2010 to November 1, 2010. The surveys averaged 15.5 minutes in length.

Respondents were first asked a series of questions to screen out those who were ineligible to participate in either of the Business DSM Programs being evaluated (Recommissioning program or the Motor and Drive Efficiency Program). These screening questions included building size in square feet (to screen out those who fall below the 50,000 square foot requirement for the Recommissioning program), whether they have motors and/or drives at their facility (to screen out those who do not have any motors or drives), and whether they are current or recent participants in either program.

Sixty-seven respondents were eligible for the Motor and Drive Efficiency Program but had not yet participated (“motors nonparticipants”). Forty-four percent of the nonparticipants surveyed were managed Xcel Energy accounts (41 of 94). Thirty-three percent of motors nonparticipants were managed compared with fifty-three percent of recommissioning nonparticipants.

In this section, we first highlight key findings from the nonparticipant surveys relevant to the Motor and Drive Efficiency Program. This is followed by more detailed findings in the following categories: Program Awareness, Decision-Making Factors, Satisfaction, and Customer Profile.

6.2 KEY FINDINGS

Key findings from the nonparticipant survey include:

- There is evidence to support the net-to-gross findings that some business customers are willing to install efficient motors and/or drives without participating in a utility program. Twenty-six percent of motors nonparticipants indicated that they had already installed efficient motors or drives in the past two years.
- Nonparticipants who had implemented or considered implementing motors or drives most frequently mentioned not being aware of the program’s existence as their reason for not participating. While it was not a systematic issue, several respondents did mention that they did not participate because they felt the program was confusing or the application process too long or burdensome.
- Satisfaction with Xcel Energy among nonparticipants is high, especially among managed accounts. Most respondents (74 percent) stated that they were satisfied with Xcel Energy as their energy provider. Eighty-five percent of managed accounts and sixty-six percent of unmanaged accounts reported they were satisfied or very satisfied with Xcel Energy.



- Respondents reported that they most frequently refer to vendors or contractors when looking for more information on energy-efficient equipment (38 percent). If they were to implement energy-efficient equipment, 57 percent said they would contact a vendor or contractor. This indicates that trade ally participation is a key factor in funneling participants into the programs.
- Most respondents indicate that they have taken some type of action to reduce their energy use at their facility. Those who have not most frequently indicated that they did not feel that their facility currently needed to reduce energy.

When these findings are compared with the participant survey findings, several similarities and differences are clear. Seventy-four percent of Colorado nonparticipants rated their satisfaction with Xcel Energy as a seven or higher and Motors participants reported the same percentage as nonparticipants (74 percent) of those who indicated they were “satisfied” (7 or above on a zero to ten scale). Also, similar to Motors program participants, emails and mailings from Xcel Energy are the most frequently reported preferred methods of receiving program information amongst program nonparticipants. Finally, the most frequently reported barrier to installing new energy efficient equipment is a lack of capital or financing amongst nonparticipants - Motors program participants reported the same when it comes to barriers to participating in the Motor and Drive Efficiency Program. This may reflect the current economic climate, resulting in companies placing a lower priority on spending money on energy-efficiency.

6.3 DETAILED FINDINGS

6.3.1 Program Awareness

Regardless of program eligibility, most Colorado respondents indicated that they preferred to learn more about Xcel programs through an email from Xcel Energy (37 percent), a direct mailing from Xcel Energy (20 percent), or a bill insert (12 percent) (Table 6-1). No respondents indicated that they preferred to receive information via social media (i.e. blogs, Facebook, Twitter).

Table 6-1. How Respondent Prefers to Learn About Xcel Energy Programs

How respondent prefers to learn about Xcel Energy programs	Responses (n=94)	Percent
Email from Xcel Energy	35	37%
Stand-alone direct mail piece from Xcel Energy	19	20%
A flyer in your Xcel Energy bill	11	12%
Receiving a phone call from Xcel Account Manager	8	9%
Xcel Energy's website	6	6%
Workshop or Expo for customers	6	6%
Other (Specify)	9	10%

Source: Nonparticipant Survey, questions PA3-PA3E

The following presents findings specifically relating to motors nonparticipants.

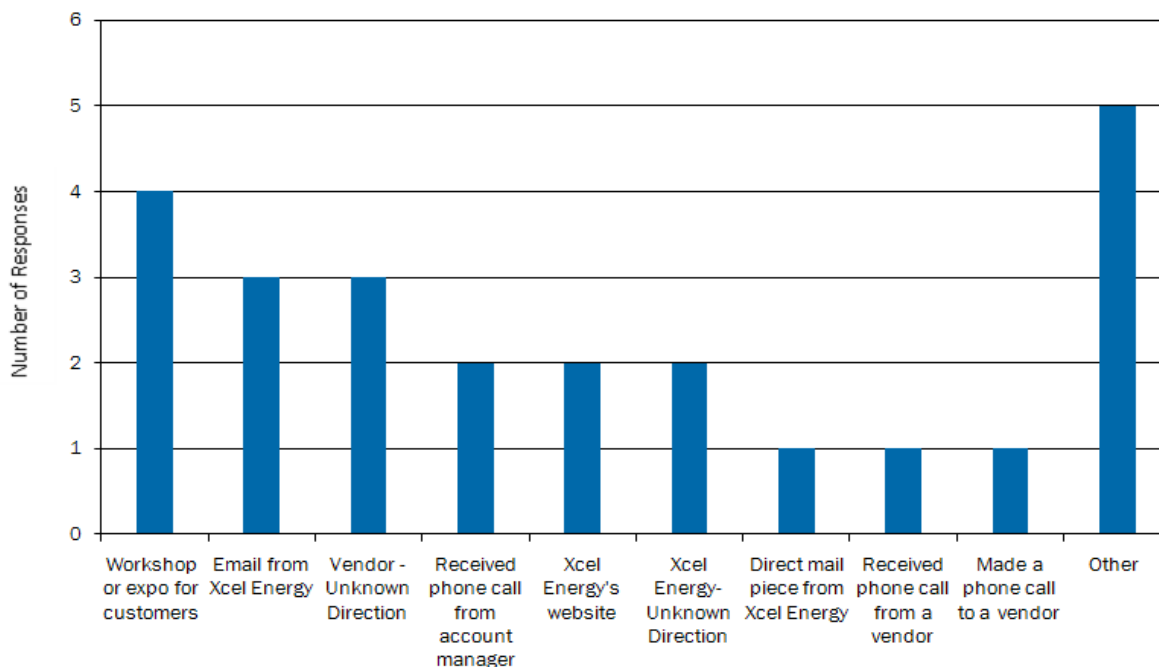
a. MOTORS

Twenty-eight percent of motors nonparticipants were aware of the Motor and Drive Efficiency Program. Of those who were aware, it was nearly an even split between managed and unmanaged accounts (10



were managed and nine were unmanaged accounts). Motors nonparticipants also frequently received information on the program from Xcel Energy; however, they also reported receiving information on the program from vendors (Figure 6-1).

Figure 6-1. How Respondent Heard of Motors Program (n=19)¹⁰



Source: Nonparticipant Survey, question PA1_1

Of those who had heard of the Motor and Drive Efficiency Program, a little more than half stated that the means through which they heard of it gave them enough information to participate (10 out of 18). Eight of the eighteen motors nonparticipants indicated that the source did not give them all the information needed to participate in the program. There was no one particular method identified that was ineffective in providing enough information.

As shown in Table 6-2, almost half of respondents eligible for the Motors program have either implemented or considered installing efficient motors or drives in the past two years (48 percent total). Twenty-six percent reported that they have installed energy-efficient motors or drives, while twenty-two percent indicated that they had considered it. Of those who indicated that they had not considered installing motors or drives in the past two years, seventy-nine percent were unmanaged accounts. Of those who had implemented or considered implementing efficient motors and/or drives (31 respondents), fourteen had heard of the program. Again, these findings support the recommendations made in the net-to-gross memo for the Motor and Drive Efficiency Program; there is evidence that

¹⁰ “Unknown direction” refers to customers who indicated “vendor” or “Xcel Energy” in an open-ended response, but did not indicate which communication method was used (i.e. placing a phone call, receiving a phone call, receiving an email, etc).



some customers are willing to install efficient motors and drives without the assistance of an Xcel Energy program, indicating at least some level of free-ridership.

Table 6-2. Implemented or Considered Implementing Motors or VSDs in Past Two Years

Respondent considered or has implemented Motors or VSDs in past 2 years	Responses (n = 65)	Percent
Yes, implemented	17	26%
Yes, considered	14	22%
No	34	52%

Source: Nonparticipant Survey, question PA4_1

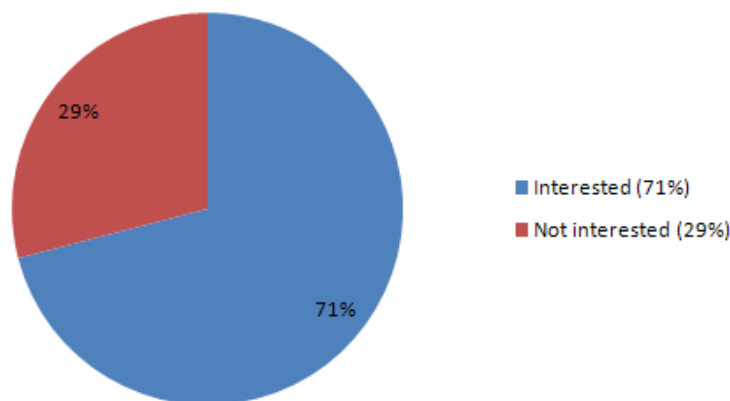
Sixty-five percent of those who considered or had already installed motors or drives indicated that they had considered or had already installed variable speed drives, while fifty-five percent indicated that they had considered or had already installed efficient motors. Five noted that they considered participating in the Motor and Drive Efficiency Program when they were thinking about installing these measures, and two mentioned that they actually applied to participate. Motors nonparticipants most frequently stated that they did not know the program was available for the particular measures they were installing as their reason for not participating in the program (42 percent). Ten percent noted that they needed the equipment immediately and did not have time to go through the program, and six percent stated that cost was a barrier in installing equipment through the program. Most responses gathered in the “Other” category indicated that the respondent simply had not “gotten around to it” yet, or they are in the process of hiring a firm to install the equipment.

Slightly over half of motors nonparticipants reported that either all or some of their motors were driven by variable speed drives (55 percent). When asked whether they had any plans to install new motors or drives in the next year, over one-third said yes (36 percent). Of those, fifteen respondents mentioned that they would be likely to install motors, and eleven mentioned they would be likely to install variable speed drives.

As shown in Figure 6-2, seventy-one percent of motors nonparticipants indicated that they would be interested in participating in the Motor and Drive Efficiency Program in the future (rating of seven or above on a ten point scale). Of those who gave a score of less than seven, a wide variety of reasons were given for a lack of interest in participating; two respondents indicated that the amount of the rebate was not significant enough, and two indicated that the program was still difficult to understand. One respondent each mentioned the application process and needing equipment immediately as barriers to participating in the program. In the “Other” category, respondents indicated a wide variety of reasons for not being interested in participating in the program, including simply not “getting around to it yet” and complications from changes in management in the near future.



Figure 6-2. Interest in Participating in Motor and Drive Efficiency Program in the Future (n=62)



Source: Nonparticipant Survey, question PA8_1

Next, we present overarching findings affecting all program nonparticipants in Colorado.

6.3.2 Decision Making Factors

Most frequently, respondents reported that they look to contractors or vendors when they want to gather more information on energy-efficient equipment and processes (38 percent). Nineteen percent stated that they would reference Xcel Energy, either through their website, or by contacting their account manager or the Business Solutions Center.

When asked who they would contact if they wanted to implement energy efficient equipment, fifty-seven percent said they would contact a contractor or a vendor. Another twenty-one percent stated that they would refer to internal staff, and ten percent would contact Xcel Energy (Table 6-3).

Table 6-3. Who Respondent Would Contact to Implement Energy Efficient Equipment

Who would contact to implement equipment/process	Responses (n = 94)	Percent
Contractor/vendor	54	57%
Internal staff	20	21%
Engineer	10	11%
Xcel Energy	9	10%
Manufacturer	6	6%
Other	8	9%
Don't know	5	5%

Source: Nonparticipant Survey, question 10b

When asked to rate the importance of several factors on their decision to install energy-efficiency equipment (on a scale where zero is not at all important and ten is very important), respondents rated compatibility with existing equipment the highest (9.1), followed closely by the efficiency level of



equipment (9.0). Life of equipment, initial purchase cost, and operating cost all were given a rating of 8.9. Lowest in importance were the recommendation of a utility and a recommendation of a vendor or supplier, given ratings of 7.5 and 7.2 respectively (Table 6-4).

Table 6-4. Factors Influential to Installing Energy-Efficient Equipment

Influencing factors	Mean	n
Compatibility with existing equipment	9.1	91
Efficiency level of equipment	9.0	94
Life of equipment	8.9	93
Initial purchase cost	8.9	93
Operating cost	8.9	94
Length of payback period	8.7	91
Environmental concerns	8.2	94
Availability of a program rebate	8.1	94
Age or condition of existing equipment	7.9	92
If equipment is readily available	7.8	92
Recommendation of utility	7.5	92
Recommendation of contractor or supplier	7.2	94

Source: Nonparticipant Survey, questions I1a to I1m

Twenty-four percent of respondents mentioned that their company has policies in place that mandate the use of energy efficient equipment. As shown in Table 6-5, when asked what barriers are in the way of installing new equipment, a majority of respondents (74 percent) mentioned a lack of capital. Other barriers mentioned include compatibility with existing equipment (10 percent), concerns about return on investment (7 percent), conflicts with the long-term budget (6 percent), and issues with the approval of decision-makers (5 percent).

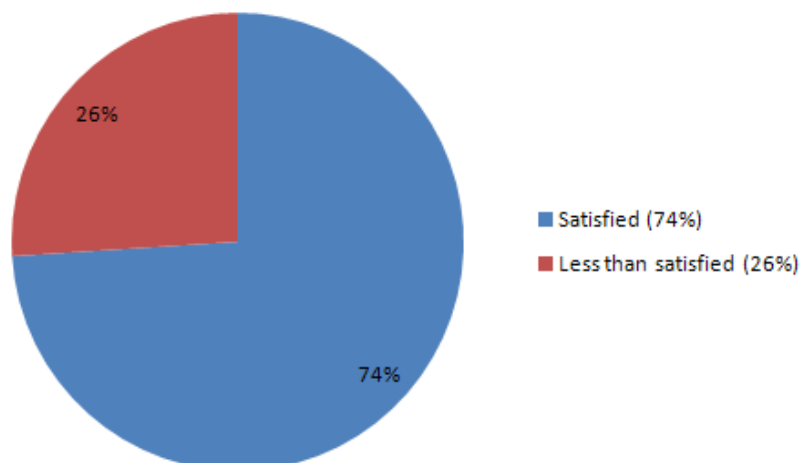
**Table 6-5. Barriers to Installing New Equipment (n = 94)**

Barriers to installing new equipment	Responses (n=94)	Percent
Lack of capital	70	74%
Compatibility with existing equipment	9	10%
Uncertain of return on investment	7	7%
Longer term budget	6	6%
Approval by decision-makers	5	5%
None	4	4%
Time constraints	2	2%
Lack of resources to implement	2	2%
Availability	2	2%
Contractors not familiar with measures	1	1%
Other	12	13%
Don't know	3	3%

Source: Nonparticipant Survey, question I4.

6.3.3 Satisfaction

Overall, program nonparticipants reported high levels of satisfaction with Xcel Energy as their energy provider. Nearly three-quarters of respondents (74 percent) rated their satisfaction with Xcel Energy as a seven or higher on a ten-point scale, where zero is not at all satisfied and ten is very satisfied (Figure 6-3). Eighty-five percent of managed accounts and sixty-six percent of unmanaged accounts reported they were satisfied or very satisfied with Xcel Energy. The mean of all responses was 7.2.

Figure 6-3. Satisfaction with Xcel Energy



Source: Nonparticipant Survey, question SA8

6.3.4 Nonparticipant Customer Profile

Most respondents own their facility (75 percent) with twenty-one percent renting, and two percent managing the property. Two percent mentioned that they own some of their property and lease other parts.

When asked if they had taken any additional actions to reduce their energy use at their facility in the past few years, fifty-three percent of respondents reported installing high-efficiency lighting equipment. Respondents also frequently mentioned installing lighting controls (22 percent) and high-efficiency heating equipment (15 percent).

Nineteen percent of respondents reported not taking any actions within the past few years to reduce their energy use. When asked why they had not taken action to reduce their energy use, ten respondents said that there was no need for them to do so at the time. Respondents also mentioned disruption to business operations, high initial cost and budget constraints, uncertainty about which equipment to install, and aesthetics as reasons for not taking action to reduce their energy use (Table 6-6).

Table 6-6. Reason No Other Actions Taken

Reason no other actions taken	Responses (n=18)
No need	10
Disruption to business operations	3
High initial cost	2
Budget constraints	2
Don't know what to do	1
Need for certain look/feel (aesthetics)	1
Other	3

Source: Nonparticipant Survey, question F7

6.4 CONCLUSION

Overall, program nonparticipants indicated a high level of satisfaction with Xcel Energy, and most would be interested in participating in the program at some point in the future. A major barrier to measure installation is a lack of capital. The findings in this memorandum indicate that while program information is reaching some customers, there are still marketing opportunities within the target markets. These findings also support the recommendations made in the net-to-gross memo, as a small group of respondents indicate that they have considered or have already implemented energy-efficient measures or actions without participating in a utility program.



7. EVALUATION RESULTS—BENCHMARKING

This section presents the results of the benchmarking study of 19 other motors and drives programs.

7.1 INTRODUCTION

The benchmarking study identified and characterized other utility programs of particular interest to Xcel Energy. The research focused on gathering the following types of information:

- Program goals, objectives, and scope: Are the goals, objectives, and program scope consistent with Xcel Energy's program?
- Effectiveness of the program in meeting goals and objectives: What has worked well and what has been a problem? What external influences may be influencing their programs and how are they addressing them?
- Key elements of program design: What are the structure, amount and type of incentive, and eligibility requirements?
- Marketing and recruitment of customers: How do they market and recruit customers? What key customer segments do and do not participate in the program? What is their customer retention?
- Quantification of program impacts: How do they determine their baseline and technical assumptions and net-to-gross calculations?
- Trade allies: How does the program leverage the trade ally market infrastructure? What technical, sales support or incentives are provided to trade allies?
- Program penetration and standard practice in their market: How do they estimate and track penetration and standard practice in their market? Does this vary by customer segment?

The research was conducted using a combination of internet searches, email inquiries and telephone interviews with utility program managers. The internet research provided program background information for 19 programs. The evaluation team created a draft summary table of the internet research, which the Xcel Energy product manager reviewed to identify programs of most interest for follow-up interviews. Evaluators next conducted eight in-depth interviews with program managers (6) and implementers (2) to obtain further insight into program design and implementation. The secondary research and in-depth interviews were completed between July and September 2010.

7.2 KEY FINDINGS

Xcel Energy's Motor and Drive Efficiency Program is generally consistent with most of the programs that were reviewed. In particular, the qualifying motor models and VFD end-uses are generally similar. In addition, the application/participation process is similar for most of the programs with both prescriptive and custom components. A comparison with the benchmarked programs indicates that Xcel Energy's prescriptive application forms provide good guidance and are not overly onerous to complete. In addition, Xcel Energy accommodates larger motors in its prescriptive program component as most of the benchmarked programs only have prescriptive rebates for motors up to 200 horsepower (HP).

In comparison to the benchmarked programs, Xcel Energy's rebates for prescriptive motors appear to be on the low side of the range. This appears to be a result of Xcel Energy having separate rebate



levels for New versus Upgrade motors. This is a different approach than the other programs. Xcel Energy's distinct and higher rebates for upgrade motors gives the program more design flexibility to fine-tune rebate levels for cost-effectiveness reasons than most of the benchmarked programs. At the same time, the benchmark research indicates that Xcel Energy's rebates for VFDs are relatively low.

The most commonly mentioned program challenge is upcoming federal regulations requiring the manufacture of NEMA Premium motors as the minimum efficiency. There is a mixed response in whether the programs will end prescriptive incentives at the end of 2010 or continue an inventory program element into 2011 as Xcel Energy is planning. Most programs are exploring other program elements to respond to the changes such as motors with higher efficiency thresholds above NEMA Premium, green re-winds, rebates for early retirement and increasing the custom portion of their program.

Most programs do fairly limited measurement and verification (M&V) of motors and drives because they are a smaller savings component of larger programs. The identified NTG ratios currently applied range from 70 percent to 96 percent. However, it is important to note that the 96 percent NTG is a placeholder that is currently being updated through a program evaluation and therefore will change in the near future.

The benchmarking study identified the following best practices:

- *Utilization of vendors to market the program as much as possible.* Vendors are in frequent, direct contact with customers and are well positioned to recruit participants of all sizes and from all sectors. Many customers prefer that vendors fill out program applications, and vendors can often do this more accurately than the customers. Application completion problems can be more quickly rectified by working with specific vendors.
- *Streamlined and clear application processes with expanded prescriptive offerings to the extent possible.* All of the programs strive to have streamlined, clear application processes, although some programs require pre-approval of prescriptive measures due to budget limitations. The simplest applications require the customer to only input measure quantities and calculate incentives (and attach invoices, etc.), or enter limited information into spreadsheets where incentives are automatically calculated. Care must be used, however, to ensure that spreadsheets or writeable PDFs work for all/most computers and software. Some program managers reported they are trying to move some custom drives for specific applications into a prescriptive program component, an option Xcel Energy is also interested in. Another program also recently increased its prescriptive motor component to 500 HP like Xcel Energy's.
- *Comprehensive program elements.* Some programs have enhanced their programs over the years to increase participation by adding new types of motors (vertical shaft, ECMs). The benchmarking study also indicates that green re-winds and motor inventories appear to be becoming more popular. Program managers report these are good program elements to respond to the current economic conditions and reduced capital investment opportunities.

7.3 DETAILED FINDINGS

This section first includes a summary table of the benchmarking results. Detailed findings are then presented in the following topic areas: Program scope and goals; Program design, measures and incentives; Program impacts; and Program recruitment and participation. Table 7-1 summarizes study information from the internet research as well as information from the program manager interviews. Interviews were conducted with program managers at the following organizations:

- NYSERDA (two interviews) – Existing Facilities Program, Business Partners Program for Motor Systems



- Southern California Edison – Express Efficiency
- Pacific Gas & Electric – Customer and Distributor Rebates
- Energy Trust of Oregon (on behalf of Portland General Electric, Pacific Power) – Production Efficiency: Motors
- Rocky Mountain Power (Utah, Wyoming) – FinAnswer Express¹¹
- Progress Energy, North Carolina – Energy Efficiency for Business
- Efficiency Vermont – Efficiency Vermont Rebate Center.

¹¹ Partial interview completed. Rocky Mountain Power also runs motors programs in parts of California, Oregon and Washington, with the goal of making all the programs generally consistent over time.

7. Evaluation Results—Benchmarking



Table 7-1. Study Information

Organization, State (Program Name)	Goals/Savings	Qualifying Prescriptive Motors	Prescriptive Motor Rebates	Prescriptive Motors Process	Application Guidance	Qualifying Custom Motors	Custom Motors Process	Organization, State (Program Name)	Qualifying Prescriptive VFDs	Prescriptive VFD Rebates	Prescriptive VFD process	Qualifying Custom VFDs	Custom VFD Process	Vendors	Website marketing	Other info
Xcel Energy, Colorado Motor and Drive Efficiency	2010 Goal = 21 GWh	NEMA Premium or higher, ODP and TEFC up to 500HP	1-200HP, New = \$25 - \$500 1-200HP Upgrade = \$200 - \$5,000 200-500HP, New = \$500 - \$1,000 200-500HP, Upgrade = \$5,000 - \$10,000	Application, invoice and specs required. Fax and mail submittals only.	Application lists steps and has example entries.	HP > 500, pre-approval required.	Separate Custom Efficiency application, engineering analysis and pre-approval required.	Xcel Energy, Colorado Motor and Drive Efficiency	Must operate pump or air movement devices up to 200 HP.	\$400 - \$8,000	Application and invoice required. Fax and mail submittals only.	HP > 200 or not for fans or pumps.	Separate Custom Efficiency application, engineering analysis and pre-approval required.	Vendors not listed on website. Vendors attend customer Expos. Vendors can submit applications for customers.	Downloadable documents on benefits of motors/drives upgrades, motor inventory and planning tools, rewind/repair info, Motor Decisions Motor info, NEMA Motors info.	"Enhanced NEMA" motors are 1% more efficient than NEMA. Have higher rebate amounts.
Efficiency Vermont, Vermont Rebate Center	2010 prescriptive motor goal = 1,200 MWh. 2009 performance: 138 motors participants, 4,387 MWh saved	NEMA Premium, ODP and TEFC up to 200 HP	1-200HP, New = \$50 - \$800	Return completed Main Program application and Motors application along with proof of purchase, residency, motor, function/location, NEMA efficiency, operating hours.	First page of application gives step by step guidance. Includes example entries.	HP > 200 or operating hours very different than 2,000 per year, must pass State cost-effectiveness tests.	Preapproval and engineering review required - contact Efficiency Vermont for details. Significant assistance provided through contracted engineers.	Efficiency Vermont, Vermont Rebate Center	New VFDs for HVAC, supply fans, exhaust fans, pumps, chilled water pumps, heating hot water circulation pumps	3.0 HP = \$500, 5.0 HP = \$750, 7.5 HP = \$1,000, 10.0 HP = \$1,200	Same application as prescriptive motors. VFD specific section towards the end.	VFDs > 10 HP or for other end uses that could save energy (air compressors, sewage pumps). Must pass state cost effectiveness tests.	Preapproval and engineering review required - contact Efficiency Vermont for details. Significant assistance provided through contracted engineers.	Vendors on website if complete at least 1 project get training. Can submit applications but customer must rebate unless signed consent.	Link to motormaster.org	motor program rebate is ~ 20 HP. May increase prescriptive drive HP and expand uses. May consider adding inventory program element like NYSERDA. Program is managed by internal staff. Some engineering assistance is available.
NYSERDA, New York Business Partners Program for Motor Systems, Existing Facilities Program	No specific motors/drives rebates goals. 2004 - 2008 Incentives goal = 100. Have done at least 114 (some not reported) covering over 10,000 motors.	NEMA Premium or higher, ODP and TEFC up to 200 HP	1-200HP, New ODP = \$45-\$630; TEFC = \$50-\$700	With motors application, attach main program application (customer information). Attach documentation - utility bill with SBC notation, invoice, spec sheets with manufacturer/model number.	First page of application describes eligibility & required data. Includes an example entry.	Large projects with HP > 200. Custom projects have \$10,000 minimum incentive (equal to approx. 83,000 annual kWh across New York). Capped at 50% of project costs (usually 15%).	Requires energy analysis by customer or ESCO. Technical analyses contracted out to 3P - do pre-proposal meeting and inspections	NYSERDA, New York Business Partners Program for Motor Systems, Existing Facilities Program	Lighthouse rate, air pumps eligible, others go through Performance Based (Custom) program. VFD speed must be automatically controlled by differential pressure, flow or temperature. Must have minimum 3% impedance series reactor in AC power input connection. Used or rebuilt equipment not eligible for pumping or air-handling. Min operating hours of 2,000/year. Backups/replacement units do not qualify. System must be controlled by differential pressure, flow, temperature, or other control variable. Must have large load diversity and be operational for May 11 - 30 11	\$900-\$6,000	Complete Main Program application. VFD application, and include proof of purchase.	Requires energy analysis by customer or ESCO. Technical analyses contracted out to 3P - do pre-proposal meeting and inspections	Vendors on website if complete at least 1 project get training. Can submit applications but customer must rebate unless signed consent.	Website section for vendors program overview, vendor support (network of field reps), marketing tools, FAQs, education opportunities, case studies, etc. Vendors also included in Motor Inventory section. Highest vendors not included in Motor Inventory section. Success stories. Evolution of NEMA rebates	Inventory portion of program contracted to 3P. Vendors get NEMA and rebates training, site visits, tools to do audits (entered into Motor Master). 3P contractor visits customers with vendors to build trust and do O/C. Prescriptive program elements managed by internal staff.	
Ameren, Illinois Act on Energy Business Program		NEMA Premium, ODP and TEFC up to 200 HP	1-200HP, New = \$7-\$450	Complete application, submit for pre-install approval (usually complete within 10 days, and valid for 90 days). Submit documentation upon project completion (due w/in 30 days). May conduct post-install inspection for verification.	Guidance section on first page of application, and lengthy detailed terms & conditions section. FAQ on the website.	HP > 200, based on kW and use.	Complete application, submit for pre-install approval (usually complete within 10 days, and valid for 90 days). Submit documentation upon project completion (due w/in 30 days). May conduct post-install inspection for verification.	Ameren, Illinois Act on Energy Business Program		\$75/HP, can't exceed 75% of the project cost.	Same application and process as prescriptive motors.	VFDs exceeding 500 HP.	Call to discuss eligibility.	Database of program offers on website. O&A section discusses the benefits of being an ally. Allies can receive incentive checks directly and apply credit on customer's invoice.	Link on the main business section for Motor System incentives. Leads to FAQ, energy-saving resources, case study application links.	Program is administered by internal staff.
Arizona Public Service, Motors & VSDs		NEMA Premium or higher, ODP and TEFC up to 500 HP	1-200HP, New = \$10 to \$1,500HP 200-500HP, New = \$1-\$1.4P	Submit pre-notification application. Install. Within 6 months, submit final application and copies of invoices & receipts detailing purchases, services provided and other costs. If Express Solutions customer (< 100kW), install contractor does all paperwork. Program pays the rebate directly to the contractor.	One XLS document for all incentives (lighting, retrofit, motor, etc). Tabs at beginning explain how to use, but not completely clear. No examples provided, but application has checklist of all docs needed.	Incentives for any project (retrofit, motor, etc) that produces verifiable savings, but doesn't fit the prescriptive list. Funded at \$0.11/annual kWh savings. Checklist similar to prescriptive process. Payment happens 4-6 weeks after approval.	Must pass Benefit/Cost test. Rebasement projects must provide old equipment removed from site. Must provide description of proposed project, facilities affected, and detailed cost breakdown by measure. Checklist similar to prescriptive process. Payment happens 4-6 weeks after approval.	Arizona Public Service, Motors & VSDs	Incentive per horsepower (all sizes). VSDs required by ASPE&E 60.1, O&A are not eligible for New Construction Incentives.	\$60/HP, can't exceed 75% of measure cost through Nov 2010.	Same application and process as prescriptive motors.		Customer proposal (engineering analysis) project pre-approval/customer acceptance. Installation (submit proof of installation). Final approval letter issued and check sent to customer.	Link on main page for Business program for monthly demand of 100 kW or less. An approved contractor conducts a free facility assessment, handles all paperwork and installs the equipment. Higher rebate handling offered to business-qualified for enrollment on first-come, first-served basis. Load management programs to help customer understand their energy consumption. Motors and Drives program is administered by internal staff.	Program management and operations are outsourced. Express Solutions for Business program for monthly demand of 100 kW or less. An approved contractor conducts a free facility assessment, handles all paperwork and installs the equipment. Higher rebate handling offered to business-qualified for enrollment on first-come, first-served basis. Load management programs to help customer understand their energy consumption. Motors and Drives program is administered by internal staff.	
Connecticut Light & Power, Connecticut Monthrip	Jan. 2005 - June 2006: 46 motors participants, total 591,269 kWh saved	NEMA Premium, ODP and TEFC, must operate at least 2000 hours annually	1-200HP, New ODP = \$45-\$630; TEFC = \$50-\$700	Send in signed application, invoice and manufacturer's specification sheet.	Application has example entry.	Prescriptive application may save custom rebates may be available for > 200 HP, must call.	Not on website, must contact program for more information.	Connecticut Light & Power, Connecticut Monthrip						No information on website.		
Efficiency Maine, Maine Energy Wise		NEMA Premium, ODP and TEFC up to 200 HP	1-200HP, New or Upgrade: ODP = \$45, \$630; TEFC = \$50-\$700	Send application, specification sheets, and invoices after installation. Separate but similar applications for new construction and retrofit motors.	Application has step by step eligibility determination and application requirements; has example entry to outline "ask an expert" form.	Custom incentives, available on a case by case basis. Incentive based on energy savings compared to previous system or, for new construction, a baseline standard.	Customer proposal (engineering analysis) project pre-approval/customer acceptance. Installation-post installation verification and possible inspection.	Efficiency Maine, Maine Energy Wise	Eligible end uses include: supply/return fans for air handling, chilled/hot water pumps, circulation pumps on hours source heat pumps, boiler feed water pumps and hydraulic pumps, blowers on dust collection systems and boiler draft fans.	7.5 - 20 HP = \$1,700 25,500	Separate applications for retrofit and new construction VFD projects; complete & sign application, obtain "pre-approved incentive" letter, complete the project and send signed copies of invoices and pre-approved letter.	Application requires information on baseline material/labor costs.	Customer proposal (engineering analysis) project pre-approval/customer acceptance. Installation (submit proof of installation). Final approval letter issued and check sent to customer.	Online tool to find a qualified partner: list of benefits for companies registered as Qualified Partners.	Materials website section includes a brochure, guidelines, glossary of terms, technical sheets, tips & information on VFDs, "Plan Ahead and Be Ready", Retire Motors Fast", motors & VFD case studies.	Field staff can work onsite with contractor during project development. Motors and Drives program is administered by internal staff.
Energy Trust Oregon, Oregon Production Efficiency: Motor Rebate Program	No program goals. Total motors participants = 200. Total 1-200 HP motors = 967 (2010 YTD is 75). Total custom motors = 13. Total Green Rewinds = 170 (2010 YTD is 67)	NEMA Premium, ODP and TEFC up to 200 HP	1-200HP, New = \$10 - \$2,000	Industrial/Ag 1. Purchase a qualifying motor listed on program information sheet. 2. Fill out Form O&A and submit it to Energy Trust along with any required invoices or documentation. Business: 1. Find a contractor. 2. Install new equipment. 3. Submit form 12ge with the contractor invoice, utility bill and IRS Form W-9 & 4.	Very straightforward application. Check box for quantity & type of motor. Fill out participant information & send in with proof of purchase.	HP > 200, \$0.25/annual kWh saved up to 50% of total approved cost. Must be installed by 10/31/10 and final paperwork in by 12/31/10. Maximum of \$500,000 per site per year.	Discuss project with Energy Trust. Submit Energy Information Release form to avoid project. Complete technical study if needed. Receive Project Detail & Incentive Estimate from Energy Trust. Obtain contractor bids. Sign Incentive Offer and Agreement. Implement project. Submit invoice, utility bill, IRS Form W-9 and Completion Certification form. May be post-installation incentive if incentive Contact EM for a site visit. Staff will evaluate the motor system as a whole, measure the baseline and provide an estimate on the savings. When the motor is installed, a post-installation energy measurement determines the incentive amount.	Energy Trust Oregon, Oregon Production Efficiency: Motor Rebate Program	Supply/return fans, exhaust fans, chilled/hot water distribution pumps, boiler feed pumps.	3-8 HP (Cumulative motor HP controlled by each VSD): \$700 - \$1,200	Same application and process as prescriptive motors.	Larger VFDs or for non-prescriptive uses (HVAC sensors) eligible for incentives up to 50% of incremental costs based on 25¢ per annual kWh saved and \$1.00 per therm saved.	Similar process as custom motors, regional Sales Engineers assist with technical calculations and applications for (motors projects too).	Web portal to find a vendor/contractor. Vendors have simple 1-page tear-away application pads for prescriptive measures.	Industry & Agriculture page has a direct link for Motors & Drives. This link opens a well formatted page that has information on Details, Eligibility, Steps, and forms. Also has VFD Upgrades Calculator. Can follow program on Facebook and Twitter.	Program mostly run by internal staff, some vendor marketing contracted out and also Sales Engineers for custom projects (by region/sector). Have Green Rewind program for up to 5,000 HP. Western States Production Group runs program in Oregon motors. \$1/HP for customer and shop, \$.25/kWh to O&P for utility. Incentives listed, no forms received.
Eugene Water & Electric Board, Oregon Premium Efficiency Motor Rebate Program / Easy Upgrades	2007: 31 motors participants; 2008: 3 motors participants	Must be: 1. a new, three-phase, AC induction motor, 2. One to 500 HP, 3. NEMA design A, B, or C, 4. Installed or inventoried in EWER's electric service area.	1-200HP, New = \$20 - \$1,250 200-500HP, New = \$1,250 - \$2,150	1. Suppliers and contractors may offer the rebate as a discount from the motor purchase price. Motor price, rebate, and net price will be itemized on invoice. OR 2. Apply directly to EWER for rebate. Submit applications within 60 days of purchase with copy of purchase invoice.	Either receive rebate through supplier or contractor as a discount purchase price, or submit 1-page application within 60 days of purchase.	Determined on a case-by-case basis, and usually requires an on-site staff visit.		Eugene Water & Electric Board, Oregon Premium Efficiency Motor Rebate Program / Easy Upgrades					A supplier reimbursement form stating the vendor can sell the customer a NEMA motor, and give the customer the full rebate as a discount on the purchase price. Vendor then submits Reimbursement form within 60 days.	Very difficult to find hidden in the Business section.		
Idaho Power, Idaho Easy Upgrades, Building Efficiency, Custom Efficiency		NEMA Premium, ODP and TEFC up to 200 HP	1-200HP, New = \$20 - \$750; for retrofit = \$3 per change in HP	Preliminary application reserves project's incentive for up to 90 days. An incentive acceptance is sent with details on deadlines and next steps. After project is complete, submit final stage application form and supporting documentation.	General guidelines for all business programs.	Motors > 200 HP may be eligible. \$30 for ECM Motor	Not on website, must contact program for more information.	Idaho Power, Idaho Easy Upgrades, Building Efficiency, Custom Efficiency	For non-MIAC system motor control between 5 and 200 HP. Must operate at least 2,000 hours per year.	\$40/HP	Incentives are based on the motor horsepower that each VSD controls. An analysis that shows the motor's loading, profile and manufacturer's specification sheet for the VSDs to be used.			No information on website.	Under Energy Efficiency Business Programs. Monthly call for information under the "Easy Upgrades" program page.	

7. Evaluation Results—Benchmarking



Organization, State	Goals/Savings	Qualifying Prescriptive Motors	NEMA Premium Rebates	Prescriptive Motors Process	Application Guidance	Qualifying Custom Motors	Custom Motors Process	Organization, State	Qualifying Prescriptive VFDs	Prescriptive VFD Rebates	Prescriptive VFD Process	Qualifying Custom VFDs	Custom VFD Process	Vendors	Website marketing	Other Info
NV Energy, Nevada Nevada Sure Bid	No formal goals for motors and drives. Motors demand estimated at \$ 5,000/yr. Program vendors sell 1,000 motors per year; 20-40 custom projects per year.	NEMA Premium or higher, ODP and TEFC up to 200HP	1-200HP, New = \$6 - \$300	1. Submit pre-approval, Application and Project Information forms. Good for 90 days. 2. Obtain Funding Reservation Letter. 3. Install measures within 90 days. 4. Submit Completion Transmittal, Application and Agreement. 5. Provide documentation as directed. 6. Receive incentive based on program database, confirm desired motor is eligible. Database is pre-loaded with motor specs, efficiency levels, models - don't have to type in much info. System tells vendor what rebate is, records customer info, processes rebate automatically. Requires customer pre-approval.	Polices and procedures document. General application for any incentives/rebates. Some guidance at beginning.	Prescriptive projects with estimated Incentives > \$1,500 or expected annual energy savings of 750,000 kWh per year. Pre-notification applications required.	Pre-notification required.	NV Energy, Nevada Nevada Sure Bid	For < 200HP HVAC fans, single speed cooling tower fans, chilled/condenser and hot water circulation pumps, boiler feed water pumps as well as for installations on process related machinery.	\$60/HP	Same application and process as prescriptive motors.			A list of Southern and Northern contractors is provided with a disclaimer. A \$25 incentive for contractors who enter the installed unit information into utility's tracking system.	Motor information found in program summaries and applications.	Sure Bid Team will conduct pre-inspections as necessary (after a Pre-Notification Application is submitted)
Pacific Gas & Electric, California Customer and Distributor Rebates	No formal goals for motors and drives. Motors demand estimated at \$ 5,000/yr. Program vendors sell 1,000 motors per year; 20-40 custom projects per year.	NEMA Premium or higher, ODP and TEFC up to 500HP	1-500HP, New = VENDORS paid \$15-\$200 per motor (some may be passed on to customer)	Submit pre-approval Incentive application. When approved, proceed with install. When project completed, submit all required documentation, including paid invoice and final incentive application for the rebates within 60 days of completion. Payment takes approximately 8 to 10 weeks.	N/A	NEMA motors > 500 HP, paid at \$0.09 - \$0.26 per kWh, \$100 - \$150 per on-peak kW, and \$1 them, capped at 50% to 80% of measure cost.	Complete downloadable project application spreadsheet with estimated savings. PG&E must approve project before install, and inspects existing equipment for retrofits. Incentives finalized after project approval.	Pacific Gas & Electric, California Customer and Distributor Rebates	For HVAC supply air fans up to 100HP	\$80/HP May add vendor incentives in future.	Most drives that are not prescriptive, paid at \$0.09 \$0.26 per kWh, \$100 - \$150 per on-peak kW, and \$1 them, capped at 50% to 80% of measure cost.	Complete downloadable project application spreadsheet with estimated savings. PG&E must approve project before install, and inspects existing equipment for retrofits. Incentives finalized after project approval.	Complete application form and submit with proof of purchase. Form collects customer tax and property info, and allows payment transfer. Form has example entries. Customers can also submit online.	Vendors drive prescriptive motors element and receive the program incentives. Are listed on EASA website but not PG&E.	Business/Energy Savings & Rebates webpage has links to custom incentives application, and deemed incentives product list (with VFDs) and application. No separate motors and drives info.	Partners area on program management and operations are outsourced. Few motors rebated, most industrial customers have opted out of program. Customers with \$500,000-2,000,000 annual kWh can receive up to 50% of the cost of an energy or feasibility study every 3 years, up to \$10,000 of incentives for contracted feasibility studies, energy audits, etc.
Progress Energy, North Carolina Energy Efficiency for Business	No formal goals for motors and drives. 2010 VFD savings for custom motor/drives = 2,140 MWH, prescript motor/drives = 3 MWH.	1-200 HP, ODP and TEFC. Rise/wind motors do not qualify. Incentives are based on the motor's Internal Full Load Efficiencies.	1-200HP, New = \$10-\$450	Submit pre-approval Incentive application. When approved, proceed with install. When project completed, submit all required documentation, including paid invoice and final incentive application for the rebates within 60 days of completion. Payment takes approximately 8 to 10 weeks.	General application for all rebates. Polices and procedures manual details everything customer needs to know.	For motors > 200 HP, one-time payment = \$0.08/kWh saved in first year. Required payback period is between one year and less than 7 years. Incentive can cover up to 75% of the incremental measure cost.	Pre-approval required. Program engineer's work with customer or installing contractors to review the proposed savings methodology and to identify the information necessary to support the savings estimate.	Progress Energy, North Carolina Energy Efficiency for Business	For existing chillers, cooling towers, HVAC fans, or HVAC pumps. VFD must accompany the permanent removal or disabling of any flow control or throttling devices such as inlet valves, bypass dampers, and valves.	\$45/HP	In HVAC program, submit pre-approval application, receive approval. Do installation; submit documentation including paid invoice with final incentive application within 60 days of completion.	VFDs for process applications (mostly air compressors), paid at \$0.08/kWh saved in first year. Incentive can cover up to 75% of the incremental measure cost.	Pre-approval required. Program engineers work with customers or installing contractors to review the proposed savings methodology and to identify the information necessary to support the savings estimate.	Online tool to search for a contractor. Marketing tools available for participating TIEs.	Several pages of information about efficient motors, and VFDs. Online brochure. Can follow on twitter.	Partners area on program management and operations are outsourced. Few motors rebated, most industrial customers have opted out of program. Customers with \$500,000-2,000,000 annual kWh can receive up to 50% of the cost of an energy or feasibility study every 3 years, up to \$10,000 of incentives for contracted feasibility studies, energy audits, etc.
Progress Energy, Florida Motor Upgrade		1. Rise/wind motor/drives phase and 1 HP or higher. 2. If motors are 25 HP or smaller, minimum of 2.	1-200HP, New = \$5 - \$375 Any motor size > 250 HP must be 95.4% and receives \$1,75/HP	Provide copies of invoices and itemized inventory of equipment installed.	One example entry in program brochure.	No information on website.	Not on website, must contact program for more information.	Progress Energy, Florida Motor Upgrade	No information on website.		No information on website.			Online brochure, limited information. Have to contact utility for info on how to apply, etc.	Program management and operations are handled internally.	
Puget Sound Energy, Washington Premium Efficiency Motor Rebate Program		NEMA Premium or higher, ODP and TEFC up to 200HP	ODP: \$81(-5HP) to \$2(125-200HP) per HP. TEFC: \$20(1-5HP) to \$3 (125-200HP) per HP	1. Purchase and install qualifying equipment. 2. Submit signed application for payment, material receipts or contractor invoice. Funding availability is subject to annual program budgets.	Documentation requirements listed on application, no examples.	No information on website.	Not on website, must contact program for more information.	Puget Sound Energy, Washington Premium Efficiency Motor Rebate Program	VSDs for use in HVAC fan or closed loop pump applications, with a variable load, where not required by code.	\$100/HP	Obtain pre-authorization letter, complete the installation within 60 days of authorization; submit application along with receipts or contractor invoices.			Found under "Other Rebates", includes eligibility guidelines, how to participate, and a link to the NEMA website.	Program management and operations are outsourced. Resource Conservation Manager program - PSE provides participation form for RCMs employed by customers. PSE works with the RCM to increase customer efficiency.	Motors and Drives program managed internally and operated by contractor. Most commercial and industrial participation is via vendors who fill out applications. Recently added Green Reward element, participation low but growing; delivered by 3P.
Rocky Mountain Power, Utah, Wyoming FinAnwer Express	No specific motors and drives goals.	NEMA Premium or higher, Design A or B up to 200 HP, TEFC and ODP	1-200HP, New = \$45-\$630 200-500HP, New = \$630-\$1,229	Order/purchase & install, complete the application packet forms, sign the documents, retain copies of all forms and documents, mail the forms and documents to processing center.	In application packet, step by step checklist.	Electronically commutated motors and generator motor rewinds.	RMP does analysis of measures costs and energy savings. Incentives = RMP's estimate of annual energy savings x 30.08/with.	Rocky Mountain Power, Utah, Wyoming FinAnwer Express	VFDs > 100 HP for HVAC and pumps	\$65/HP	Same application and process as prescriptive motors. Submit a detailed sales receipt and a current copy of the customer utility bill.	Larger VFDs, farm and dairy, some compressed air.		On main rebate page, list of contractors, distributors, and other resources participating. Provided "robby as a convenience" and does not warrant or guarantee work.	Program under both Small Commercial and Industrial Large Commercial. Online inquiry form; email for experts; PDF brochure, case studies.	For new construction projects, rebates not available where VFDs are required by ASHRAE 90.1 2004, which requires a VFD on HVAC fans > 10 HP. Program management and operations are outsourced.
Salt River Project, Arizona Powerwise Standard Business Solutions Motor Rebate Program		New, three phase, induction motors; NEMA 1-500 HP ODP and TEFC, 1200, 1800, or 3600 RPM	1-200HP, New = \$30-\$465 200-500HP, New = \$530-\$990	Complete & submit rebate reservation request (optional, but recommended). Purchase & install approved measures. Complete & submit rebate application with dated sales receipt/invoice.	General application for all prescriptive rebates. Application checklist.	Electronically commutated motors - 350/HP	Same as prescriptive.	Salt River Project, Arizona Powerwise Standard Business Solutions Motor Rebate Program	HVAC fans and pumps < 100 HP. For retrofit projects with variable load, any throttling or bypass devices (such as inlet valves), bypass dampers. Three-way valves or throttling valves must be removed or permanently disabled. Rebates are not available for retrofits of existing VFDs.	< 100HP = \$55/HP	Use the general application; submit with invoice and receipts.	VFDs larger than 100HP may be eligible for rebates under the Powerwise Custom Business Solutions program.	Submit general application with a dated sales receipt/invoice. In the Rebate application mark the "Efficiency" as "NA" and the Measure Size as "N/A" and the nameplate motor size of the affected motor.	List of contractors, distributors, and other Alliance participants that focus on Motors/VFDs. Has name, city, contact info, and description of company.	Webpage for all rebates, shows current total rebates funds available, online application forms, program requirements, and case studies.	For new construction projects, rebates not available where VFDs are required by ASHRAE 90.1 2004, which requires a VFD on HVAC fans > 10 HP. Program management and operations are outsourced.
San Diego Gas & Electric, California Energy Efficiency Business Rebates		NEMA Premium Efficiency ODP and TEFC motors, 1-200 HP	1-200HP, New = \$35-\$1,260	Complete and submit application with customer/tax info, package designer, invoice, product model and manufacturer specifications. Application can be mailed, faxed or emailed.	General application for all prescriptive rebates. Only one example for daily operating hours.	Electronically commutated motor - 335/Motor. Efficient evaporator fan motor - 350/Motor	Use the same prescriptive application; fill out additional section at end that asks for Energy/On-Peak demand savings.	San Diego Gas & Electric, California Energy Efficiency Business Rebates	HVAC fans & throttling devices, such as inlet valves, bypass dampers, valves, are removed or permanently disabled.	\$80/HP	Same application and process as prescriptive motors.			No information on website.	Case studies	Motors and Drives program is administered entirely by internal staff.
Southern California Edison, California Express Efficiency	No specific motors and drives program or goals. 2008 Savings: Industrial Motors - 11,861,273 kWh. Industrial VFDs - 11,391,741 kWh	NEMA Premium or higher, Design A or B up to 200 HP, TEFC and ODP	1-200HP, New = \$35 - \$1,260	Two paths - 1. After installing qualified motor, submit incentive application online or by mail. Must have a customer account to submit online. 2. Prior to installation, submit application including planned project. SCE sends an Express Installation Report Form to complete and return once project is complete. Submit with proof of payment, and manufacturers' specification sheets.	Application includes multiple Yes/No checkboxes to ensure eligibility, and sample entries. Online application tool provides guidance, SCE has database of manufacturer specifications to assist customers.	Non-prescriptive motors of any size, new or added motor load, motor generator set replacements paid at \$ 0.9/kWh or \$100/kWh, capped at 50% of project.	Call customer rep, then fill out application. Applications vary by sector/program. Many custom generator set replacements paid at \$ 0.9/kWh or \$100/kWh, capped at 50% of project.	Southern California Edison, California Express Efficiency	VFDs replacing inlet guide vanes or bypass dampers on existing HVAC supply air fans no larger than 100 HP. Throttling devices must be permanently disabled.	\$80/HP	Return application; a qualified contractor arranges a pre-inspection, receive Project Approval letter, sign & Return Agreement and install. Complete & return the Installation Report with the required supporting documentation; a SCE contractor arranges post-inspection. SCE issues incentive check.	VFDs for chiller compressor, ventilation fan, condenser fan, cooling tower, chiller and hot water pump motor. Kitchen exhaust fan, parking garage exhaust fan, condenser water pump - paid at \$ 0.9/kWh or \$100/kWh, capped at 50% of project.	Call customer rep, then fill out application. Applications vary by sector/program. Many custom projects identified during free comprehensive audits; significant engineering and financial analysis provided by SCE.	Customer referral program directory of contractors.	Lots of info in Business/Energy Construction/Field Solutions website section. No simple links for motor/drives - info is organized by customer sector, have to drill down for prescriptive rebates catalog.	Not known if Express Efficiency operated internally or contracted. 3P contractors used to run sector-oriented programs (e.g. refrigeration). Custom and large project rebates (> \$250,000) paid 60% up front, 40% after M&V. Promote Motor Decision Matrix for customer selection; may result in immediate replacements for 15%.
Western Massachusetts Electric Co., Massachusetts MotorUp		NEMA Premium efficiency, three-phase 1-200 HP ODP or TEFC 1200, 1800 or 3600 RPM motors. All motors must operate a minimum of 2,000 hours annually.	1-200HP, New ODP: \$45-\$630; TEFC \$65-\$700	Check eligibility. Receive pre-approval. Install equipment. Submit application with copy of invoice. Receive rebate after post installation verification.	Example entries for all parts of the application.	HP < 200, or if differs from prescriptive motor characteristics.	Contact program administrator to ensure eligibility. Pre-approval submitted and pre-approved incentive letter issued. Install equipment. Fill out custom rebate application and send a copy of invoice. Installation verified, and rebate sent.	Western Massachusetts Electric Co., Massachusetts MotorUp	Use of qualifying installation types in the application.	\$1,350 (ODP) to \$1,350 (ODP)	Separate applications for retrofit and new construction; obtain pre-approval, install equipment, return application, invoice, and post-installation section of the original application.	VFDs installed in process applications, waste water or municipal water supply uses.	Custom application requires detailed energy savings calculations.	WMECO maintains a list of licensed suppliers and energy brokers offering services in the service territory. Tips provided to help select the right supplier.	Equipment Information pages. Links to applications containing step by step instructions and contact information for all program administration contacts.	Motors and Drives program is administered by internal staff.



7.3.1 Program scope and goals

Xcel Energy's 2010 savings goal for the Motor and Drive Efficiency Program is approximately 21 GWH. Information about other programs' savings goals, specifically for motors and drives, was not available on the internet, however the program manager interviews completed reveal that most programs do not have formal participation or savings goals, as savings from these measures are typically small relative to other measures that receive more focus (e.g., lighting). Instead, savings goals from motors and drives are typically grouped with other measures at the sector (business, industrial) or state level. Most of the program managers or implementers noted that they were generally satisfied with their programs' participation, noting that both large and small customers install measures through the programs. One program with a specific savings goal for prescriptive motors, however, noted that 2010 participation has been far below expectations. Another program manager noted that for their public benefits program few motors are rebated because most industrial customers have opted not to pay into state energy efficiency programs.

The most commonly mentioned program challenge was upcoming federal regulations requiring the manufacture of NEMA Premium motors as the minimum efficiency. Planned changes are presented in Table 7-1 below. In summary, there is a mixed response in whether the programs will end prescriptive incentives at the end of 2010 or continue an inventory program element into 2011. Most programs are planning to terminate their prescriptive rebates unless additional analyses show that it is cost effective to rebate the highest efficiency Premium Plus motors. Most programs are also exploring other program elements to respond to the changes, such as motors with higher efficiency thresholds above NEMA Premium, green re-winds, rebates for early retirement and increasing the custom portion of their program.



Table 7-2. Planned 2011 Program Changes

Organization, State (Program Name)	Planned 2011 changes
Efficiency Vermont, Vermont (Rebate Center)	Will analyze new high efficiency thresholds, are 5-6 levels above NEMA Premium on CEE website covering 600 motors, will assess rebates cost effectiveness and then determine program continuation.
NYSERDA, New York (Business Partners Program for Motor Systems, Existing Facilities Program)	Motors inventory program element will continue; considering options for motors rebates - for early retirement only, continued new purchases, and/or green re-winds.
Pacific Gas & Electric, California (Customer and Distributor Rebates)	May offer vendor rebates only for Tier 2 motors that exceed NEMA Premium by 2% to 4% - TBD by 3P implementer. Concerned that many manufacturers will not be able to exceed NEMA Premium and supply will drop significantly. Will consider motor inventory program and green re-winds if CPUC will allow savings.
Energy Trust Oregon, Oregon (Production Efficiency: Motors)	Will end prescriptive motors rebates, may still do custom projects > NEMA Premium, but will be much more difficult to make cost effective.
Progress Energy, North Carolina (Energy Efficiency for Business)	Will end prescriptive motors rebates in late December.
Rocky Mountain Power, Utah, Wyoming (FinAnswer Express)	Ending prescriptive rebates in December unless can find cost effective NEMA Premium Plus threshold and use that. Will increase focus on green re-winds.
Southern California Edison, California (Express Efficiency Premium Efficiency Motors)	Considering 3P motors inventory program and green re-wind program, although savings are small and hard to measure. Incremental energy savings from NEMA Tier 2 motors not justifying higher cost, but still being studied.

Other challenges reported include the poor economy. It was reported that the poor economy has driven some customers out of business, and other customers are changing from three to two cycle motors or conducting more repairs.¹² In addition, new state and/or federal clean air regulations to address global warming have the potential to redirect customer spending away from energy efficiency, according to one interviewee. On the other hand, increasing interest in “green” and LEED construction in particular is helping to offset some of the adverse economic impacts.

Some programs have enhanced their programs over the years to increase participation by adding new types of motors (vertical shaft, ECMs). The most commonly reported way to increase participation was to conduct outreach to more vendors to promote the program. There were no universally mentioned factors for program success, and each program noted aspects of its own program that were beneficial. One program, for instance, noted that custom VFDs for air compressors were particularly popular. Another program manager stressed that “program simplicity” (i.e., easy to complete applications) was a key participation driver. In particular, vendors drive much of the prescriptive motors participation and like the 1-page applications they are supplied with on tear-away pads, according to the program manager. Notably, two program managers and a program implementer reported that their programs provide significant, customer-focused technical assistance for custom projects. As part of the non-residential customer audit process, for instance, one program reviews customer energy bills, does equipment metering, and conducts engineering and basic financial analyses at no cost. The program

¹² Some customers are also demanding very short payback periods now, which often leads them to install less expensive projects (e.g., VFDs instead of motors). One program manager perceived that federal stimulus funding for infrastructure construction has also increased drives sales.



manager noted that custom projects can still “take awhile to complete,” and that the solution is to better manage customer expectations.¹³

7.3.2 Program design, measures and incentives

While most of the programs are administered by internal utility staff, some programs or program elements are administered by third-party contractors. Third-party implementers of the benchmarked programs include KEMA, Nexant, Applied Proactive Technologies, and Green Motors Practices Group. Many of the programs have similar designs, with prescriptive and custom rebate offerings, and pre-approval and engineering analysis required for custom projects. In addition, the qualifying measures and end-uses are generally similar (e.g., ODP and TEFC motor designs, prescriptive VFDs rebates for pumping and air handling). However, Xcel Energy’s program differs from other programs in some ways.

Some programs require pre-approval of prescriptive projects to ensure rebate funding is available, while Xcel Energy does not. In addition, most programs only have prescriptive rebates for motors up to 200 HP, with larger motors requiring custom approvals. None of the interviewed program managers mentioned that their HP limit was too low, although one utility had recently raised the rebates up to 500 HP (and will terminate the motors rebates in December anyway). In comparison, Xcel Energy’s prescriptive rebates cover up to 500 HP and direct more motors into the more simplified application process. Furthermore, most programs do not have separate rebate levels for New versus Upgrade motors as Xcel Energy does.

Xcel Energy’s rebate amounts are in the lower part of the range for 1 – 200 HP models when compared to the benchmarked programs. This is probably because other programs assume that some new motor purchases will be for upgrades and have “blended” rebate levels. One interviewed manager reported that their prescriptive rebates don’t capture retrofits well. These would essentially require 6,000 operating hours a year to ensure a reasonable payback period. In contrast, Xcel Energy’s separate rebates for motor upgrades are a valuable program feature, allowing the program to fine-tune these rebates to achieve acceptable payback periods for customers. Lastly, no other programs appear to offer higher rebates for “Enhanced NEMA” like Xcel Energy does. (Note: Xcel Energy increased its motors and drives rebates effective January 2009, and also enhanced the prescriptive rebate applications to give more customer guidance on where to find required information (e.g., motor model number) on typical invoices/specification sheets.)

Xcel Energy’s prescriptive rebates for VFDs, equivalent to \$40/HP, are relatively low compared to the other programs and could potentially be raised if demand declines. Among the programs that were reviewed, one trend is to move more custom drives into the prescriptive path, by raising maximum HP levels and expanding the range of eligible end uses (e.g., for boiler and air compression pumps). One program periodically invites drives vendors to brown bag lunches to present potential new custom drives equipment and applications to program staff.

The programs research revealed two unique program offerings – motors inventories/audits and rebates for green re-winds. One program has a well-established inventory program element, whereby a third-party contractor recruits and manages a pool of participating vendors to complete motors inventories for customers. The managing contractor also attends customer meetings with the vendors and some site audits to enhance customer trust in the program and ensure that the vendors are doing things properly. Two programs in western states offer rebates for green motor re-winds through a third-party

¹³ Conversely, the project manager also reported some customers are focused mainly on the rebates they will receive, and are very tolerant of longer project schedules.



program implementer. Financial incentives are offered to the customer, rewind shop and program implementer.

7.3.3 Program impacts

Table 7-2 summarizes program impacts information that was obtained from the program manager interviews. As shown in the table, none of programs are currently integrating spillover into their impacts calculations, and the smaller programs are generally not doing net-to-gross (NTG) calculations or conducting much measurement and verification (M&V) of motors and drives. The NTG ratios that are currently applied range from 70 percent to 96 percent. Some utilities are currently conducting evaluation studies that will update these figures. In particular, the NTG ratio of 96 percent is from secondary sources and is currently being updated through evaluation research.¹⁴ None of the program managers offered anecdotal evidence that their current NTG ratios were too high or too low.

Measures of baseline operating assumptions have been based on a variety of sources, including the California DEER database, EPACT motors, local/federal codes, and ongoing M&V measurements.

¹⁴ The California DEER Database notes that many utilities use a NTG ratio of 0.96 for motors and drives, and that previous studies of California's 2004 – 2005 programs estimated NTG at 0.75. California currently focuses on “high impact measures” for detailed M&V, and motors/drives are typically not included.

**Table 7-3. Program Impacts Summary Information**

Organization	Program	Impacts Information
NYSERDA	Existing Facilities Program	NTG currently being determined via 46 interviews with key decision makers during on-sites for M&V. 100 motors being logged for run hours and loads. Current baseline assumptions detailed in New York Public Service Department Technical Manual (September, 2009)
Southern California Edison	Express Efficiency	NTG estimated at program level, is 0.70 for all prescriptive measures (Express Efficiency), 0.64 for all custom measures. No spillover. Title 24 and federal standards used for baseline. Project M&V required for custom projects and/or high seasonality – evaluators choose appropriate IMPVP.
Pacific Gas & Electric	Customer and Distributor Rebates	Use NTG = 0.80, is not adjusted for M&V. No spillover. Title 24 and federal standards used for baseline.
Energy Trust of Oregon	Existing Building Efficiency Program	NTG and spillover not calculated or applied. EPACT motors assumed for baseline by Regional Technical Forum. Do little M&V because motors/drives small program element. Pre/post metering done for custom projects.
Rocky Mountain Power	FinAnswer Express	Some states using NTG = 0.96 (from DEER) for planning. Will be updated when state M&V reports completed. No spillover. Baseline motor assumed to be local code or federal standard. Some site visits to verify HP of prescriptive measures. VFDs baseline = load profile with new VFD. Baselines for (deemed) HVAC/dairy VFDs determined from RMP studies; sample monitored 1 year after installs.
Progress Energy, NC	Energy Efficiency for Business	NTG = 0.70 for all programs now; no spillover. Motors and drives baselines based on DEER; use average of ODP and TEFC at 1800 rpm. NTG and baselines will be updated late October when M&V study done.
Efficiency Vermont	Efficiency Vermont Rebate Center	NTG and spillover not calculated or applied. Baseline assumptions (from 3P studies) detailed in Efficiency Vermont Technical Reference Manual. Meter projects > 25 kW coincident with system peak, also some smaller projects to verify customer calculations.

7.3.4 Program recruitment and participation

None of the program managers that were interviewed are targeting specific customer sizes or sectors (although account representatives may specialize in sectors). Program managers report their customers come from commercial office, manufacturing/industrial, wastewater, and paper processing sectors, to name a few. Similarly, the programs have no eligibility requirements regarding customer size, demand, etc. as long as customers are ratepayers. Small and mid-sized businesses are not targeted differently, but one program may add a direct install VFD element next year for smaller businesses and would consider a segmented marketing strategy. No programs are tracking market penetration or doing segmentation studies, and most rely on broad based media marketing about general business programs to promote motors and drives. Other marketing tools include: focus groups for specific customer segments, account manager presentations at trade shows, website program information, and flyers/handouts.

Vendors were commonly mentioned as an effective tool to recruit a wide range of customers. Typically, vendors receive training on eligible measures, program rebates and how to represent the program.



One program has a small industrial account representative visit vendors, explain the program, give them applications, and enroll them in the program after checking their licensing. These vendors (mostly motors/drives retailers but some electric contractors) get listed on the program website and receive a placard for their business noting that they are a trade ally. Another program has utilized a third-party program implementer to enroll (numerous) vendors that attend a 2-hour training. These vendors, mostly distributors, sign an agreement form with insurance/indemnity provisions.

Two programs are offering vendor incentives.¹⁵ One program only offers the vendor incentive to green re-wind shops, because the specialized equipment is expensive to install (participating customers and the green re-wind delivery contractor also receive incentives). Another program has designed its core prescriptive motors program (up to 500 HP) around vendor incentives, which amount to \$15 to \$200 per NEMA motor sold.¹⁶ According to the program manager, motors vendors are twice as motivated to “up-sell” program equipment as customers are to obtain rebates, and program motor sales increased four to five-fold when program incentives were re-directed from the customers to the vendors several years ago. Vendor and customer satisfaction with the program is high, in part because the program design eliminates the need for customers to complete lengthy applications and do detailed engineering calculations. As customers are inquiring about/purchasing motors, participating vendors log into the program database and confirm product eligibility. The database is populated with motors specifications, models, efficiency levels, etc., so that the vendors only have to enter limited information (e.g., customer account). Importantly, the vendor must also enter the exact planned location of the purchased motor(s) (building, floor and room), as ten percent of the motors are randomly verified by PG&E staff.¹⁷ The system tells the vendor what the rebates would be and processes the rebates automatically. Seventy vendors have participated in the program since 2006.

Not surprisingly, program managers report the main reason customers participate in the programs is to reduce equipment and energy costs, while some customers also have environmental concerns. Program managers believe the primary participation barrier is the perceived difficulty of participating in any rebate programs. One program manager specifically acknowledged that previous rebate applications were too long and complicated before being simplified a few years ago.

None of the programs reported significant problems related to filling out program applications correctly. Programs that receive many applications from vendors can correct problems quickly by working with particular vendors to rectify problems. In addition, some programs have taken steps to simplify their applications. For instance, some programs are offering similar rebates for different motor speeds/models. One program that used to receive many applications for ineligible measures changed its application to include a series of Yes/No checkboxes to confirm eligibility. This has improved the quality of program applications. The same program also maintains a database of motors manufacturing specifications that can be used to assist customers needing this information.

One program manager (with robust prescriptive motor rebates) perceived that many companies have policies to always buy NEMA Premium motors, but do not bother to fill out the applications because they do not value the rebates. Another program manager (also with rebates in the high range for 1-200 HP motors) perceived that their application was too long and time consuming to justify program

¹⁵ Vendor incentives used to be offered for a program that provides motors audits/inventories to promote product stocking. These incentives were eliminated when the program began to achieve its inventory goals, and some vendors dropped out of the program; now vendors re-entering the program to better understand and serve their customers.

¹⁶ The program expectation is that some of the incentive amount is passed on to the customer.

¹⁷ It is permissible for the motor(s) to be at a general storage facility, as long as the facility is also recorded in the purchase database.



participation, which is lagging. This same manager noted that many vendors were reluctant to promote NEMA motors if they also do re-winds.

7.4 CONCLUSION

In summary, Xcel Energy's Motor and Drive Efficiency Program is generally consistent with most of the programs that were reviewed, although it differs in some key respects. In particular, Xcel Energy's programs allows for a greater range of motors to go through its prescriptive component. Xcel Energy also appears to offer rebate amounts toward the lower range, especially for drives.



8. EVALUATION RESULTS—GROSS AND NET SAVINGS

This section presents the results of the gross savings evaluation conducted as a part of the Xcel Energy Business Demand-Side Management program evaluation.

The results are based on a nested sampling approach including 30 projects with a desk review and 20 projects with onsite analysis and metered data collection.

8.1 KEY FINDINGS

- Overall Ex-Post to Ex-Ante Gross Savings Ratio for the motors and drive program sample with on-site analysis and metered data collection was at 81.1% for peak demand reduction and 78.1% for energy savings.
- The largest savings adjustments for the savings were due to ineligible measures under the program requirements. Within that category, the largest category of ineligible equipment was equipment that did not have automatic controls installed.
- The default assumptions for prescriptive motor and drive savings are reasonable. No changes are recommended to the prescriptive motor and drive calculations. This is also confirmed as the eligible prescriptive projects in the sample had a realization rate of 105.4%.

8.2 DETAILED FINDINGS

8.2.1 Motors and Drives

To evaluate the Colorado Motor and Drive Efficiency program, evaluators reviewed a total of 30 projects. The desk reviews included a review of the prescriptive motor calculations as well as a review of the inputs used to determine the savings. Within the 30 projects that were desk reviewed, 20 projects were selected for onsite inspection and in-depth evaluation. The projects were selected based on a combination of the savings that were associated with the project as well as the uncertainty in the savings estimates. Backup projects were selected to replace projects where a selected onsite could not be completed due to customer unwillingness or the scheduling considerations necessitated by customer and the tight timeline for the onsite portion of this evaluation.

The savings for each project were then modified based on the results of the evaluation. An Ex-Post to Ex-Ante Gross Savings Ratio for the sample was then developed. The Ex-Post to Ex-Ante Gross Savings Ratio was defined as the sum of the sample verified savings (ex post) divided by the claimed (ex ante) savings. As shown in Table 8-1 below, the realized savings for peak demand reduction (kW), marketing demand reduction (kW), and energy (kWh) were all lower than the claimed savings.

**Table 8-1. Sample Savings and Savings Ratios**

All Projects	kW-Peak	kW	kWh
	Ex Ante	1,048.5	1,217.0
Ex Post	850.2	942.6	5,089,788
Savings Ratios	81.1%	77.5%	78.1%

To isolate the causes of the reduction in the Ex-Post to Ex-Ante Gross Savings Ratio, the projects were divided into custom and prescriptive projects and desk reviewed only projects. The projects that were only desk reviewed were found to have minimal adjustments, having Ex-Post to Ex-Ante Gross Savings Ratios of approximately 100% for peak demand reduction, marketing demand reduction, and energy savings. The projects that had onsite visits completed however, had much lower Ex-Post to Ex-Ante Gross Savings Ratios. The savings and Ex-Post to Ex-Ante Gross Savings Ratios for each category are given in Table 8-2 below.

Table 8-2. Savings and Savings Ratios by Evaluation Method

All Projects	kW-Peak			kW-Mkt			kWh		
	All Projects	Onsite Projects	Desk Review Projects	All Projects	Onsite Projects	Desk Review Projects	All Projects	Onsite Projects	Desk Review Projects
Ex Ante	1,048.5	566.9	481.6	1,217.0	656.3	560.8	6,513,545	3,027,911.5	3,485,633
Ex Post	850.2	368.8	481.4	942.6	381.8	560.8	5,089,788	1,604,999.4	3,484,789
Savings Ratios	81.1%	65.1%	100.0%	77.5%	58.2%	100.0%	78.1%	53.0%	100.0%

Although many projects were adjusted due to operational considerations, such as motor load factors, hours of operation, or duty cycles differing from values assumed in the original analysis, the majority of the net savings adjustments were due to projects that did not meet eligibility requirements. As shown in Table 8-3 below, approximately 85% of the reduction in savings was due to ineligible savings. The single largest cause for savings being removed was due to VFDs being installed with no automatic control. This accounted for a reduction of 551,102 kWh. An additional two VFDs did not have controls installed and were replacing existing functional VFDs. This accounted for an additional 206,664 kWh.

**Table 8-3. Savings Adjustments by Cause**

Adjustment Cause	Quantity	Savings Adjustment	Percent of Savings Reduction	Savings Breakdown
New Construction VAV System (Savings Ineligible)	1 Project, 4 VFDs	-389,152 kWh	27.3%	83.7% Ineligible
Replacing Burned Out VFD installed under Code Requirements (Savings Ineligible)	1 Project, 1 VFD	-21,776 kWh	1.5%	
Replacing Functional VFD (Savings Ineligible)	0 Projects	-0 kWh	0%	
No Automatic Controls (Savings Ineligible)	3 Projects, 11 VFDs	-551,102 kWh	38.7%	
Both Replaced Functional VFD and No Automatic Controls	1 Project, 2 VFDs	-206,664 kWh	14.5%	
Equipment not Installed	1 Project, 1 Motor	-24,195 kWh	1.7%	
Equipment is Redundant or Equal to the Baseline (No Associated Savings)	2 Projects, 2 VFDs, 1 Motor	-41,073 kWh	2.9%	7.9% Operated or Installed Differently
All other Operated or Installed Differently	1 Project, 1 Motors	-71,129 kWh	5.0%	
Tracking Error	1 Project, 1 Motors	+500 kWh	-0.0%	8.4% Analysis or Input Error
Calculation Error	1 Project, 1 Motors	-119,165 kWh	-8.4%	
Total		-1,423,757 kWh	100%	100%

It should be noted that, based on the table above, “Operated or Installed Differently” accounted for less than 8% of the reduction in claimed savings. If the ineligible portions of projects, or projects with calculation or tracking errors are removed from the sample. The Ex-Post to Ex-Ante Gross Savings Ratio of the remaining portion of the sample is 97.8%. The Ex-Post to Ex-Ante Gross Savings Ratio for eligible prescriptive project was 105.4%.

Because motor and drive projects could be analyzed through the custom or the prescriptive paths, differences between the two types of projects were also reviewed.



a. Prescriptive motor and drive projects

Of the 30 projects reviewed for the evaluation, 27 of the projects were prescriptive. The prescriptive projects examined were calculated using the motor and drive savings calculator. As noted in Section 10, baseline and technical assumptions, no calculation error or retroactive changes were recommended, therefore, all of the changes made to the savings are due to operational changes, ineligible measures, or tracking error.

Based on the evaluation, the prescriptive projects reviewed in the sample have an Ex-Post to Ex-Ante Gross Savings Ratio of 66.4% for peak demand reduction and 72.9% for energy savings, as shown in Table 8-4.

Table 8-4. Prescriptive Project Savings and Savings Ratios

Prescriptive	kW-Peak	kW	kWh
Ex Ante	613.6	782.2	3,872,226
Ex Post	407.2	499.6	2,824,301
Savings Ratios	66.4%	63.9%	72.9%

When categorized into the desk review only sites and sites with verification, again, the Ex-Post to Ex-Ante Gross Savings Ratio for the desk reviewed sites was approximately 100% for peak demand reduction, marketing demand reduction, and energy savings. For sites that an onsite verification was completed, the Ex-Post to Ex-Ante Gross Savings Ratio was much lower, at less than 40% for peak demand and marketing demand and approximately 50% for energy savings, as shown in Table 8-5.

Table 8-5. Prescriptive Project Savings and Savings Ratio by Evaluation Method

Prescriptive	kW-Peak			kW-Mkt			kWh		
	All Projects	Onsite Projects	Desk Review Projects	All Projects	Onsite Projects	Desk Review Projects	All Projects	Onsite Projects	Desk Review Projects
Ex Ante	613.6	332.9	280.7	782.2	422.3	359.9	3,872,226	2,134,057	1,738,169
Ex Post	407.2	126.6	280.6	499.6	139.7	359.9	2,824,301	1,086,976	1,737,325
Savings Ratios	66.4%	38.0%	99.9%	63.9%	33.1%	100.0%	72.9%	50.9%	100.0%

It should be noted that all of the savings removed adjustments for “ineligible savings” or “operated or installed differently” were removed due to the onsite inspection.

b. Custom motor and drive projects

Of the 30 projects reviewed for the evaluation, only three of the projects were custom. Custom calculations were developed for each project to accurately assess the impacts associated with the installation of the motor or drive projects.



Based on the evaluation, the three custom projects reviewed in the sample have a combined Ex-Post to Ex-Ante Gross Savings Ratio of 101.9% for peak demand reduction and 85.8% for energy savings, as shown in Table 8-6.

Table 8-6. Custom Project Savings and Savings Ratios

Custom	kW-Peak	kW	kWh
Ex Ante	434.8	434.8	2,641,319
Ex Post	443.0	443.0	2,265,487
Savings Ratios	101.9%	101.9%	85.8%

Again, when categorized into the desk review only sites and sites with verification, again, the Ex-Post to Ex-Ante Gross Savings Ratio for the desk reviewed sites was approximately 100% for peak demand reduction, marketing demand reduction, and energy savings. For sites that an onsite verification was completed, the Ex-Post to Ex-Ante Gross Savings Ratio varied, at less than 103.5% for peak demand and marketing demand and approximately 58% for energy savings, as shown in Table 8-7.

Table 8-7. Custom Project Savings and Savings Ratios by Evaluation Method

Custom	kW-Peak			kW-Mkt			kWh		
	All Projects	Onsite Projects	Desk Review Projects	All Projects	Onsite Projects	Desk Review Projects	All Projects	Onsite Projects	Desk Review Projects
Ex Ante	434.8	234.0	200.9	434.8	234.0	200.9	2,641,319	893,855.0	1,747,464
Ex Post	443.0	242.2	200.9	443.0	242.2	200.9	2,265,487	518,023.3	1,747,464
Savings Ratios	101.9%	103.5%	100.0%	101.9%	103.5%	100.0%	85.8%	58.0%	100.0%

One of the custom projects was adjusted due to a calculation error. Two errors were found in this analysis. First, the motor load factor was estimated for the motors in question as the demand of the utility meter divided by the peak demand of the utility meter. A more appropriate method would be to remove the demand of any unrelated equipment from the utility meter demand, and then divide the remaining demand of the utility meter by the expected kW of the motor, at full load condition. Secondly, a demand curve with respect to motor load factor was developed based on assuming power factor and current profiles. This combination of two assumed profiles was used to determine the operating demand of the motor at part load conditions. However, this profile was found to be unrealistic, with the motor requiring 39% of the full load demand at 10% load. For the ex post analysis, the overall efficiency profile developed in the project file (which included motor and drive efficiencies at part load conditions).

The savings for one project were calculated based on collected pre- and post-installation metered data. It should be noted that when the metered data were examined, it was determined that the metering was done by metering only two of the three legs of the three-phase input power. The equipment in question had significantly unbalanced loads (the current on the three legs varied significantly). Therefore, significant inaccuracies can be introduced into the data due only two of the three legs being metered. In cases where the loads are unbalanced, all three legs of three phase input power should be metered.



9. EVALUATION RESULTS—NET TO GROSS

This section presents program net-to-gross recommendations and details the methodology.

9.1 INTRODUCTION

The recommended net-to-gross ratio (NTGR) for the program is based on a review of program files and interviews with 1) 2009-2010 participating customers and influential vendors, 2) in-depth interviews with trade allies, 3) a literature review and benchmarking interviews with program managers of similar programs in the US, and 4) results from surveys with eligible nonparticipants. Planned future program changes were also used as inputs into the final NTGR recommendation.

The NTGR is the ratio of net program-attributable savings over program gross savings before any adjustment. This ratio includes **program free-riders** (i.e., participants that would have implemented at least some, if not all, of the actions incentivized by the program in absence of that program) and **program-induced spillover** (i.e., additional energy-efficiency projects implemented by a customer due to program influences but without any financial or technical assistance from the program).

When interpreting NTGR as one indicator of program performance, it is important to keep the following in mind:

- The NTGR is a conservative estimate of Xcel Energy’s program attribution. Program attribution refers to energy impacts that can be confidently attributed to program efforts. While the NTGR does take into account participant and nonparticipant spillover, this is a conservative approach and limited to ‘like’ spillover as discussed below. In addition, the NTGR does not take into account all market effects resulting from the programs (e.g., increased inventory, vendor changes in sales practices, etc.).
- The NTGR should continue to be revisited and revised as program modifications are made that would have an upward or downward effect on the NTGR. The NTGR analysis presented here is based on program participation in 2009 and the first half of 2010. These should be taken into account in deciding what NTGR to apply for a program. Recent program changes are discussed in each program section in this memorandum as well as recommended adjustments to the NTGR based on these planned program changes.

Key findings from the net-to-gross research are highlighted below, followed by a detailed methodology overview and results.

9.2 KEY FINDINGS

Table 9-1 below presents the current deemed NTGR used for the programs, the NTGR calculated as a result of using the California self report approach (SRA), and our recommended NTGR based on triangulation of multiple sources of information from customers, vendors, spillover, and planned program changes.

Table 9-1. Program NTGR

Program	Current Deemed NTGR	California SRA NTGR	Recommended NTGR
Colorado Motors & Drives	.87	0.54	.65



Our estimations of NTGR are based on several sources including participant and nonparticipant interviews, vendor interviews, and benchmarking data. Table 9-2 shows the number of participating customer decision makers interviewed by measure type for the program. We also conducted in-depth qualitative interviews with both participating and nonparticipating vendors for all programs. Quantitative surveys were conducted with those vendors identified by program participants as influential in their decision making process. In addition, utility benchmarking data on NTGR was collected for each program to the extent it was available for benchmarked programs. A detailed cooperation rate for the participant survey effort is in the technical appendix to this report.

Table 9-2. Breakdown of Respondents Used to Calculate the Net-to-Gross Ratio

		Participants Surveyed with Electric Savings	Participants Surveyed with Natural Gas Savings
Motors & Drives (Colorado)	New motors	12	0
	Upgraded motors	38	0
	Drives	48	0

Next we provide an overview of the approach used to calculate a NTGR for Xcel Energy's business DSM programs, followed by a detailed discussion of the NTGR results for the program.

9.3 METHODOLOGY

9.3.1 Estimating the Net-to-Gross Ratio Using Self-Report Methods

We computed the NTGR following the California self-report framework for standard net-to-gross projects¹⁸. The standard net-to-gross analysis specified in the California framework uses three primary sources of information to estimate net-to-gross: program files and information, participant (decision-maker) surveys, and vendor (participating trade ally) surveys. Our approach to using each of these information sources for estimating free-ridership and spillover is described in more detail below.

Program information is used to provide key inputs needed for the decision-maker survey. This information includes contact information, services/equipment received through the program, participation date, and estimated energy savings.

The decision-maker survey, targeted at participating customers, asked highly structured questions about actions that would have been taken in the absence of the program. The survey was informed through the information in program files. Respondents were first asked a series of questions to establish project context. They were then asked to rate the importance of program influences vs. non-program influences. Third, they were asked to rate the significance of different factors and events that may have led to their decision to install the efficient equipment at the time they did, including questions on the age or condition of the equipment, type of project, recommendations received, and business policies related to equipment purchases.

¹⁸ Methodological Framework for Using the Self-Report Approach to Estimating Net-to-Gross Ratios for Nonresidential Customers, Prepared for the Energy Division, California Public Utilities Commission by the Nonresidential Net-To-Gross Ratio Working Group, Revised May 8, 2009. This method estimates net-to-gross directly rather than estimating 1 minus free-ridership.



The decision-maker survey also collected information about what participants would have done in the absence of the program. Specifically, respondents were asked a number of questions to assess the impact the program had on the timing, quantity, and efficiency level of the measure installed. Answers to these questions formed an initial picture of the program's influence—i.e., did the program impact the timing of the decision to replace equipment, and if so, by how many months/years? Did the program impact the quantity of equipment installed, and if so, by how much (partial free-ridership)? Did the program impact the efficiency of equipment installed, and if so, by how much (partial free-ridership)? As discussed above, in cases where the decision maker states that the vendor was highly influential in their decision to participate in the program, we attempted to interview the vendor to get their perspective on program influence (these are referred to as 'influential vendors').

A net-to-gross ratio was calculated for each participant. The calculation of the self-report-approach net-to-gross ratio based only on free-ridership is summarized below in text and in Figure 1. The calculation is also described in more detail in the Appendix. In summary, the net-to-gross ratio based on free-ridership is calculated as an average of three scores representing responses to one or more questions about the decision to install a program measure:

A **Timing and Selection** score that captures the influence of the most important of various program and program-related elements in influencing the customer to select the specific program measure at this time. Program influence through vendor recommendations is also captured in this score when the customer says the vendor was influential in their decision. In these cases, the influential vendor was also interviewed and their responses were incorporated into the timing and selection score.

An overall **Program Influence** score that captures the perceived importance of the program (whether rebate, recommendation, or other information) in the decision to implement the specific measure that was eventually adopted or installed. The overall program influence score is reduced by half if the respondent says they learned about the program only after they decided to install the program qualifying measure.

A **No-Program** score that captures the likelihood of various actions the customer might have taken at this time and in the future if the program had not been available. This score accounts for deferred free-ridership by capturing the likelihood that the customer would have installed program qualifying measures at a later date if the program had not been available.

The core net-to-gross ratio is the average of these three scores divided by 10, as shown in Figure 9-1 below.



Figure 9-1. Net-to-Gross Ratio Flowchart Based on Self-report Free-ridership

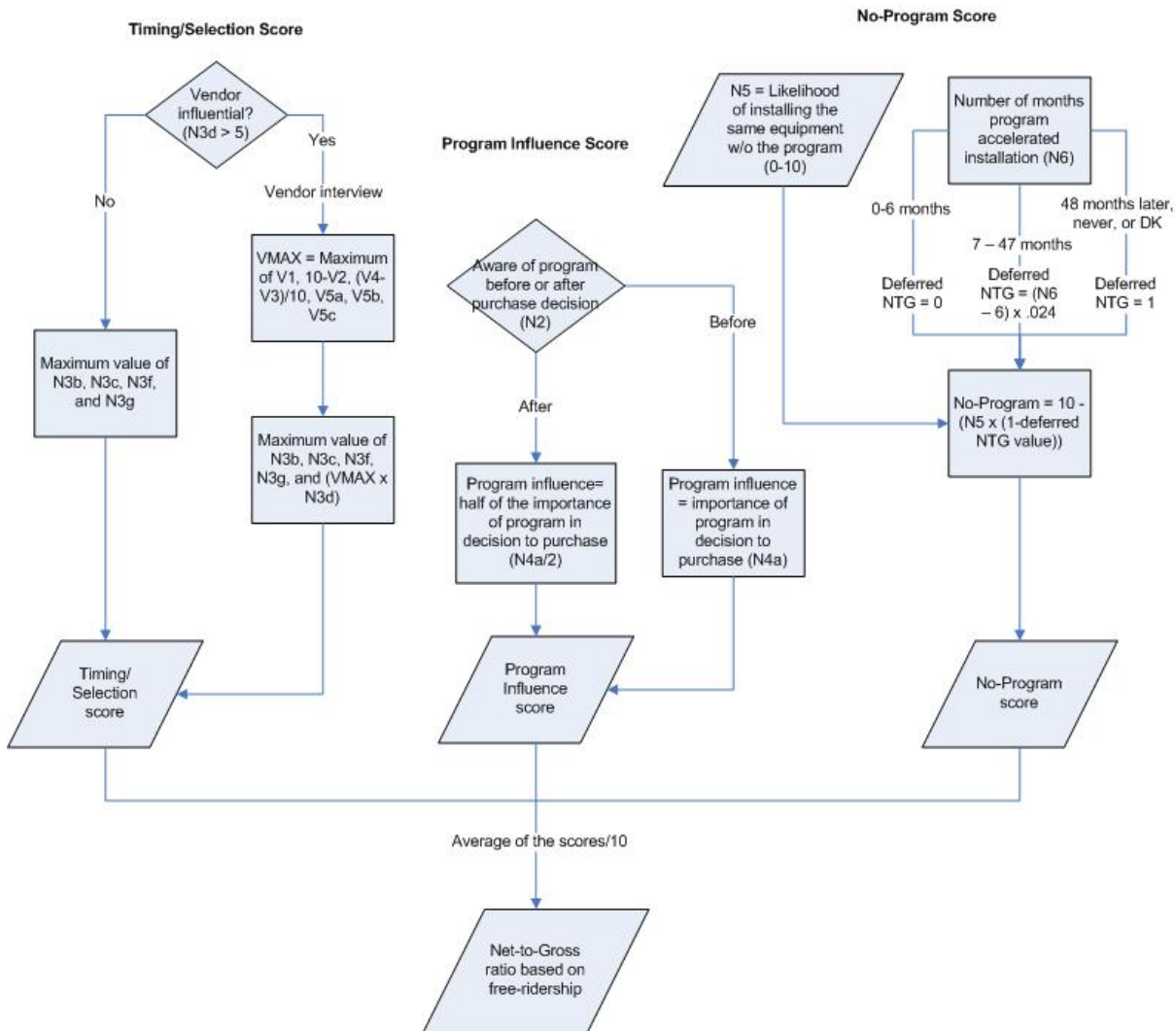


Table 9-3 presents the Timing and Selection, Program Influence, and No-Program Scores, as well as the final average NTGR based on free-ridership self reports.

Table 9-3. Independent Scores and Final NTGR Score by Program Based on Self Reports¹⁹

Program	Number of respondents	Timing & Selection Score	Program Influence Score	No Program Score	Final Score (no spillover)
Colorado Motors & Drives	97	7.77	4.65	3.82	0.54

The California framework defines partial free-ridership as when, in the absence of the program, the participant would have installed something more efficient than the program-assumed baseline

¹⁹ Weighted by BTUs.



efficiency but not as efficient as the item actually installed as a result of the program. Partial free-ridership results for each program are discussed in the program-specific sections.

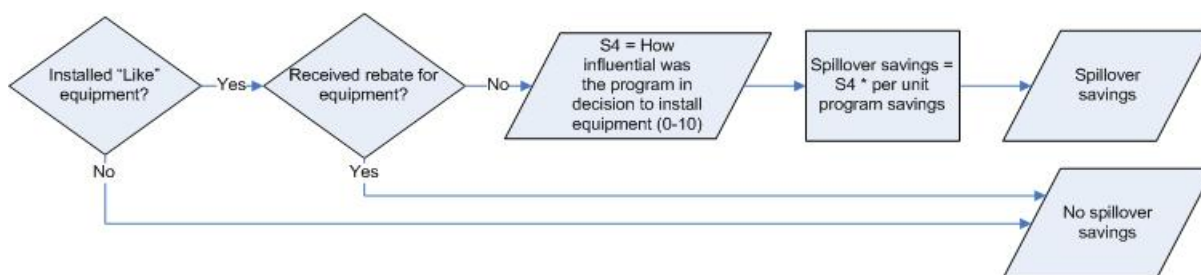
9.3.2 Measuring Spillover

In addition to the California framework, we also examined spillover and free drivers to calculate the net-to-gross ratio. **Spillover** refers to additional energy-efficient equipment installed by a customer due to program influences but without any financial or technical assistance from the program. **Participant “like” spillover** occurs when a customer installed equipment or conducted services through the program in the past year and then installed additional equipment or conducted additional services of the same type due to program influences.

California’s self-report protocol includes a battery of questions to quantify spillover for use in estimating spillover. The spillover methodology uses a series of questions designed to measure “like” spillover. These questions ask about recent purchases (since program participation) of any additional energy-efficient equipment of the same type as installed through the program that were made *without* any technical or financial assistance from the utility, but were influenced by the program. Since California does not allow for spillover to be included in net savings estimates, we followed the Massachusetts analysis methodology²⁰ for estimating spillover. A “like” spillover estimate is computed based on how much more of the same energy-efficient equipment the participant installed outside the program and did so because of their positive experience with the program.

One of the issues with attempting to quantify spillover savings is how to value the savings of measures installed outside the program since we are relying on customer self-reports of the quantity and efficiency of any measures installed. We used a conservative approach and reported only those measures installed outside the program that were of exactly the same type and efficiency as the ones installed through the program. Our conservative approach allowed customers to be more certain about whether the equipment they installed outside the program was the same type as the program equipment. This, in turn, made it possible for us to use the estimated program savings for that measure to calculate the customer’s “like” spillover savings. Figure 9-2 details the process for quantifying spillover savings.

Figure 9-2. Customer “Like” Spillover Savings



9.3.3 Measuring Nonparticipant Spillover

Free drivers, or nonparticipant spillover, refer to energy efficient measures installed or services conducted by program nonparticipants due to the program's influence. The program can have an influence on design professionals and vendors as well as an influence on product availability, product

²⁰ “Standardized Methods for Free-Ridership and Spillover Evaluation—Task 5 Final Report (Revised)”, prepared for the Massachusetts Utilities, June 13, 2003.



acceptance, customer expectations, and other market effects. All may induce nonparticipants to buy more high efficiency products than they would have in the absence of the program.

Nonparticipant spillover was measured qualitatively. The data for this type of analysis could be collected from nonparticipants directly or from the design professionals and vendors who recommended, sold, and/or installed qualifying high efficiency equipment. We prefer to survey the design professionals and/or vendors primarily because they typically provide much more accurate information about the efficiency level of installed equipment than nonparticipants do. Our experience has shown that customers cannot provide enough data about the new equipment they have installed to allow for accurate estimates of the energy savings achieved from the equipment. While they usually can report what type of equipment was installed, they typically cannot provide sufficient information about the quantity, size, efficiency, and/or operation of that equipment to determine whether the equipment is "program-eligible." On the other hand, design professionals and equipment vendors who have worked with the program are typically more knowledgeable about equipment and are familiar with what is and is not "program-eligible."

For this effort, participating vendors and providers were asked about any changes attributed to the program in their recommendations of program-eligible equipment or services, how frequent they recommend program-eligible equipment or services, and the amount of program-eligible equipment or services they sell that receive program incentives. These results were weighted by the number of full time employees to account for larger firms having a greater effect on the market. These responses were examined to determine what, if any, nonparticipant spillover might exist because of program activity. Specific results are discussed in each program section.

a. Peer utility benchmarking

As part of the benchmarking review of similar programs offered in the U.S. and Canada, we examined the NTGR, and whether the NTGR for each program was a deemed value or whether it was based on an evaluation of that program. In cases where the programs were comparable in design and scope to Xcel Energy's program, and the NTGR reflected that specific program's performance (e.g., not deemed, evaluated at the program and not the sector level), we considered the NTGR for that program when determining whether the Xcel Energy's NTGR should be adjusted.

b. Measuring influence of previous experience

Finally, we also examined participants' reports of the importance past participation in the program had on their decision to install the efficient equipment or implement the recommendations. In the current California NTGR battery, this factor is not included in the calculated NTGR, although a question is asked about the importance of previous program participation. The Massachusetts standardized methodology for estimating free-ridership recognizes the importance that past participation may have had on the current project.

The Massachusetts methodology asks respondents to simply agree or disagree with three statements about the influence of past program participation on their decision to participate in the current program. If they agree to all three statements, the free-ridership rate is reduced by 75 percent. If they agree to two of the statements, the free-ridership rate is reduced by 37.5 percent. The California battery of questions asked participants to rate the importance of their previous experience with the program on their decision to implement the energy efficient measure/action at that time. Consistent with the Massachusetts methodology to recognize the importance of previous participation, if participants rated their past experience with the program as high (a nine or a ten on a scale of 0-10 with ten being "very important"), we reduced their free-ridership rate by 75 percent. If they rated the importance of their past experience with the program a seven or an 8, we reduced their free-ridership rate by 37.5 percent. Lower ratings of the importance of previous program experience did not receive any adjustment. Specific findings are discussed in each program section.



c. Future program considerations

Based on interviews with Product Managers, we also considered planned program changes in our final recommended NTGR for each program. This is discussed in more detail below.

9.4 DETAILED RESULTS

9.4.1 Self-Report Net-To-Gross Ratio and Like Spillover

Free-riders in the Motor and Drive Efficiency Program include customers that would have installed at least some program-eligible measures within four years without any financial assistance from the program. Table 9-4 below presents the calculated net-to-gross ratio and the calculated like spillover from customer self-reports. The overall combined NTGR and spillover from customer self-reports is .57. This overall estimate is weighted by savings, and reflects the fact that drives (which had the lowest calculated NTGR) accounted for two-thirds of the kWh savings. Rates were highest for new motors, and lowest for drives.

Table 9-4. Motors and Drives Preliminary NTGR Calculation Using Customer Self-reports

	Number of respondents	Calculated NTGR	Calculated Participant 'like' spillover	Combined NTGR (Calculated NTGR + spillover)
New Motor ²¹	12	.46	.45	.91
Upgraded Motor	38	.62	.00	.62
Drives	48	.53	.03	.56
Overall	97 ²²	.54	.03	.57

9.4.2 Partial free-ridership

Of the 97 participants interviewed as part of the Motor and Drive Efficiency Program, eight participants reported that, in absence of the program, they would have installed equipment more efficient than code but less efficient than what was installed through the program. For these cases, an adjustment could either be made to the net-to-gross ratio or to the gross savings. For all eight cases, we feel that the calculated net-to-gross ratio already accurately accounts for the impact of the program on these participants. Therefore, no further adjustment to the net-to-gross ratio was made.

9.4.3 Spillover from trade ally in-depth interviews

In total, 21 interviews were conducted with motors and drives vendors. We conducted ten qualitative, in-depth, high-level interviews with participating and nonparticipating vendors about the program. This interview explored pre- and post-participation recommendations and collected vendor feedback on the expected purchase of efficient motors and drives in the absence of the program. Additionally, we conducted 11 quantitative interviews with vendors who were identified as influential in a respondent's

²¹ There is some overlap between new motors and upgraded motors as some participants had both types of motors

²² A total of 98 interviews were conducted; however, one respondent indicated 'Don't Know' throughout the net-to-gross battery of questions and therefore could not be included in the calculations.



decision-making process. The quantitative interviews discussed 28 specific program installations and the results were used in the NTGR calculation.

The program had a slight influence on the recommendation practices of influential vendors. On average, influential vendors report a 13 percent increase in their recommendation of efficient motors and drives since program participation. However, they note that most of the efficient motors and drives they sell (91 percent) receive a rebate. This would suggest that at most, nine percent of their sales of efficient equipment are outside the program and can be viewed as non-participant spillover or ‘free drivers.’

In the in-depth interviews with vendors, five of the ten interviewed vendors said they believe that the program is causing customers to purchase more efficient equipment than they otherwise would have purchased. Two of the ten thought this occurs “sometimes,” one thought the program rebates have no impact (because they have not sold any program equipment), and two were unsure. These response patterns were generally consistent regardless of whether the vendor works with motors, drives, or both types of equipment.

When asked to rate the difficulty of selling program eligible equipment to customers on a scale of one (“very difficult”) to five (“not at all difficult”), most of these vendors gave scores of three to four. Vendors that gave higher ratings sometimes noted that the equipment energy savings were the key participation driver, while vendors that gave scores of three (or less) noted that program rebates are the main program driver and could still be raised to increase participation. Based on these in-depth interviews with vendors, we suggest that the range for the net-to-gross ratio falls between 50 and 70 percent.

9.4.4 Peer utility benchmarking

Results from the benchmarking review indicated that NTGR currently applied in the reviewed programs ranged from 64 to 96 percent. The 96 percent is a deemed value from the California DEER database and therefore we do not think it is a useful data point and recommend no adjustments to the ratio based on this value. Removing this NTGR, the NTGRs ranged from .64 for Southern California Edison’s custom measures and .70 for Southern California Edison’s prescriptive measures to .80 for Pacific Gas and Electric’s program. Progress Energy is North Carolina falls in the middle with a .70 NTGR.

9.4.5 Influence of previous program experience

We examined participants’ reports of the importance past participation in the program had on their decision to install the efficient equipment. To examine this for motors and drives, we asked participants to rate the influence that past participation had on their decision to install the current efficient equipment (using a 0–10 scale with zero being not at important and ten being very important). If participants rated their past experience with the program as a nine or a ten (36 percent of participants), we reduced their free-ridership rate by 75 percent. If they rated the importance of their past experience with the program a seven or eight (28 percent of participants), we reduced their free-ridership rate by 37.5 percent. Lower ratings did not receive any adjustment. Using this approach, the calculated NTGR using customer reports would increase by .08.

9.4.6 Known future program considerations

Finally, we looked at recent changes that could affect the NTGR going forward. This includes the recent re-organization of the Business Solutions Center (BSC) discussed in the internal review results. These recent changes are likely to increase the percentage of customers participating in the program that are non-managed accounts. All but two participants included in the 2009-2010 NTGR were managed accounts. A qualitative look at the difference in NTGR between managed and non-managed accounts (Table 9-5) indicates that non-managed accounts’ NTGR may be as much as 20 percent



higher than managed accounts. The 2009 NTGR research for Xcel Energy's Colorado Business Cooling program found a similar trend in that non-managed accounts had a significantly higher NTGR than managed accounts²³.

Table 9-5. Motors and Drives Preliminary NTGR Calculation Using Customer Self-reports for Managed Accounts

	Number of respondents	NTGR (including spillover)	NTGR (adjusted for previous program exp. and spillover)
Non-managed accounts	2	0.69	0.87
Managed accounts	95	0.57	0.65

In addition, because the program will be changing the type of motors incentivized due to changes in federal standards, we examined the type of motors included in our analysis though a limited number of projects including enhanced motors were included in the 2009-2010 NTGR. A qualitative look at the difference in NTGR between projects with no enhanced motors and projects with enhanced motors (Table 9-6) indicates that projects with enhanced motors have NTGRs as much as 30 percent higher.

Table 9-6. Motors and Drives Preliminary NTGR Calculation Using Customer Self-reports for Enhanced Motors

	Number of respondents	NTGR (including spillover)	NTGR (adjusted for previous program exp. and spillover)
No enhanced motors at project	92	0.57	0.65
Mix of enhanced and non-enhanced upgraded motors	5	0.76	0.94

9.4.7 Other program considerations

We recommend a tracking system analysis be done at the end of 2010 to determine if non-managed account participants and the number of projects with enhanced motors have increased from 2009 to 2010. If there is an upward trend, we recommend a NTGR of .70 be set for the 2011 program. If there is not an upward trend, we recommend a NTGR of .65 be set for the 2011 program.

Drives accounted for the majority of 2009 program savings. Drives have the lowest customer-reported NTGR. This is also supported by the trade ally interviews that discussed that drives have become a known technology among many customers who have seen the resulting energy savings. Adjustments to the NTGR in future years should also take into account the proportion of savings resulting from drives versus motor projects. If there is a downward trend in the proportion of program savings that are resulting from drives, we recommend a NTGR of .75.

9.4.8 Recommended net-to-gross ratio

Averaging across the four different primary data NTGR ratios for 2009 – 2010 participants weighted for project savings (.57=customer self report, .66 customer self report and vendor change in sales, .60=in-depth interviews, .65=customer self report and importance of past participation) results in a NTGR of

²³ PA Consulting Group, Process and Impact Evaluation of the Colorado Business Cooling Efficiency Program, January 15, 2010.



.62. Additionally, findings from the nonparticipant surveys, indicating that some customers are willing to install motors and drives without outside assistance, further support these findings.

Based on this additional evidence from these different sources, we believe the final NTGR for different project types falls between:

- .56 (customer self report on drives projects) on the low end
- .94 (customer self report on projects which include enhanced motors) on the high end.

If there is not an upward trend in non-managed account participation and enhanced motors projects as discussed in the “Other Program Considerations” sub-section above, we recommend applying a NTGR of .65 for the Colorado Motors & Drives program. If the percentage of non-managed accounts and enhanced motor projects increases, we recommend the NTGR is adjusted upward to .70 for 2011.



10. EVALUATION RESULTS—TECHNICAL AND BASELINE ASSUMPTIONS

This section presents the results of the verification of the baseline and technical assumptions conducted as a part of the Xcel Energy Business Demand-Side Management program evaluation.

10.1 INTRODUCTION

This section outlines the initial review of the deemed savings for the Xcel Energy Motors and Drives prescriptive program component. The results of this task were used in conjunction with the remainder of the evaluation activities to provide Xcel Energy with recommendations to assist them to improve the savings estimates and documentation for subsequent program years.

The review process focused on three different aspects of the Motors and Drives deemed savings: the calculation algorithms, the researched values used in calculating the deemed savings with the appropriate algorithm, and the final deemed savings values.

The calculation algorithms were reviewed on the basis of engineering knowledge to ensure their accuracy and consistency with engineering fundamentals. These algorithms were also compared to those used by other programs in other jurisdictions for consistency.

The researched values include those used for hours of operation, load factor, baseline efficiency, variable speed drive savings, peak coincidence factor, incremental cost, line loss factor, and net-to-gross ratio. These factors were developed based on details from other programs, as well as published studies. The values used in the deemed savings were verified for accuracy compared to their original sources, as well as being compared to values used in other jurisdictions and programs.

Finally, the actual claimed values for the programs were evaluated to ensure their accuracy with the previously mentioned algorithms and assumed values. Review of the claimed values also provided insight into the savings calculation methodology and any areas where potential errors may occur.

To determine the validity of the default assumptions and the resulting values for the Xcel Energy motors and drives calculations, a literature review was completed to verify that the savings estimates and methodology, expected useful life, and baseline assumptions were reasonable and consistent with other programs. Reviewed sources included:

- The 1-2-3 Approach to Motor Management. Motor Decisions Matter Campaign, Consortium for Energy Efficient Economy.
- Efficiency Vermont. Technical Reference Manual. 2004.
- United States Industrial Electric Motor Systems Market Opportunities Assessment, EERE, US Department of Energy (DOE), Dec 2002—Source for operating hours for industrial motors and source for motor load factor data (Tables 1-18 and 1-19).
- Appendix A of the Operations Manual. ComEd Smart Ideas Program. 2010.
- FES-M1. Premium Efficiency Motors. Workpapers. Consumers Energy.
- FES-M2. VFDs. Workpapers for Consumers Energy.



10.2 KEY FINDINGS

10.2.1 Motors and Drives

- Review of the algorithms shows that all algorithms are mathematically correct, and consistent with engineering fundamentals. Therefore, no changes to the algorithms are recommended.
- As a result of upcoming changes in legislation, specifically the Energy Independence and Security Act of 2007, the baseline motor efficiency used for Plan A motors will need to be increased. In most cases, the baseline efficiency is the premium efficiency level currently used for the high efficiency option in the calculation.
- It is also suggested that Xcel Energy consider increasing the baseline motor efficiency for Plan B motors. According to the current assumptions, the expected useful life of a motor is 20 years. Based on that criterion, all pre-EPACT motors are at or near the end of their expected useful life. The baseline motor efficiency for Plan B motors should be transitioned to EPACT 1992 standard minimum efficiency levels.
- The energy and demand savings associated with the VFD installations are reasonable when compared to other sources, however, the peak coincident demand savings varies widely across the literature reviewed. Xcel Energy may want to conduct additional research to better determine the appropriate peak coincident demand savings for VFD installations.
- The effective useful life values used for drives appear to be greater than used for other programs. It is suggested that the effective useful life be reduced to 15 years.

10.3 DETAILED FINDINGS

10.3.1 Motors

a. Baseline motor efficiency

For the Plan A motor projects, the baseline efficiency used in the analysis is the EPACT 1992 standard minimum efficiency. This is reasonable and appropriate for new motor installations and is consistent with other program sources reviewed. Therefore, no retroactive changes are recommended.

It should be noted that due to upcoming changes in legislation, specifically the Energy Independence and Security Act of 2007, the baseline motor efficiency used for Plan A motors will need to be increased. In most cases, the baseline efficiency is the premium efficiency level currently used for the high efficiency option in the calculation.

For the Plan B motor projects, the baseline efficiency used in the analysis is “typical” pre-EPACT standard motor efficiencies. It should be noted that the source listed for the pre-EPACT motor efficiencies is a Washington State University study funded by the DOE. The pre-EPACT motor efficiencies from the Washington State University funded by the DOE are also given in the American Council for an Energy Efficient Economy report, “The 1-2-3 Approach to Motor Management.” The values given in the current calculation are not consistent with the ACEEE report. However, the differences are typically minor, and therefore, no retroactive changes are recommended.

However, as given in the current calculation assumptions, the effective useful life of a motor is assumed to be 20 years. Therefore, based on that criterion, all pre-EPACT motors are at or near the end of their expected useful life. It is recommended that the baseline motor efficiency for Plan B motors be transitioned to EPACT 1992 standard minimum efficiencies.



b. Proposed motor efficiency

The proposed motor efficiency used to determine the savings is the actual installed motor efficiency. This “quasi-custom” approach allows greater flexibility in estimating savings for a project. No changes are recommended.

c. Expected useful life values

The savings for motor projects are claimed based on an expected useful life of 20 years. Based on the results of the literature review, the claimed effective useful life for motor projects is typically claimed to be 15 years (see Table 10-1). However, it should be noted that the 15 year expected useful life is based on the expected life of a standard efficiency motor. Premium efficiency motors, due to lower operating temperature, are expected to have an expected useful life of 20 years. Therefore, we recommend keeping the expected useful life of 20 years for motors.

Table 10-1. Expected Useful Life Factors - Motors

Source	Technology	Application	Effective Useful Life	Notes
ComEd Smart Ideas	Motors	All	15 Years	
Michigan MEMD	Motors	All	15 Years	
Ohio TRM	Motors	All	16 Years	
	Motors	HVAC Fan	15 Years	
Efficiency Vermont (2010)	NEMA Premium Motor	All	20 Years	
	Existing or Baseline Motor	All	15 Years	
Efficiency Vermont (2005)	NEMA Premium Motor	All	20 Years	
	Existing or Baseline Motor	All	15 Years	
	Motor	Remediation	10 Years	
Pennsylvania Act 129 Technical Reference Manual	Motors	Industrial	20 Years	15 Years Claimed in TRC
	Motors	Commercial	20 Years	15 Years Claimed in TRC
Efficiency Maine TRM (2007)	Motors	All	15 Years	

d. Hours of operation

The hours of operation for the motor projects are assumed to vary based on building type and application. The hours of operation for commercial building applications were taken from the Efficiency Vermont Technical Reference User Manual, 2004. The industrial motor hours of operation were taken from the United States Industrial Electric Motor Systems Market Opportunities Assessment, EERE, US DOE, 2002. No changes are recommended to the motor hours of operation.



10.3.2 Drives

a. Baseline condition

The baseline condition for drive projects is assumed to be a motor with a 75% load factor for pumping or a 65% load factor for fan applications. It is not defined for the purposes of the analysis if the baseline system is assumed to be constant volume, throttled (riding the curve), inlet guide vanes, cycling, other, or a combination of these methods.

b. Proposed condition

The proposed condition for drive projects is the baseline motor, with the average load factor reduced by 33%. The reduction of 33% is not unreasonable when compared to other sources. In addition, the resulting energy savings and non-coincident peak demand savings are not unreasonable as well.

c. Coincidence factor

For drive installations a peak coincidence factor of 0.78 is currently used. This results in a peak coincident demand savings of approximately 0.14 kW for fans and 0.16 kW for pumps (depending on motor size, enclosure, and rpm).

It should be noted that peak coincident demand savings values that are claimed vary significantly, based on input assumptions, application, and what time of day and year the peak is expected to occur at.

Claimed coincident peak reduction savings for several example programs are given in Table 10-2.

Table 10-2. Claimed Coincident Peak Reduction Savings

Program	Application	Peak Reduction (kW/HP)	Notes
ComEd Smart Ideas	HVAC Fans or Pumps	0.025 kW	20% peak coincidence factor
Consumers Energy Business Solutions	Process Pumps	0.23 kW	0.78 coincidence factor
Hawaii Energy	HVAC Fans	0.20 kW	5-9 pm Peak, Expected many businesses operating in low speed conditions.
Efficiency Vermont	Supply Fans	0.173 kW	Winter Peak
	Return Fans	0.263 kW	Winter Peak
	Exhaust Fans	0.012 kW	Winter Peak
	Chilled Water Pumps	0.188 kW	Summer Peak
	Boiler Feedwater Pumps	0.098 kW	Winter Peak

Therefore, it is recommended that no retroactive changes be made, but further research be completed to determine the effect of VFD installations for Xcel Energy Colorado customers.



d. Expected useful life values

The savings for drive projects are claimed based on an expected useful life of 20 years. Based on the results of the literature review, the claimed effective useful life for VFD projects is typically claimed to be 15 years for HVAC related VFDs, with process VFDs having a shorter expected useful life of 10 years (see Table 10-3). The correlation with process VFDs is less well-defined; therefore, we recommend that the expected useful life for VFDs overall be reduced to 15 years.

Table 10-3. Expected Useful Life Factors - VFD

Source	Technology	Application	Effective Useful Life
ComEd Smart Ideas	VFD	HVAC	15 Years
Michigan MEMD	VFD	Process Pumping	15 Years
	VFD	HVAC Fan	10 Years
	VFD	HVAC Pump	10 Years
Hawaii Energy	VFD	HVAC Fan	15 Years
Ohio TRM	VFD	HVAC Application	15 Years
DEER (2005)	VFD	Agricultural-Unknown	10 Years
	VFD	Commercial-Unknown	10 Years
	VFD	<50HP HVAC	16 Years
DEER (2008)	VFD	HVAC Supply Fan	15 Years
Efficiency Vermont (2005)	VFD	Process	10 Years
	VFD	Non-Process	15 Years
	VFD	Remediation	12 Years
Pennsylvania Act 129 Technical Reference Manual	VFD	Industrial	15 Years
	VFD	Commercial	15 Years
Efficiency Maine TRM (2007)	VFD	HVAC	13 Years
Massachusetts TRM (PY2011-Plan Version)	VFD	HVAC-Lost Opportunity	15 Years
	VFD	HVAC-Retrofit	13 Years

e. Hours of operation

The hours of operation for the motor projects are assumed to vary based on building type and application. The hours of operation for commercial building applications were taken from the Efficiency Vermont Technical Reference User Manual, 2004. The industrial motor hours of operation were taken from the United States Industrial Electric Motor Systems Market Opportunities Assessment, EERE, US DOE, 2002. No changes are recommended to the motor hours of operation.



11. RECOMMENDATIONS

Overall, the evaluation findings show that Xcel Energy's Motor and Drive Efficiency Program is well designed, has achieved its savings goals, and has resulted in high participant satisfaction. Going forward, the main challenges for the program will be retaining high savings in light of federal changes mandating the manufacture of NEMA Premium motors, reducing free ridership, and improving customer ease of participation. Within that overall context, we offer the following recommendations for Xcel Energy's consideration.

Recommendation #1: Focus on enhanced motors with efficiency levels above NEMA Premium.

The program is likely to eliminate prescriptive incentives for NEMA Premium motors sometime in 2011 after these motors become the standard specification for manufacturers and the existing inventory of non-NEMA motors has been depleted. In addition, VFDs, which are the primary contributor to program savings, are reported as becoming a standard technology due to building codes requirements, demonstrated high energy savings, declining costs, and performance benefits (e.g., allowing companies to fine-tune some processes). All of these factors are contributing to the measure's relatively high free-ridership as evidenced in the NTG research. Conversely, the free-ridership that was estimated for enhanced motors with efficiency levels greater than standard NEMA Premium is very low. Going forward, we recommend that the program focus its promotions on the next level of enhanced motors to further move the market and increase its claimable savings.

Recommendation #2: Simplify the prescriptive measures application process.

The evaluation research indicates that a simplified application process would help to improve customer satisfaction and potentially reduce the number of applications with inaccurate information. This recommendation focuses on the prescriptive component of the program, while the next recommendation addresses the custom component of the program. At the same time, it is important that the applications collect sufficient information to verify the energy savings. Options suggested during the evaluation research for a streamlined application process included:

- Utilizing check boxes to confirm product/end-use eligibility and/or select equipment types
- Requiring only the equipment make/model, and retrieving the manufacturer specifications from a dynamic database (or Xcel Energy staff that maintain a set of hard copies)
- Electronic application tools, that do the above, and automatically calculate incentives and populate customer information
- Only require customers to provide evidence of equipment eligibility (i.e. NEMA efficiency, make, model number, hp, RPM) instead of entering all the information themselves. Vendors can help them identify this information on relevant product documentation.

Recommendation #3: Reduce custom projects pre-approval times or better manage turn-around time expectations.

Custom projects, though few in number, can continue to offer the program large savings opportunities. To improve customer and trade ally satisfaction, these types of projects need to be processed and approved more quickly by Xcel Energy, so that customers do not "give up" on future custom projects and/or spread critical opinions in the market. During the internal review, Xcel Energy staff were aware of this need and were working on improving the process. If processing times cannot be reduced, we recommend Xcel Energy explicitly and proactively communicate expected project timelines to manage customer expectations.



Recommendation #4: Increase outreach to small and mid-sized customers. These customer groups have lower levels of free ridership are least aware of the program and least able to fill out program applications without assistance.

Most of the program's customer participants are large managed accounts. The participant survey found many of them have corporate policies to purchase (proven) energy efficient equipment. We believe this may be increasing the program's free ridership. Xcel Energy has already taken steps to increase the participation of non-managed accounts through its BSC group, and should continue to focus on this market segment. In particular, this group is expected to have lower levels of free ridership as found in the NTG evaluation research. According to trade allies, this group is also least aware of the program and least able to fill out program applications without assistance (other recommendations are offered to address this latter issue).

Recommendation #5: Increase trade ally program involvement. In particular, provide more vendor education so they can complete more program applications and promote the buy down option to customers.

Trade allies, or vendors, are in frequent, direct contact with customers and are well positioned to recruit participants of all sizes and from all sectors. The nonparticipant survey found that vendors are the first source of information customers turn to when looking to make equipment purchases. In addition, many participants said they prefer that vendors fill out program applications, and vendors can often do this more accurately than the customers. In particular, administrative staff for smaller customers have increased workload demands and little time to devote to completing rebate application forms. As program marketing strategies focus on smaller to medium sized customers, efforts should be made to reduce the program participation burden by simplifying the application process (discussed earlier) and/or having vendors do more of the application. Other program managers that participated in the benchmarking study noted that recurring application problems can be more quickly rectified by having vendors complete applications and working with a relatively small group of specific vendors. Importantly, the program must ensure that all vendors know that they can complete applications for customers, and periodic personal "check-ins" by program staff would be useful to confirm that vendors are fully aware of the ways in which they can assist customers. In addition, the vendor interviews found that not all vendors were aware of the program option to "buy down" projects for customers. Given that several customers and vendors said they prefer this option, we recommend increased education on buy downs to vendors.

Recommendation #6: Consider offering additional program services to increase opportunities for claimed savings.

Program managers around the country report that "green" motor re-winds (which restore motors near to their original efficiency levels) and motor inventories are good program elements to respond to current economic conditions, characterized by reduced capital investment opportunities. In particular, comprehensive motors inventories may lead to more immediate replacements of inefficient, operable motors. However, additional research may be needed to understand if customer staff will maintain the inventories and value them over time.

Recommendation #7: Consider an upstream, vendor-driven design to promote enhanced motors projects.

One of the larger peer utility programs included in the benchmarking study has successfully utilized motors vendors to "up-sell" NEMA premium motors to customers for several years. For this program, vendors receive the program rebates. According to the interviewed program manager, vendors are more motivated to research and recommend NEMA efficient motors than customers are to research and select these motors. Reported advantages of this program design are: high motors sales with comparatively reduced rebate levels (paid to the vendors); reduced customer administrative burden;



and improved utility data quality and reduced administrative burden. With the changes in the federal standards for motors that begin in 2011, an upstream vendor-driven design may help Xcel Energy move more enhanced motors projects into the market. Xcel Energy could investigate this option in 2011 for possible inclusion in the 2012 program.

Recommendation #8: Continue to use the current peak coincidence factor, and propose 2012 funding to investigate the validity of changing this value. Include funding to investigate the impact of developing a dual track for heating and cooling.

For drive installations a peak coincidence factor of 0.78 is currently used. This results in a peak coincidence demand savings of approximately 0.14 kW for fans and 0.16 kW for pumps (depending on motor size, enclosure, and rpm). Peak coincidence demand savings, however, can vary significantly, depending on the input assumptions, application, if the utility has a summer or winter peak, and the time of day the peak occurs. Xcel Energy should conduct additional research for peak coincidence demand savings for VFD installations to tailor them specifically for Colorado customers.

Recommendation #9: Use the existing motor life of 20 years, and propose funding in the next filing plan to investigate the reasonableness of the motor life.

The claimed savings for motor projects are currently based on an expected useful life of 20 years. The results of the literature review, however, show that the effective useful life for motor projects with standard efficiency motors is more typically 15 years. There are minor derivations within the literature; therefore, Xcel Energy could further explore the reasonableness of the motor useful life in their next plan. However, premium efficiency motors, due to lower operating temperature, are expected to have an expected useful life of 20 years. Since the new efficiency standards will require premium efficiency motor installation in the future, we recommend that Xcel Energy retain the effective useful life of 20 years.

Recommendation #10: Reduce the life of VFD projects to 15 years, and propose funding in the next filing plan to investigate the reasonableness of the drive life.

While there does appear to be some variability within the literature regarding the effective useful life for VFD projects, all of the programs reviewed suggested an effective useful life in the range of 10 years to 16 years, depending on the program and the application. There are some indications within the literature reviewed that process VFDs may have shorter useful lives; therefore, Xcel Energy could further explore the reasonableness of the process VFD useful life in their next plan. However, because this correlation is less clearly defined, we suggest that the effective useful life for all types of VFDs be reduced to 15 years to be consistent with reviewed programs and literature.

Recommendation #11: Utilize a Net-to-Gross ratio of .65.

If the percentage of non-managed accounts and enhanced motors projects increases, we recommend that the NTGR be adjusted upwards to .70 for 2011.



APPENDIX A: PROGRAM STAFF INTERVIEW GUIDE

Internal Staff interview guide

Interview Objectives:

- Identify program activities, inputs (resources), outputs, short to medium term outcomes and long term outcomes to develop the program logic model
- Identify important influences on program operation and achievements
- Identify issues that should be incorporated into evaluation activities
- Characterize program operations including staffing, outreach activities and marketing, types of customers participating and not participating and role of the trade allies
- Identify areas that are working well and opportunities for improvement

A. Describe your role within Xcel Energy and with the program(s)

- 1) Responsibilities or role regarding the program...
 - When became involved
 - How have responsibilities/role changed over time
 - On average, what percent of your workload is spent on the program monthly?
- 2) Who do you interact with (others) regarding the program?
 - Other Xcel Energy staff, trade allies, customers
 - Roles and responsibilities of these other persons
 - Success of interactions; suggestions for improvements

B. Program Design and Marketing

- 1) Who was involved in the program design? Was the program patterned after another program(s)? If so, were any modifications made to improve the program design?
- 2) What are the program goals? How are program goals communicated internally and externally? How well has the program been performing in relation to goals? Why?
- 3) Are there similarities between the projects that participate in the program, or is each project unique?
- 4) What are the target markets within the commercial sector for the program?
- 5) What marketing activities are being used to reach the different target markets? How effective have each of these methods been in identifying and enrolling potential participants? Why?
- 6) What are major barriers to participation?
 - Why do you think customers choose to participate or not participate?
 - What are the comparative strengths of these reasons?
 - Are the marketing efforts designed to build on customers' reasons for participation and minimize reasons for nonparticipation?



- 7) Are there sufficient program resources to meet the programs goals? (Probe: Examples of resources are staff resources, incentives, program partners support (co-op ads, spiffs), and marketing materials.)

C. Program Operations

- 1) What are the participation steps from the customer's perspective? Have these changed over time?
- 2) Describe your communications and working relationship with trade allies. What support is provided through the program to trade allies? In what areas could this be improved?
- 3) What is the level of customer satisfaction with the various aspects of the program (participation process, program application, measure performance, rebate processing, etc.)? How can satisfaction be improved?
- 4) What aspects of the program implementation are working well? Which are not working well?
- 5) How does the type of equipment or services being purchased and installed through the program vary? Why do you think there is this variation?
- 6) Do the incentive levels seem appropriate? If not, why not? What, if any, changes in the incentive levels do you think may be needed?
- 7) What do you see as future challenges for the program?
- 8) How are participants and non participants tracked? Is the system used for tracking helpful or not? What would be helpful to track that is not currently available? How easy is it to use the tracking system?
- 9) How do you identify prospective customers for the program?

D. Program impacts

- 1) (If relevant), Next I'd like to ask you about various technical inputs into your current tracking system estimates for gross energy and demand impacts. Could you please briefly summarize your approach for these inputs and any concerns/issues you may have with the input. Capture across the specific pieces of program equipment or service (RCx).



Inputs	Summary of Approach	Concerns/issues (if any)
Baseline equipment		
Replacement equipment specifications (e.g., capacity, nominal rating of equipment capacity, energy efficiency ratio)		
Operating hours		
System coincidence factors		
Load factors		
O&M savings and/or costs		
Equipment/measure life		
Persistence, snapback, and degradation		
Incremental costs		
Free-ridership and spillover rate		

- 2) Have these inputs changes over the course of the program? If so, how?
- 3) Are there any plans to make changes to these inputs moving forward? If so, how?

E. Evaluation

- 1) What are your needs from this evaluation?
- 2) What do you hope to learn from the evaluation?
- 3) (Probe if not mentioned in 1 or 2) Do you have any specific questions that you want to make sure are included in primary data collection activities with market actors. Probe about trade ally interviews, participant and non-participant surveys, the benchmarking study and the engineering review.

F. Inputs for Logic Model. This next series of questions will be used in conjunction with a review of program documentation to develop the program logic model. The program logic model is a visual representation of the program's theory. The program theory articulates what the program is trying to achieve, through what interventions, and with respect to which market actors.



- 1) What are the primary activities the program is expecting to conduct? (Interviewer note: Probe about activities with trade allies, other stakeholders and customers as applicable. If needed give examples such as recruitment and training of contractors, recruiting customers and installing high efficiency equipment or performing audit.)
- 2) For each of the activities we just discussed, what are the outputs of the activities? Outputs are direct, immediate results from the activity and often can be contract metrics for the program. Examples include number of trade allies participating, number of incentive equipment or marketing activities conducted.
- 3) Now for each program activity and corresponding output, what are the expected outcomes? For example, how do you expect the program to influence trade allies business practices? How is the program expected to influence customer awareness and behaviors? (probe to distinguish outcomes that are in the program's control from those that are not)
- 4) Now for each of the outcomes we just discussed, can you tell me if you think this will be a near-term outcome of the program in the next 12 months or if this is a longer-term outcome of the program (2-3 years out)?
- 5) Now I would like to step back through each program activity with you and discuss the resources that are needed to support each program activity we talked about. (Interviewer note: Walk them through each program activity.) Examples of resources are staff resources, incentives, program partners and marketing materials.
- 6) What are other key outputs you have developed for the program that we have not already discussed? Examples include a tracking system or application materials.

G. Other Suggestions for Improvement

- marketing
- staffing
- resources
- training
- quality control
- program tracking system
- communication.



APPENDIX B: TRADE ALLY INTERVIEW GUIDE

Xcel Energy
DSM Programs Business Evaluation
TRADE Ally Interview protocol

B.1 INTERVIEW GUIDE FORMAT

This interview guide is for trade allies that have participated in the last two years in Xcel Energy's DSM business programs being evaluated in 2010. This includes both trade allies that have been fairly active in the program as well as 'informed' non-participants. Informed non-participants are trade allies that have completed a project through the program, but have had very limited involvement. An example would be a trade ally who has done one or two projects through the program or who completed projects in 2009, but not 2010 to-date.

First the guide summarizes the key researchable issues that the interviews will explore across all the programs and at the program-specific level. Next, the interview guide presents the specific questions to be asked. Trade allies will only be asked about the relevant program, indicated by [program] when name of the program is to be stated or referred to as the program in the below guide. Specific questions and probes only relevant for one program are noted at the beginning of the question with the program indicated in []. There are also program specific modules, which will only be asked for that program.

Because senior staff will be conducting interviews, trade ally interviews will be semi-structured. Therefore the following interview protocol is only a guide to ensure certain topics are covered, but evaluators will follow the flow of the interview and modify questions as needed to fit the interviewee's circumstance.

B.2 OVERARCHING KEY RESEARCHABLE ISSUES

- How are the programs leveraging the trade ally infrastructure and are there areas for improvement?
- What impact have the programs had on the relevant commercial market in terms of greater availability of efficient products or program services?
- What are the opportunities to streamline the application and rebate process?
- Are trade allies effectively conveying program information and encouraging customer participation? What additional training or support from Xcel Energy do trade allies need to more effectively support the programs?
- How effective is the marketing of the programs? Are there customer segments that marketing efforts should specifically target? What are strategies for effectively marketing the program to identified customer segments such as small/medium business? Is more program-specific marketing needed?
- Are rebate levels and program equipment/services optimally set to encourage participation while maximizing the cost-effectiveness of the program?
- What is the customer decision-making processes regarding participation in Xcel Energy's Business DSM Programs? What are customer barriers to participation?
- How receptive are customers towards energy efficiency measures given the current economic conditions?



B.3 MOTORS/VSDS KEY RESEARCHABLE ISSUES

- How satisfied are vendors with communications about the program? Are any changes needed?
- How informed are customers about program equipment and rebates?
- What barriers prevent customers from purchasing program equipment?
- What is the impact of the general economy, versus other factors?
- Is it difficult to obtain motors specification information?
- Are pre-approvals for custom equipment a significant barrier?
- What would cause vendors to specify program equipment more often?
- Are sales of VSDs projected to increase, decrease or remain level?
- Will vendor sales practices change when premium motors become the new federal standard?

B.4 EFFICIENCY CONTROLS RESEARCHABLE ISSUES

- Are providers aware of what information they need to provide in their proposals for their customers to gain pre-approval? What barriers do they face in gathering this information?
- Has the number of lighting control projects been limited? What can Xcel Energy do to encourage participation from more lighting contractors and promote lighting projects?
- What benefits do controls providers receive from participating in the program? How influential is the contractor rebate in motivating providers to participate in the program?
- Are providers aware of the recent rebate level change? Has this change affected their communications with customers and/or the level of customer interest in the program?
- How aware are customers of the (existence and benefits of technologies for implementing energy efficient building control systems?
- Are there any barriers specific to small business customers that may be preventing them from installing EMS or other building controls systems?

B.5 RECOMMISSIONING RESEARCHABLE ISSUES

- How are the current tools (e.g., sample report, calculator tools) offered by the program to the providers beneficial? Are there opportunities for improvements in the offered tools? What other tools do they need to be successful?
- What level of influence do the providers have on the customers' decision to participate in the program or implement the recommendations?
- Do providers expect the volume of recommissioning work to increase, stay the same, or decrease?
- Why are some studies more exhaustive than others? What are the barriers that discourage providers from covering all opportunities within a facility?
- Are some easily remedied recommissioning opportunities being corrected and not being identified to the customer?



- Are some recommissioning opportunities being identified to the customers but not included in the report?
- Who makes the decision to implement study recommendations?
- What improvements do you see as necessary for the pre-approval and rebate stages of the Recommissioning program?
- Other utilities require customers to implement opportunities from their studies. Would this be a beneficial to Xcel Energy's recommissioning program?

B.6 INTRODUCTION

My name is _____, with [company]. Xcel Energy has hired us to evaluate its [relevant program]. The study will provide recommendations on how they can improve the program for you and your customers. I would like to ask you some questions about your experience with the [program]. Your feedback on the program is extremely valuable as Xcel Energy wants to improve your experience and satisfaction with the program as well as your customers. As part of this study we are talking to approximately ten businesses such as yourself that work with the [program] as well as customers who have and have not participated in the program. This interview should take approximately [30 minutes of your time for Motors and Drives, Efficiency Controls, 45 minutes for Recommissioning] . May we take some time now to do the interview? (If no, when would be a convenient time?)

NAME: _____

COMPANY: _____

TITLE: _____

PHONE: _____

INTERVIEWER: _____

DATE COMPLETED: _____ **LENGTH:** _____

B.7 FIRMOGRAPHICS

Research company website before interview to learn about company.

F1. What is your primary role(s) in the supply and delivery of [relevant program equipment or service] to the commercial customer market? (Examples include manufacturer, manufacturer representative, wholesale distributor, engineering firm, contractor, energy services firm, etc.)

F2. Could you please tell me specifically the types of [program] equipment or services you sell/specify for commercial customers? Probe for the specific types, sizes and efficiency levels as applicable. Note: Commercial refers to all businesses in Xcel Energy's territory that qualify for the program.

F3. What percentage of your commercial business is:

- Planned Equipment Replacement? _____%



- New Equipment Purchases (for new buildings) _____%
- Failed/Emergency Equipment Replacement _____%
- Other (specify)_____%

F4. What percent of the projects that you completed in the last 12 months were for small or medium businesses in terms of energy usage versus large businesses? We are defining small businesses as those with 100 or less employees. Medium businesses have over 100 employees. Large businesses are those that have an Xcel Energy account manager.

B.8 PROGRAM AWARENESS AND INVOLVEMENT

P1. Could you describe for me your participation in [Program]? Probe for reasons ally participates at the reported level of activity.

P2. When did you first get involved with [Program]?

P3. How did you first hear about [Program]? (Do not prompt. Circle all that apply)

- Through Xcel Energy staff (probe if account manager, channel manager, product manager, etc.)
- Attended workshop or training seminar and learned about the program
- Through a manufacturer/supply house
- Learned about the program at trade show
- Saw/heard ads for the program (Where?_____)
- Attended a program-sponsored information session
- Magazine, newspaper, TV, radio (morning, evening, weekend,)..etc
- Xcel Energy Website
- Business Colleague
- Business Customer
- Other _____
- Don't know/unsure

P4. Why did you decide to participate/get involved in the program? (*Do not prompt*)

P4a. When was the last time you completed a project through/sold equipment through the program?

P4b. (IF HAVEN'T COMPLETED A PROJECT/SOLD EQUIPMENT IN LAST YEAR) Why have you not completed a project through the program recently?

P5. Do you expect your participation/involvement in the program to increase, decrease or stay the same in the next 12 months? Why? If not mentioned, probe specifically what the slower economy has on their current and expected involvement in the program.



P6. What could the program do to help you provide more services/promote program equipment more? [Motors and Drives] Probe to see if batch applications processing is desired.

P7. Do you feel there are adequate program communications? Are any changes needed? How do you like to receive communications about the program?

P8. Who do you typically interact with from the program? For what purposes? How would you describe your interactions with program staff? (minimal, helpful, very involved, probe to characterize)?

P9. What is the primary benefit(s) you receive from [Program]?

P9a. [CONTROLS] Are you aware that the Efficiency Controls Program offers rebates to installation contractors? Have you received any of these rebates? What impact, if any, did the contractor rebate have on your participation in the program?

[RCx – MN only (not CO)] Are you aware that the Recommissioning Program offers trade incentives for identifying a certain level of savings within a study? (They can earn \$2/1,000 kWh identified in a study).

P10. [RCX] How satisfied are you with the current tools and support offered by the program such as the savings calculator and sample recommissioning reports? Would you say you are very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied?

P10a. [RCX and CONTROLS] What additional support could the program offer that you would find beneficial? Are there any additional tools that the program should offer?

P11. Are there other types of energy efficiency programs that you participate in /are aware of? If yes, do you think there are lessons learned for Xcel Energy from these other programs?

B.9 CUSTOMER INTERACTIONS

C1. Do you actively promote [Program]? What percent of your customers already know about [Program] before you tell them about it? How do they find out about the program? Who (title/position) do you need to work with in order to get interest and close the sale. What info do they seek from you? Why do customers call you – equipment failure, maintenance/service call, warranty work, primary interest in energy efficiency, other?

C1a [CONTROLS] How aware are your customers of technologies for controlling their lighting, heating, cooling, or ventilation systems (through a centralized system vs. stand-alone controls)?

C2. What are the primary reasons why customers typically want to participate in the program? What factors most influence customer project decision-making? Ask of mentioned factors: which are the one or two most important in influencing customers' decisions? Probe for differences among customer segments and differences for new construction and retrofits.

If needed, examples of factors include the following:

- Fits standard design
- Overall cost of the project
- Availability of a rebate through utility program
- Information and education provided by utility on the benefits of energy-efficient technologies or services



- Saves electric costs
- Helps the environment
- Shows good corporate citizenship
- Meets payback criteria
- Impact on company financials
- Recommendation of manufacturer, supplier, contractor, etc.

C3. What are the primary reasons why customers typically do not want to participate in the program? Do these reasons vary across different customer segments? (PROBE: small vs. large customers) [MOTORS and DRIVES] Are pre-approvals for large/custom program equipment a barrier? If YES: Is this because of the application paperwork, approval time or other factors?

C4. On a scale of 1 to 5 where 1 is very difficult and 5 is not at all difficult, how difficult do you find it to sell [high efficiency program equipment or service] to your customers?

C4a. Probe to understand why the program equipment or service is easy or difficult to sell for respondent and why there are “lost opportunities” for Xcel Energy (e.g., projects that are not high efficiency that could have been or recommissioning studies that do not result in projects). Characterize customer participation barriers (e.g., incremental cost of efficient high efficiency equipment, too long of a payback period, etc.) to the extent possible. If not mentioned, probe specifically about the effect of the slower economy on customers’ decision to participate in program.

C4b. Probe if they have any specific recommendations to make it less difficult.

C5. What do you think are the main benefits your customers receive by participating in [Program]?

C6. What additional services would you like to see the program provide customers?

C7. What can be done to increase the number of participating customers in the program? Probe about managed accounts (large customers) versus small and medium size customers.

C8. Are there other opportunities to promote energy-efficient products and services to business customers that the program is not currently addressing?

C9. Would you like to see the program do more direct or specific marketing to customers for the program? If yes, what kind of marketing would you like to see added? [For Motors and Drives, probe specifically about magazines Xcel Energy should use/subscribe to for placing program-specific advertising].

B.10 MOTORS AND DRIVES SPECIFIC QUESTIONS

M1. Are there components of the program that are confusing to you? What do you find that is unclear or confusing about our program?

M2. What do you need from the program to be more effective in promoting the motors and drive components? Are there marketing components (analytical tools, feature sheets, technical sheets) missing that you need to sell higher efficiency?

M3. What is the biggest challenge that you face with the motors/drive program?



M4. What do you think needs to change with the program to get customers more interested in making the purchase of the higher efficiency equipment?

M5. What are the top three reasons/explanations given to you by customers for not purchasing a higher efficiency option?

M6. What tools/resources do you use to make sell the higher efficient equipment? Do you use any of the tools/resources that Xcel Energy makes available to you? Why or why not?

M7. How often do you do a motor inventory /assessment planning for your customers? An example of this is how many motors a customer has and what of their stock they should replace/repair or rewind.

B.11 RECOMMISSIONING SPECIFIC QUESTIONS

R1. Do you typically only conduct recommissioning studies, only implement building recommissioning procedures, or do you both conduct the study and implement the recommissioning procedures?

R2. (IF CONDUCTS STUDY) What opportunities do you typically identify during a recommissioning study?

R3. (IF CONDUCTS STUDY) Do you feel studies are typically exhaustive in identifying opportunities at customer facilities? How could studies identify more opportunities at customer facilities? What are the challenges in identifying additional opportunities? (PROMPT WITH EXAMPLES OF OPPORTUNITES NOT MENTIONED ABOVE)

R4. (IF CONDUCTS STUDY) Are there any opportunities that you identify that are communicated to the customer but aren't recorded in the study? If so, what are they?

R5. In your experience, who typically makes the decision to implement the opportunities identified in the recommissioning study? Is there anything the program should do to encourage implementation?

R6. Do you actively seek new customers to perform studies on or do you just focus on existing customers. If you don't seek new customers, why?

R7. Do you understand Xcel Energy's study documentation requirements, specifically what you need to provide to document energy savings?

R8. Are there specific technical training needs you have? If so, what training sessions would you like to see Xcel Energy offer?

R9. What percent of your business focuses on RCx?

R10. Do you feel you are conservative with your savings estimates? (Interviewer note: Xcel Energy's last research found providers are conservative, which leads to the question if the program is missing out on capturing realistic energy savings.)

R11. Do you have any suggestions on how to structure the program's study rebate so that the customer can get an idea of what amount they may be eligible for before they apply for preapproval?

R12. What other support do you need from Xcel Energy (i.e. hands on training to help identify measures)?



B.12 CONTROLS SPECIFIC QUESTIONS

EC1. What types of equipment is controlled by the automated control systems you typically implement? (PROBE: lighting, heating, cooling, ventilation)

EC2. How would you describe your experiences with submitting project proposals for pre-approval? Have you been aware of all of the information you need to include in your proposals to gain pre-approval? Has Xcel Energy ever followed-up with you requesting more information? Is there any additional information or resources that Xcel Energy could provide to clarify necessary information?

EC3. Do you help your customers fill out the pre-approval rebate application and/or project worksheet (if yes, proactively offer, or wait for customer to ask for help)? What obstacles do customers typically face in providing information needed for pre-approval? What obstacles do you face in providing information needed for preapproval?

EC4. (IF INSTALLS LIGHTING CONTROL SYSTEMS) The program has historically seen low participation in comprehensive lighting control projects – do you have any ideas why participation in these types of projects has been limited? Do you have any recommendations for Xcel Energy on how to encourage more participation among both lighting contractors and business customers?

B.13 PROGRAM PROCEDURES

E1. On a scale of 1 to 5 where 1 is 'very difficult' and 5 is 'not at all difficult', how would you rate the program's administrative burden in terms of application requirements and processing? Why do you give this ranking?

E2. What is your involvement with the application portion of the program? What is working well about the application process from the customer's point of view? Your point of view? How would you like to see the application process improved? Probe specifically about the pre-approval process for custom measures if not mentioned.

E3. Are the customer rebates offered through the program adequate? How would you like to see the rebate structure revised?

E3a. [CONTROLS] Are you aware that the program changed its rebate levels in the fall of 2009? Has this change affected your communications with customers? Has it affected customer interest in the program?

E4. What changes would you make to the equipment and/or services rebated through the program?

B.14 COMMERCIAL MARKET

M1. One of the purposes of the program is to encourage customers to purchase more efficient equipment or services than they would otherwise purchase. Do you feel the program is accomplishing this? Why or why not?

M2. What direction do you see the commercial market taking in [state] in the next 2 years? Do you see specific challenges for Xcel Energy or opportunities to promote efficient equipment or services?

M3. [MOTORS, if they sell VFDs] Do you think your sales of VFDs will increase, decrease or remain the same? Why?

M4. [MOTORS] Will you change your equipment stocking or sales practices in any way when premium motors become the new federal standard?



B.15 CONCLUSION

C1. What do you think is working best in Xcel Energy's [program]?

C2. What do you think is most in need of improvement?

C3. Overall, how satisfied are you with the program? Would you say you are very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied? How could your satisfaction be increased?

C4. Would you recommend the program to others in your field, i.e. other trade allies you know?

Is there anything else that you would like to share concerning the [Program]?

Thank you for your time. This completes our interview.



APPENDIX C: PARTICIPANT SURVEY INSTRUMENT AND COOPERATION RATE

Xcel Energy Business DSM Participant Survey

One participant survey will be used for the following programs: Motor and Drive Efficiency Program, Recommissioning Program, and the Efficiency Controls Program. Program specific questions are noted where applicable.

The complete list of survey modules follows:

- Introduction
- Identification of Decision-Maker
- Installation Verification
- Source of Program Information
- Net-to Gross
- Spillover
- Program Satisfaction
- Operating Hours
- Customer Characteristics

Sample variables

The following fills will be used throughout the survey. These fills are program and measure specific. Some of these may need to be revised once we have had a chance to examine the participant database.

[Program] Program name:

Motor and Drive Efficiency Program
Recommissioning Program
Efficiency Controls Program

[Date] Date of participation

[Rebate] Rebate amount

[Quantity] Quantity of measure installed (If greater than one, fill with quantity installed).

[All Assistance] Assistance received through program

Rebate of [rebate] for **[EEMeasure]**



(RCx) Rebate of [rebate] for a study to identify recommissioning opportunities within your facility

(RCx) Rebate of [rebate] for implementing opportunities

[Action] Action program encouraged

- Purchased a **[EEMeasure]** (Motors/Controls)
- (RCx) Implement opportunities identified through the recommissioning study
- (RCx) Have a recommissioning study done
- (RCx) Implement energy-saving opportunities

[Measure type] generic product description

- 1 Motor
- 2 Control system
- 3 Building study

[EEMeasure] Specific high efficiency equipment implemented or service performed

- 1 Energy efficient motor
- 2 Variable speed drive (adjustable frequency drive)
- 3 Efficiency control systems
- 4 Opportunities identified through the recommissioning study (RCx)
- 5 Energy efficient motors and variable speed drives

[Stage] RCx program stage

- 1 Received study
- 2 Received study and implemented recommended measures
- 3 Implemented energy-saving measures

[ECO] Specific energy conservation opportunity measures implemented through RCx program

[Custom] Flagged if no prescriptive motors were installed

[Address] address where measure implemented

[Contact name] contact listed in participant files

[Program contact and phone number] name and phone number of Xcel Energy Market Research staff responsible for program evaluation:

Mandy McLean – Controls

Mike Morris - Motors

Bruce Nielsen - Recommissioning)

Introduction



Hello, my name is **[interviewer name]**, and I'm calling on behalf of Xcel Energy regarding your firm's participation in their **[program]**. May I speak with **[contact name]**?

- 1 Yes
- 2 No [attempt to convert]

(RCx) I'm with Tetra Tech, an independent research firm. I am calling to learn about your experiences with your recent recommissioning project and the rebates you received through Xcel Energy's **[program]**.

(MOTORS/CONTROLS) I'm with Tetra Tech, an independent research firm. I am calling to learn about your experiences with the **[EEMeasure]** that you received a rebate for through Xcel Energy's **[program]**.

I'm not selling anything; I'd just like to ask your opinion about this program. You should have received an email or letter from Xcel Energy explaining the purpose of this study. Let me assure you that your responses will be kept confidential and your individual responses will not be revealed to anyone unless you grant permission.

Before we start, I would like to inform you that for quality control purposes, this call will be recorded and monitored and that this call will take between 15 and 20 minutes of your time.

(Who is doing this study: Xcel Energy has hired our firm to evaluate the program. As part of the evaluation, we're talking with customers that participated in the program to understand their experiences and satisfaction with the program.)

(Why are you conducting this study: Studies like this help Xcel Energy better understand customers' need for an interest in energy efficiency programs and services.)

(Timing: This survey should take between 15 and 20 minutes of your time. Is this a good time for us to speak with you? IF NOT, SET UP CALL BACK APPOINTMENT OR OFFER TO LET THEM CALL US BACK AT 1-800-454-5070.)

(Sales concern: I am not selling anything; we would simply like to learn about your experience with the program. Your responses will be kept confidential. If you would like to talk with someone from Xcel Energy about this study, feel free to call **[program contact and phone number]**.)

(NOTE: For all questions, "DON'T KNOW" and "REFUSED" will be coded if offered as a response.)

Identification of Decision-Maker

C1 (MOTORS/CONTROLS) Program records indicate that you received a rebate for a **[EEMeasure]** through the **[program]** around **[date]**. Is this correct? (ASK FOR EACH MEASURE REBATED)

(RCx) Program records indicate that you received a rebate (IF STAGE = 1) for conducting a recommissioning study (IF STAGE = 2: and a rebate for **[ECO]**) (IF STAGE = 3) for **[ECO]**) through the Recommissioning program around **[date]**. Is this correct?

- 1 Yes (SKIP TO C5)
- 2 No (SPECIFY WHAT IS INCORRECT ABOUT THIS STATEMENT. IF



DOESN'T RECALL MEASURE, ASK C2)

C2 (ASK IF DOESN'T RECALL THE MEASURE) Is there someone else at your firm that would be more knowledgeable about your organizations' participation in Xcel Energy's **[program]**?

- 1 Yes (*SKIP TO C4*)
- 2 No
- D DON'T KNOW
- R REFUSED (*TERMINATE*)

C3 Through Xcel Energy's **[program]**, your organization received **[all assistance]**. Are you sure you don't recall this? (RECORD ONE NUMBER)

- 1 Don't remember (*TERMINATE, RECORD ANY COMMENTS*)
- 2 Remember (*READ, "GREAT, THEN LET'S CONTINUE", SKIP TO C5*)
- R REFUSED (*TERMINATE*)

C4 May I please speak with that person? (RECORD ONE NUMBER)

- 1 Yes (*BEGIN THE SURVEY AGAIN WITH THIS NEW RESPONDENT*)
- 2 No (*TERMINATE*)
- D DON'T KNOW (*TERMINATE*)
- R REFUSED (*TERMINATE*)

C5 (RCx) Thank you. [IF STAGE = 2 OR STAGE = 3: For the rest of the survey, I'll be referring to those measures as "the implemented measures".] Are you the person most knowledgeable about your organization's decision to have a recommissioning study done (IF STAGE = 2: and implement the recommended measures) through Xcel Energy's **[program]**?

(MOTORS/CONTROLS) Are you the person most knowledgeable about your organization's decision to install **[EEMeasure]** through Xcel Energy's **[program]**?

- 1 Yes
- 2 No
- D DON'T KNOW (*TERMINATE*)
- R REFUSED (*TERMINATE*)

C6 (RCx) Who else at your company was involved in the decision of whether or not to (IF STAGE = 1 OR STAGE = 2) have a recommissioning study done (IF STAGE = 2: and implement the recommended measures)(IF STAGE = 3: implement the recommended measures) through the **[program]**?

(MOTORS/CONTROLS) Who else at your company was involved in the decision of whether or not to install **[EEMeasure]** through the **[program]**?

(PROBE: IF MORE THAN ONE DECISION MAKER, ASK R WHO WAS RESPONSIBLE FOR MAKING THE ULTIMATE DECISION)

- 1 No one else
- 2 (SPECIFY):

Name	Title	Phone number	Probe for role:



(IF RESPONDENT WAS INVOLVED IN THE DECISION, CONTINUE; ELSE TERMINATE AND DIAL ONE OF DECISION MAKERS IN C6)

Installation Verification

IO1a (RCx AND STAGE <> 3) How did you select the recommissioning study provider? (INDICATE ALL THAT APPLY)

- 1 List of providers
- 2 Obtain competitive bids from providers
- 3 Used previous provider
- 4 Recommendation from friend/colleague
- 5 White pages/Internet search
- 6 Internal staff conducted study
- 7 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

IO1b (RCx and STAGE = 2 OR STAGE = 3) Who implemented the [EEMeasure]? Someone within your organization or an outside contractor or vendor?

- 1 Internal staff
- 2 External contractor or vendor
- D DON'T KNOW
- R REFUSED

IO1c (IF IO1b=2) How did you select the contractor who implemented the recommendations from the study?

- 1 Recommendation of study provider
- 2 Used same provider that completed the study
- 3 Obtain competitive bids from providers
- 4 Used previous provider
- 5 Recommendation from friend/colleague
- 6 White pages/Internet search
- D DON'T KNOW
- R REFUSED

IO1d (RCx) Would you have preferred that Xcel Energy provide a preapproved list that you could choose from or did you like the flexibility of being able to select the study provider (STAGE=2: and the contractor who implemented the study recommendations?

- 1 Prefer to have a preapproved list
- 2 Prefer the flexibility to choose own contractor
- 3 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED



(REPEAT I1a – I4 SERIES FOR EACH EEMeASURE, IF RCX AND STAGE = 1, SKIP TO PA1)

I1a (MOTORS/VSDS) Is/are the **[Quantity]** **[EEMeasure]** still installed and operating at your business?

(EFFICIENCY CONTROLS) Is/are the **[EEMeasure]** still installed and operating according to the recommended control strategy?

(RCx AND STAGE = 2 OR STAGE = 3) Is/are the **[EEMeasure]** still operating according to the study's recommended specifications?

- 1 Yes
- 2 No (SKIP TO I2)
- D DON'T KNOW (IF NO OTHER KNOWLEDGEABLE R, TERMINATE)
- R REFUSED (IF NO OTHER KNOWLEDGEABLE R, TERMINATE)

I1b (MOTORS) On what type of equipment was the **[EEMeasure]** installed?

- 1 Fan
- 2 Pump
- 3 Something else (SPECIFY)

(ONLY ASK IF I1a = NO. ELSE SKIP TO PA1)

I2 (MOTORS) Was it/Were they ever installed?

(RCX/EFFICIENCY CONTROLS) Was/were the **[EEMeasure]** ever in operation?

- 1 Yes (SKIP TO I4)
- 2 No
- D DON'T KNOW
- R REFUSED

I3 Do you plan on implementing **[EEMeasure]** at **[address]**?

- 1 Yes → When do you plan to install it? _____ (month) ____ (year)
- 2 No
- D DON'T KNOW
- R REFUSED

I4 (MOTORS) Why isn't it currently operating at **[address]**?

(EFFICIENCY CONTROLS/RCx) Why isn't it currently operating according to the recommended control/ recommissioning strategy at **[address]**? (SELECT ALL THAT APPLY)

- 1 Equipment didn't work properly
- 2 Equipment failed/broke
- 3 Unhappy with performance [SPECIFY]
- 4 Installed at other location [SPECIFY ADDRESS]
- 5 Lack of order to product
- 6 Change in production schedule
- 7 Eliminated production line permanently
- 8 Eliminated production line temporarily
- 9 Other [SPECIFY]
- D DON'T KNOW
- R REFUSED



Source of Program Awareness/Social Media

PA1 How did you learn about the [all assistance] available through Xcel Energy's [program]?
 PROBE: Did you hear about the program from any other sources? (DO NOT READ LIST, RECORD ALL THAT APPLY)

- 1 Information in your mailbox (*SKIP TO PA1a*)
- 2 A phone call (*SKIP TO PA1b*)
- 3 By making a phone call (*SKIP TO PA1c*)
- 4 An online resource (*SKIP TO PA1d*)
- 5 A mass advertising campaign (*SKIP TO PA1e*)
- 6 Other (SPECIFY) (*SKIP TO PA2*)
- *7 Previous experience
- *8 Vendor
- *9 Xcel Energy event
- D DON'T KNOW (*SKIP TO PA2*)
- R REFUSED (*SKIP TO PA2*)

(*IF PA1 = 1*)

PA1a Where did you receive the information in your mailbox from?

- 1 A flyer in your Xcel Energy bill (bill insert) (*SKIP TO PA2*)
- 2 Stand-alone direct mail piece from Xcel Energy (*SKIP TO PA2*)
- 3 Information from a vendor that sells the equipment or service related to the program (*SKIP TO PA2*)
- D DON'T KNOW (*SKIP TO PA2*)
- R REFUSED (*SKIP TO PA2*)

(*IF PA1 = 2*)

PA1b Who did you receive a phone call from?

- 1 From an Xcel Energy Account Manager (*SKIP TO PA2*)
- 2 From Xcel Energy's Business Solution Center (BSC) (*SKIP TO PA2*)
- 3 From a vendor that sells the equipment or service related to the program (*SKIP TO PA2*)
- D DON'T KNOW (*SKIP TO PA2*)
- R REFUSED (*SKIP TO PA2*)

(*IF PA1 = 3*)

PA1c Who did you call?

- 1 Xcel Energy about your bill or your service (*SKIP TO PA2*)
- 2 Xcel Energy specifically about the program(s) (*SKIP TO PA2*)
- 3 A vendor that sells the equipment or service related to the program (*SKIP TO PA2*)
- D DON'T KNOW (*SKIP TO PA2*)
- R REFUSED (*SKIP TO PA2*)

(*IF PA1 = 4*)



PA1d Which online resource?

- 1 Email from Xcel Energy (*SKIP TO PA2*)
- 2 Xcel Energy's website (*SKIP TO PA2*)
- 3 A vendor's website (*SKIP TO PA2*)
- 4 An online ad (*SKIP TO PA2*)
- 5 An Xcel Energy blog (*SKIP TO PA2*)
- 6 A blog other than Xcel Energy's (*SKIP TO PA2*)
- 7 Xcel Energy's Facebook fan page (*SKIP TO PA2*)
- 8 Xcel Energy's Twitter page (*SKIP TO PA2*)
- D DON'T KNOW (*SKIP TO PA2*)
- R REFUSED (*SKIP TO PA2*)

(*IF PA1 = 5*)

PA1e What type of advertising campaign?

- 1 A radio ad (*SKIP TO PA2*)
- 2 A television ad (*SKIP TO PA2*)
- 3 A newspaper ad (*SKIP TO PA2*)
- 4 Billboards (*SKIP TO PA2*)
- D DON'T KNOW (*SKIP TO PA2*)
- R REFUSED (*SKIP TO PA2*)

PA2 How would you prefer to learn more about the **[program]** or other energy efficiency programs offered by Xcel Energy in the future? By... (READ LIST)

- 1 Receiving information in your mailbox (*SKIP TO PA2a*)
- 2 Receiving a phone call (*SKIP TO PA2b*)
- 3 You making a phone call (*SKIP TO PA2c*)
- 4 You using an online resource or e-mail (*SKIP TO PA2d*)
- 5 A mass advertising campaign (*SKIP TO PA2e*)
- 6 Other (SPECIFY)
- D DON'T KNOW (*SKIP TO PA3*)
- R REFUSED (*SKIP TO PA3*)

PA2a Where would you prefer to receive it from?

- 1 A flyer in your Xcel Energy bill (bill insert) (*SKIP TO PA3*)
- 2 Stand-alone direct mail piece from Xcel Energy (*SKIP TO PA3*)
- 3 Information from a vendor that sells the equipment or service related to the program (*SKIP TO PA3*)
- D DON'T KNOW (*SKIP TO PA3*)
- R REFUSED (*SKIP TO PA3*)

PA2b Who would you prefer to receive a phone call from?

- 1 From an Xcel Energy account manager (*SKIP TO PA3*)
- 2 From Xcel Energy's Business Solution Center (BSC) (*SKIP TO PA3*)
- 3 From a vendor that sells the equipment or service related to the program (*SKIP TO PA3*)
- D DON'T KNOW (*SKIP TO PA3*)
- R REFUSED (*SKIP TO PA3*)

PA2c Who would you prefer to call?

- 1 Xcel Energy about your bill or your service (*SKIP TO PA3*)



- 2 Xcel Energy specifically about the program(s) (SKIP TO PA3)
- 3 A vendor that sells the equipment or service related to the program (SKIP TO PA3)
- D DON'T KNOW (SKIP TO PA3)
- R REFUSED (SKIP TO PA3)

PA2d Which online resource?

- 1 Email from Xcel Energy (SKIP TO PA3)
- 2 Xcel Energy's website (SKIP TO PA3)
- 3 A vendor's website (SKIP TO PA3)
- 4 An Online ad (SKIP TO PA3)
- 5 An Xcel Energy blog (SKIP TO PA3)
- 6 An blog other than Xcel Energy's (SKIP TO PA3)
- 7 Xcel Energy's Facebook fan page (SKIP TO PA3)
- 8 Xcel Energy's Twitter page (SKIP TO PA3)
- D DON'T KNOW (SKIP TO PA3)
- R REFUSED (SKIP TO PA3)

PA2e From what type of advertising campaign?

- 1 A radio ad (SKIP TO PA3)
- 2 A television ad (SKIP TO PA3)
- 3 A newspaper ad (SKIP TO PA3)
- 4 Billboards (SKIP TO PA3)
- D DON'T KNOW (SKIP TO PA3)
- R REFUSED (SKIP TO PA3)

PA3 (RCx) Where does your organization typically go to get information on recommissioning?

(RECORD VERBATIM)

- 99 Have not looked into recommissioning before participation

Net-to-Gross Questions²⁴

(IF RCX & STAGE = 1, SKIP)

N1 Why did you decide to purchase/implement [EEMeasure]? (CHECK ALL THAT APPLY. DO NOT READ LIST. PROBE WITH "Were there any other reasons?")

- 1 (The program incentive)
- 2 (The program-provided technical assistance)
- 3 (RCX only: The program-subsidized study)

²⁴ The question numbers in this section match the numbering in the CA PDF file describing the NTGR approach and analysis document revised May 8, 2009.



- 4 (Recommendation of third party contractor/engineer)
- 5 (Recommendation of Xcel Energy staff)
- 6 (Recommendation of internal staff)
- 7 (Wanted to save energy)
- 8 (Wanted to reduce costs)
- 9 (Past experience with the program)
- 10 (Funding from an outside source – SPECIFY SOURCE & AMOUNT)
- 11 (Something else – SPECIFY)
- D DON'T KNOW
- R REFUSED

N2 (ASK IF PRESCRIPTIVE MOTORS) Did you hear about Xcel Energy's **[program]** BEFORE or AFTER you decided to purchase/implement the exact same **[EEMeasure]** that was eventually purchased/implemented? (PROGRAM INFLUENCE SCORE)

- 1 Before
- 2 After
- D DON'T KNOW
- R REFUSED

N2a (MOTORS/CONTROLS) Did you receive a feasibility study or custom analysis through the **[program]**?

- 1 Yes
- 2 No
- D DON'T KNOW
- R REFUSED

N2b (RCx AND STAGE = 1 OR STAGE = 2) The Recommissioning program paid a portion of the cost for a study of your facility that identified energy conservation opportunities. Using a 0 to 10 scale, where 0 means not at all important and 10 means very important, please rate the importance of that financial assistance in your decision to conduct the recommissioning study at that time?

- 0-10 rating
- D DON'T KNOW
- R REFUSED



N3 (MOTORS) The program offers rebates to cover a portion of the cost of purchasing and implementing energy efficient motors and drives on fans and pumps.

(CONTROLS): The program offers custom engineering analysis of proposed projects to determine a pre-approved rebate amount based on potential energy savings for implementing energy efficient building control systems

(RCx IF STAGE=2): In addition to paying a portion of the cost for a recommissioning study, the program provides rebates for implementing energy efficient recommissioning opportunities identified in the study

(RCx IF STAGE = 3) The program provides rebates for implementing energy efficient recommissioning opportunities at your facility.

With that in mind, I'm going to ask you to rate the importance of factors that might have influenced your decision to purchase/implement **[EEMeasure]**. Using a 0 to 10 scale, where 0 means not at all important and 10 means very important, please rate the importance of each of the following in your decision to purchase/implement this [EEmeasure] at this time. (ROTATE LIST; AT END OF LIST ASK: Is there anything else that I may have missed? RECORD RESPONSE AS OTHER)

- a. The age or condition of the old equipment
- b. Availability of the program rebate (TIMING AND SELECTION SCORE²⁵)
- c. (IF MOTORS & CONTROLS & N2a=YES) Information provided through an Xcel Energy feasibility study or audit or custom analysis (TIMING AND SELECTION SCORE)
- d. Recommendation from a vendor/supplier (IF > 5, COLLECT NAME AND CONTACT INFORMATION OF VENDOR AND INTERVIEW VENDOR) (TIMING AND SELECTION SCORE)
- e. Previous experience with the **[program]**
- f. Information from the program training course or seminar (TIMING AND SELECTION SCORE)
- g. Information from the program or utility marketing materials (TIMING AND SELECTION SCORE)
- h. Standard practice or corporate policy in our business
- i. Payback on investment
- j. General concerns about the environment/global warming/energy independence
- k. (IF Q1=YES) Financial assistance or rebate from [INSERT Q2 SOURCE]
- l. Other (SPECIFY)

²⁵ For items that are used in the NTGR algorithm, we have indicated the score where the response is used. Appendix A at the end of this document explains how the questions are used in the algorithm.



N4 Now I'd like to ask you about the importance of the program (IF RCX AND STAGE = 1 OR STAGE = 2: including the program-subsidized study) to your decision. Again using the 0 to 10 rating scale, where 0 means "Not at all important" and 10 means "Very important", please rate the overall importance of program versus [IF N3A > N3J: the age or condition of the old equipment] [IF N3J > N3A: your general concerns about the environment] [IF N3A = N3J: factors outside of the program such as the age or condition of the old equipment and your general concerns about the environment] in your decision to implement the specific **[EEMeasure]**.

I'd like you to give me a 0 to 10 score for the program's influence and a 0 to 10 score for the influence of the most important other factor so that the two scores total 10. (PROGRAM INFLUENCE SCORE)

- a. ___ rating of the importance of the **[program]**
- b. ___ rating of the importance of most important other factor

N5 Now I would like you to think about the action you would have taken if the **[program]** had not been available.

N5a (RCx, STAGE = 1) Using a 0 to 10 scale, where 0 is not at all likely and 10 is extremely likely, how likely is it that you would have had a recommissioning study done if the **[program]** had not been available? (NO-PROGRAM SCORE)

- ___ (0-10)
- D DON'T KNOW
- R REFUSED

N5b (MOTORS/CONTROLS) Using a 0 to 10 scale, where 0 is not at all likely and 10 is extremely likely, how likely is it that you would have installed exactly the same equipment if the **[program]** had not been available? (NO-PROGRAM SCORE)

(RCx, STAGE=2 OR STAGE = 3) Using a 0 to 10 scale, where 0 is not at all likely and 10 is extremely likely, how likely is it that you would have implemented [EEMeasure] if the **[program]** had not been available? (NO-PROGRAM SCORE)

- ___ (0-10)
- D DON'T KNOW
- R REFUSED

(ASK IF N5>0)

N6 (MOTORS/CONTROLS) You said that there was a **[N5 response]** in 10 likelihood that you would have installed exactly the same equipment if the **[program]** had not been available. When do you think you would have installed this equipment?

(RCx if STAGE=1) You said that there was a **[N5 response]** in 10 likelihood that you would have had a recommissioning study done if the **[program]** had not been available. When do you think you would have had a recommissioning study done?

(RCx if STAGE=2) You said that there was a **[N5 response]** in 10 likelihood that you would have had a recommissioning study done and implemented **[EEMeasure]** if the **[program]** had



not been available. When do you think you would have had a recommissioning study done and implemented [EEMeasure]?

(NO-PROGRAM SCORE)

(RCx if STAGE=3) You said that there was a [N5 response] in 10 likelihood that you would have implemented [EEMeasure] if the [program] had not been available. When do you think you would have implemented [EEMeasure]?

(NO-PROGRAM SCORE)

(INTERVIEWER: PLEASE ANSWER IN MONTHS)

- ___ Within 6 months? [NTG = 0]
- ___ 6 – 47 months later [NTG=(months-6)*.024]
- ___ 4 or more years later [NTG=1]
- ___ Never [NTG=1]
- D DON'T KNOW [NTG=1]
- R REFUSED

PARTIAL FREE-RIDERSHIP BATTERY²⁶

P1a (MOTORS/CONTROLS) Now I would like you to think one last time about what action you would have taken if the program had not been available. Supposing that you had not participated in the program, which of the following alternatives would you have been MOST likely to do? (READ LIST, RANDOMIZE OPTIONS 1-6, INDICATE ONLY ONE)

- 1 Install or implement fewer high efficiency units
- 2 Install standard efficiency equipment or whatever required by code
- 3 Install equipment more efficient than code, but less efficient than we installed through the program
- 4 Repair/refurbish the existing equipment
- 5 Done nothing (keep the existing equipment as is)
- 6 Install the exact same equipment
- 7 Something else (specify)
- D DON'T KNOW
- R REFUSED

P1b (RCx AND STAGE <> 1) Now I would like you to think one last time about what action you would have taken if the program had not been available. Supposing that you had not participated in the program, which of the following alternatives would you have been MOST likely to do? (READ LIST, INDICATE ONLY ONE)

- 1 Implement fewer recommendations
- 2 Done nothing (keep the existing equipment as is)
- 3 Implement the exact same recommendations

²⁶ This battery is used to adjust gross savings prior to applying the NTGR



- 4 Something else (specify)
- D DON'T KNOW
- R REFUSED

(IF P1a=1 or P1b = 1)

P4 How many measures would you have installed or implemented? (RECORD NUMBER OF UNITS OR PERCENTAGE OF UNITS ACTUALLY INSTALLED)

- ___ Number of units OR ___ Percentage of units
- D DON'T KNOW
 - R REFUSED

P6 (IF P1a=3 and MOTORS) Can you tell me what model or efficiency level you were considering as an alternative? (INTERVIEWER: IT IS OK TO TAKE AN ANSWER SUCH AS "10% more efficient than code", "10% less efficient than the program equipment", "standard efficiency motor", or "premium efficiency motor".)

(RECORD VERBATIM)

P7a (IF MOTORS OR CONTROLS) Did this equipment replace existing equipment?

- 1 Yes
- 2 No
- D DON'T KNOW
- R REFUSED

P7B (IF MOTORS OR CONTROLS AND P7A = YES) How long do you think the existing equipment/control system would have lasted before requiring replacement?

- ___ Years
- D DON'T KNOW
 - R REFUSED

Like Spillover

S1 Since you participated in the [program], have you purchased/implemented the same [EEMeasure] without the assistance of an Xcel Energy program at this facility or at other locations served by Xcel Energy?

- 1 Yes, only at this facility
- 2 Yes, only at another facility
- 3 Yes, at both this and another facility
- 4 No (SKIP TO S6)
- D DON'T KNOW (SKIP TO S6)
- R REFUSED (SKIP TO S6)



S2 What specific energy efficiency measure did you purchase/implement without the assistance of an Xcel Energy program? (DO NOT READ; INDICATE ALL THAT APPLY)

- 1 Energy efficient motor (SPECIFY QUANTITY AND HP CLASS BY 1-40 HP, 41-100 HP, 101-500 HP, or 501+ HP)
- 2 Variable speed drive (SPECIFY QUANTITY)
- 3 Efficiency control system (SPECIFY TYPE AND NUMBER OF ADDITIONAL LOCATIONS/SYSTEMS)
- 4 Recommissioning study → How many?
- 5 An opportunity identified in recommissioning study (SPECIFY)
- 7 Other (specify) → How many?
- D DON'T KNOW
- R REFUSED

(ASK IF S2=1 AND MOTORS)

S3 How do you know that this equipment is high efficiency or otherwise saves energy? (PROBE: IS IT LABELED AS "NEMA PREMIUM"? IS IT ENERGY STAR® RATED; DID THE VENDOR TELL YOU?)

(RECORD VERBATIM)

S4 I'm going to read a statement about the energy efficiency measure that you purchased/implemented on your own. On a scale from 0-10, with 0 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statement.

My past experience with the **[program]** influenced my decision to install or implement this **[S2 response]** on my own.

- _____ (0-10)
- D DON'T KNOW
- R REFUSED

S5 Why did you purchase/implement this energy efficiency measure without going through an Xcel Energy program? (DO NOT READ; INDICATE ALL THAT APPLY)

- a. Application process too burdensome/Too much paperwork
- b. Takes too long to get pre-approval
- c. Takes too long to approve the rebate
- d. No time to participate, needed equipment immediately
- e. The program had ended
- f. The equipment would not qualify (PROBE: WHY NOT?)
- g. The amount of the rebate wasn't important enough
- h. Did not know program was available for this equipment
- i. There was no program available
- j. Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

S6 (MOTORS) Do you plan to install any new drives or motors in the next year?



- 1 Yes (Specify: Motor, Drive, or Both)
- 2 No (SKIP TO SA1)
- D DON'T KNOW (SKIP TO SA1)
- R REFUSED (SKIP TO SA1)

S7 (MOTORS) Which equipment types and sizes are you likely to install, regardless if you use Xcel Energy's program or not?

- 1 1 to 40 horsepower (HP) motor (SPECIFY: Is this an upgrade or replacement?)
- 2 41 to 100 horsepower motor (SPECIFY: Is this an upgrade or replacement?)
- 3 101 to 500 horsepower motor (SPECIFY: Is this an upgrade or replacement?)
- 4 500 or greater horsepower motor (SPECIFY: Is this an upgrade or replacement?)
- 5 1 to 50 horsepower VFD
- 6 51 to 200 horsepower VFD
- 7 200 or greater horsepower VFD
- D DON'T KNOW
- R REFUSED

Program Satisfaction

Next I'd like to ask you some questions about your experiences when participating in the **[program]**.

SA1a (CONTROLS) Who completed the pre-approval application, including the project worksheet, for you? (INDICATE ALL THAT APPLY)

(RCx) Who completed the pre-approval application for you? (INDICATE ALL THAT APPLY)

- 1 The Xcel Energy account representative
- 2 The equipment or study vendor
- 3 Respondent
- 4 Someone else at your company
- 5 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

SA1b (RCx AND STAGE <> 3) Who completed the study rebate application for you? (INDICATE ALL THAT APPLY)

- 1 An Xcel Energy account representative
- 2 The study vendor
- 3 Respondent
- 4 Someone else at your company
- 5 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

SA1c (RCx/MOTORS) And who completed the implementation rebate application form for you? (INDICATE ALL THAT APPLY)

- 1 An Xcel Energy account representative
- 2 The equipment vendor
- 3 Respondent
- 4 Someone else at your company
- 5 Other (SPECIFY)
- N Not yet complete



- D DON'T KNOW
- R REFUSED

SA1d (IF SA1c = 3) Did you require any assistance from Xcel staff or an equipment vendor?

- 1 Yes
- 2 No
- D DON'T KNOW
- R REFUSED

SA1e (IF SA1d = 1) With what did you require assistance? (DO NOT READ)

- 1 Motor type
- 2 Model number
- 3 Drive HP
- 4 Motor HP
- 5 Efficiency
- 6 General specifications
- 7 Custom process info/operations worksheet
- 8 Other, SPECIFY

SA2a (RCx AND STAGE <> 3) Who told you how much rebate you would receive for conducting a recommissioning study? (INDICATE ALL THAT APPLY)

- 1 Xcel Energy representative
- 2 Study vendor
- 3 No one – I figured it out myself
- 4 Other (specify)
- D DON'T KNOW
- R REFUSED

SA2b (CONTROLS/MOTORS/RCx IF STAGE=2 OR 3) Who told you how much rebate you would receive for installing [EEMeasure] through the program? (INDICATE ALL THAT APPLY)

- 1 Xcel Energy representative
- 2 Contractor or vendor
- 3 Pre-approval letter
- 4 No one – I figured it out myself
- 5 Other (specify)
- D DON'T KNOW
- R REFUSED

SA3a (RCx AND STAGE <> 3) Was the rebate amount you received for the recommissioning study less, more, or the same as was initially determined/estimated?

- 1 Less → Why was it less? (RECORD VERBATIM)
- 2 More
- 3 The Same
- D DON'T KNOW
- R REFUSED

SA3b (CONTROLS/MOTORS/RCx IF STAGE=2 OR 3) Was the rebate amount you received less, more, or the same as was initially determined/estimated for project implementation? ?

- 1 Less → Why was it less? (RECORD VERBATIM)
- 2 More



- 3 The Same
- D DON'T KNOW
- R REFUSED

SA4 Using a 0 to 10 scale, with 0 being very dissatisfied and 10 being very satisfied, how satisfied are you overall with the Xcel Energy **[program]**?

- ___ (0-10)
- D DON'T KNOW
- R REFUSED

SA5 Why do you say that?

(RECORD VERBATIM)

SA6 Next, I'd like you to tell me how satisfied you are with specific aspects of the **[program]** on that same 0-10 scale with 0 being very dissatisfied and 10 being very satisfied. (ROTATE LIST)

- a. ___ (0-10) The type of equipment eligible for the program (If <7, probe: Why is that?)
- b. ___ (0-10) Requirements for equipment eligibility (If <7, probe: Why is that?)
- c. ___ (0-10) (CUSTOM MOTORS/CONTROL) The length of time it took from project start to end (If <7, probe: Why is that?)
- d. ___ (0-10) (RCx AND STAGE <> 3) The length of time it took from study start to study end (If <7, probe: Why is that?)
- e. ___ (0-10) (RCx) The length of time it took from implementation start to implementation end (If <7, probe: Why is that?)
- f. ___ (0-10) (MOTORS/CONTROL) The amount of the rebate (If <7, probe: Why is that?)
- g. ___ (0-10) (RCx AND STAGE <> 3) The amount of the study rebate (If <7, probe: Why is that?)
- h. ___ (0-10) (RCx) The amount of the implementation rebate (If <7, probe: Why is that?)
- i. ___ (0-10) The rebate application process in general
- j. ___ (0-10) (RCx/CUSTOM MOTORS) The pre-approval process, including the required project documentation (If <7, probe: Why is that?)
- k. ___ (0-10) (CONTROL) The pre-approval process, including the project worksheet (If <7, probe: Why is that?)
- l. ___ (0-10) (RCX) The study done to identify potential energy saving measures (If <7, probe: Why is that?)
- m. ___ (0-10) The program's handling of your questions or complaints (If <7, probe: Why is that?)
- n. ___ (0-10) The amount of time it took to receive the rebate (If <7, probe: Why is that?)
- o. ___ (0-10) (RCx/CONTROLS) The contractor who installed the equipment or implement the measures (If <7, probe: Why is that?)
- p. ___ (0-10) The support you received from Xcel Energy (If <7, probe: Why is that?)
- q. ___ (0-10) (RCx) The amount of energy savings or measures identified in your study



SA6x (IF SA6i<7) You mentioned earlier that you weren't satisfied with the application process. What is the most difficult part of the application process? (DO NOT READ, RECORD ALL)

- 1 Understanding how to complete the application
- 2 Time required to fill out application
- 3 Amount of information required
- 4 Getting/providing the technical specifications
- 5 Determining the rebate
- 6 Determining if motor is enhanced efficiency/higher than premium
- 7 Time lapse between completing the application and getting approval from Xcel Energy
- 8 Other
- D DON'T KNOW
- R REFUSED

SA7a (RCx AND STAGE <> 3) What barriers did you face, either inside or outside of your company, when deciding whether or not to have a recommissioning study done?

(SAME RESPONSE CATEGORIES AS SA7b)

SA7b (MOTORS/CONTROLS/RCx IF STAGE=2 OR 3) What barriers did you face, either inside or outside of your company, when deciding whether or not to purchase or implement this [EEMeasure] through the program?

(DO NOT READ; INDICATE ALL THAT APPLY)

- 1 No barriers
- 2 Other priorities for capital spending
- 3 Lack of funds available for investment
- 4 Lack of financing
- 5 Economy
- 6 Amount of management time to oversee projects
- 7 Incremental cost for more efficient equipment higher than we expected
- 8 Rebate amount not high enough
- 9 Business hesitant to replace existing working equipment
- 10 Upper management doesn't see the benefit of energy efficient equipment
- 11 Unsure of energy savings potential
- 12 We lease the space
- 13 Contractors weren't familiar with program
- 14 Internal staff lacked expertise about measures
- 15 Rebate application process was demanding
- 16 Amount of information needed for pre-approval process
- 17 Other (SPECIFY)
- D DON'T KNOW

SA7c (CONTROLS) What types of equipment are controlled by the controls system implemented through Xcel Energy's program? (SELECT ALL THAT APPLY)

- 1 Lighting equipment
- 2 Heating equipment
- 3 Cooling equipment



- 4 Ventilation equipment
- 5 Other equipment
- D DON'T KNOW
- R REFUSED

SA7d (IF CONTROLS AND DID NOT INSTALL A LIGHTING CONTROLS SYSTEM IN SA7c) Are you aware that the Efficiency Controls program offers rebates for automated systems that centrally control lighting equipment, including a range of technologies such as occupancy sensors?

- 1 Yes
- 2 No
- D DON'T KNOW
- R REFUSED

SA7e (IF EFFICIENCY CONTROLS AND DID NOT INSTALL A LIGHTING CONTROLS SYSTEM) Has your company investigated or considered installing an efficient lighting controls system?

- 1 Yes
- 2 No
- D DON'T KNOW
- R REFUSED

(IF SA7D = 1)

SA7e Why haven't you pursued installing a lighting controls system through the program?

(RECORD VERBATIM)

SA8 Which aspects of the **[program]**, if any, would you change? (DO NOT READ LIST; INDICATE ALL THAT APPLY. PROBE: Anything else?)

- 1 No change
- 2 Include additional types of equipment (SPECIFY)
- 3 Increase the rebate level (SPECIFY)
- 4 Speed up the rebate processing
- 5 Speed up pre-approval process
- 6 Simplify the program application process or form (SPECIFY)
- 7 Require less information
- 8 (MOTORS) Do not require motors specifications
- 9 Have completely web-based/online process
- 10 (MOTORS) Eliminate pre-approvals for custom motors/VFDs
- 11 Give more detailed instructions or examples on application/form
- 12 Ensure that quoted rebate is the same as actual rebate
- 13 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

SA9 I would like you to think in terms of your satisfaction with Xcel Energy overall. On a 0-to-10 scale where 0 means VERY DISSATISFIED and 10 means VERY SATISFIED, how would you



rate your satisfaction with Xcel Energy? (IF NECESSARY, SAY:) You can use any number from 0 to 10. (REPEAT SCALE IF NECESSARY)

- (0-10)
- D DON'T KNOW
- R REFUSED

Customer Characteristics

F1 Do you own or rent/lease the space you occupy at this location?

- 1 Own
- 2 Rent/lease
- 3 Own some and rent/lease some
- 4 Manage property
- 5 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

F2 What actions other than the ones we have already discussed has your business taken at this location within the past few years in order to reduce your energy use. (DO NOT READ; INDICATE ALL THAT APPLY)

- 1 None
- 2 Installed high efficiency lighting equipment
- 3 Added lighting controls, occupancy sensors, and or time clocks
- 4 Installed high efficiency cooling equipment
- 5 Installed high efficiency heating equipment
- 6 Installed high efficiency ventilation equipment
- 7 Added controls to the heating, ventilation or air conditioning systems to reduce use
- 8 Made changes to the heating, ventilation or air conditioning system maintenance schedule
- 9 Made changes to the building envelope (e.g., insulation, window film, etc.)
- 10 Participated in other Xcel energy efficiency programs (SPECIFY)
- 11 Facility-wide energy awareness training
- 12 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

F3 (IF HAVEN'T DONE ANYTHING) What are the reasons you haven't been able to make any additional energy saving improvements at this facility? (DO NOT READ; CIRCLE ALL THAT APPLY)

- 1 No need
- 2 Lack of available equipment
- 3 High initial cost
- 4 Don't know what to do
- 5 Don't have the staff to identify or make these improvements
- 6 Customer comfort
- 7 Need for certain look/feel (aesthetics)
- 8 Disruption to business operations



- 9 Lease the space
- 10 Poor economy
- 11 Budget constraints
- 12 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

F4 Can we have your permission to release your company's answers to Xcel Energy on an individual basis and possibly have a representative from Xcel Energy follow up with you to discuss issues that are of particular concern to you?

- 1 Yes
- 2 No
- D DON'T KNOW
- R REFUSED

F5 As part of our evaluation, we may need to follow-up on some of this information. Would it be all right if someone called you if needed?

- 1 Yes
- 2 No
- D DON'T KNOW
- R REFUSED

F6 Those are all of the questions that we have. For confirmation, can you please tell me your title?

(RECORD VERBATIM)

COM I'd like to thank you for your help with this survey! Do you have any comments you'd like to share?

(RECORD VERBATIM)

NTGR Scoring Algorithm and Example

The calculation of the self-report-based core NTGR is described below. The NTGR is calculated as an average of three scores representing responses to one or more questions about the decision to install a program measure.

- A **Timing and Selection** score that captures the influence of the most important of various program and program-related elements in influencing the customer to select the specific program measure at this time. Program influence through vendor recommendations is also captured in this score.
- An overall **Program Influence** score that captures the perceived importance of the program (whether rebate, recommendation, or other information) in the decision to implement the specific measure that that was eventually adopted or installed. The overall program influence score is reduced by half if the respondent says they learned about the program only after they decided to install the program qualifying measure.
- A **No-Program** score that captures the likelihood of various actions the customer might have taken at this time and in the future if the program had not been available. This score accounts



for deferred free-ridership by capturing the likelihood that the customer would have installed program qualifying measures at a later date if the program had not been available.

Calculation of each of the above scores is discussed below. For each score, the questions contributing to the calculation are presented (in parenthesis), the calculation is described, and an example is provided.

Timing and Selection Score

For the decision maker, the questions asked are:

Using a 0 to 10 rating scale, where 0 means not at all important and 10 means very important, please rate the importance of each of the following in your decision to implement this specific measure at this time:

- Availability of the PROGRAM rebate (N3b)
- Information provided through a recent feasibility study, energy audit or other types of technical assistance provided through the PROGRAM (N3c)
- Information from PROGRAM training course (N3f)
- Information from other PROGRAM marketing materials (N3g)
- Recommendation from a vendor/supplier (If >5, a vendor interview is triggered) (N3d)

For the vendor, the questions asked if the interview is triggered are:

- V1. I'm going to ask you to rate the importance of the **[program]** in influencing your decision to recommend [measure] to [Customer name] and other customers. Using a 0 to 10 scale where 0 is "Not at all important" and 10 is "Very Important", how important was the **[program]**, including incentives as well as program services and information, in influencing your decision to recommend that [Customer name] install the energy efficiency [measure] at this time?
- V2 And using a 0 to 10 likelihood scale, where 0 denotes "not at all likely" and 10 denotes "very likely," if the **[program]**, including incentives as well as program services and information, had not been available, what is the likelihood that you would have recommended this specific energy efficiency [measure] to [Customer name]?
- V3 Now, using a 0 to 100 percent scale, in what percent of total sales situations did you recommend [measure] before you learned about the **[program]**?
- V4 And using the same 0 to 100 percent scale, in what percent of total sales situations do you recommend [measure] now that you have worked with the **[program]**? (VMAX)
- V5 And, using the same 0 to 10 scale where 0 is "Not at all important" and 10 is "Very important", how important in your recommendation were . . . ?
- ____ Training seminars provided by Xcel Energy?
 - ____ Information provided by the Xcel Energy website?
 - ____ Your firm's past participation in a rebate or audit program sponsored by Xcel Energy?



If the vendor interview is triggered, a score is calculated that captures the highest degree of program influence on the vendor's recommendation. This score (VMAX) is calculated as the MAXIMUM value of the following:

- The response to question V1
- 10 minus the response to question V2
- The response to question V4 minus the response to question V3, divided by 10
- The response to question V5a.
- The response to question V5b.
- The response to question V5c.

The Timing and Selection Score is calculated as:

The highest of the responses to the first four decision maker questions and, if the vendor interview has been triggered, the VMAX score multiplied by the score the decision makers assigned to the vendor recommendation.

Example:

The decision maker provides responses of 5 for the importance of the rebate, 6 for an audit or feasibility study, 3 for training, 2 for other marketing materials, and seven for the vendor recommendation, which means a vendor interview is triggered.

The vendor responses are eight for the significance of the program, 5 for the likelihood of recommending the measure in the absence of the program, 40% for how often the measure was recommended before program awareness and 60% for how often it is recommended after program awareness, 3 for the importance of training, 2 for the importance of the website and 5 for the importance of previous participation. The VMAX score is the greatest of 8, $(10-5)$, $(60-40)/10$, 3, 2 and 5. So VMAX is 8. This score is multiplied by the importance of the vendor recommendation, to which the decision maker assigned a 7, so the vendor score is 5.6.

The timing and selection score is the maximum of the five decision maker responses (5, 6, 3, and 2) and the vendor score (5.6). Even though the vendor interview was triggered, the vendor score is not as high as the 6 assigned to the importance of the audit or feasibility study, so the timing and selection score is 6.

Program Influence Score

The questions asked are:

1. Did you hear about Xcel Energy's **[program]** BEFORE or AFTER you decided to purchase the exact same [measure] that was eventually purchased? (N2)
2. Now I'd like to ask you about the importance of the program (IF RCX: including the program-subsidized study) to your decision. Again using the 0 to 10 rating scale, where 0 means "Not at all important" and 10 means "Very important", please rate the overall importance of program versus *[IF N3A > N3J: the age or condition of the old equipment]* *[IF N3J > N3A: your general concerns about the environment]* *[IF N3A = N3J: factors outside of the program such as the age or condition of the old equipment and your general concerns about the environment]* in your decision to implement the specific **[EEMeasure]**.



I'd like you to give me a 0 to 10 score for the program's influence and a 0 to 10 score for the influence of the most important other factor so that the two scores total 10. (PROGRAM INFLUENCE SCORE)

- a. ___ rating of the importance of the **[program]** (N4a)
- b. ___ rating of the importance of most important other factor (N4b)

The program influence score is calculated as:

The program importance response, on the 0 to 10 scale, to question 2a reduced by half if the respondent became aware of the program only after having decided to adopt the program qualifying measure per the response to question 1. As question 1 is only asked for projects without a pre-approval process, we assume that pre-approved projects (custom motors, controls, and recommissioning projects) were aware of the program before having decided to adopt the program qualifying measure.

Example:

The decision maker says they became aware of the program before deciding to implement the measure, and provides a response of 7 to question 2a. Therefore, becomes the program influence score is 7.

No-Program Score

The questions asked are:

1. Using a 0 to 10 scale, where 0 is not at all likely and 10 is extremely likely, how likely is it that you would have installed exactly the same equipment if the **[program]** had not been available? (N5)
2. (IF 1>0). You said that there was a [N5 response] in 10 likelihood that you would have installed the same equipment if the **[program]** had not been available. When do you think you would have installed this equipment? (PLEASE ANSWER IN MONTHS) (N6)
 - a. _____ Within 6 months? (Deferred NTG Value=0)
 - b. _____ 7 to 47 months later (Deferred NTG Value=(months-6)*.024)
 - c. _____ 48 or more months later (Deferred NTG Value =1)
 - d. _____ Never (Deferred NTG Value=1)
 - d. _____ Don't know (Deferred NTG Value=1)

Note: The value 0.024 is 1 divided by 41 (41 is calculated as 47 – 6). This assumes that the deferred NTG value is a linear function beginning in month 7 through month 47, increasing 0.024 for each month of deferred installation.

The No-Program Score is calculated as:



10 minus (the likelihood of installing the same equipment multiplied by one minus the deferred net-to-gross value associated with the timing of that installation).

Example:

The respondent says there is a 4 in 10 likelihood that they would have installed the same equipment. In response to question 5, the decision maker says they would have installed the qualifying equipment 18 months later, which has a NTGR value of $(18-6) \cdot 0.24$, or .29 associated with it.

The No-Program score is 10 minus $(4 \cdot (1 - .29))$, which is 10 minus $4 \cdot .71$ or 7.16.

Core NTG Ratio

The self reported NTGR ratio is simply the average of the Program Influence, Timing and Selection, and No-Program Scores, divided by 10.

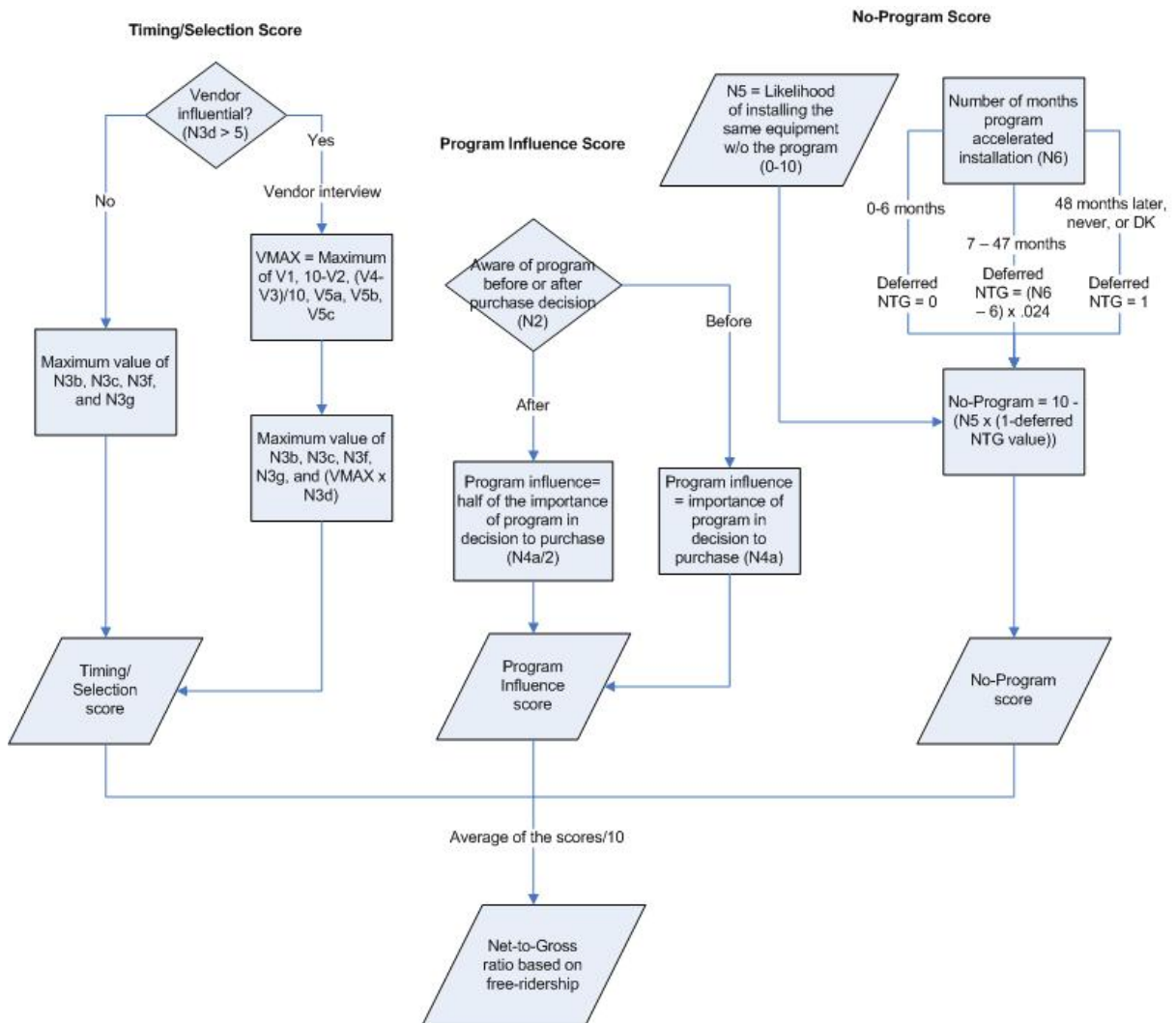
Example:

The NTGR is the average of 6, 8 and 7.2, or 7.1 divided by 10 = .71. This figure is then applied to adjusted gross savings to yield net savings.

The following flowchart documents the calculation of the self-report-based core NTG ratio.



Figure 11-1. Self-report NTGR flowchart



Accounting for Partial Free-ridership

What is referred to as partial free-ridership is accounted for in the gross impact analysis and not in the NTGR calculation. Information is gathered on partial free-ridership using the following questions asked as part of the decision maker NTGR survey.



P1a (MOTORS/CONTROLS) Now I would like you to think one last time about what action you would have taken if the program had not been available. Supposing that you had not participated in the program, which of the following alternatives would you have been MOST likely to do? (READ LIST, INDICATE ONLY ONE)

- 1 Install or implement fewer high efficiency units
- 2 Install standard efficiency equipment or whatever required by code
- 3 Install equipment more efficient than code, but less efficient than we installed through the program
- 4 Repair/refurbish the existing equipment
- 5 Done nothing (keep the existing equipment as is)
- 6 Install the exact same equipment
- 7 Something else (specify)
- D DON'T KNOW
- R REFUSED

P1b (RCx) Now I would like you to think one last time about what action you would have taken if the program had not been available. Supposing that you had not participated in the program, which of the following alternatives would you have been MOST likely to do? (READ LIST, INDICATE ONLY ONE)

- 1 Implement fewer recommendations
- 2 Done nothing (keep the existing equipment as is)
- 3 Implement the exact same recommendations
- 4 Something else (specify)
- D DON'T KNOW
- R REFUSED

P4 (IF P1a=1 or P1b = 1) How many measures would you have installed or implemented? (RECORD NUMBER OF UNITS OR PERCENTAGE OF UNITS ACTUALLY INSTALLED)

- ___ Number of units OR ___ Percentage of units
- D DON'T KNOW
 - R REFUSED

P6 (IF P1a=3 and MOTORS) Can you tell me what model or efficiency level you were considering as an alternative? (INTERVIEWER: IT IS OK TO TAKE AN ANSWER SUCH AS "10 PERCENT MORE EFFICIENT THAN CODE" OR "10 PERCENT LESS EFFICIENT THAN THE PROGRAM EQUIPMENT")

(RECORD VERBATIM)



P7a (IF MOTORS OR CONTROLS) Did this equipment replace existing equipment?

- 1 Yes
- 2 No
- D DON'T KNOW
- R REFUSED

P7b (IF P1a=4 AND MOTORS AND OR CONTROLS AND it is a 'Retrofit/Replacement' project AND P7A = YES) How long do you think the existing equipment/control system would have lasted before requiring replacement?

- ____ Years
- D DON'T KNOW
- R REFUSED

As noted above, it is most appropriate to address partial free-ridership by adjusting the gross savings, the partial free-ridership questions should be asked of the key project decision maker during the NTG interview as well as by the engineer(s) conducting the on-site for a given project at the time the on-site audit is taking place. This information should help the NTG analysis team gain a more complete understanding of the equipment selection decision. However, all partial free-ridership findings will be passed back to the engineer for consideration in any calculations they may make.

Since the partial free-ridership adjustment will be taking place in the gross savings calculation and since the current NTG scoring algorithm does not incorporate the partial free-ridership questions, there is no need to incorporate partial free-ridership into the NTG scoring algorithm. However, when weighing other information that might have been used to override the algorithm-derived NTG score, the NTG analysis team will need to ensure that we are not inadvertently adjusting the savings twice for the same partial free-ridership i.e., through adjustments both to the gross savings calculation and to the NTG ratio.

“Like” Spillover methodology

California's self-report protocol includes a battery of questions to quantify spillover for use in estimating spillover. The spillover methodology uses a series of questions designed to measure "like" spillover. These questions ask about recent purchases (since program participation) of any additional energy-efficient equipment of the same type as installed through the program that were made *without* any technical or financial assistance from the utility, but were influenced by the program. A "like" spillover estimate is computed based on how much more of the same energy-efficient equipment the participant installed outside the program and did so because of their positive experience with the program.

Survey free-ridership questions are followed by questions designed to measure "like" spillover. These questions ask about recent purchases (since program participation) of any additional energy-efficient equipment of the same type as installed through the program that were made *without* any technical or financial assistance from the utility. A "like" spillover estimate is computed based on how much more of the same energy-efficient equipment the participant installed outside the program and did so because of their positive experience with the program. This estimate is separate from the free-ridership estimate and does not factor into any free-ridership analysis.



One of the issues with attempting to quantify spillover savings is how to value the savings of measures installed outside the program since we are relying on customer self-reports of the quantity and efficiency of any measures installed. We use a conservative approach and report only those measures installed outside the program that were of exactly the same type and efficiency as the ones installed through the program. Our conservative approach allows customers to be more certain about whether the equipment they installed outside the program was the same type as the program equipment. This, in turn, makes it possible for us to use the estimated program savings for that measure to calculate the customer's "like" spillover savings.

The following flowchart documents the calculation of the self-report-based spillover savings.

Figure 11-2. Self-report Spillover flowchart

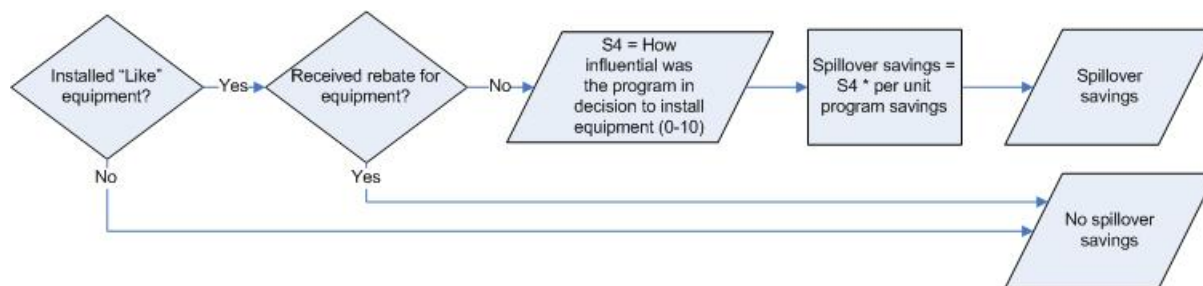




Table 11-1. Participant Survey Cooperation Rate

Sample Disposition	Colorado Motors & Drives	Colorado Recommissioning			Minnesota Recommissioning			Minnesota Efficiency Controls
		Study only	Implemented	Total	Study only	Implemented	Total	
Sample Size	255	40	22	62	38	40	78	74
Number not in service ⁴	10	0	0	0	2	2	4	0
Non-working number ⁴	9	3	1	4	0	0	0	2
Removed per Xcel Energy's request ¹	21	1	10	11	2	0	2	0
Ineligible - Does not recall participation, or incorrect contact	9	1	0	1	13	5	18	8
Disconnected number	2	4	0	4	0	0	0	0
Adjusted Sample Size	204	31	11	42	21	33	54	64
Hard Refusal	3	1	0	1	0	1	1	0
Soft Refusal	3	0	1	1	0	0	0	2
Incompletes (partial interviews)	5	1	0	1	0	1	1	0
Unavailable for duration	1	0	0	0	1	0	1	1
Language barrier/non-English	0	0	0	0	0	0	0	0
Active ²	94	9	6	15	9	19	28	28
Completed Surveys	98	20	4	24	11	12	23	33
Cooperation Rate ³	48.0%	64.5%	36.4%	57.1%	52.4%	36.4%	42.6%	51.6%

¹ Examples of these include: did not actually participate in program, account managers requesting their clients not be contacted further, etc.

² An average of 6 contacts per active case were made to reach these still active cases

³ Number of completed surveys divided by Adjusted Sample Size

⁴ All bad numbers were traced with a telephone append service or directory assistance service



APPENDIX D: NONPARTICIPANT SURVEY AND COOPERATION RATE

D.1 XCEL ENERGY BUSINESS DSM NONPARTICIPANT SURVEY

One nonparticipant survey will be used for the following programs: Motors/VSD Program, Recommissioning Program, and the Efficiency Controls Program. Program specific questions are noted where applicable. Separate sample lists will be provided by Xcel Energy program staff.

The complete list of survey modules follows:

- Introduction
- Identification of Decision-Maker
- Source of Program Information/Social Media
- Important Factors in Decisions to Purchase New Equipment
- Satisfaction
- Operating Hours
- Customer Characteristics

Sample variables

The following fills will be used throughout the survey. These fills are program and measure specific. Some of these may need to be revised once we have had a chance to examine the participant database.

[Program]	Program name
1	Motor & Drive Efficiency Program
2	Recommissioning Program
3	Efficiency Controls Program

[Program description] Program description

(MOTORS) provides rebates for the installation of energy efficient motors and variable speed drives (sometimes referred to as adjustable frequency drives) for controlling the motors that operate fans and pumps.

(CONTROLS): provides rebates for the installation of a system of controls that are centrally operated, typically via a computer software package. These systems have the potential to control facility functions in a way that saves energy, either through operator action or automatic programming. The most common energy-using applications controlled by a control system include heating, cooling, ventilation, and lighting.

(RCx) is designed to assist Xcel Energy's large commercial and industrial customers improve the efficiency of a building's existing operating systems. Recommissioning is intended to "tune-up" existing functional systems to run as efficiently as possible.



[Action] Action taken on own

(MOTORS) Installed energy efficient motors and/or variable speed drives on fans and pumps.

(CONTROLS): Installed a system of controls or sensors on your heating, cooling, ventilation, and/or lighting.

(RCx) Had recommissioning done to “tune-up” existing functional systems to run as efficiently as possible.

[Address] address where measure implemented

[Contact name] contact listed in participant files

[Program contact and phone number] name and phone number of Xcel Energy staff responsible for program evaluation

Introduction

Hello, my name is **[interviewer name]**, and I'm calling on behalf of Xcel Energy. May I speak with the person most familiar with purchasing and maintaining the energy-using equipment for **[business name]** at **[address]**?

- 1 Yes
- 2 No [attempt to convert]

I'm with Tetra Tech, an independent research firm. We have been hired by Xcel Energy to talk with some of their customers about the types of energy using equipment they have at their company and about the programs that Xcel Energy is offering to their business customers.

I'm not selling anything; I'd just like to ask your opinions. Let me assure you that your responses will be kept confidential and your individual responses will not be revealed to anyone unless you grant permission.

Before we start, I would like to inform you that for quality control purposes, this call will be recorded and monitored.

(Who is doing this study: Xcel Energy has hired our firm to evaluate one of the energy efficiency business programs. As part of the evaluation, we're talking with customers that did and did not participate in the program to understand their awareness and experiences with the program.)

(Why are you conducting this study: Studies like this help Xcel Energy better understand customers' need for an interest in energy efficiency programs and services.)

(Timing: This survey should take about 10 minutes of your time. Is this a good time for us to speak with you? IF NOT, SET UP CALL BACK APPOINTMENT OR OFFER TO LET THEM CALL US BACK AT 1-800-454-5070.)

(Sales concern: I am not selling anything; we would simply like to learn about your experience with high efficiency equipment and energy efficiency programs. Your responses will be kept confidential. If



you would like to talk with someone from Xcel Energy about this study, feel free to call **[program contact and phone number]**.)

(NOTE: For all questions, "DON'T KNOW" and "REFUSED" will be coded if offered as a response.)

Identification of Decision-Maker

- C1** Are you the person who is most knowledgeable about the decision making process for maintaining or purchasing new energy-using equipment at this location?
- 1 Yes (SKIP TO C3)
 2 No (ASK C2)
- C2** Who else at your firm would be more knowledgeable about your organizations' decision making processes related to maintaining existing equipment or purchasing new energy using equipment at this location? May I please speak with that person? (RECORD ONE NUMBER)
- 1 Yes (SPECIFY NAME AND BEGIN THE SURVEY AGAIN WITH THIS NEW RESPONDENT)
 2 No (TERMINATE)
 D DON'T KNOW (TERMINATE)
 R REFUSED (TERMINATE)
- C3** Who else at your company is typically involved in the decision of whether or not to purchase new equipment at this location?
- 1 No one else
 2 (SPECIFY)

Screener

- SCR1** (MOTORS) Does your organization have any motors at this location/(IF MULTIPLE) any of your locations?
- 1 Yes
 2 No (THANK & TERMINATE)
 D DON'T KNOW (THANK & TERMINATE)
 R REFUSED (THANK & TERMINATE)
- SCR2** (IF SINGLE) What is the approximate square footage of the space your business occupies at this location?
- ___ Square feet (IF Colorado RCX & < 50,000 sq ft. THANK & TERMINATE)
 D DON'T KNOW
 R REFUSED
- SCR2** (IF MULTIPLE) Are any of the buildings you oversee over 50,000 square feet?
- 1 Yes, all
 2 Yes, some (SPECIFY)
 3 No, none
 D DON'T KNOW
 R REFUSED



SCR3 (IF MOTORS) Do you have an Xcel Energy account representative assigned to your company?

- 1 Yes (ALSO ASK RCX BATTERY)
- 2 No
- D DON'T KNOW
- R REFUSED

SCR2_P Is your company currently participating in Xcel Energy's [PROGRAM], or have you participated in the past?

- 1 Yes (Thank and Terminate)
- 2 No
- D Don't Know
- R Refused

Source of Program Awareness/Social Media

PA0a Building recommissioning is a systematic process of ensuring that all of the building systems perform interactively and as efficiently as possible according to the building intent and the owner's operational needs. Before today, were you familiar with recommissioning, sometimes called "retrocomissioning"?

- 1 Yes
- 2 No
- D DON'T KNOW
- R REFUSED

PA0b Xcel Energy is offering an energy-saving program called the [program], which [program description]. Before today, had you heard of this program? (RECORD ONE NUMBER)

- 1 Yes
- 2 No (SKIP TO PA3)
- D DON'T KNOW (SKIP TO PA3)
- R REFUSED (SKIP TO PA3)

PA1 How did you learn about Xcel Energy's [program]? PROBE: Did you hear about the program from any other sources? (DO NOT READ LIST, RECORD ALL THAT APPLY)

- 1 Information in your mailbox (SKIP TO PA1a)
- 2 A phone call (SKIP TO PA1b)
- 3 By making a phone call (SKIP TO PA1c)
- 4 An online resource or e-mail (SKIP TO PA1d)
- 5 A mass advertising campaign (SKIP TO PA1e)
- 6 A workshop or Expo for customers (SKIP TO PA2)
- 7 Other (SPECIFY) (SKIP TO PA2)
- D DON'T KNOW (SKIP TO PA2)
- R REFUSED (SKIP TO PA2)

PA1a Where did you receive it from?

- 1 A flyer in your Xcel Energy bill (bill insert) (SKIP TO PA2)
- 2 Stand-alone direct mail piece from Xcel Energy (SKIP TO PA2)



- 3 Information from a vendor that sells the equipment or service related to the program (*SKIP TO PA2*)
- D DON'T KNOW (*SKIP TO PA2*)
- R REFUSED (*SKIP TO PA2*)

PA1b Who did you receive a phone call from?

- 1 From an Xcel Energy Account Manager (*SKIP TO PA2*)
- 2 From Xcel Energy's Business Solutions Center (BSC) (*SKIP TO PA2*)
- 3 From a vendor that sells the equipment or service related to the program (SPECIFY VENDOR TYPE) (*SKIP TO PA2*)
- D DON'T KNOW (*SKIP TO PA2*)
- R REFUSED (*SKIP TO PA2*)

PA1c Who did you call?

- 1 Xcel Energy about your bill or your service (*SKIP TO PA2*)
- 2 Xcel Energy specifically about the program(s) (*SKIP TO PA2*)
- 3 A vendor that sells the equipment or service related to the program (*SKIP TO PA2*)
- D DON'T KNOW (*SKIP TO PA2*)
- R REFUSED (*SKIP TO PA2*)

PA1d Which online resource?

- 1 Email from Xcel Energy (*SKIP TO PA2*)
- 2 Xcel Energy's website (*SKIP TO PA2*)
- 3 A vendor's website (*SKIP TO PA2*)
- 4 An online ad (*SKIP TO PA2*)
- 5 An Xcel Energy blog (*SKIP TO PA2*)
- 6 A blog other than Xcel Energy's (*SKIP TO PA2*)
- 7 Xcel Energy's Facebook fan page (*SKIP TO PA2*)
- 8 Xcel Energy's Twitter page (*SKIP TO PA2*)
- D DON'T KNOW (*SKIP TO PA2*)
- R REFUSED (*SKIP TO PA2*)

PA1e What type of advertising campaign?

- 1 A radio ad (SPECIFY WHEN IF POSSIBLE) (*SKIP TO PA2*)
- 2 A television ad (SPECIFY WHEN IF POSSIBLE) (*SKIP TO PA2*)
- 3 A newspaper ad (*SKIP TO PA2*)
- 4 Billboards (*SKIP TO PA2*)
- D DON'T KNOW (*SKIP TO PA2*)
- R REFUSED (*SKIP TO PA2*)

PA2 You said that you received information from **[insert sources of information from PA1]**. Did this provide you with enough information to know how to participate in the program if you wanted to?

- 1 Yes
- 2 No → What additional information would you have liked to receive? (SPECIFY)
- D DON'T KNOW
- R REFUSED



PA3 How would you prefer to learn more about the **[program]** or other energy efficiency programs offered by Xcel Energy in the future? By... (READ LIST)

- 1 Receiving information in your mailbox (SKIP TO PA3a)
- 2 Receiving a phone call (SKIP TO PA3b)
- 3 You making a phone call (SKIP TO PA3c)
- 4 You using an online resource or e-mail (SKIP TO PA3d)
- 5 A mass advertising campaign (SKIP TO PA3e)
- 6 A workshop or Expo for customers (SKIP TO PA2)
- 7 Other (SPECIFY)
- D DON'T KNOW (SKIP TO PA4)
- R REFUSED (SKIP TO PA4)

PA3a Where would you prefer to receive it from?

- 1 A flyer in your Xcel Energy bill (bill insert) (SKIP TO PA4)
- 2 Stand-alone direct mail piece from Xcel Energy (SKIP TO PA4)
- 3 Information from a vendor that sells the equipment or service related to the program (SKIP TO PA4)
- D DON'T KNOW (SKIP TO PA4)
- R REFUSED (SKIP TO PA4)

PA3b Who would you prefer to receive a phone call from?

- 1 From an Xcel Energy account manager (SKIP TO PA4)
- 2 From Xcel Energy's Business Solutions Center (BSC) (SKIP TO PA4)
- 3 From a vendor that sells the equipment or service related to the program (SKIP TO PA4)
- D DON'T KNOW (SKIP TO PA4)
- R REFUSED (SKIP TO PA4)

PA3c Who would you prefer to call?

- 1 Xcel Energy about your bill or your service (SKIP TO PA4)
- 2 Xcel Energy specifically about the program(s) (SKIP TO PA4)
- 3 A vendor that sells the equipment or service related to the program (SKIP TO PA4)
- D DON'T KNOW (SKIP TO PA4)
- R REFUSED (SKIP TO PA4)

PA3d Which online resource?

- 1 Email from Xcel Energy (SKIP TO PA4)
- 2 Xcel Energy's website (SKIP TO PA4)
- 3 A vendor's website (SKIP TO PA4)
- 4 An Online ad (SKIP TO PA4)
- 5 An Xcel Energy blog (SKIP TO PA4)
- 6 An blog other than Xcel Energy's (SKIP TO PA4)
- 7 Xcel Energy's Facebook fan page (SKIP TO PA4)
- 8 Xcel Energy's Twitter page (SKIP TO PA4)
- D DON'T KNOW (SKIP TO PA4)
- R REFUSED (SKIP TO PA4)



PA3e From what type of advertising campaign?

- 1 A radio ad (SKIP TO PA4)
- 2 A television ad (SKIP TO PA4)
- 3 A newspaper ad (SKIP TO PA4)
- 4 Billboards (SKIP TO PA4)
- D DON'T KNOW (SKIP TO PA4)
- R REFUSED (SKIP TO PA4)

PA4 Have you **[Action]** or considered **[ACTION]** in the past two years?

- 1 Yes, implemented
- 2 Yes, considered
- 3 No (SKIP TO PA8)
- D DON'T KNOW (SKIP TO PA8)
- R REFUSED (SKIP TO PA8)

PA5 What did you [IF PA4 = 1: do, IF PA4 = 2, consider doing]? (INDICATE ALL THAT APPLY)

- 1 Energy efficient motor (SPECIFY QUANTITY AND HP CLASS BY 1 to 40 HP, 41 to 100 HP, 101 to 200, 201 to 300, 301 to 500 HP, or 501 plus HP)
- 2 Variable speed drive (SPECIFY QUANTITY)
- 3 Efficiency control system (SPECIFY TYPE: Heating, Cooling, Ventilation, Lighting, or specify others)
- 4 Recommissioning study
- 5 Implemented measures recommended in recommissioning study
- 6 Other (specify) → How many?
- D DON'T KNOW
- R REFUSED

PA6 (ASK IF PA0b = YES) Did you consider participating in the **[Program]** when you [IF PA4 = 1: did this?][IF PA4 = 2, considered doing this]?

- 1 Yes
- 2 No
- D DON'T KNOW
- R REFUSED

PA6a (ASK IF PA6=1) Did you apply to participate in the **[Program]**?

- 1 Yes
- 2 No
- D DON'T KNOW
- R REFUSED

PA7 (IF PA6a<>1) Why didn't you do this through this program? (IF PA6a=1) Why didn't you complete **[ACTION]** through the program? (DO NOT READ) (RECORD ALL THAT APPLY)

- a. Application process too burdensome/Too much paperwork
- b. Takes too long to get approval
- c. No time to participate, needed equipment immediately
- d. The program had ended



- e. The equipment would not qualify (PROBE: WHY NOT?)
- f. The amount of the rebate wasn't important enough
- g. Did not know program was available for this equipment
- h. There was no program available
- i. Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

PA7a (ASK IF PA6a=1) What additional support would you need to **[ACTION]** through the program?

(RECORD VERBATIM)

PA8 Using a scale of 0 to 10, with 0 being not at all interested and 10 being very interested, how interested will you be in participating in the **[Program]** in the future?

_____ (0-10)

- D DON'T KNOW
- R REFUSED

PA9 (ASK IF A8 <7) Why wouldn't you consider participating in this program in the future? (DO NOT READ) (RECORD ALL THAT APPLY)

- a. Application process seems too burdensome/Too much paperwork
- b. Would take too long to get internal approval
- c. Xcel Energy's program pre-approval process would take too long
- c. No time to participate, would need equipment immediately
- d. The amount of the rebate isn't important enough
- e.. Program is still unclear/difficult to understand
- f. Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

Important Factors in Decisions to Purchase New Equipment

Next I'd like to ask some questions about decision making at your business.

I0a If you were considering installing processes to save energy or new energy efficient equipment at your company, where would you look for information regarding the new equipment or processes?

- 1 Internal staff (SPECIFY NAME and TITLE)
- 2 Xcel Energy website
- 3 Xcel Energy account manager
- 4 Xcel Energy Business Solution Center (BSC)
- 5 General Internet search (e.g., Google search)
- 6 Contractor/vendor



- 7 Engineer
- 8 Manufacturer
- 9 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

10b And who would you contact to implement the new equipment or process? (INDICATE ALL THAT APPLY)

- 1 Internal staff (SPECIFY NAME and TITLE)
- 2 Contractor/vendor
- 3 Engineer
- 4 Xcel Energy
- 5 Manufacturer
- 6 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

11 On a scale of 0-10, with 0 being not at all important and 10 being very important, how important would each of the following be to your business when considering new equipment or processes? (ROTATE LIST)

- ___ age or condition of existing equipment
- ___ availability of a program rebate
- ___ recommendation of utility
- ___ recommendation of contractor or supplier
- ___ compatibility with existing equipment
- ___ initial purchase cost
- ___ operating cost
- ___ length of payback period (IF GT 5, What payback period do you strive for?)
- ___ efficiency level of equipment
- ___ life of equipment
- ___ if equipment is readily available
- ___ environmental concerns
- ___ (ALWAYS READ LAST) some other consideration not already mentioned (SPECIFY)

12 Does your business have a policy that mandates the installation of energy efficient equipment when purchasing new equipment?

- 1 Yes
- 2 No (SKIP TO 14)
- D DON'T KNOW (SKIP TO 14)
- R REFUSED (SKIP TO 14)

13 What is the policy? (PROBE AND SPECIFY)

(RECORD VERBATIM)

14 What are some of the major obstacles or barriers that your business faces when considering purchasing new energy using equipment at your facility? (DO NOT READ; INDICATE ALL THAT APPLY)

- 1 Need to incorporate plans into longer term budget
- 2 Lack of capital
- 3 Time constraints



- 4 Lack of resources to implement
- 5 Approval by decision-makers
- 6 Uncertainty regarding return on investment
- 7 Contractors aren't familiar with measures
- 8 Lack of awareness of or knowledge about energy savings opportunities
- 9 Lack of knowledge about how to obtain assistance from Xcel Energy
- 10 Low prioritization of energy conservation in firm
- 11 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

I6 (MOTORS) Regarding your drives for fans and pumps, are all, some, or none of your motors driven by variable speed drives?

- 1 All
- 2 Some
- 3 None
- D DON'T KNOW
- R REFUSED

I7 How do you decide whether to rewind or repair a motor versus buying a new motor? (PROBE ON WHAT IS THE THRESHOLD)

(RECORD VERBATIM)

I8 Do you plan to install any new drives or motors in the next year?

- 1 Yes
- 2 No (SKIP TO SA8)
- D DON'T KNOW (SKIP TO SA8)
- R REFUSED (SKIP TO SA8)

I9 Which equipment types and sizes are you are likely to install, regardless if you use Xcel Energy's program or not?

- 1 1 to 40 horsepower motor (SPECIFY: Is this an upgrade or replacement?)
- 2 41 to 100 horsepower motor (SPECIFY: Is this an upgrade or replacement?)
- 3 101 to 500 horsepower motor (SPECIFY: Is this an upgrade or replacement?)
- 4 500+ horsepower motor (SPECIFY: Is this an upgrade or replacement?)
- 5 1 to 50 horsepower VFD
- 6 51 to 200 horsepower VFD
- 7 200+ horsepower VFD
- D DON'T KNOW
- R REFUSED



I10 (CONTROLS) Is your heating, cooling, ventilation, lighting or other systems at this location managed by a centrally controlled system? (INDICATE ALL THAT APPLY)

- 1 Yes, lighting
- 2 Yes, heating
- 3 Yes, cooling
- 4 Yes, ventilation
- 5 Yes, other (SPECIFY)
- 6 No
- D DON'T KNOW
- R REFUSED

Satisfaction

SA8 I would like you to think in terms of your satisfaction with Xcel Energy overall. On a 0-to-10 scale where 0 means VERY DISSATISFED and 10 means VERY SATISFIED, how would you rate your satisfaction with Xcel Energy? (IF NECESSARY, SAY:) You can use any number from 0 to 10. (REPEAT SCALE IF NECESSARY)

- _____ (0-10)
- D DON'T KNOW
- R REFUSED

OPERATING HOURS

Next I'd like to talk about the hours that your business is open.

H1 During what days of the week and hours of the day is your business open for operations? (RECORD DAYS OPEN AND OPENING AND CLOSING TIME IN MILITARY TIME)

- 1 Monday OPEN TIME: _____ CLOSE TIME: _____
- 2 Tuesday OPEN TIME: _____ CLOSE TIME: _____
- 3 Wednesday OPEN TIME: _____ CLOSE TIME: _____
- 4 Thursday OPEN TIME: _____ CLOSE TIME: _____
- 5 Friday OPEN TIME: _____ CLOSE TIME: _____
- 6 Saturday OPEN TIME: _____ CLOSE TIME: _____
- 7 Sunday OPEN TIME: _____ CLOSE TIME: _____
- 8 Open 24 hours a day, 7 days a week



Customer Characteristics

F1 Last, I'd like to ask you a few more questions regarding your facility.

What business activity accounts for most of the floor space covered by your Xcel Energy bill at **[ADDRESS]**? (RECORD VERBATIM AND THEN CODE BELOW)

- 1 Office/professional
- 2 Data center/computer server farm
- 3 Warehouse or distribution center
- 4 Food sales or service→What is the total seating capacity of the food service areas in this building? _____
- 5 Retail
- 6 Education→How many students can be seated in all of the classrooms in this building at one time? _____
- 7 Religious worship→What is the total seating capacity of the religious worship areas in this building? _____
- 8 Public assembly→What is the fixed seating capacity of the public assembly areas in this building? _____
- 9 Health care→(IF APPLICABLE) What is the inpatient licensed bed capacity? _____
- 10 Service
- 11 Lodging→How many guest rooms or occupant rooms are there? _____
- 12 Public order and safety
- 13 Industrial/Manufacturing (SPECIFY)
- 14 Agricultural (SPECIFY)
- 15 Vacant (SPECIFY)
- 16 Leisure/Recreation (SPECIFY)
- 16 Other (SPECIFY IN DETAIL)
- D DON'T KNOW
- R REFUSED

F2 Which of the following best describes the space you occupy at **[ADDRESS]**? Is it . . . ? (READ LIST)

- 1 Located in an enclosed shopping mall
- 2 Located in an unenclosed shopping mall
- 3 Occupies part of a free-standing building
- 4 Occupies an entire free-standing building
- 5 Occupies part of a single building with apartments attached
- 6 Occupies an entire single building with apartments attached
- 7 Located in an apartment complex
- 8 Space at **[ADDRESS]** is the common area of an apartment/rental property
- 9 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

F4 Do you own or rent/lease the space you occupy at this location?

- 1 Own
- 2 Rent/lease
- 3 Own some and rent/lease some
- 4 Manage property
- 5 Other (SPECIFY)



D DON'T KNOW
R REFUSED

F6 What actions other than the ones we have already discussed has your business taken at this location within the past few years in order to reduce your energy use? (DO NOT READ; INDICATE ALL THAT APPLY)

- 1 None
- 2 Installed high efficiency lighting equipment
- 3 Added lighting controls, occupancy sensors, and or time clocks
- 4 Installed high efficiency cooling equipment
- 5 Installed high efficiency heating equipment
- 6 Installed high efficiency ventilation equipment
- 7 Added controls to the heating, ventilation or air conditioning systems to reduce use
- 8 Made changes to the heating, ventilation or air conditioning system maintenance schedule
- 9 Made changes to the building envelope such as insulation, window film, etc.
- 10 Participated in other Xcel Energy energy efficiency programs (SPECIFY)
- 11 Facility-wide energy awareness training
- 12 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

F7 (IF HAVEN'T DONE ANYTHING) What are the reasons you haven't made any additional energy saving improvements at this facility? (DO NOT READ; CIRCLE ALL THAT APPLY)

- 1 No need
- 2 Lack of available equipment
- 3 High initial cost
- 4 Don't know what to do
- 5 Don't have the staff to identify or make these improvements
- 6 Customer comfort
- 7 Need for certain look/feel (aesthetics)
- 8 Disruption to business operations
- 9 Lease the space
- 10 Poor economy
- 11 Budget constraints
- 12 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

F8 Can we have your permission to release your company's answers to Xcel Energy on an individual basis and possibly have a representative from Xcel Energy follow up with you to discuss issues that are of particular concern to you?

- 1 Yes
- 2 No
- D DON'T KNOW

F9 Those are all of the questions that we have. For confirmation, can you please tell me your title?

(RECORD VERBATIM)



COM I'd like to thank you for your help with this survey! Do you have any comments you'd like to share?

(RECORD VERBATIM)

Table 11-2. Nonparticipant Survey Cooperation Rate

Sample Disposition	Colorado	Minnesota
Sample Size	599	684
Number not in service	44	58
Non-working number	1	0
Ineligible for program	24	57
Ineligible- other ³	33	40
Disconnected number	17	19
Non-business number	5	12
Adjusted Sample Size	475	498
Hard Refusal	19	27
Soft Refusal	33	23
Incompletes (partial interviews)	8	14
Unavailable for duration	14	12
Language barrier/non-English	0	0
Active ¹	307	301
Completed Surveys	94	121
Cooperation Rate²	19.8%	24.3%

¹ An average of 8 contacts per active case were made to reach these still active cases

² Number of completed surveys divided by Adjusted Sample Size

³ These include cases where the respondent indicated they had very recently complete



APPENDIX E: BENCHMARKING PROGRAM MANAGER INTERVIEW GUIDE

Xcel Energy DSM Evaluation Program Managers Interview Guide –
Task 6 Peer Utility Benchmarking: Final 8/12/10

Introduction

Identify Xcel Energy as the company commissioning this study; provide a brief description of Xcel Energy's program, then a brief description of the program that we're interested in learning more about in an effort to improve Xcel Energy's program.

Explain purpose of study and which measures you want to discuss (e.g., motors and drives) if others may be included in program.

Offer to share results as motivation to participate – see needed information to share study results at the end of this interview guide.

Program scope and goals

- 1) What are your roles and responsibilities for the program? Is the program managed internally or by a 3rd party?
- 2) What are your program goals and/or objectives? (Probe for both written and informal) Who sets the goals? Are they annual goals or multiyear goals?
- 3) Overall, how effective has the program been in achieving these goals and objectives? Are there ways you think the program could be more effective in achieving its goals?

Program Design, Measures and Incentives

- 4) What are the products/measures offered by your program?
 - a) (Motors) Do you have a custom measure component?
 - i) (If YES) What types of projects are typically covered?
 - b) (Motors) Do you have a motor inventory program?
 - i) (If YES) Is the program run in-house or outsourced?
 - (1) What aspects are outsourced?
 - c) (Motors, if Drives component) What types of end use equipment must the drives be used for?
 - d) (RCx) How does the program offer incentives for the recommissioning study and the implementation of recommended opportunities? Independently or are they linked?
 - e) (Efficiency Controls) Does the program offer incentives for whole-building HVAC or lighting controls systems?
- 5) Which measures comprise the bulk of the program?



- a) (Motors) Are there any particular measures that customers are not purchasing/installing? (If YES) Why do you think this is?
- b) (RCx) Are the recommissioning studies identifying all of the opportunities available at a facility? How do you encourage exhaustive recommissioning studies?
- 6) How do you determine your baseline and technical assumptions for energy impacts? What M&V do you conduct as part of project implementation? Probe about thresholds for conducting M&V, percentage of projects, etc.
- 7) What is the incentive structure (i.e. prescriptive, custom, both)? How are incentive levels calculated?
- 8) What are the current rebate/incentive levels as a proportion of typical project costs?
- 9) How have your rebate levels changed over time?
 - a) (If changes made) Why did you make these changes?
- 10) What documentation or approvals are required to receive a rebate?
 - a) (Motors) Does this vary by motor size?
 - b) Do you have any special arrangements for receiving applications from trade allies on behalf of customers?
 - c) Have you had any problems obtaining correctly completed documentation from customers or trade allies?
 - i) If YES, What problems do you have, and what steps have you taken to address this?
 - d) Do trade allies receive incentives from your program? (get description)
 - i) (if NO) Have you ever offered these incentives?
 - (1) If (YES) Why did you eliminate the incentives?
- 11) (RCx specific questions) What percentage of your customers implement the opportunities identified in the RCx study within one year? What have you found effective in decreasing that turnaround time? What is the typical timeframe for implementing measures?

How many studies do you review on an annual basis? Who and how many individuals review them? Are they internal engineers or is it done by a 3rd party?

How much calculation detail is required? What assumptions do you allow?

Do you allow study providers to include non-RCx items in the study?

How do you handle providers who find minimal savings per the study-portion of the RCx program?
- 12) What external influences are impacting your program? How are you addressing them?



- a) (Motors) Probe on expected program changes when federal regulations for new motors efficiency change in 2011.
- 13) What has worked particularly well with the program? What has been a problem?
- 14) What do you see as future challenges for the program?
- 15) Have you performed any net-to-gross or spillover calculations for the program? (If YES) How were those derived, and what are the results? (If NO) Does your program incorporate net-to-gross, free-ridership or spillover, and if yes, what are those numbers?
- 16) How do you estimate and track penetration and standard practice in your market? Does this vary by customer segment?

Program recruitment and participation

- 17) How long has the program been offered?
- 18) What types of customers do you target for the program (business types, size, etc.)?
 - a) What is the mix of managed and non-managed accounts?
 - b) Do you have eligibility requirements relating to customer energy consumption or building size? If so, what are those thresholds, and how did you determine them?
- 19) What is the process for recruiting customers for the program, and who does this?
 - a) Do you use any outside contractors for customer recruitment or providing other services to customers related to the program?
 - b) Are there other marketing efforts? Any social media marketing?
- 20) (Motors, RCx) Do you do anything different to target small to mid-size businesses (Motors - less than 500 KW, RCx – less than 200 kW peak demand or unmanaged, Controls - unmanaged)? Probe about any effective strategies with this sector.
- 21) Do you segment customers for marketing your program? If yes, how? What key customer segments participate in the program? What customer segments do not participate?
- 22) Why do customers typically decide to participate in the program? Do reasons vary by customer types (or segments)?
- 23) What are the major barriers to participation?
- 24) How does the program leverage the trade ally market infrastructure?
 - a) (If allies utilized) How do you conduct outreach to trade allies? Has this been effective?
 - b) What do allies have to do to participate in the program (e.g. attend training, register, etc)
 - c) (RCx) How does the program communicate what is expected in the RCx study to the vendors?



- d) (Motors, Efficiency Controls) What types of vendors typically participate in the program (e.g. lighting, HVAC, process)?
 - e) (Motors, Efficiency Controls, RCx) What tools or information do you provide to vendors to inform their customers about program offerings and requirements?
- 25) Do you offer trade ally incentives?
- a) If YES, what are the incentive levels, and what is required of the trade allies to get them?
 - b) Are the incentives offered always or periodically? Why?

Conclusion

- 26) Are there any other topics that we have not covered in this interview that we should be aware of about this Program?
- 27) Do you have any program information (e.g., FAQ sheets, evaluation results) that you would be willing to share with us?

Thank you for your time. Verify their name, position and email address for receiving the summary of results (if a summary of the results is desired).